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Division of labour between Poland and member countries of the European Communities: Past experiences and prospects

Kiel Working Papers, No. 536

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Suggested citation: Misala, Józef (1992) : Division of labour between Poland and member countries of the European Communities: Past experiences and prospects, Kiel Working Papers, No. 536, <http://hdl.handle.net/10419/47224>

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Kieler Arbeitspapiere Kiel Working Papers

Kiel Working Paper No. 536

DIVISION OF LABOUR BETWEEN POLAND
AND MEMBER COUNTRIES OF THE
EUROPEAN COMMUNITIES;
PAST EXPERIENCES AND PROSPECTS

by
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ISSN 0342 - 0787

Institut für Weltwirtschaft
Düsternbrooker Weg 120, 2300 Kiel

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Weltwirtschaft
Kiel
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October 1992

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**DIVISION OF LABOUR BETWEEN POLAND
AND MEMBER COUNTRIES OF THE EUROPEAN COMMUNITIES;
PAST EXPERIENCES AND PROSPECTS***

Introduction

Poland is a country which initiated recent profound political, economic and social transformation in Eastern and Central Europe. As a result of the so-called Round-Table negotiations, of agreements between the ruling Communist Party and Solidarity-led opposition, and of the parliamentary elections held in June 1989, the first non-communist government was formed and began to stabilize national economy and to transform the economic system of the country to a market-oriented economy. These endeavours were continued in the following years by the subsequent Polish governments, albeit with different intensity and results. Nevertheless, since 1989 the situation in the country has changed considerably. Poland begun i.a. to be a country with the "demand-constrained" economy (instead of the "resources-constrained" one), the majority of prices are free, economic relations with abroad are substantially liberalized etc.

The political, economic and social changes in Poland — and not only — are observed in (and supported by) the so-called West, and perhaps especially the member countries of the European Communities (EC for short) which — as a result of German unification and endeavours to accomplish by the end of 1992 the well-known program "Europe 1992" — are now more or less directly bordering Poland. Moreover, an association agreement (the so-called Europe Agreement) between Poland (also Czecho-Slovakia and Hungary) and the European Communities was signed in December 1991. The aim of this agreement is to provide appropriate framework for the development of political dialogue and for widely understood economic and cultural relations between the partners, including the creation of a free trade area in industrial products in the ten following years. Generally, we have also to do with the establishment of preconditions of the new stage of division of labour between the member countries of the European Communities and Poland (also Czecho-Slovakia and Hungary) where the Europe Agreements are clearly treated as specific vehicles to full membership in the EC.

* 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. Orłowski for many helpful comments, as well as 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 study is to overview the development of trade relations between Poland and the member countries of the European Communities in the last years (with special regard to the period 1989-1991), and to discuss various aspects of the pattern of division of labour between these partners. The paper is organized as follows. In chapter I traditional analysis of import and export relations between Poland and the EC is presented. Then follows a description of the pattern of division of labour between Poland and the member countries of the European Communities in the years 1989-1991 with an application of the well-known B. Balassa's concept of "revealed comparative advantage" [Balassa, 1976] at the two-, and four-digit level of statistical data aggregation according to the Combined Nomenclature (CN) adopted some years ago by the EC members and since 1989 also adopted by Poland. Chapter III entails an analysis of the intra-industry specialization between these countries, while in chapter IV prospects for trade specialization are investigated.

The analysis in chapter I deals with total trade of Poland with the EC member countries (trade operated both by state-owned enterprises and by private enterprises). Contrary to this, due to the lack of appropriate data, analyses in chapters II and III refer only to the trade of Poland's public sector in the years 1989-1991 for which accordingly disaggregated statistical material from the Polish sources is available. It is intended to repeat the research-work with regard to the trade of private persons and enterprises from Poland with the EC member countries and to compare the results with those obtained in the presented study when the appropriate statistical data are available. Anyway, it seems reasonable to study more deeply the pattern of division of labour of Poland's public sector with partners from the EC in the year preceeding political, economic and social changes in the country and during two years of the transition from the planned economy to the market one. The data are provided by the Centrum Informatyki Handlu Zagranicznego (Foreign Trade Informations Centre) from Warsaw.

Just to explain some definitions and to avoid misunderstandings. The division of Polish economy into two sectors with regard to property rights is up-to-now a clear conventional one. The private sector in foreign trade comprises activities of private persons, of private companies of commercial law, of joint-ventures with foreign capital and their representatives, as well as of foundations, while the public sector activities comprise the former state-owned foreign trade enterprises (centralas) which are privatised now. 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 CN sections and divisions are provided in the respective tables only. However, the respective CN codes are mentioned in these tables.

I. Poland and Member Countries of the European Communities as Trading Partners

Member countries of the EC have always been important trade partners of Poland. Imports from these countries made usually up to 20 % of the total Polish imports and Polish exports to them made up to 22 % of the total Polish exports during the 1970's and early 1980's. However, in the 1980's their share in the Poland's foreign turnover clearly increased. This was especially visible after 1989.

Table 1 — Geographical Structure of Poland's Foreign Trade in Selected Years of 1981-1991 (% of total turnover in current prices in Polish zlotys)

Specification	1981	1985	1986	1987	1988	1989	1990 ^a	1991 ^a
	<i>Poland's Imports</i>							
World	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Central and Eastern Europe	51.3	60.7	60.8	53.2	47.1	40.1	22.4	19.0
EC countries	20.6	20.1	21.3	25.1	28.3	33.8	45.6	49.9
Other countries	28.1	19.2	17.9	21.7	24.6	26.1	32.0	31.1
	<i>Poland's Exports</i>							
World	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Central and Eastern Europe	45.1	54.8	53.9	48.5	46.5	40.6	21.5	16.8
EC countries	24.4	22.4	22.1	26.5	28.3	32.1	47.2	55.6
Other countries	30.5	22.8	24.0	25.0	25.2	27.3	31.3	27.6

^a With private trade

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

In connection with the radical change of political and economic situation in Poland and with the collapse of the trade system within the former Council for Mutual Economic Assistance (CMEA), the geographical structure of the Polish foreign trade has visibly altered in favour of an increasing role of Western market economies. On both imports and exports of Poland, the market of the EC member countries has begun to be considered as the most important. All this has brought some evolution in the trade structure of the EC. However, respective change was relatively small. The share of Poland in the external imports of the EC member countries increased from 0.5 % in 1984 to 0.9 % in 1989, 1.2 % in 1990 and 1.3 % in 1991, while the share in the EC's external exports in respective years was 0.5 %, 1.0 %, 1.1 % and 1.9 %. Therefore, the great asymmetry in trade dependence of the partners still exists.

One of the most characteristic features of the Poland's total foreign trade, as well as of its trade with the EC member countries, was the speedy development of the private sector's external transactions in the last three years. This was especially true for the imports dealings which in 1990 constituted 17.9 % and in 1991 even 62.0 % of the total value of Poland's global imports from these countries. Respective shares in Poland's exports to them were 5.8 % and 27.8 %. Two major conclusions are clearly emerging. Firstly, when studying changes in the pattern of division of labour between Poland and the EC member countries in the years 1989-1991 one has to take into consideration that foreign trade transactions reflect decisions of state owned companies which

are less determined by economic factors than decisions of private firms. Secondly, when thinking about the future pattern of the division of labour between Poland and the EC member countries one has to take into account that the state will reduce its activities. Table 2 exhibits the dynamics and structure of the Poland's state trade and private trade with these countries so far as it is possible at the moment.

Table 2 — Dynamics and Structure of Poland's Trade with the EC Member Countries in 1981-1991 by Status of Transactors (earlier year = 100, %; current prices)

Specification	Dynamics										Share of private trade in %	
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1990	1991
<i>Poland's imports</i>											17.9	62.0
Total	88.9	101.1	114.8	117.4	87.4	97.6	118.2	143.1	821.4	200.7	x	x
Private imports	.	.	.	.	.	.	.	.	.	696.3	x	x
<i>Poland's exports</i>											5.8	27.8
Total	109.5	107.0	136.2	108.6	82.5	98.6	115.6	114.8	1029.5	136.4	x	x
Private exports	.	.	.	.	.	.	.	.	.	648.1	x	x

Source: As in Table 1.

Table 3 — Geographical Structure of the Poland's Foreign Trade with the EC Member Countries in Selected Years of 1981-1991 (%)

Countries	Poland's imports					Poland's exports				
	1981	1985	1989	1990	1991 ^b	1981	1985	1989	1990	1991 ^b
Belgium	4.3	6.3	5.0	3.3	5.3	5.0	4.0	3.8	3.4	3.6
Denmark	2.0	2.1	3.3	2.7	4.3	3.8	5.1	4.5	3.8	4.2
France	23.1	8.6	9.7	7.0	7.3	11.1	10.0	7.5	6.9	6.8
Greece	2.4	0.4	1.3	0.7	0.8	1.8	1.4	1.9	1.2	0.7
Spain	1.0	1.1	1.6	1.2	1.9	2.5	2.9	2.1	1.5	1.0
Netherlands	5.9	8.6	7.2	6.2	9.8	5.0	7.6	12.7	6.7	9.3
Ireland	0.4	0.3	0.4	0.5	0.3	0.8	1.8	1.6	0.9	0.6
Luxemburg	0.1	0.1	0.1	0.1	0.2	0.0	0.1	0.1	0.2	0.4
Portugal	0.0	0.1	0.1	0.1	0.1	0.3	0.4	0.2	0.1	0.1
Germany ^a	35.3	44.6	48.4	47.3	53.2	42.6	39.0	44.0	53.8	53.0
Great Britain	15.8	17.4	9.6	13.3	8.0	15.3	17.9	12.8	15.2	12.8
Italy	9.7	10.4	13.3	17.6	8.8	11.8	9.8	8.8	6.3	7.5
EC-12	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

^a Until 1989 without the former East Germany but with West Berlin; ^b Private trade included.

Source: As in table 1.

Germany is by far the leading trade partner of Poland among the EC member countries, and with clearly increasing importance in the last years even despite the fact that the accession of the former German Democratic Republic to the Federal Republic of Germany in 1990 has led to the disastrous collapse of many economic relationships between Polish enterprises and enterprises from the new Bundesländern.¹ The United Kingdom, France, Italy and the Netherlands followed usually Germany on the list of Poland's trade partners being the founding members of the European Communities, while Luxemburg, Portugal, Greece and Spain have played up-to-now only a minor role. On the whole, it is not only geographic proximity which can be made responsible for the surge of Polish external turnover towards European Communities' members, and towards Germany especially. One has to add to this many other factors, and among them first and foremost structural and technological ones.

According to the rather very misleading Polish nomenclature of traded goods (unfortunately still presented in the yearbooks of the Main Statistical Office in Warsaw), products of electro-engineering industry dominated clearly in the turnover between Poland and member countries of the EC. They were usually followed by the products of basic metal industry and products of wood and paper industry. In Poland's imports important were also as a rule products of the other industries, while in its exports fuels and power, products of agriculture and products of forestry.

The ranking of goods has changed somewhat in recent years. When analysing data of table 4, it comes out that in the imports of Poland the share of fuels and power, and of products of the main industries (excluding chemical and wood and paper industries) increased, while in its exports the same was true with regard to the share of products of basic metal industries, of products of mineral industry, and especially with regard to the share of products of construction industry and of products of mineral industry. In connection with this, the structure of the balance of trade changed, too.

Trade balance of Poland vis-à-vis the member countries of the EC was in the 1980's a positive one. This was also and even especially true for 1990 when the surge of Polish exports on the Western countries' markets occurred in reaction to the continuing slack domestic demand being the result of the government's tight monetary, fiscal and income policies. In 1991, Poland's state controlled part of the economy had still a positive trade balance with the EC's member countries but the surplus was smaller than in the previous year.

¹ See among others: Misala, Pac, Kalinowska [1991], Misala [1992b].

Table 4 — Commodity Pattern of the Poland's Trade with the EC Member Countries in Selected Years of 1985-1991 (%)

Specification	1985	1989	1990	1991 ^a
<i>Poland's imports</i>				
Fuels and power	1.3	1.2	5.2	5.4
Products of basic metal industries	12.2	12.0	8.4	3.9
Products of electro-engineering industry	30.7	37.6	50.5	43.7
Products of chemical industry	30.3	23.2	16.6	15.6
Products of mineral industry	1.4	1.2	1.4	2.3
Products of wood and paper industry	0.8	1.1	1.1	2.6
Products of light industry	5.2	5.1	4.0	5.1
Products of food industry	10.1	9.9	8.9	13.3
Products of other industries	1.2	2.0	2.3	4.0
Construction	-	0.0	0.1	0.0
Products of agriculture	6.7	6.6	1.4	4.0
Products of forestry	0.1	0.1	0.1	0.1
Products not elsewhere classified	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0
<i>Poland's exports</i>				
Fuels and power	25.4	10.9	10.8	7.6
Products of basic metal industries	15.8	18.1	19.6	19.3
Products of electro-engineering industry	11.5	17.7	18.4	17.8
Products of chemical industry	11.9	9.7	11.3	8.2
Products of mineral industry	1.1	1.5	2.2	4.5
Products of wood and paper industry	4.5	5.5	5.4	9.0
Products of light industry	7.2	6.7	6.8	7.0
Products of food industry	12.2	17.3	12.7	11.5
Products of other industries	0.5	0.7	0.6	1.6
Construction	2.2	2.4	5.1	5.0
Products of agriculture	7.0	8.8	6.2	7.9
Products of forestry	0.6	0.3	0.5	0.4
Products not elsewhere classified	0.1	0.4	0.4	0.2
Total	100.0	100.0	100.0	100.0
^a Private trade included.				

Source: As in table 1.

Exports of construction products and services, as well — albeit to smaller degree — exports of products of forestry, of products of basic metal industries, of products of wood and paper industry, of products of agriculture, of products of mineral industry, of fuels and power, and of products of light industry were mainly responsible for the positive trade balance of Poland in its trade relations with the EC's member countries. On the contrary, in trade turnover with these countries Poland faced as a rule deficit in turnover of products of electro-engineering industry, of products of chemical industry and of products of the so-called other industries. In contrast to the 1980's, in 1991 Poland had additionally a trade deficit with products of food processing industry, this industry belonging to the group of the least efficient industries in this country [Report, 1990]. Additionally, reductions of exports' surpluses in the exchange of fuels and power, and of products of light industry

were observed. Summarizing, in 1991 Polish positive trade balance in relations with the EC member countries was mainly based on exports of construction goods and services, and — to much lesser degree — on exports of products of forestry, of products of basic metal industries, of products of wood and paper industry, of products of agriculture, of fuels and power, and of products of light industry.

Table 5 — Exports/Imports' Ratios by Comodity Groups in Poland's Trade with the Member Countries of the European Communities in Selected Years of 1985-1991 (%)

Specification	1985	1989	1990	1991 ^a
Fuels and power	2 224.3	1 138.8	371.9	149.7
Products of basic metal industries	151.9	181.9	416.9	515.5
Products of electro-engineering industry	44.3	57.3	64.9	43.3
Products of chemical industry	45.3	50.2	122.0	55.7
Products of mineral industry	84.7	145.4	273.7	203.5
Products of wood and paper industry	626.3	630.6	845.9	373.6
Products of light industry	163.3	158.9	299.2	144.6
Products of food industry	137.1	201.2	255.1	90.0
Products of other industries	44.5	40.6	45.4	41.5
Construction	x	20 145.4	16 602.4	186 988.6
Products of agriculture	118.9	148.7	800.8	208.3
Products of forestry	711.0	264.0	9 697.5	1 526.7
Products not elsewhere specified	167.5	457.4	668.9	480.1
Total	116.0	119.6	178.4	105.7

^a Private trade included.

Source: As in table 1; own calculations.

II. Pattern of Competitiveness in Trade Relations between Poland and the EC Member Countries

In order to measure and to study more deeply the structure of Poland's competitiveness vis-à-vis the European Communities' member countries, a variant of the "revealed comparative advantage" (RCA) concept, originally proposed by Balassa [1976], was applied.² The specific version of the indicator was chosen as follows:

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

² The reasons are quite obvious. As Never and Röller [1990, p. 101] write "a standard approach to assess comparative advantage 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 shortage of reliable data".

where:

x_i — Poland's exports to the EC member countries of "i" commodity group or products

m_i — Poland's imports from the EC member countries of "i" commodity group or products

X — Total Poland's exports to the EC member countries

M — Total Poland's imports from the EC member countries

t — years' indices

i — commodity groups' or products' indices.

Table 1 presents the results of calculations of the RCA values at the two-digit level of statistical data aggregation according to the Combined Nomenclature. The negative RCA values indicate lack of revealed comparative advantage, while the positive ones the existence of revealed comparative advantage of Poland in its trade relations with the EC member countries. Every RCA indicator is intended to describe only what is, and not what ought to be, or what is rational and efficient. Therefore, there is a necessity of discussion (but also a room for it) just to point out the main important causes explaining the structure of competitiveness measured as mentioned above.

Table 6 — RCA Indices in Poland's Trade with the EC Member Countries at the Two-Digit Level of the CN in 1989-1991

CN Code	Specification	1989	1990	1991
01	Live animals	5.05	4.60	2.89
02	Meat and plucks	0.45	1.79	0.01
03	Fish and Crustaceans	2.51	2.30	1.91
04	Dairy products, eggs and honey	0.55	1.02	0.37
05	Other animal products	1.16	0.76	0.45
06	Live plants and trees, bulbs, cut flowers	0.38	0.65	-0.10
07	Edible vegetables, roots, tubers	4.59	5.17	4.78
08	Edible fruit and nuts	0.32	0.66	0.60
09	Coffee, tea, mate and spices		-1.49	-4.10
10	Cereals	-4.17	-0.29	-1.18
11	Products of the milling industry, malt, etc.	-0.10	2.06	1.58
12	Oil seeds and fruits, grains, staw, fodder	2.35	2.98	1.62
13	Lacs, gums, resins and other vegetable saps		-3.89	-3.99
14	Vegetable plaiting materials	-2.86	-3.07	-3.59
15	Animal or vegetable fats and oils	-1.80	-1.02	-1.70
16	Preparations of meat, of fish or of crustaceans	1.96	0.46	0.32
17	Sugar and sugar confectionary	0.36	1.45	1.18
18	Cocoa and cocoa preparations	-1.33	-2.14	-2.05
19	Preparations of cereals, flour, starch or milk	1.20	-3.81	-5.41
20	Preparations of vegetables, fruit and nuts	2.40	1.38	1.84
21	Miscellaneous edible preparations	-2.27	-2.07	-2.07
22	Beverages, spirits and vinegar	-0.94	-1.06	-0.65
23	Residues from the food industries and fodder	-1.62	-1.76	-1.54
24	Tobacco and manufactured tobacco substitutes	-0.21	-1.09	-4.15
25	Salt, sulphur, earth, stone, cement etc.	0.66	0.72	1.30
26	Ores, slag and ash	-2.64	-1.52	-2.42
27	Mineral fuels and oils, waxes	2.57	0.73	0.82
28	Inorganic chemicals, compounds of metals	-0.43	0.03	-0.08
29	Organic chemicals	-0.44	-0.41	-0.35

Table 6 continued

CN Code	Specification	1989	1990	1991
30	Pharmaceutical products	-2.90	-2.54	-3.65
31	Fertilizers	3.60	5.37	1.51
32	Tanning or dyeing extracts, dyes, pigments	-0.54	-0.46	-0.88
33	Essential oils and resinoids, perfumery	-2.89	-3.02	-4.21
34	Soap, washing preparations	-1.75	-1.83	-2.70
35	Albuminoidal substances	1.85	1.07	0.67
36	Explosives, pyrotechnic products, matches	0.58	2.14	1.69
37	Photographic or cinematographic goods	-2.63	-2.48	-3.83
38	Miscellaneous chemical products	-3.30	-2.51	-3.18
39	Plastics and articles thereof	-1.21	-0.63	-0.61
40	Rubber and articles thereof	-0.65	-0.15	-0.40
41	Raw hides and skins and leather	-0.70	0.82	-0.25
42	Articles of leather, saddlery and harness	3.18	2.20	2.03
43	Furskins and artificial fur	3.33	2.88	-0.65
44	Wood and articles of wood	3.75	4.29	3.13
45	Cork and articles of cork	-5.60	-5.03	-6.17
46	Manufactures of staw and other plaiting material	.	8.62	-1.08
47	Pulp of wood or of other cellulosic material	1.65	0.70	-0.82
48	Paper and paperboard	0.09	0.41	-0.07
49	Printed books, newspapers, pictures etc.	-2.05	-2.07	-2.41
50	Silk	1.57	2.25	0.94
51	Wool, animal hair, yarn and woven fabric	0.18	-0.21	-0.58
52	Cotton	-1.98	-0.90	-2.57
53	Other vegetable textile fibres, paper yarn	0.54	0.32	-1.00
54	Man-made filaments	-1.60	-0.30	-0.03
55	Man-made staple fibres	-1.87	-1.39	-1.91
56	Wadding, felt and non-woven special yarns	-0.44	-0.38	-2.08
57	Carpets and other textile floor coverings	0.34	0.64	2.04
58	Special woven fabrics, tufted textile fabrics	2.17	1.29	0.30
59	Impregnated, coated or laminated textile fabrics	-2.19	-2.74	-2.19
60	Knitted or crocheted fabrics	0.81	0.71	0.44
61	Articles of apparel and clothing accessories, knitted or crocheted	-0.52	0.74	0.90
62	Not knitted or crocheted articles of apparel and clothing	0.21	0.01	-0.28
63	Other made up textile articles	2.44	2.58	2.00
64	Footwear, garters and the like	1.50	1.18	1.25
65	Headgear and parts thereof	-5.65	0.76	3.10
66	Umbrellas, sticks, whips, riding-crops	0.54	-5.32	.
67	Prepared feathers and down	.	.	.
68	Articles of stone, plaster, cement, asbestos etc.	-1.57	-1.43	-0.97
69	Ceramic products	-0.75	-0.22	0.21
70	Glass and glassware	1.08	1.34	1.33
71	Pearls, precious stones and metals	2.35	2.96	2.79
72	Iron and steel	0.54	0.56	0.7
73	Articles of iron and steel	1.51	0.72	1.11
74	Copper and articles thereof	1.90	3.19	3.07
75	Nickel and articles thereof	0.58	1.07	-2.68
76	Aluminium and articles thereof	-2.57	-0.12	-0.33
78	Lead and articles thereof	8.18	0.73	0.78
79	Zinc and articles thereof	2.97	2.33	4.09
80	Tin and articles thereof	.	-7.25	-3.18
81	Other base metals, cements and articles thereof	-1.94	-2.00	-2.97
82	Tools, implements, cutlery, spoons and forks	0.02	-0.08	0.19
83	Miscellaneous articles of base metal	-0.15	-0.65	0.18

Table 6 continued

CN Code	Specification	1989	1990	1991
84	Nuclear reactors, boilers, machinery and appliances	-1.67	-1.94	-1.57
85	Electrical machinery and equipment, recorders etc.	-0.16	-0.87	-0.60
86	Locomotives, rolling-stock, track fixtures	1.03	-0.11	-1.41
87	Vehicles other than railway or tramway rolling-stock	-0.72	-0.96	-1.04
88	Aircraft, spacecraft and parts thereof	0.97	1.92	-1.32
89	Ships, boats and floating structures	3.80	2.13	2.76
90	Instruments and apparatus	-2.09	-2.19	-1.76
91	Clocks and watches and parts thereof	-1.36	-1.92	-3.79
92	Musical instruments	0.80	0.65	-0.93
93	Armes and ammunition	1.35	0.77	-2.55
94	Furniture, bedding, mattresses, lamps	4.30	3.34	4.04
95	Toys, games and sports requisites	0.00	-1.53	-1.92
96	Miscellaneous manufactured articles	-0.31	-0.89	-0.57
97	Works of art, collectors' pieces and antiques		3.93	1.79

Source: CIHZ [1992].

Table 7 — Stability of Competitiveness' Structure in Poland's Trade with the EC Member Countries at One-, and Two-Digit Levels of the CN in 1989-1991 (correlation coefficients, n=21 and 94 respectively)

Periods	At the one-digit level	At the two-digit level
1989/1990	0.79	0.62
1990/1991	0.76	0.75
1989/1990	0.54	0.65

^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: Data of table 6 and table 1 in the annex; own calculations.

There appeared some changes in the structure of revealed comparative advantages in trade between Poland and the EC member countries after 1989 which reflect the new political, institutional and economic circumstances. However, the structure of Poland's competitiveness vis-à-vis these countries remained by and large stable and this in turn makes it easier to some extent to explain the pattern of comparative advantages, as well as to draw some conclusions concerning the possible development in the future.

The correlation coefficients obtained are compatible to a great extent with the proposition concerning inter-temporal stability of competitiveness' structure in Poland's trade with the EC member countries in 1989-1991. In order to explain the pattern of competitiveness the neo-factor hypothesis based on the Heckscher-Ohlin-Samuelson theorem and the neo-technology hypothesis are applied. Having in mind these two hypotheses (in reality sets of them), one can divide the traded goods into several groups.

Möbius and Schumacher [1991], Böhnlein and Heitger [1991], and Böhnlein and Caspari [1991] studied the structure of Poland's exports to the EC member countries in 1989 and 1990 at the four-digit level of the CN. Table 8 presents the results obtained by Möbius and Schumacher [1991], and by Böhnlein and Heitger [1991].

Table 8 — Value of the 50 Most Important Products Exported by Poland to the EC Member Countries and Trade Barriers of the EC in 1989

CN Code	Specification	Value ^a		Change in %	APS ^b	Duty ^c	Quota ^d
		1989	1990				
<i>Natural resources-intensive products</i>							
2503	Sulphur	85.9	66.6	-22.5		0.0	Sp
2701	Coal, briquettes etc.	386.7	390.2	0.9		0.0 ^e	F
2704	Coke and semi-coke of coal	23.0	46.3	101.3		0.0 ^c	F
2707	Oils, products of high temp. coal tar	12.9	12.1	-6.2		0.0	
2710	Petroleum oils except crude	78.0	98.7	26.5	+	5.3	
3102	Mineral and chemical fertilizers	19.1			+/*	8.6	BL, FRG, GR, I
4002	Synthetic rubber and factice	13.5	21.7	60.7		0.0	
4407	Wood sawn	96.8	124.3	28.4		0.0	I
7204	Ferrous waste and scrap	58.0	58.8	1.4		0.0	
<i>Labour-intensive products</i>							
2523	Cement and cement clinkers	26.1	31.6	21.1		3.2	BL
4202	Suit-cases, containers of leather	14.7	20.9	42.2	+/*	5.1	Sp
4411	Fibreboard of wood, other ligneous materials	15.2	23.6	55.3	+/*	1.0	FRG
4412	Plywood, veneered panels	10.5	19.8	88.6		1.0 ^f	FRG
4421	Other articles of wood	11.6	24.5	111.2		4.9	
4804	Uncoated kraft paper and paperboard	11.6	14.4	24.1		0.6	GR, I
4805	Other uncoated paper	14.7	20.8	41.5		0.9	GR, I
6201	Men's/boys' overcoats	40.9	71.4	74.6	+/*	1.4	
6202	Women's/girls' overcoats	34.3	62.8	83.1	+/*	1.4	
6203	Men's/boys' suits, breches, etc.	65.4	103.0	57.5	*/*	1.4	
6204	Women's/girls' suits, bretches, etc.	82.1	120.3	46.5	+/*	1.4	

Table 8 continued

CN Code	Specification	Value ^a		Change in %	APS ^b	Duty ^c	Quota ^d
		1989	1990				
6205	Men's/boys' shirts	35.3	56.4	59.8	+	1.3	
6206	Women's/girl's blouses and shirts	42.0	65.6	56.2	+	1.4	
6302	Bed/table/toilet linen	11.5	18.2	58.3	+/*	1.3	
6403	Footwear made with leather	53.3	82.6	54.4	+/*	0.8	BL, DK, FRG
7004	Drawn and blown glass	11.3	16.6	47.0		0.6	BL, I
7013	Glassware for household	12.6	20.0	58.7	+/*	1.2	BL, FRG
7308	Structures of iron and steel	37.5	50.5	34.7		4.1	
7317	Nails, tacks of iron and steel	11.4	12.4	9.7		4.6	
7318	Screws, bolts of iron and steel	10.5	20.3	93.3		6.5	DK, FRG, Sp
7326	Other iron and steel articles	20.1	42.6	112.0		5.3	GR
9401	Certain seats	37.6	63.6	69.2		5.6	DK
9403	Other furnitures	86.6	126.7	46.3	+	5.6	DK, Sp
	<i>Capital-intensive products</i>						
4011	Pneumatic tyres of rubber	16.3	22.0	35.0	+/*	5.8	GR, Sp
7106	Silver in various forms	30.3	32.9	8.6		0.0	
7208	Flat-rolled products of iron	46.5	34.3	-26.4		4.9	
7211	Smaller flat-rolled products of iron	14.6	15.7	7.5		4.4	
7213	Bars and rods; hot rolled	20.8	25.0	20.2		4.9	
7216	Angles, shapes of iron and steel	52.3	87.4	67.1		4.4	
7307	Tube or pipe fittings of iron and steel	13.3	27.6	107.5		6.2	FRG
7403	Refined copper and alloys	266.1	318.7	19.8		0.0	
7408	Copper wire	15.9	15.5	-2.5		0.6	
8703	Motor cars for persons	122.2	80.7	-34.0	+/*	1.0	P
	<i>Technology-intensive products easy to imitate</i>						
3501	Casein and its derivatives	61.5	75.7	23.1		8.2	
3904	Polymers of chloride	14.5	44.6	207.6	+/*	12.5	
	<i>Technology-intensive products difficult to imitate</i>						
8408	Diesel engines	18.2	0.6	-96.7		5.3 ^g	GR, I
8409	Parts suitable for diesel engines	10.8	20.2	87.0		4.9	I
8482	Ball or roller bearings	20.5	35.0	70.7	+/*	0.9	Sp, I
8509	Electro-mechanical domestic appliances	11.8	11.9	0.8		4.4	
8544	Insulated cable/wire etc.	54.5	106.1	95.0		6.5	GR, Sp
8901	Certain vessels specially equipped	22.2	15.3	-31.3		0.2	FRG, Sp

^a Millions of US dollars. - ^b +, without custom duties/Quota; *, the limits of imports to the EC reached by Poland. -

^c In %. - ^d Special quotas imposed by selected countries according to EEC-regulations No. 3420/1983. - ^e Deviant rates of duty in some EC-countries only. - ^f Exemption from the payment of duty within the limits of an annual tariff quota for certain tariff-lines within this group. - ^g No duty on certain 8-digit positions which are not listed separately in EC trade statistics; SP-Spain, F-France, BL-Benclux, FRG-Federal Republic of Germany, GR-Greece, I-Italy, DK-Denmark.

Source: Böhnlein, Heitger [1991, pp. 137-138], Möbius, Schumacher [1991, annex].

Following the data of table 8, natural resources'-intensive products and labour-intensive products dominated in 1989 in the sample of the 50 most important products exported by Poland to the EC member countries (33.3 % and 30.8 % respectively), while the share of capital-intensive products in this sample was 26.4 %, the share of technology-intensive products easy to imitate 3.4 %, and the share of technology-intensive products difficult to imitate 6.1 %. Respective proportions in this sample were generally similar in 1990, and this seems to be in line with the factor endowment to be supposed for these countries. However, let's notice it, the share of natural resources'-intensive products and the share of capital-intensive products dropped in the meantime (from 33.3 % to 28.5 %, and from 26.4 % to 22.9 % respectively), while the shares of labour-intensive products and of technology-intensive products (easy and difficult to imitate) increased clearly. In 1990 the share of labour-intensive products in Poland's exports to the EC member countries was 37.8 %, while the share of technology-intensive products easy to imitate 4.2 %, and the share of technology-intensive products difficult to imitate 6.6 %. It seems reasonable to extend this kind of analysis for the whole public sector's trade of Poland with the EC member countries in the period 1989-1991.

Table 9 — RCA-Indices in Poland's Trade with the EC Member Countries by Factor Intensities at the Four-Digit Level of the CN in 1989-1991 Taking Into Account the 50 Most Important Products Exported by Poland to These Countries^a

Specification	1989	1990	1991
Natural resources'-intensive products	0.33	-0.26	-0.25
Labour-intensive products	0.14	0.81	0.06
Capital-intensive products	0.29	0.45	0.42
Technology-intensive products easy to imitate	-1.27	-0.80	-0.48
Technology-intensive products difficult to imitate	-0.84	-0.60	-0.16
a In accordance with the product groups' division suggested by Böhnlein and Heitger [1991], and by Böhnlein and Caspari [1991].			

Source: CIHZ [1992]; own calculations.

Some conclusions seem to be obvious taking into account the product groups' division suggested by Böhnlein and Heitger [1991], and by Böhnlein and Caspari [1991]. First, Poland was in 1989 visibly competitive vis-à-vis the EC member countries in the case of raw resources'-intensive products but in the following years — mainly due to the changes in the trade system of the former Council for Mutual Economic Cooperation, and especially due to the rapid increase of the prices of many raw materials imported earlier from the former Soviet Union below the so-called world market prices — the situation changed dramatically. Second, according to the rather common intuition, Poland revealed in 1989-1991 comparative advantage vis-à-vis the EC member countries in labour-intensive products and in capital-intensive products, and the situation changed only slightly in the analysed years. Third, Poland was in these years not competitive in the case of technology-intensive products. Moreover, according to the stipulations underlined elsewhere [e.g. Klodt, 1991; Bode et al., 1991] and in accordance with the so-called neo-technology hypotheses of international trade, the Poland's competitiveness in the case of these products improved to some extent. Having in mind the product

groups' division suggested by Böhnlein and Heitger [1991], and by Böhnlein and Caspari [1991], this was also true, even especially, in the case of technology-intensive products difficult to imitate.

As mentioned earlier, the picture of Poland's trade with the EC member countries presented in the study is not complete due to the lack of statistical data concerning the appropriate dealings of the so-called private sector. However, some explanations seem reasonable at the moment. Firstly, the private sector's activities in Poland's foreign trade in 1989 were negligible and in 1990 rather limited (see table 2) and therefore one can assume the structure of Poland's public sector competitiveness vis-à-vis the EC member countries in these years as mirroring the structure of the respective competitiveness of the country (see also table 4). Secondly, to the best knowledge of the author and according with the results of the research-work provided by Dziewulski [1992], the structure of the imports of Poland's private sector in 1991 was similar to that of Poland's public sector, while in the whole exports of Poland (let's add once again, in exports which was directed mainly to the EC member countries), just the private sector — as Dziewulski [1992, p. 7] writes "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" (therefore products rather labour-intensive and natural resources'-intensive). Thirdly, once again to the author's best knowledge, there is to take into account some specific problems and aspects when researching the pattern of division of labour between Poland and the EC member countries, and with Germany especially. E.g., it is hard to explain Poland's revealed comparative advantage vis-à-vis these countries in the case of diesel engines — nota bene classified by Böhnlein and Heitger [1991], and Böhnlein and Caspari [1991] as technology-intensive products difficult to imitate — without knowing that mainly due to the low labour costs in Poland many such engines (being more or less exploited, let's say after 100 000 km) are regenerated in Poland and sent back to the West (mainly to Germany) probably without their full earlier registration by the appropriate customs' services as products imported to Poland. All this leads to the conclusion that the more detailed study is necessary in order to explain the pattern of division of labour between Poland and the EC member countries.

To the author's best knowledge, there is not available better division of traded products by factor intensities at the very low (disaggregated) level as this provided by Mange [1990], who refers i.a. to the well-known works of Hufbauer [1970], Sautter [1983] and Leamer [1984]. Unfortunately, Mange [1990] operates in his book only with the data prepared according to the Standard International Trade Classification (SITC) Revisited II. In order to study more deeply pattern of the division of labour between Poland (more exactly — Poland's public sector in foreign trade) and the EC member countries, the effort has been undertaken to transform the classification of traded goods prepared by Mange [1990] to that coinciding with the CN.³ Therefore, it is possible to present the results of analysis of trade between these countries according to factor intensities at the four-digit level of this nomenclature.

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

There are many positive aspects of the classification of the traded goods suggested originally by Mange [1990]. Firstly, it is possible to analyse almost the whole trade between the European countries; almost in this sense that many products traded between them but not produced there or being very difficult to classify are excluded (e.g. tea, copra, coffee, viscosis, guns, war tanks). Secondly, new products' groups can be presented (land-intensive and forest-intensive products). And, thirdly, the majority of the products' groups' specified in table 10 can be divided into sub-groups. The next table contains RCA indices in Poland's trade with the EC member countries when applying this kind of disaggregation (see also tables 4 and 5 in the annex).

Table 10 — RCA Indices in Poland's Trade with the EC Member Countries by Factor Intensities at the Four-Digit Level of the CN in 1989-1991

Specification	1989	1990	1991
Land-intensive products	-0.07	0.56	-0.26
Forest-intensive products	1.92	2.33	1.83
Natural resources'-intensive products	0.93	0.76	0.72
Labour-intensive products	-0.52	-0.66	-0.40
Capital-intensive products	0.48	0.62	0.57
Technology-intensive products	-1.57	-1.79	-1.54

Source: CIHZ [1992]; own calculations.

Table 11 — RCA Indices in Poland's Trade with the EC Member Countries by Factor Intensities and with Traded Goods Disaggregated into 13 Sub-Groups at the Four-Digit Level of the CN in 1989-1991

Specification	1989	1990	1991
Land-intensive products			
both of vegetable and animal origin	-2.90	-2.35	-2.32
of vegetable origin (not processed)	-0.84	0.83	-0.07
of vegetable origin (processed)	-0.34	-0.07	-0.41
of animal origin (not processed)	0.84	1.92	-0.04
of animal origin (processed)	1.16	0.75	0.52
Forest-intensive products			
not processed	2.92	4.47	2.66
processed	1.57	2.07	1.64
Natural resources'-intensive products	0.93	0.76	0.72
Labour-intensive products			
skilled labour-intensive products	-1.17	-1.29	-0.90
unskilled labour-intensive products	0.37	0.36	0.39
Capital-intensive products	0.48	0.62	0.57
Technology-intensive products			
easy to imitate	-1.50	-1.78	-1.53
difficult to imitate	-2.11	-1.91	-1.67

Source: CIHZ [1992]; own calculations.

Somewhat different picture appears when taking into account the vast majority of goods traded between Poland and the EC member countries. According to results of such an analysis, Poland revealed in 1989-1991 the clear comparative advantage in forest-intensive products (particularly in not processed ones), in natural

resources'-intensive products and in capital-intensive products, while the EC member countries 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 this sense that lack of Poland's comparative advantage in skilled labour-intensive products was accompanied by revealed comparative advantage in unskilled labour-intensive ones.

The situation in trade with land-intensive products was in 1989-1991 complicated, too, but this is rather easy to explain. In 1989 Poland was not competitive vis-à-vis the EC member countries (with the exception of land-intensive products of animal origin) and in the next year revealed its comparative advantage due to many reasons on the import-(demand-)side, and on the export-(supply-)side. Generally, the reactions expected from the conventional theory appeared. The restrictive monetary, fiscal and income policies in the country, as well as — almost in whole analysed year — the clearly undervalued national currency resulted in the sharp reduction of real aggregate demand (absorption), including imports demand, while on the other hand the producers were forced (by the low internal demand) and encouraged (by the exchange rate's level) to expand their exports. Additionally, due to the decrease of domestic food consumption, due to the change of the domestic real interest rate from being negative to being high but positive, as well as due to the endeavours of the private persons and various economic units in Poland to decrease the domestic stocks of many agrifood products (and not only), many of the stocks found their outlet also on the highly protected agricultural market of the EC member countries [Report, 1990]. Situation in 1991 was substantially different even that the internal demand barrier was still at work. On the one hand, the overshooting of the deep devaluation of zloty disappeared due to inflation, and on the other, the domestic stocks of goods stabilized on the very low level.

With regard to other products' groups, the data of table 11 seem to confirm some tendencies expected due to the changes in factor endowment and in relative prices in the country. First and foremost, the revealed comparative advantage of Poland in natural resources'-intensive products clearly decreased, while the scope of Poland's disadvantage in skilled labour-intensive products and in technology-intensive products visibly declined.

Capital-intensive products dominate still in Poland's exports to the EC member countries (see table 5 in the annex), and in connection with it these products are also to be found on the list of the most competitive ones (e.g. cement, fertilizers, products of iron and steel). Due to the factor endowment, relatively high competitive are also some natural resources (e.g. sulphur, carbides), some agricultural and fishing products (e.g. poultry, fish, preserved vegetables), as well as such forest-intensive products as wood sawn or plywood. Interestingly, Poland reveals also comparative advantage in many labour-intensive products (especially in unskilled labour-intensive ones), and this is also due to the cooperation agreements with regard to the so-called job processing (Lohnveredelung).

Table 12 — List of the Most Competitive Polish Products in Poland's Trade Relations with the EC Member Countries in 1989-1991

CN Code	Specification	RCA Indicators		
		1989	1990	1991
0105	Live poultry	0.92	0.44	1.51
0207	Meat and edible offal of the poultry	4.23	7.81	2.95
0301	Live fish	1.94	2.03	4.23
0302	Fish, fresh or chilled	2.27	1.85	3.01
0304	Fish fillets and other fish meat	5.56	4.58	2.90
0307	Moluscs	.	6.64	5.28
0511	Animal products n.e.s.	2.53	2.21	3.80
0711	Vegetables provisionally preserved	6.40	5.29	4.71
1205	Rape seeds	9.68	7.52	7.04
1701	Cane and beet sugar	0.30	2.74	7.55
1703	Molasses resulting from the extraction of sugar	6.10	2.30	5.27
2001	Vegetables and fruits prepared by vinegar	3.35	2.49	3.77
2009	Fruit and vegetable juices	2.89	1.89	2.70
2503	Sulphur	6.96	3.98	4.70
2523	Portland cement	6.76	6.62	8.96
2713	Petroleum coke, petroleum bitumen	2.08	0.90	3.09
2836	Carborates	1.14	1.71	2.25
2849	Carbides	2.41	2.03	2.40
2926	Nitrile-function compounds	2.02	0.97	3.82
2935	Sulphonamides	0.89	1.84	2.24
3102	Mineral or chemical fertilizers	3.32	4.70	4.88
3915	Wast, parings and scrap of plastics	4.25	7.96	2.77
4008	Plates, sheets and strip of vulcanized rubber	1.17	0.82	4.26
4011	New pneumatic tyres of rubber	0.93	1.57	2.05
4101	Raw hides and skins of bovine animals	0.49	4.58	2.55
4202	Trunks, vanity, suit etc. from leather and plastics	5.20	2.39	2.63
4203	Articles of apparel and clothing accessories of leather	2.68	2.43	3.10
4302	Tanned or dressed furskins	1.38	0.34	4.64
4407	Wood sawn or chipped lengthwise	8.55	5.07	6.41
4412	Plywood, veneered panels	6.31	5.62	4.27
4418	Builders' joinery and carpentry of wood	5.80	2.79	3.62
4419	Tableware and kitchenware of wood	9.52	8.59	2.97
5112	Woven fabrics of combed wool	3.01	3.64	9.30
5701	Carpets and other textile floor coverings	0.93	1.52	2.27
5804	Tulles	3.74	3.50	3.27
6107	Men's or boys' underpants, briefs, pyjamas etc.	0.50	3.70	3.24
6301	Blankets and travelling rugs	3.91	3.38	2.69
6302	Bed-linen, table-linen, toilet-linen	11.47	5.17	9.20
6306	Tarpaulins, sails for boats, saiboards	3.64	2.06	2.26
6403	Footwear with outer soles of rubber	2.32	2.48	2.49
6911	Tableware and kitchenware of porcelain	2.99	5.13	2.45
6912	Other ceramic tableware	0.37	5.44	2.30
7010	Glass ampoules	2.39	5.03	4.74
7013	Glassware of a kind used for household	2.37	1.86	2.39
7106	Silver and silver-plated semi-manufactures	6.83	7.58	6.62
7207	Semi-finished products of iron or non-alloy steel	5.59	5.33	6.77
7301	Ship piling of iron and steel	6.55	3.58	4.50
7302	Railway or tramway truck construction of iron	1.58	1.76	2.29
7303	Tubes, pipes and hollow profiles of cast iron	4.48	5.93	2.10
7309	Reservoirs, tanks, containers	1.37	2.32	2.99

Table 12 continued

CN Code	Specification	RCA Indicators		
		1989	1990	1991
7323	Household articles of iron and steel	2.13	3.45	2.58
7326	Other articles of iron and steel	1.76	1.36	2.72
7403	Refined copper and copper alloys, unwrought	2.91	3.72	6.45
7407	Copper bars, rods and profiles	4.38	4.59	5.94
7409	Copper plates and sheets	0.19	0.76	2.31
7419	Other articles of copper	1.82	4.03	2.01
8201	Hand tools	4.12	2.97	3.48
8203	Files, rasps, pliers, pincers etc.	1.96	1.21	2.07
8213	Scissors and tailors' shears	2.76	1.20	3.86
8511	Electrical ignition or starting equipment	1.27	0.53	2.00
8544	Insulated wire, cable and conductors	1.95	1.88	2.36
8606	Railway or tramway goods vans and wagons	.	0.60	2.14
9401	Seats and parts thereof	7.97	1.79	2.38
9403	Other furniture and parts thereof	4.36	4.43	4.31
9404	Mattress supports, articles of bedding	7.49	2.12	2.97
9405	Lamps and lighting fittings	2.64	2.03	4.31
9505	Festival entertainment articles	.	1.32	2.79
9609	Travel sets for personal toilet	3.20	2.43	5.22

Source: CIHZ [1992]; own calculations.

Table 13 — Share of the Job Processed Goods (JP Goods) Imported From Poland in the Total EC-Extra Imports of Specified Goods from this country in 1988-1991 (%)

Specification	Clothing from wovens	Other clothing	Shoes	Radios, TV and other recording or reproducing apparatus
1988	15.1	81.9	15.8	2.4
1990	29.6	87.4	33.3	4.0
1991	45.8	89.3	28.5	10.4
Growth Rate of JP Goods from Poland in 1988-91	92.9	41.5	50.5	96.4
Share in EC-Extra Imports of JP Goods				
1988	1.0	13.3	3.9	0.4
1991	5.9	20.7	9.4	1.0

Source: Langhammer [1992a, p. 14].

Summarizing, the pattern of the inter-industry division of labour between Poland and the EC members was rather the typical one for economic relations between countries with different factor endowment and with their different productivity, as well as with different levels of economic development. This pattern was relatively

stable. However, some interesting tendencies appeared in the last years and there is some reason to believe that the new pattern of division of labour between Poland and the EC member countries is emerging.

III. Intra-Industry Specialization between Poland and the EC Member Countries

Taking once again as a starting point the up-to-date achievements of the international trade theory, there appears evidently the problem of intra-industry specialization (division of labour), that means the problem of the exchange of like (similar) goods and their parts between countries [Grubel, Lloyd, 1975; Giersch, 1978; Tharakan, 1983]. Moreover, empirical evidence on this kind of division of labour between Poland and the EC member countries remains relatively scarce, and the hypotheses and conclusions presented earlier seem even contradictory to some extent [Pelzman, 1978; Weiss, 1983; Siwinski, 1980; Misala, 1986]. To meet partly these theoretical and practical aspects, both very important, indicators of the intensity of intra-industry trade between Poland and the EC member countries 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 the EC member countries in section (branch) "i"

m_i — Poland's imports from the EC member countries in section (branch) "i"

i — section's (branch'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, while indicator 0 means the total lack of intra-industry trade, and indicator 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 the EC member countries at the two-digit level of CN are presented in table 14 (see also table 2 in the annex).

Table 14 — IIT-Indicators in Poland's Turnover with the EC Member Countries at the Two-Digit Level of the CN in 1989-1991

CN Code	Specification	1989	1990	1991
01	Live animals	0.01	0.01	0.05
02	Meat and plucks	0.79	0.18	0.67
03	Fish and crustaceans	0.15	0.11	0.14
04	Dairy products, eggs and honey	0.74	0.35	0.52
05	Other animal products	0.48	0.43	0.49
06	Live plants and trees, bulbs, cut flowers etc.	0.82	0.47	0.72
07	Edible vegetables and roots and tubers	0.02	0.01	0.01
08	Edible fruit and nuts	0.85	0.47	0.43
09	Coffee, tea, mate and spices	0.00	0.55	0.06

Table 14 continued

CN Code	Specification	1989	1990	1991
10	Cereals	0.03	0.88	0.76
11	Products of the milling industry, malt, etc.	0.94	0.14	0.19
12	Oil seeds and fruits, grains, straw, fodder	0.18	0.06	0.18
13	Lacs, gums, resins and other vegetable saps	0.00	0.07	0.07
14	Vegetable plaiting materials	0.11	0.14	0.10
15	Animal or vegetable fats and oils	0.28	0.76	0.53
16	Preparations of meat, of fish or of crustaceans	0.25	0.54	0.54
17	Sugar and sugar confectionary	0.83	0.24	0.27
18	Cocoa and coca preparations	0.41	0.33	0.41
19	Preparations of cereals, flour, starch or milk	0.47	0.07	0.02
20	Preparations of vegetables, fruit and nuts	0.17	0.26	0.15
21	Miscellaneous edible preparations	0.18	0.35	0.40
22	Beverages, spirits and vinegar	0.56	0.74	0.98
23	Residues from the food industries, fodder	0.33	0.45	0.60
24	Tobacco and manufactured tobacco substitutes	0.88	0.72	0.06
25	Salt, sulphur, earths, stone, cement etc.	0.69	0.45	0.24
26	Ores, slag and ash	0.13	0.54	0.30
27	Mineral fuels and oils, waxes	0.14	0.44	0.36
28	Inorganic chemicals, compounds of metals	0.78	0.73	0.70
29	Organic metals	0.77	0.94	0.83
30	Pharmaceutical products	0.10	0.23	0.10
31	Fertilizers	0.05	0.01	0.20
32	Tanning or dyeing extracts, dyes, pigments	0.73	0.97	0.90
33	Essential oils and resinoids, perfumery	0.10	0.15	0.06
34	Soap, washing preparations	0.29	0.43	0.23
35	Albuminoidal substances	0.28	0.34	0.41
36	Explosives, pyrotechnic products, matches	0.73	0.13	0.17
37	Photographic or cinematographic goods	0.13	0.25	0.08
38	Miscellaneous chemical products	0.07	0.24	0.15
39	Plastics and articles thereof	0.45	0.95	0.96
40	Rubber and articles thereof	0.68	0.82	0.69
41	Raw hides and skins and leather	0.66	0.41	0.79
42	Articles of leather, saddlery and harness	0.08	0.12	0.12
43	Furskins and artificial fur	0.07	0.06	0.98
44	Wood and articles of wood	0.05	0.02	0.04
45	Cork and articles of cork	0.01	0.02	0.01
46	Manufactures of straw and other plaiting material	0.00	0.00	0.81
47	Pulp of wood or of other cellulosic material	0.33	0.45	0.93
48	Paper and paperboard	0.96	0.56	0.70
49	Printed books, newspapers, pictures etc.	0.22	0.35	0.30
50	Silk	0.35	0.12	0.33
51	Wool, animal hair, yarn and woven fabric	0.92	0.84	0.95
52	Cotton	0.24	0.82	0.26
53	Other vegetable textile fibres, paper yarn	0.75	0.60	0.84
54	Man-made filaments	0.33	0.91	0.68
55	Man-made staple fibres	0.26	0.59	0.45
56	Wadding, felt and non-woven special groups	0.78	0.93	0.40
57	Carpets and other textile floor coverings	0.84	0.48	0.12
58	Special woven fabrics, tufted textile fabrics	0.21	0.28	0.54
59	Impregnated, coated or laminated textile fabrics	0.20	0.20	0.36
60	Knitted or crocheted fabrics	0.62	0.45	0.99
61	Articles of apparel and clothing accessories, knitted or crocheted	0.74	0.44	0.42
62	Not knitted or crocheted articles of apparel and clothing	0.90	0.74	0.86

Table 14 continued

CN Code	Specification	1989	1990	1991
63	Other made up textile articles	0.16	0.09	0.10
64	Footwear, garters and the like	0.37	0.31	0.28
65	Headgear and parts thereof	0.01	0.44	0.41
66	Umbrellas, sticks, whips, riding-crops	0.74	0.02	0.00
67	Prepared feathers and dawn	0.00	0.00	0.00
68	Articles of stone, plaster, cement, asbestos, etc.	0.34	0.58	0.65
69	Ceramic products	0.63	0.85	0.73
70	Glass and glasware	0.51	0.27	0.19
71	Pearls, precious stones and metals	0.18	0.06	0.08
72	Iron and steel	0.74	0.50	0.58
73	Articles of iron and steel	0.37	0.45	0.33
74	Copper and articles thereof	0.26	0.05	0.05
75	Nickel and articles thereof	0.73	0.34	0.26
76	Aluminium and articles thereof	0.14	0.80	0.81
78	Lead and articles thereof	0.00	0.44	0.55
79	Zinc and articles thereof	0.10	0.11	0.12
80	Tin and articles thereof	0.00	0.00	0.15
81	Other base metals, cerments and articles thereof	0.25	0.37	0.18
82	Tools, implements, cuttlery, spoons and forks	1.00	0.78	0.59
83	Miscellaneous articles of base metal	0.92	0.94	0.59
84	Nuclear reactors, boilers, machinery and appliances	0.31	0.39	0.58
85	Electrical machinery and equipment, recorders etc.	0.91	0.83	0.96
86	Locomotives, rolling-stock, track fixtures	0.53	0.80	0.65
87	Vehicles other than railway and tramway rolling-stock	0.65	0.78	0.82
88	Aircraft, spacecraft and parts thereof	0.56	0.16	0.69
89	Ships, boats and floating structures	0.04	0.13	0.06
90	Instruments and apparatus	0.22	0.32	0.51
91	Clocks and watches and parts thereof	0.40	0.40	0.09
92	Musical instruments	0.63	0.47	0.88
93	Arms and ammunition	0.42	0.43	0.27
94	Furniture, bedding, mattresses, lamps	0.03	0.04	0.02
95	Toys, games and sport requisites	0.99	0.53	0.45
96	Miscellaneous manufactured articles	0.84	0.82	0.94
97	Works of art, collectors' pieces and antiques	0.00	0.02	0.15
	Non-weighted average	0.41	0.40	0.42
	Structural deviation	0.32	0.29	0.31
	Weighted average ^a	0.41	0.38	0.40

^a Weights as in table 2 of the annex.

Source: CIHZ [1992]; own calculations.

The intensity and the importance of the intra-industry specialization in Poland's trade relations with the EC member countries were rather very limited in 1989-1991. This is especially reflected by the IIT indicators' weighted means which were pretty low in these years. There were many reasons of the clearly shallow intra-industry trade intensity and the most general ones were differences in the economic development of partners, as well as the complementary structure of trade and of competitiveness in the turnover Poland - the EC. Due to this, the real base of the intra-industry division of labour between Poland and the EC member countries was in 1989-1991 relatively small and this fact is also proved by the high values of standard

deviations of IIT indicators when taking into account 1-digit and 2-digit positions of the goods classification of the CN. Another general reason was the limited number of goods traded between these countries and this is easy to prove when studying the 4-digit positions of the CN; many of the products were not at all traded between Poland and the EC member countries in the analysed years, while on the other hand a lot of products imported to Poland didn't appear simultaneously in its exports to the EC countries.

Table 15 — Number and Relative Importance of Products Traded and Not Traded between Poland and the EC Member Countries in 1989-1991 at the 4-Digit Level of the CN

Specification	1989		1990		1991	
	Total	%	Total	%	Total	%
Four-digit positions of the CN	1 160	100.0	1 160	100.0	1 160	100.0
Products traded between Poland and the EC members						
Poland's imports	950	81.9	1 008	86.9	890	76.7
Poland's exports	693	59.7	741	63.9	734	63.3
Products not traded between Poland and the EC members						
Poland's imports	210	18.1	152	13.1	270	23.3
Poland's exports	467	40.3	419	36.1	426	36.7

Source: CIHZ [1992]; own calculations.

The empirical evidence on intra-industry division of labour in trade between Poland and the EC member countries leads to the conclusion that the same general determinants of this kind of division of labour operate in this trade as in trade among western countries. Relatively very low intensity of intra-industry turnover between Poland and the EC members 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 trade between Poland and the EC member countries seems to support this view.

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

Periods	At the one-digit level	At the two-digit level
1989-1990	0.84	0.53
1990-1991	0.86	0.45
1989-1991	0.95	0.67

a Calculated according to the formula presented in table 9.

Source: CIHZ [1992]; own calculations.

As in the case of the structure of competitiveness, the structure of intra-industry division of labour in trade relations between Poland and the EC member countries was rather stable and therefore predictable. However, some new tendencies were observed, too.

Table 17 — IIT Indicators in Poland's Turnover with the EC Member Countries in Products' Groups Selected by Factor Intensities at the Four-Digit Level of the CN in 1989-1991

Specification	1989	1990	1991
Land-intensive products	0.53	0.40	0.60
Forest-intensive products	0.19	0.08	0.12
Natural resources'-intensive products	0.54	0.42	0.39
Labour-intensive products	0.71	0.60	0.78
Capital-intensive products	0.73	0.47	0.43
Technology-intensive products	0.29	0.43	0.57
Land-intensive products			
both of vegetable and animal origin	0.11	0.29	0.33
of vegetable origin (not processed)	0.63	0.40	0.69
of vegetable origin (processed)	0.87	0.75	0.85
of animal origin (not processed)	0.58	0.15	0.68
of animal origin (processed)	0.45	0.42	0.45
Forest-intensive products			
not processed	0.10	0.01	0.07
processed	0.33	0.13	0.17
Natural resources'-intensive products	0.54	0.42	0.39
Labour-intensive products			
skilled labour-intensive products	0.50	0.66	0.91
unskilled labour-intensive products	0.79	0.57	0.50
Capital-intensive products	0.73	0.47	0.43
Technology-intensive products			
easy to imitate	0.39	0.46	0.61
difficult to imitate	0.23	0.41	0.55

Source: CIHZ [1992]; own calculations.

On statistical grounds alone, the data presented in table 17 could not prove the earlier conclusions with regard to the intensity and importance of the intra-industry division of labour between Poland and the EC member countries. What these data prove is first and foremost that — according to the expectations stemming from the intra-industry trade theory — the intensity of this kind of division of labour between these countries was the highest in the case of products with relatively low value added (e.g. land-intensive products, natural resources'-intensive products and even capital-intensive products, especially some of them), the forest-intensive products being the clear exception. This should not wonder taking i.a. into account the earlier mentioned role and importance of the so-called job-processing in the total turnover between Poland and the EC member countries. Let's add to this the very interesting statements of Langhammer [1992a, p. 12], who writes i.a. "passive Lohnveredelung (passive job processing - my remark J.M.) ist einerseits eine typische Frühstufe intra-industrieller Verflechtung zwischen Anbietern aus Ländern mit sehr unterschiedlicher Ressourcenausstattung, andererseits ein politischer Kompromiß zwischen den gegenläufigen Interessen von Faktor- und 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 mit 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." By the way, when studying the list of the products recording the highest IIT indicators in turnover between Poland and the EC member countries (see table 18), there is also to take into account some additional problems and i.a. the problem of the shifts (removals) of some production activities in accordance with the general principles of the environmental policy in the West.

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

CN Code	Specification	1989	1990	1991
2007	Jams, fruit jellies, marmalades, pastes	0.50	0.83	0.75
2101	Extracts, essences and concentrates of coffee, tea etc.	0.81	0.60	0.92
2208	Undenatured ethyl alcohol	0.37	0.59	0.80
2804	Hydrogen, rare gases and other non-metals	0.18	0.97	0.91
2811	Inorganic acids and oxygen compounds	0.36	0.33	0.77
2825	Hydrazine and hydroxylamine	0.32	0.42	0.82
2833	Sulphates, alums	0.43	0.61	0.78
2902	Cyclic hydrocarbons	0.84	0.69	0.91
2904	Derivatives of hydrocarbons	0.74	0.93	0.98
2914	Ketones and quinones	0.69	0.94	0.83
2918	Carboxylic acids	0.24	0.55	0.90
3404	Artificial waxes and prepared waxes	0.32	0.57	0.71
3507	Enzymes	0.41	0.35	0.78
3907	Polyacetate and epoxide resins	0.43	0.49	0.96
3908	Polyamides in primary form	0.23	0.55	0.92
3909	Amino-resins, phenolic resins and polyurethanes	0.29	0.73	0.70
3920	Plates, sheets, film, foil and strip of plastics	0.49	0.91	0.87
4012	Retraded or used pneumatic tyres	0.65	0.67	0.73
4104	Leather of bovine or equine animals	0.34	0.95	0.98
4802	Uncoated paper and paperboard	0.48	0.64	0.70
5808	Braids in the piece	0.70	0.60	0.87
5911	Textile product and articles for technical uses	0.32	0.11	0.73
6102	Women's or girls' overcoats and jackets	0.32	0.54	0.94
6205	Men's or boys' shirts	1.00	0.19	0.91
6206	Women's or girls' blouses and shirts	0.45	0.85	0.87
6208	Women's or girls' singlets and other vests	0.83	0.55	0.92
6405	Footwear	0.54	0.72	0.95
6805	Natural or artificial abrasive powder	0.54	0.80	0.80
6910	Ceramic sinks, wash basins	0.73	0.74	0.76
7202	Ferro-alloys	0.45	0.49	0.94
7217	Wire of iron or non-alloy steel	0.75	0.94	0.95
7307	Tube or pipe fittings	0.77	0.32	0.98
7311	Containers for compressed or liquefied gas	0.80	0.55	0.94
7312	Stranded wire, ropes and cables of iron and steel	0.56	0.77	0.85

Table 18 continued

CN Code	Specification	1989	1990	1991
7314	Cloth, grill, netting and fencing of iron and steel	0.54	0.98	0.94
7321	Stores, ranges, grates, cookers	0.85	0.61	0.83
7603	Aluminium powder and flakes	0.56	0.02	0.94
7616	Other articles of aluminium	0.95	0.34	0.97
8207	Tools for hand tools	0.98	0.86	0.74
8209	Plates, sticks and tips for tools	0.45	0.73	0.78
8211	Knives with cutting blades	0.45	0.73	0.78
8409	Parts of piston engines	0.96	0.53	0.90
8418	Refrigerators and freezers	0.74	0.78	0.91
8421	Centrifuges, including centrifugal dryers	0.63	0.62	0.94
8431	Parts of the machinery	0.26	0.81	0.77
8433	Harvesting or threshing machinery	0.61	0.99	0.96
8445	Machines for preparing textile fibres	0.34	0.16	0.85
8448	Auxiliary machinery	0.19	0.51	0.84
8452	Sewing machines	0.11	0.54	0.91
8458	Lathes for removing metal	0.83	0.57	0.73
8472	Hectographes, duplicating and addressing machines	0.54	0.97	0.82
8481	Taps, cocks and valves for pipes	0.75	0.67	0.98
8482	Ball or roller bearings	0.92	0.81	0.78
8507	Electric accumulators	0.82	0.75	0.81
8519	Turntables, record-players, cassette-players	0.58	0.66	0.94
8520	Magnetic tape recorders	0.38	0.69	0.80
8527	Reception apparatus for radio-telephony	0.82	0.88	0.82
8540	Thermionic, cold cathode valves and tubes	0.94	0.59	0.71
8545	Carbon electrodes, carbon brushes	0.73	0.73	0.85
8547	Insulating fittings for electrical machines	0.51	0.93	0.83
8607	Parts of railway or tramway locomotives	0.92	0.81	0.79
8704	Motor vehicles for the transport of goods	0.18	0.75	0.79
8716	Trailers and semi-trailers	0.45	0.93	0.83
8907	Rafts, tanks, coffer-dams, landing stages	0.26	0.67	0.90
9011	Compound optical microscopes	0.84	0.56	0.76
9017	Drawing, marking and calculating instruments	0.45	0.75	0.75
9026	Instruments for measuring or checking the flow	0.55	0.64	0.79

Source: CIHZ [1992]; own calculations.

We face still difficulties to include the natural environment as additional, specific and very important factor into the standard analyses of international trade flows, both of inter-industry and intra-industry type, and it is really a great pity and first and foremost a problem. Another, much less important problem is, that the differences in the quality of products and their parts traded in the framework of the phenomenon called intra-industry division of labour are difficult to present and to evaluate in the standard analyses of intra-industry trade. Anyway, some comparisons of the imports' and exports' prices of goods traded between Poland and the EC member countries lead to the conclusion that there exists in many cases an intra-industry trade based just on these differences (e.g. exchange of more and less reliable ball or roller bearings between Poland and Germany), what just explains the differences in the imports' and exports' prices of traded goods, and of their accessories and spare-parts [Bozyk, Misala, 1988; Danielewski, Kloc, 1991]. Anyway, there seems to exist a difference between the "intra-industry division of labour" among the "equal countries" and the

"intra-industry division of labour" among "non-equal ones". This is mainly due to structural and technological factors. But not only.

Coming back to the main subject, the data of table 17 seem to prove some changes in the intra-industry division of labour between Poland and the EC member countries after 1989. Let's notice first and foremost the increasing intensity of this kind of division of labour in the case of technology-intensive products, both easy to imitate ones and difficult to imitate ones. There can be additionally stated that the intensity of the intra-industry trade between Poland and the EC member countries increased clearly in 1989-1991 in the case of skilled labour-intensive products, while the opposite was true in the case of unskilled labour-intensive ones. Is the new pattern of division of labour between Poland and the EC member countries sustainable?

IV. Prospects and Some Conclusions

Poland is undertaking an historical experiment in pioneering the transformation of the centrally planned system into a market economy and this process seems to be an irreversible one. Institutional and structural developments are likely to take a number of years but the process can be only continued. Quite simply, the "point of no return" was reached and there are no viable alternatives to the "going forwards".

It is hard to say over what period the troublesome endeavours will lead to greater openness and competitiveness of Poland's national economy. What we know is that this is necessary. Moreover, systemic and structural transformation requires i.a. substantial liberalization of the current account and of the capital account. Without these crucial steps, the unavoidable speeding-up of the demonopolization and privatization processes are difficult to imagine. Further liberalization of the domestic markets and a full currency convertibility are the next necessary ingredients. Without them, the real comparative advantages of the Poland's national economy will remain by and large unknown, while just establishing these advantages is clearly a starting point of the reintegration into the world economy and of the necessary increase in competitiveness.

There are some real facts, too, which will probably promote openness of the Poland's economy and the most important one is that the socialist planning and integration has repressed foreign trade. As stated elsewhere [CEPR, 1990 pp. 31-32] "although East European countries have not been entirely autarkic, they have not been very open; primarily they have traded among themselves and with the USSR ... there are large potential gains from international trade that are left unexploited". Let's add to this that the level of openness grows usually with the rising level of economic development.

The growing openness of the Poland's national economy is taking place in the international context. Therefore some conclusions can be drawn from the theory of location and from the emerging theory of the international division of labour.

Table 19 — International Division of Labour by Country Categories

Specification	Core	Semi-periphery	Periphery
Profile of production structure			
diversified	xxx	xx	x
internally integrated	xxx	xx	x
relative wage level	xxx	xx	x
Trade concentrated on			
core	xxx	xxx	xxx
semi-periphery	xx	x	x
periphery	xx	x	x
Pattern of exports			
skill-intensity	xxx	xx	x
physical capital-intensity	xx	xx	x
value-added content	xxx	x	x
Dependance on imports of			
raw materials and intermediates	xxx	xx	x
capital goods and technology	x	xx	xxx
investment capital	x	xx	xxx
Type of industrial enterprise			
state	xx	xxx	xxx
national private	xxx	xxx	xx
foreign	x	xx	xxx

x = little importance, xx = medium importance, xxx = high importance

Source: Kiljunen [1989, p. 128]

Poland is treated in the most important respective research works as a country belonging to the semi-periphery, while the West European countries (better the west-northern ones) constitute one of the three cores of the contemporary world economy [Seers, 1979; Rokkan, Urwin, 1983]. There are possibilities to catch up but it would not be reasonable to assume that in the next ten years - let's say until 2000 - the economic distance of Poland vis-à-vis Western Europe or United States can be totally or even substantially reduced. According to B. Heitger [1990], the fully successful catching up of the East and Central European countries until 2000 requires substantial inflow of the foreign capital (with the technology — my remark J.M.). He argues that — providing the 26.5 % share of investments in the Gross Domestic Product — the 3.8 % rate of their growth annually is needed (to be confronted with the recessionary tendencies in Poland in 1990-1991 of about 10 % of GDP per year on the average). Additionally, Maier [1991] — who takes into account the possibilities to increase the efficiency of the production factors in these countries and possible gains from the greater engagement of the East- and Central European countries in the international division of labour — puts forward that these countries are in a position to reach the average level of development of the most industrialized West European countries in about 30-40 years. Let's add to this that according to the prognosis prepared in the Switzerland, the GDP rate of growth in Poland can be higher than in these countries for the first time in 1997.⁴ The economic and other important problems of Germans after the formal unification can be mentioned in this context, too. These problems are treated sometimes as a good lesson for the excessive optimists with regard to transformation process from the planned to the market-oriented economy [Bozyk, 1992].

⁴ See: "Neue Zürcher Zeitung" from 9.02.1991. According to prognoses prepared in Poland the "take-over" process will begin definitely in 1993.

Table 20 — Poland's Foreign Trade Geographical Structure in 1989 and Possible within Some Years — According to Collins and Rodrik^a

Specification	EC-countries	Germany	EE-6 ^b	Former Soviet Union	Other countries
Imports					
Real	27.73	19.23	13.46	26.11	33.00
Projected ^a	55.69	22.13	6.00	8.96	29.35
Exports					
Real	30.45	13.57	14.13	24.96	30.46
Projected ^a	51.18	23.18	9.31	13.89	25.62

^a Projections refer to the Collins' and Rodrik' medium scenario (two to five years) "which assumes full liberalisation but unchanged real income levels" [Collins, Rodrik, 1991, p. 45]. - b) The former European CMEA countries without the former Soviet Union.

Source: Collins, Rodrik [1991, p. 41 and Annex].

Poland gravitates economically towards the EC member countries and due to many other reasons stated rather clearly elsewhere [Misala, 1992a], the so-called other solutions to integrate it with the West European countries and with the world economy have been since many years artificial ideas only. Coming back to the problem of the repressed trade of the East and Central European countries, there seems to be reasonable to present the results of some available analyses with regard to East-West European economic relations based on the so-called gravity models of international trade. According to Havrylyshyn and Pritchett [1991, p. 12-13], "the CMEA and socialist ties were tremendously effective in diverting trade ... away from "natural patterns". Bergeijk and Oldersma [1990, p. 605] came earlier to the conclusion that "Eastern Europe stands to gain most from the detente and market-oriented reform". And, basing on a valuable gravity-model analysis, Döhrn and Milton [1992, p. 40] are arguing that "assuming that the process of transformation in Eastern Europe will be successful and per capita income in these countries will double within a period of ten years, East-West trade will be three to four times greater than before the reforms started. Trade growth will be particularly intensive between the European Community and Poland, Czechoslovakia and Hungary which have signed an association agreement with the EC". Taking into account the realities and the results of the above mentioned analyses, there seems reasonable to argue that the mid-term scenario of the European East-West trade's intensities provided by Collins and Rodrik [1991] is to be treated as the most probable one.

There are many reasons to assume that the share of the EC-member countries in the Poland's foreign trade can reach in 2000 about 55-60 %. The most important ones on the Poland's demand side seem to be the following:

- a) traditions of economic co-operation;
- b) geographical proximity and therefore also the specific advantages in transportation and communication costs;
- c) inter- and intra-industrial complementarity due to differences in factor endowment, differences of relative prices of production factors and of tradable goods, as well as due to technological differences;
- d) positive and rather high rates of growth expected in Poland in the second half of the 1990's;
- e) relatively high internal demand elasticities on products imported from the EC-member countries;

- f) gradual liberalization of Polish imports from the 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).

According to the association agreement with the EC member countries, Poland should liberalize mostly its imports from them in the second half of the 1990's. It does not mean, however, that the foreign trade effects of this agreement will not appear earlier, especially taking into account that some customs duties reductions (e.g. in the case of capital-intensive products not produced in Poland) began even in 1992. Langhammer [1992b] argues that the trade diversion effect will be more visible than the trade creation one in the case of industrial products. According to him, quite different can be the development of the subsidised EC countries' agricultural exports to Poland. But he adds that "es wird in Zukunft sorgfältig zu prüfen sein, ob die weitere Entwicklung der EG-Agrarexporte von den internen Marktinterventionen oder von der Öffnung der mittel- und osteuropäischen Märkte bestimmt sein wird und ob die komparativen Vorteile der drei Staaten (of Czecho-Slovakia, Hungary and Poland - my remark J.M.) durch die EG-Agrarmarktpolitik unterlaufen werden" [Langhammer, 1992a, p. 32].

Lubinski and Sznajder [1992] prepared an interesting analysis of the possible consequences of the association agreement between Poland and the EC member countries on the Poland's imports and exports which can be called transfer effects or terms of trade effects. According to them, there are the four variants of the possible development of the Poland's imports from these countries while the various demand price elasticities for the respective imports (0.5 then 1.0 and 1.5 and 2.0) and the division of advantages due to liberalization being the most important variables. They assume that these advantages can be taken totally by the importers ($W_{im}=1$), by the exporters ($W_{ex}=1$ and $W_{im}=0$), or just shared by the respective importers and exporters ($W_{im}=0.5$ and $W_{ex}=0.5$). Next table entails the results of Lubinski's and Sznajder's most probable variants with regard to Poland's imports of industrial goods from the EC member countries.

According to Lubinski and Sznajder [1992], the yearly value of increase of Poland's imports of industrial goods from the EC member countries in 1992-1999 due to the liberalization foreseen in the association agreement can range from about 116,9 millions ECU to about 467,4 millions ECU (respectively 3.0 % and 12.1 % of the average value of Poland's imports from these countries in 1988-1990). For the foreseen liberalization process is an asymmetrical one (the majority of Poland's tariff reductions etc. will be realised in the second half of the 1990's), the respective increases of imports' value are expected to grow with a time. The same seems to be true in the case of increases of agricultural imports to Poland, relative importance of them being expected to be much smaller.

Table 21 — Yearly Value and Relative Importance of the Probable Increase of Poland's Imports of Industry Products from the EC Member Countries in 1992-1999 due to Liberalization Foreseen in the Association Agreement (thousands of ECU and %)

Wex	Wim	Price elasticity of demand	Yearly average increase of Poland's imports in 1992-1999 in thousands of ECU	Yearly average of imports' increase of Poland as % of the average value of Poland's imports from EC in 1988-1990
1	0	0.5	116.882.6	3.0
1	0	2.0	467.433.8	12.1
0.5	0.5	1.0	255.368.3	6.6

Source: Lubinski, Sznajder [1992, p. 8] and own calculations.

Table 22 — Yearly Value and Relative Importance of the Probable Increase of Poland's Imports of Agricultural Products from the EC Member Countries in 1992-1999 due to Liberalization Foreseen in the Association Agreement (thousands of ECU and %) ^{a)}

	Price elasticities of demand			
	e = 0.5	e = 1	e = 1.5	e = 2
Value				
Wim=1; Wex=0	4.144	8.289	12.433	16.578
Wim=0; Wex=1	9.929	9.929	9.929	9.929
Wim=0.5; Wex=0.5	7.141	9.316	11.493	13.668
As % of the average Poland's imports from the EC in 1988-1990				
Wim=1; Wex=0	0.11	0.21	0.32	0.43
Wim=0; Wex=1	0.26	0.26	0.26	0.26
Wim=0.5; Wex=0.5	0.18	0.24	0.30	0.35

Source: Lubinski, Sznajder [1992, p. 24] and own calculations.

Generally, the factors promoting Poland's imports can be expected to increase its exports to the member countries of the EC, too, (traditions of co-operation, geographical proximity etc.). However, the situation seems to be much more complicated in this case. This is mainly due to the lot of structural factors (e.g. Poland's difficulties to supply adequate products and to restructure the national economy, structural competitiveness of Poland's exports with exports of many other countries), and due to the lot of institutional factors (e.g. difficulties with the privatization process in Poland, protectionism of the EC), all of these factors being studied in many works [e.g. Heitger, Böhnlein, 1991; Schumacher, Mobius, 1991; Collins, Rodrik, 1991; Langhammer, 1992a,b]. What is interesting here and now are the possible consequences of the association agreement on Poland's exports to the EC.

According to Langhammer [1992], the trade creation effect of the Poland's association agreement (also of that of Czechoslovakia and of Hungary) will be rather limited. Lubinski and Sznajder (1992) seem to be also very cautious but a little bit more optimistic when analysing the so-called transfer effects.

Table 23 — Yearly Value and Relative Importance of the Probable Increase of Poland's Exports of Industry Products to the EC Member Countries in 1992 - 1998 due to Liberalization Foreseen in the Association Agreement (thousands of ECU and %)

Wex	Wim	Price of elasticity of demand	Yearly average increase of Poland's exports in 1992-1998 in thousands of ECU	Yearly average of exports' increase from Poland as % of the average value of Poland's exports to the EC in 1988-1990
0	1	0.5	84 583.4	2.0
0	1	2.0	340 490.6	8.2
0	1	1.0	176 224.4	4.2
0.5	0.5	1.0	188 256.3	4.5

Source: Lubinski, Sznajder [1992, p. 7] and own calculations.

Yearly value of increase of Poland's exports of industrial goods to the EC member countries in 1992-1998 (due to the liberalization foreseen in the association agreement) is expected by Lubinski and Sznajder [1992] to be somewhat lower than in the case of the respective Poland's imports and to range between about 84.6 millions of ECU and about 340 millions of ECU (respectively 2.0 % and 8.2 % of the average value of the total Poland's exports to these countries in 1988-1990). The authors of the presented analysis treat the increase of respective exports of about 176.2 millions of ECU as the most probable variant.

According to Lubinski and Sznajder, absolute value and relative importance of the increase of Poland's exports of agricultural products to the EC member countries can be comparable to this estimated with regard to exports of industrial products. The authors of the estimates add that Poland should gain especially from the removal of variable levies applied within the EC Common Agricultural Policy (CAP) on imports of many agricultural products from Poland. However, these levies and other protectionist measures will be also gradually removed in the EC member countries' economic relations with Czecho-Slovakia, and Hungary, and these countries — as Langhammer [1992b] shows it clearly — overlap to a great extent with Poland, and not only in the case of agricultural products. Therefore, there is also to take into account the substitution effects between production and exports of these three countries which concluded the so-called Europe Agreements with the EC. Let's add to this the next and even more important challenges for Poland's exports, namely the following:

- a) the progressive integration of the Greek, Spanish and Portuguese economies into the European system of division of labour;
- b) the incorporation of the former German Democratic Republic into the EC;
- c) the more or less advanced completion of the so-called programme "Europe 1992";
- d) the gradual accomplishment of the idea of European Economic Space.

Table 24 — Yearly Value and Relative Importance of the Probable Increase of Poland's Exports of Agricultural Products to the EC Member Countries in 1992-1996 due to Liberalization Foreseen in the Association Agreement (thousands of ECU and %).

Specification	Yearly average increase of Poland's exports in 1992-1996 in thousands of ECU	Yearly average of exports' increase from Poland as % of the average value of Poland's exports to the EC in 1988-1990
Wex=0 Wim=0		
Price elasticity of demand=0.5	149 317.2	3.6
Price elasticity of demand=2.5	167 155.2	4.0
Wex=0 Wim=0.5		
Price elasticity of demand=1	154 917.2	3.7

Source: Lubinski, Sznajder [1992, p.9] and own calculations.

All these facts and tendencies are to be treated as the sources of overall growth and of the growth of the imports' demand of the EC member countries (e.g. specific impact of the completion of the EC's Internal Market or expected economic effects of the German unification). However, these facts and tendencies are simultaneously the clear challenges for Poland, too. All this leads to the conclusion that much depends upon the structural and technological factors and changes. The visualisation of the actual Poland's place and of the structure of participation in the international division of labour helps to understand some facts and problems but this is not the whole truth (see Table 19).

The future pattern of the division of labour between Poland and the EC member countries will depend to a great extent upon their factor endowment, upon production factors' productivity and upon production factors' relative prices. With regard to these problems, the authors of the CEPR [1990] study give some evidence that Eastern Europe (therefore also Poland) is likely to generate significant exports of energy. On the other hand, the opinions are sometimes expressed that the comparative advantage of Poland lies i.a. in coal, copper, sulphur and some other natural resources. As it seems, these views are misleading to a great extent. Firstly, as Bode et al. [1991] rightfully 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), and the growing costs of their solution which are to be financed and which influence the extraction and production costs.⁵ 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 extractive industries in Poland 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 this is a problem of its own (e.g. the copper industry). Fifthly and — as it seems

⁵ 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]; Danilewski, Kloc [1991].

— most importantly, in the long run, the volume of the natural resources to be extracted in Poland is relatively limited and clearly decreasing [Danielewski, Kloc; 1991].

Table 25 — 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 1	Extraction or production in 1988 2	Sufficiency of resources in years (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	-
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].

There are still some possibilities to export natural resources and natural resources-intensive products but their relative prices will be undoubtedly increasing. The same seems to be true with regard to the prices of forestry-intensive products. The forests constitute only about 27.8 % of the total area of Poland and the 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 ml ha of forests, while in Western Germany the respective numbers were 34.9 cubic hectometres and 7.3 ml ha. There is additionally to take into account the growing costs of reforestation and of forests' protection in Poland.

It is not possible to calculate precisely capital/labour ratio in Poland. However, the general directions of the development of this ratio and of the relative prices of capital and labour are known. With regard to capital, there is to begin with the rather obvious conclusions that in comparison with the majority of the EC member countries (especially with Germany) this factor of production is relatively scarce (therefore relatively expensive) in Poland, that Poland has a huge debt and that the collapse of the former CMEA trade system (mainly via more expensive imports of many natural resources from the former Soviet Union) erodes also the scope of possibilities of specialization in production of capital-intensive products. Moreover, there is to expect some inflow of the foreign capital but due to the reasons specified more precisely elsewhere [Glismann,

Schrader; 1991; Misala, 1992], this inflow will be probably limited in the next years. Anyway, it would be quite unreasonable to expect inflows of capital in a value which is necessary or which will be welcomed.⁶

Table 26 — Estimates of Capital flows to Eastern Europe^a (billions of US dollars per year)

Specification	Eastern Europe	of which: Poland ^b
"Needs-based" approaches; a full catch-up scenario until about 2010	344. – 420.7	108.8 – 132.9
Marshall Plan-based estimates	4.8 – 14.0	1.5 – 4.4
Prospective official and multilateral financing-based estimates	15.9	5.0

^a Bulgaria, Czechoslovakia, Hungary, Poland, Romania, Yugoslavia. — ^b Own calculations taking estimates of Collins and Rodrik and a 31.6 % share of Poland's population in the total population of the above mentioned countries.

Source: Collins, Rodrik [1991, pp. 78-84] and own calculations.

Relative scarcity of capital influences and will influence also in future the relative price of labour (wage) and this of land (land rent). There is to expect that land and labour will be in Poland relatively cheap.⁷ Therefore comparative advantages of Poland in labour-intensive and in land-intensive products are likely. Anyway, according to the estimates, total population of Poland in 2000 will reach almost 40 millions, of which about 23.7 millions in the age-benchmark between 18 years and 59 (women) or 64 (men) years (the so-called economically active population), while in 2010 the respective members will be probably 41 millions and 24 millions [Secomski, Dzienio, 1988].

As Lorenz [1992] rightly underlines, there are big discrepancies between Western scholars with regard to the human capital endowment of the East and Central European countries. Eg. Giustiniani, Papadia and Porciani [1991], as well as experts of the Economic Commission for Europe (ECE, 1990) and experts of the Center for Economic Policy Research (CEPR) from London are very optimistic with regard to this. Experts from CEPR [1990, p. 11 and 12] write i.a. "to the extent that the data are interpretable they suggest that Eastern Europe has a greater proportion of research-skilled worker in the total workforce than either the EC-South or UMI, and possibly even greater than Western Europe. On the other hand, the lower rates of school and university

⁶ Siebert [1991] and Blackhurst [1992] underline the clear connections between flows of capital and labour migration and an interdependence between protectionism and migration. Blackhurst [1992, pp. 425-426] writes i.a.: "It is evident that the larger the net capital inflows (assuming they can be used efficiently), the greater the trade response of Eastern Europe and the USSR would be to improved market access in the West, and that improved market access in the West would increase the ability of these countries to attract foreign capital. Considering that younger and relatively more skilled workers have the strongest incentive to emigrate, a large emigration from Eastern Europe would reduce the regions ability to attract foreign capital."

⁷ In the same direction argue also Bode et al. [1991, p. 76] with regard to labour. They write "Komparative Vorteile auf polnischer Seite bestehen aber bei arbeitsintensiven Produktionsweisen. Denn wie aus einem Vergleich der Lohnniveaus hervorgeht, weisen Polen und auch die übrigen RGW-Länder gegenüber westlichen Marktwirtschaften erhebliche Lohnkostenvorteile auf ... So beträgt der durchschnittliche Stundenlohn ... in Polen lediglich US-\$ 1.35 ... Auch wenn man das niedrige Produktivitätsniveau in diesen Ländern berücksichtigt — es beträgt in der Regel etwa die Hälfte (oder weniger) des in westlichen Industrieländern zu beobachtenden Niveau —, bleiben deutliche Lohnkostenvorteile der osteuropäischen Länder bestehen."

enrolments (and their corresponding stocks) suggest a possible shortage of skilled production and commercial workers. These factor abundances suggest that among manufactures it is high-tech goods rather than labour-intensive goods that represent Eastern Europe's area of comparative advantage".⁸ H. Klodt [1991, pp. 6 and 7] was much more cautious and — pointing out clearly the importance of the necessary inflows of foreign capital and technology in the process of comparative advantages' changes — wrote i.a. "... it would be ill-considered to conclude that the East European stock of human capital is equivalent to the West European one. The UNESCO-statistics are only displaying information on formal qualification, and formal qualification is at best a rough indicator of market -oriented human capital. As a matter of fact, the whole educational system beyond the iron curtain was exposed to strong political pressure ... International contacts among scientists and researchers were restricted and it was difficult to get access to the international scientific community. Moreover, working in Eastern research institutions was hampered by the limited availability of modern scientific equipment. All these led to a quality differential between East and West — especially in the field of engineering and applied research. It would be quite difficult for Eastern scientists and researchers to compete with their Western colleagues on equal terms".

Collins and Rodrik [1991] indicated the opening up of domestic capital markets for foreign investors and inflows of foreign capital, as well as the appropriate assessment of the domestic human capital by these investors as the prerequisites for attracting foreign technology and for materializing the changes in the comparative advantages, too. They added, that the exchange rate policy should be also taken into account. With regard to the prospects of the Poland's (perhaps not only) trade with the EC member countries, the attitudes of Collins and Rodrik [1991], as well as of Klodt [1991] seem to be reasonable and well grounded in economic theory.

It is a well-known fact in international trade theory (approved rather clearly by the empirical evidence base on it) that the long-term comparative advantages of countries are mainly established by more or less immobile production factors [Leamer, 1984]. Consequently, their relative prices seem to be of great importance. As stated earlier, there is to expect in Poland that labour and land can be cheaper than capital, and therefore wage and land-rent relatively lower than interest rate (with the possibility of increasing divergences between interest rate — on the one hand, and the wage and land-rent on the other). Assuming all these facts as probable, there clearly appears additionally problem of the exchange rate policy or — more exactly — problem of the exchange rate policy of Poland (and not only) in conditions of the limited capital inflows. It seems reasonable there to support the opinion of Collins and Rodrik [1991] that in the circumstances of the massive inflow of the foreign capital (what is possible when there exists the necessary credibility of the government and its policy, when the foreign investors appreciate the political climate and the labour skills etc. in the inviting country), the exchange rate of the national currency can be overvalued or neutral in international standards, while the opposite is only to imagine when these requirements are not fulfilled: In such the circumstances, the possibilities to run the more or less substantial current account's deficits (and therefore also to overvalue

⁸ UMI comprises Argentina, Hong-Kong, Mexico, South Korea and Turkey.

national currency and immobile production factors) are rather impossible and, consequently, the national currency can be only undervalued. The natural and obvious result is in the case of Poland the underdevaluation of the domestic immobile factors.

Evaluating the rather convincing suggestion of Collins and Rodrik [1991] in a dynamic manner, the first conclusion is that the following devaluations of the Poland's national currency can only lead to the petrification of the some crucial problems rather well-known from the theory of international trade theory and from the theory of international factors' movements. These problems seem to be solved in the Europe Agreement between Poland (but also Czecho-Slovakia and Hungary) and the EC member countries to some extent only (e.g. limited liberalization of agricultural imports from these countries on the so-called Internal Market since 1992, very limited liberalization of the peoples' movements). But the problems seem to be serious, perhaps greater than the policy-makers are used to treat and to accept them.

According to expectations in Poland, the period of the next take-over of the Poland's national economy will begin in 1993 and the GDP rate of growth can fluctuate between 4.2 % and 4.7 % in 1993-1996 [Kazimierska, Orlowski, Welfe 1992]. Therefore, the structural changes typical for the economic growth can be expected, too, and this in turn will also influence the relative prices of the production factors (relative increase of wages etc.). This is, however, a long process. Additionally, due to many reasons from the past, the relatively speedy materialization of this process in Poland in the next 5-15 years is hard to imagine. It requires i.a. tremendous inter-sectoral and inter-regional shifts of labour in the conditions of high unemployment rate (12.6 % in June 1992), of shortages of flats, of clear infrastructural deficiencies etc. Data of Table 27 show to some extent the scope of the structural problems of the Poland's national economy.

Table 27 — Employment Structure in Poland, West Germany and in the 32 Comparator Countries in 1989 and the Scope of the Necessary Structural Shifts in Poland (% , percentage points and thousands of people)^a

Specification	Employment structure in %			Deviations of the employment structure in Poland in percentage points		Number of people in Poland to be shifted		Share of people to be shifted in the total number of employees	
	Poland	West Germany	32 comparator countries	from the employment structure of West Germany	from the employment structure of comparator countries	in comparison with West Germany	in comparison with 32 countries	in comparison with West Germany	in comparison with 32 countries
Agriculture and forestry	27.9	3.9	5.5	-23.4	-22.4	-4008.2	-3836.9	85.8	82.1
Mining	3.4	0.7	x	-2.7	x	-462.5	x	79.7	x
Industry	28.6	31.4	22.1	2.8	-6.5	479.6	-1113.4	9.8	22.7
Electricity, gas and water	2.5	1.0	0.8	-1.5	-1.7	-256.9	-291.2	59.4	67.4
Building	7.7	6.5	6.8	-1.2	-0.9	-205.5	-154.2	15.6	11.7
Services	30.5	56.5	63.3	26.0	32.8	4453.5	5618.3	76.6	96.6
Total	100.0	100.0	100.0	0.0	0.0	0.0	0.0	x	x

^a Employment structures in West Germany and in the 32 Comparator Countries taken from: Bode, Krieger-Bodeo [1990, p. 87]

Source: GUS [1991]; own calculations.

There is a relatively big potential of agricultural exports from Poland (e.g. freshed and preserved meat, fish, fruit and vegetables and related products, the so-called "healthy food"), while on the other hand, the development of these exports is a must for this country.⁹ The most important arguments are the following:

- a) shares of the Poland's agriculture in GDP, employment and exports (especially to the EC member countries) are relatively very high and will probably decrease rather very slowly;
- b) agriculture plays an important role in the Poland's stabilization policy (the most privatized sector in the country which should respond to the market incentives, hold back rural-to-urban migration, absorb to some extent the unemployment 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 upstream and downstream sectors should contribute substantially to the revitalization of the national economy;
- d) many sectors of the Poland's agriculture seems to possess comparative advantage but the distorted international agricultural markets does not guarantee price competitiveness and increasing market shares;
- e) an increase of the comparative advantage of the Poland's agriculture can be expected with the progress of the transformation and privatization processes.

While not disregarding agriculture, just Poland's industry is to be treated as the sector being the "locomotive of growth" of the country in the longer run. To put it more precisely, some branches of the Poland's industry, especially — as it seems — the more labour-intensive ones. Their clear and unquestionable specification is rather a hard task but the results of investigations of Hughes and Hare [1992] seem to be interesting at this moment, even that they are based on the so-called DRC's method¹⁰ being rather critically assessed in Poland [Kotynski, 1988].

Poland and other East and Central European countries tended to export to the West their relatively competitive products and — as Hughes and Hare [1992] prove it — this was also true in economic relations with the EC member countries. Bearing this in mind and taking into account the Poland's RCA indicators presented in tables 6 and 12, there is to believe that Poland's comparative advantage vis-à-vis these countries was particularly strong in such industries as printing, textiles, chemicals, wood products, pottery and chinaware, ferrous metallurgy and fabricated metal products, instruments and electrical equipment. Let's note that it was true even that in many of these sectors (e.g. textiles or iron and steel products) the exporters from Poland faced

⁹ See i.a.: Alton [1989], Alexandratos [1990], Report [1990], USITC [1991], Czykier-Wierzba [1992], Dicke [1992], Lorenz [1992], Tangermann [1992].

¹⁰ DRC (the domestic resource cost) are defined for branch "i" as follows:

$$DRC_i = (\text{value added in domestic prices} / \text{value added in world prices}).$$

According to this method, the most competitive branches are those with small positive DRC's (since these are the branches in which relatively few domestic resources of labour and capital are required to generate a unit of GDP at world prices). The opposite is true for branches with the large DRD's and for those with negative value added at world prices. As Hughes and hare [1992, p. 7] write, "for branches in the latter category, ... it follows that GDP measured at world prices would immediately increase if these were shut down".

many discriminatory measures of the EC member countries [Möbius, Schumacher, 1991; Kawecka-Wyrzykowska, 1992; Langhammer, 1992a,b].

Table 28 — Domestic Resource Costs Indicators by Industries for Poland in 1988

Industry according to ISIC	Specification	Based on value-added at domestic prices	Incorporating output quality adjustment
301	Meat, fish and dairy products	0.43	0.34
302	Fruit and vegetable products	7.68	17.81
303	Oils and fats	0.73	0.57
304	Cereal products	2.44	2.91
305	Sugar and confectionary	1.29	1.49
306	Other foodstuffs	0.39	0.51
313	Beverages	1.14	1.37
314	Tobacco products	0.78	-6.87
321	Textiles	1.12	1.45
322	Clothing	1.29	2.12
323	Leather products	1.09	1.29
324	Footwear	1.58	2.30
331	Wood products	1.08	1.55
332	Wooden furniture	1.19	1.99
341	Paper products	1.22	1.38
342	Printing	0.51	0.75
351	Basic chemicals	1.63	3.48
352	Other chemicals	1.01	1.67
355	Rubber products	1.06	3.83
356	Plastic products	1.03	3.06
361	Pottery and chinaware	1.09	1.42
362	Glass and glassware	1.19	1.63
363	Cement	1.34	7.02
364	Structural clay products	1.19	2.17
369	Other non-metal mineral products	1.36	2.67
371	Ferrous metallurgy	1.10	1.90
372	Non-ferrous metallurgy	1.76	2.83
381	Fabricated metal products	1.07	1.85
382	Machinery	1.03	2.54
383	Electrical equipment	1.19	2.82
384	Transport equipment	1.42	5.00
385	Instruments, etc.	0.91	1.34
390	Other manufactures	1.22	1.66
	All industries	1.17	2.07

Source: Hughes, Hare [1992, pp. 35-36].

Market signals did not provide in 1990 and 1991 sufficiently clear guidance as to the directions of changes of Poland's competitiveness and this was mainly due to the rather high inelasticity (rigidity) of specific post-socialist structures and due to the underdevelopment of institutional infrastructure of the market economy (banking system, financial system, tax system etc.). However, the situation will change (rather slowly as it seems) with the progress of transformation and privatization processes, and the most probable result will be an increase of Poland's comparative advantages in labour-intensive products, first in unskilled labour-intensive ones and then in skilled labour-intensive ones. One can expect that Poland's comparative advantage in technology-intensive products will gradually increase, too, probably especially in the case of technology-intensive products easy to imitate. There seems reasonable to share the view of Klodt [1991] that integration of Poland

and other Eastern and Central European countries will drive their industry structures towards such mobile Schumpeter industries like chemicals and chemical related products, transport equipment and electronics. Needless to say, the growth rates of this processes depends primarily upon such factors as the speed of transformation and privatization in Poland, political and economic stabilization there, abilities and motivations of people to attract foreign capital and inflows of technology and management, as well as abilities and desire just to go forward. However, there should appear an appropriate response of the West, too, including greater openness of the markets. As Czinkota [1991, p. 26] puts it rightfully "it must be understood that instability does not just result from tanks, but also from the knowledge that the nextdoor neighbour lives in poverty driven volatility".

Services were clearly neglected in Poland in the past but there is (also due to this fact) significant long-term potential for their development. The most promising seems to be the development of building services and of tourism. Also in these cases Poland offers a lot, mainly abundant supply of labour with relatively well skilled one, competitive wages, proximity to West and East European markets, attractiveness for tourists, traditions of cooperation and some experience in business with East and West, as well as commitment to transform the system, to invest and to modernize.

The pattern of the emerging division of labour between Poland and the EC member countries will be undoubtedly characterised by the growing intra-industry specialization and this in turn will increase wealth and interdependence as a consequence of enlargement of markets which makes more varieties of goods and their parts feasible and lowers prices by utilizing economies of scale. According to theory, more intensive intra-industry trade will also limit costs of restructuring and thus increase wealth, too. However, it wouldn't be reasonable to overestimate these gains in the trade relations between Poland and the EC member countries. First, the eventual full 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 of labour is the highest between countries with a similar factor endowment and similar structure of production, and it will be probably not the case in relations between these countries in the next 10-20 years. Third, this theory emphasizes additionally that even among countries interrelated by trade and with the similar structures of factor endowment and of production, economic cooperation can create intra-industry trade only 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. Experience from the past and even contents of the Poland's association agreement with the EC and their member countries show that there is a lot of efforts and of time to spent in order to be more optimistic than today. Coping with protectionism is always a hard task.

As in the case of the inter-industry division of labour between Poland and the EC member countries, the future of the respective intra-industry trade seems reasonable to evaluate according to the lessons stemming from a "stage of development" approach. There is to expect that the structure of the intra-industry division of labour between these countries will simply mirror evolution of their comparative advantages by factor intensity. It means from the perspective of Poland a continuation of gradual shifts of intra-industry trade in natural re-

sources'-intensive and unskilled labour-intensive branches to skilled labour-intensive and technology-intensive ones. There are possibilities to promote this processes by various institutional measures and there is a lot of reasons just to do it. This conclusion is well grounded in economic theory.

Annex

Table I — Revealed Comparative Advantage (RCA) Indicators in Poland's Trade with the Member Countries of the European Communities by Sections of the CN in 1989-1991

Sections	Specification	1989	1990	1991
I	Live animals and animal products	1.29	2.22	0.89
II	Vegetable products	-0.46	1.18	0.84
III	Animal or vegetable fats and oils and waxes	-1.80	-1.02	-1.67
IV	Prepared foodstuffs, beverages and tobacco	-0.35	-0.31	-0.43
V	Mineral products	1.49	0.54	0.63
VI	Chemicals and products of allied industries	-0.86	-0.40	-0.64
VII	Plastics, rubber and related articles	-1.03	-0.49	-0.42
VIII	Raw hides and skins, leather, travel goods	0.77	1.27	0.21
IX	Wood, cork and related articles	3.57	4.06	1.88
X	Pulp of wood, paper and paperboard, scrap	-0.03	0.19	-0.34
XI	Textiles and textile articles	-0.27	-0.02	-0.21
XII	Footwear, headgear, umbrellas, artificial flowers	1.50	1.16	1.13
XIII	Articles of stone, plaster, cement, asbestos, etc.	0.04	0.32	0.54
XIV	Pearls, precious stones and metals	2.35	2.96	2.53
XV	Base metals and articles of base metal	0.72	1.05	0.96
XVI	Machinery and mechanical appliances, equipment etc.	-1.17	-1.55	-1.15
XVII	Vehicles, aircraft, vessels and equipment	-0.09	-0.23	-0.09
XVIII	Optical and photographic instruments and apparatus	-1.92	-2.03	-1.66
XIX	Arms and ammunition	1.35	0.77	-2.52
XX	Miscellaneous manufactured articles	2.29	1.06	0.98
XXI	Works of art, collectors pieces and antiques	-	3.93	1.83

Source: CIHZ [1992]; own calculations.

Annex

Table 2 — Intra-Industry Trade Indicators in Poland's Trade with Member Countries of the European Communities by Sections of the CN in 1989-1991

Sections	Specification	1989	1990	1991
I	Live animals and animal products	0.44	0.12	0.35
II	Vegetable products	0.76	0.31	0.37
III	Animal or vegetable fats and oils and waxes	0.28	0.76	0.53
IV	Prepared foodstuffs, beverages and tobacco	0.82	0.89	0.89
V	Mineral products	0.37	0.51	0.44
VI	Chemicals and products of allied industries	0.59	0.94	0.99
VII	Plastics, rubber and related articles	0.52	0.98	0.88
VIII	Raw hides and skins	0.64	0.29	0.59
IX	Wood, cork and related articles	0.06	0.02	0.05
X	Pulp of wood, paper and paperboard, scrap etc.	0.98	0.66	0.84
XI	Textiles and textile articles	0.86	0.75	0.78
XII	Footwear, headgear, umbrellas, artificial flowers etc.	0.37	0.31	0.29
XIII	Articles of stone, plaster, cement, asbestos, etc.	0.99	0.60	0.46
XIV	Pearls, precious stones and metals	0.18	0.06	0.08
XV	Base metals and articles of base metal	0.66	0.34	0.33
XVI	Machinery and mechanical appliances, equipment etc.	0.47	0.53	0.76
XVII	Vehicles, aircraft, vessels and equipment	0.94	0.86	0.72
XVIII	Optical and photographic instruments and apparatus	0.25	0.36	0.53
XIX	Arms and ammunition	0.42	0.43	0.27
XX	Miscellaneous manufactured articles	0.19	0.34	0.33
XXI	Works of art, collectors pieces and antiques	0.00	0.02	0.15
	Non-weighted mean	0.51	0.48	0.51
	Standard deviation	0.30	0.30	0.27
	Weighted mean ^a	0.26	0.22	0.25

^a Weighted by the share of respective sections in Poland's exports to the EC member countries.

Source: CIHZ [1992]; own calculations.

Annex

Table 3 — RCA-Indices in Poland's Trade with the EC Member Countries in the Case of the 50 Most Important Products Exported by Poland in 1989-1991

CN Code	Specification	1989	1990	1991
	<i>Natural resources-intensive products</i>			
2503	Sulphur	6.96	3.98	4.70
2701	Coal, briquettes etc.	7.76	x ^a	x ^a
2704	Coke and semi coke of coal	8.63	x ^a	x ^a
2707	Oils, products of high temp. coal tar	1.61	1.23	0.84
2710	Petroleum oils except crude	1.16	-0.20	0.19
3102	Mineral and chemical fertilizers	3.32	4.70	4.88
4002	Synthetic rubber and factice	-5.16	-1.55	-2.00
4407	Wood sawn	8.55	5.07	6.41
7204	Ferrous waste and scrap	5.59	5.33	6.77
	<i>Labour-intensive products</i>			
2523	Cement and cement clinkers	6.76	6.62	8.96
4202	Suit-cases, containers of leather	5.20	2.39	2.63
4411	Fibreboard of wood, other ligneous materials	x	4.76	4.66
4412	Plywood, reneered panels	6.31	5.62	4.27
4421	Other articles of wood	5.06	6.13	x
4804	Uncoated kraft paper and paperboard	0.54	4.14	1.70
4805	Other uncoated paper	1.65	2.56	1.80
6201	Men's/boys' overcoats	0.57	0.23	0.25
6202	Women's/girls' overcoats	-0.75	-1.52	-1.98
6203	Men's/boys' suits, breches, etc.	0.75	0.86	0.67
6204	Women's/girls' suits, breches, etc.	-1.13	-0.19	1.07
6205	Men's/boys' shirts	0.01	1.76	-0.50
6206	Women's/girls' blouses and shirts	-1.21	-0.82	-0.43
6302	Bed/table toilet linen	11.47	5.17	9.20
6403	Footwear made with leather	2.32	2.48	2.49
7004	Drawn and blown glass	3.77	4.91	x
7013	Glassware for household	2.37	1.86	2.39
7308	Structures of iron and steel	2.37	3.05	0.83
7317	Nails, tacks of iron and steel	4.96	4.23	5.06
7318	Screws, bolts of iron and steel	0.32	0.29	0.79
7326	Other iron and steel articles	1.76	1.36	2.72
9401	Certain seats	7.97	1.79	2.38
9403	Other furnitures	4.36	4.43	4.31
	<i>Capital-intensive products</i>			
4011	Pneumatic tyres of rubber	0.93	1.57	2.05
7106	Silver in various forms	6.83	7.58	6.62
7208	Flat-rolled products of iron	0.41	-0.11	1.34
7211	Smaller flat-rolled products of iron	1.11	0.49	1.75
7213	Bars and rods; hot rolled	x ^a	x ^a	x ^a
7216	Angles, shapes of iron and steel	1.32	1.24	1.98
7307	Tube or pipe fittings of iron and steel	0.48	1.14	-0.72
7403	Refined copper and alloys	2.91	3.72	6.45
7408	Copper wire	1.77	1.13	1.22
8703	Motor cars for persons	-0.14	-1.73	-2.84
	<i>Technology-intensive products easy to imitate</i>	x ^a	7.16	6.19
3904	Polymers of chloride	x ^a	-2.78	-1.03
	<i>Technology-intensive products difficult to imitate</i>			
8408	Diesel engines	2.49	0.67	0.09
8409	Parts suitable for diesel engines	-0.06	0.50	-0.48
8482	Ball or roller bearings	-0.13	-0.14	-0.23
8509	Electro-mechanical domestic appliances	2.23	1.18	1.95
8544	Insulated cable/wire etc.	1.95	1.88	2.36
8901	Certain vessels specially equipped	x ^a	1.97	x ^a

a Lack of imports to Poland.

Source: CIHZ [1992]; own calculations.

Annex

Table 4 — Structure of Poland's Imports from the EC Member Countries by Factor Intensities at the Four-Digit Level of the CN in 1989-1991^a

Specification	1989	1990	1991
Land-intensive products	24.9	11.7	16.2
Forest-intensive products	0.7	0.4	0.8
Natural resources'-intensive products	7.2	8.3	8.5
Labour-intensive products	23.8	29.1	26.2
Capital-intensive products	21.5	19.9	24.0
Technology-intensive products	21.9	30.6	24.3
Total	100.0	100.0	100.0
Land-intensive products			
both of vegetable and animal origin	0.6	1.5	1.7
of vegetable origin (not processed)	11.7	1.6	2.6
of vegetable origin (processed)	7.2	6.2	7.6
of animal origin (not processed)	4.3	1.3	3.3
of animal origin (processed)	1.0	1.0	1.0
Forest-intensive products			
not processed	0.0	0.0	0.1
processed	0.6	0.4	0.7
Natural resources'-intensive products	7.2	8.3	8.5
Labour-intensive products			
skilled labour-intensive products	17.8	23.0	19.8
unskilled labour-intensive products	5.9	6.1	6.4
Capital-intensive products	21.5	19.9	24.0
Technology-intensive products			
easy to imitate	18.7	26.7	21.2
difficult to imitate	3.3	4.0	3.1
Total	100.0	100.0	100.0
^a Indicators may not add perfectly due to the roundings.			

Source: CIHZ [1992]; own calculations.

Annex

Table 5 — Structure of Poland's Exports to the EC Member Countries by Factor Intensities at the Four-Digit Level of the CN in 1989-1991^a

Specification	1989	1990	1991
Land-intensive products	23.2	20.5	12.5
Forest-intensive products	5.0	4.6	4.8
Natural resources'-intensive products	18.4	17.7	17.4
Labour-intensive products	14.1	15.1	17.5
Capital-intensive products	34.7	37.0	42.6
Technology-intensive products	4.6	5.1	5.2
Total	100.0	100.0	100.0
Land-intensive products			
both of vegetable and animal origin	0.0	0.2	0.2
of vegetable origin (not processed)	5.1	3.8	2.3
of vegetable origin (processed)	5.2	5.8	5.0
of animal origin (not processed)	10.0	8.8	3.1
of animal origin (processed)	3.0	2.0	1.7
Forest-intensive products			
not processed	2.0	1.2	1.3
processed	3.0	3.4	3.6
Natural resources'-intensive products	18.4	17.7	17.5
Labour-intensive products			
skilled labour-intensive products	5.5	6.3	8.0
unskilled labour-intensive products	8.6	8.7	9.5
Capital-intensive products	34.7	37.0	42.6
Technology-intensive products			
easy to imitate	4.1	4.5	4.6
difficult to imitate	0.4	0.6	0.6
Total	100.0	100.0	100.0
^a Indicators may not add perfectly due to the roundings.			

Source: CIHZ [1992]; own calculations.

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