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The Poland competitiveness and the trade connections in reference to the countries of Central and Eastern Europe and former USSR

Abstract

In the paper is presented multiaspectual indicatory statistical analysis (TI, RCA, IIT, ESI) of the Polish trade with the countries of Central and Eastern Europe and former USSR in the reference to UE-15 countries. The chosen group of countries encloses all the former republics of the USSR (Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Lithuania, Latvia, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan) and Bulgaria, Czech Republic, Romania, Hungary, Slovakia. Studied countries were divided into two groups - UE and non UE. It was showed that in the first group had appeared a tendency to levelling the competitiveness and to the growth of cooperation, in second however the level of cooperation is close to the zero and the level of competitiveness diminishes in relation to Poland. 1.

1. Introduction

The aim of the paper is the multiaspectual comparative analysis of the Polish trade in the reference to the trade competitiveness of the Polish economy and the economies of Central and Eastern Europe countries and also the countries of the former USSR on the background of Poland's trade with European Union. The survey was carried out on the basis of the annual data from the 1999-2007 period coming from the Eurostat Comext Database. The chosen group of countries encloses all the former republics of the USSR (Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan,

Lithuania, Latvia, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan) and Bulgaria, Czech Republic, Romania, Hungary, Slovakia.

Coefficients making up the basis to comparisons between countries are brought back to group UE-15, what means the countries of European Union before the enlargement in 2004 treated together as a standard area characterizing the high level of the economic development and having the significant competitive position in the majority of freight groups. The considered group of countries was divided into EU countries and other countries. First group contains all the countries which belonged to European Union in 2008 (Estonia, Lithuania, Latvia, Bulgaria, Czech Republic, Romania, Hungary, Slovakia) independently from their status in the studied period, the second-remaining countries among mentioned.

The existing literature shows that suitable place in the international division of the work establishes the key matter for the long-term perspective of the development of individual countries. Authors show (Lucas 1988, Young 1991, Grossman, Helman 1991), that the inappropriate specialization may lead to the durable lowering of the rate of the economic growth. Changes in the specialization may be caused by various factors. Standard Heckscher-Ohlin model suggests, that the reason may be the change of the factors endowment or / and the change of the prices relationship among them. The other conceptions (Helpman 1981, Helman, Krugman 1985) show however the larger compiling, and in the situation, when enterprises achieve the advantages of the scale, and the national economy shows the strong connection with foreign, many conclusions coming from classic models may be incorrect. As Wong (Wong 1995) proves, in the face of strong national economies the world trade does not follow the changing relative advantages, but is fully determined by existing initial advantages. This means that exists the tendency to the polarization of trade flows and the growth of the level of specialization. In present paper the author verifies, if this principle finds the use for Polish economy in reference to the studied group of countries, or, maybe, as in developed countries (Brasili, Epifani, Helg 2000) the degree of the specialization decreases because of unification of factors endowment in the global economy.

In the literature the notion of comparative advantages is distinguished from the notion of competitiveness, which results first of all from relatively higher ability to the obtainment of the access to national and foreign markets. Despite the considerable similarity of notions the difference arises from not taking into account some possibilities of achieving the competitive position on the market by the classic theory: superiority in marketing strategy and the other different aspects of the existence of the imperfect competition. It is often underlined, that competitiveness is short-term parameter (Wysokińska 2001,

Wysokińska 2002, pp. 36-40) and the comparative advantages are more stretched in the time, but also labile. In the paper despite of use of the so-called coefficient of revealed comparative advantage aggregate competitiveness is studied, which takes into account both durable advantages resulting from disposing the specific factors, and the short-term, having source in the imperfect competition.

The intra-industry trade which makes up the predominant part of turnover among developed countries at present is the additional element considered in the investigation. The intra-industry exchange overweighs between similar countries in relation to the proportion between the capital and the labor, the level of the qualification etc. This kind of trade will have place between countries with the similar level of the economic development mainly. This is the characteristic situation for industrial manufacturers on the high technological level rather than for raw materials and traditional industrial products. This means that intra-industry trade will step out the most probably in the range of manufactured products between high developed countries. The high part of the intra-industry exchange would testify simultaneously about the level of the development and also about similarity in the degree of the economic development of Poland and the studied country.

For the opinion of its intensity the key meaning has the problem of the aggregation or otherwise the criterion of distinguishing the products from one trade (the branch of industry, the group of the product, the various changes of the same product). The higher degree the desagregation the lower coefficients of the intensity of the intra-industry trade are. They are even to zero on the level of identical products. These matters are not solved to the end. For the first, the one part of freight groups is more heterogeneous than other, at any level of the aggregation (Czarny 2002, p.201). For the second, on the highest desagregation level often happens that homothetic products belong to the statistically various groups of products (Balassa 1979) what causes that intra-industry trade is treated as the inter-industry. So, there is no possibility to show the accepted by all level of the aggregation and even the classification SITC vs. CN (Pomfred 1985, Greenaway, Milner 1985). That is why the four-digit CN aggregation was accepted according to Kandogan proposal (Kandogan 2003) as the basic.[24]

The intensity of the intra-industry trade is identified with commitment in the international cooperation of enterprises in the paper. Applied barriers and trade limitations also have the enlarged influence on the intra-industry trade. The

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[24] Calculations made for Poland and UE for the period of 1989-1997 on eight-digit CN codes (Michałek, Śledziewska-Kołodziejska 2000) show that IIT coefficients then are approx. 10 points lower than got by the author.

same is with transaction costs. These factors should appear in reduced part of intra-industry trade together with the growth of the distance and also in the case the lack the membership of the given country in EU, which membership is treated as free trade among chosen country and Poland. This point of view is formally entitled exclusively from the half of 2004, however due to free trade agreements between Poland and most of studied countries in the case of the predominant majority of goods there was no trade barriers in practice.

All studied countries were in a relatively uniform economic area twenty years earlier, all of them were centrally planned economies and the mutual co-operation among them and Poland was hold within the Council for Mutual Economic Assistance (CMEA). This forejudged about their considerably stronger mutual integration than with the rest of the world. CMEA and socialist block disintegration caused that all these countries had stood up in the face of the necessity of building the economic system from new in compliance to the principles of the market economy. The effectiveness of the transformation and its advancement had the doubtless significant influence on ability to matching challenges put through the more and more integrating global market and therefore had the direct shift on susceptibility and ability to import and the export of these countries. All of these countries on the start of the system transformation we can consider as relatively richly equipped in labor and relatively poor in the capital. The comparison of the Poland's to these countries trade competitiveness also makes possible (taking into considerations certain corrections coming out from affluence in natural resources) also makes possible evaluation of changes in factors endowment.

The introduction of results in every case was simplified to average coefficients for the given country because of the extensiveness of the analyzed material.

2. The general profile of the trade

Turnovers with the chosen group of countries is the small part of the Polish foreign trade especially in the reference to countries UE-15 (above 60%). They are a little more significant only in the case of Russia, Czech Republic, Hungary and Ukraine. In the case of economically small Asiatic republics of the USSR few transactions were noted annually.

The signification of these countries successively grows simultaneously with the gradual weakens of the position of the EU, although still predominant, which most probably comes from the relatively uniform factors endowment on

the start of the transformation, the relatively small size of economies themselves, and in case of former republics of USSR, also from low purchasing power.

Table 1. The freight turnover of Poland with chosen countries, millions €, in parentheses share in the total Polish export and import

|	IMPORT		EXPORT		BALANCE	
	1999	2007	1999	2007	1999	2007
Armenia	0,1 (0,0%)	4,5 (0,0%)	2,3 (0,0%)	7,5 (0,0%)	+2,1	+2,9
Azerbaijan	2,1 (0,0%)	3,2 (0,0%)	22,3 (0,1%)	50,9 (0,0%)	+20,1	+47,7
Bulgaria	38,7 (0,1%)	177,5 (0,1%)	66,8 (0,3%)	398,5 (0,4%)	+28,1	+221,0
Belarus	155,0 (0,4%)	824,4 (0,7%)	219,0 (0,9%)	824,3 (0,8%)	+63,9	-0,1
Czech Republic	1381,9 (3,2%)	4668,3 (3,9%)	974,0 (3,8%)	5665,9 (5,5%)	-407,9	+997,6
Estonia	17,3 (0,0%)	119,5 (0,1%)	86,3 (0,3%)	584,2 (0,6%)	+69,0	+464,7
Georgia	0,6 (0,0%)	3,3 (0,0%)	14,4 (0,1%)	44,7 (0,0%)	+13,8	+41,4
Kazakhstan	39,8 (0,1%)	296,1 (0,2%)	47,6 (0,2%)	348,1 (0,3%)	+7,8	+52,0
Kyrgyzstan	2,5 (0,0%)	1,6 (0,0%)	2,7 (0,0%)	20,3 (0,0%)	+0,2	+18,8
Lithuania	190,2 (0,4%)	733,0 (0,6%)	407,5 (1,6%)	1670,0 (1,6%)	+217,3	+937,0
Latvia	27,1 (0,1%)	195,0 (0,2%)	190,1 (0,7%)	794,5 (0,8%)	+163,1	+599,5
Moldova	6,7 (0,0%)	88,1 (0,1%)	37,3 (0,1%)	127,8 (0,1%)	+30,6	+39,7
Romania	143,9 (0,3%)	487,4 (0,4%)	121,7 (0,5%)	1583,9 (1,5%)	-22,3	+1096,4
Russia	2514,5 (5,8%)	10450,6 (8,6%)	667,7 (2,6%)	4727,4 (4,6%)	-1846,7	-5723,2
Slovakia	531,7 (1,2%)	2356,9 (1,9%)	334,5 (1,3%)	2230,0 (2,2%)	-197,3	-126,9
Tajikistan	3,2 (0,0%)	7,6 (0,0%)	2,7 (0,0%)	12,4 (0,0%)	-0,6	+4,8
Turkmenistan	14,2 (0,0%)	1,0 (0,0%)	3,5 (0,0%)	12,1 (0,0%)	-10,8	+11,1
Ukraine	317,8 (0,7%)	1228,4 (1,0%)	660,9 (2,6%)	4051,4 (4,0%)	+343,1	+2823,0
Uzbekistan	44,0 (0,1%)	497,3 (0,4%)	33,0 (0,1%)	46,5 (0,0%)	-11,0	-450,8

Hungary	586,1 (1,4%)	2615,1 (2,2%)	504,9 (2,0%)	2971,8 (2,9%)	-81,2	+356,7
UE-15	27959,1 (64,9%)	76538,7 (63,3%)	18089,9 (70,5%)	64328,5 (62,9%)	-9869,2	-12210,2
Others	9074,3 (21,1%)	19614,3 (16,2%)	3181,3 (12,4%)	11758,8 (11,5%)	-5893,0	-7855,5

Source: own calculations on the basis of Eurostat Comext Database, date of the access 11.11.2008,
       http://fd.comext.eurostat.cec.eu.int/xtweb/.

Inclusion of these factors allows to make considerably more optimistic conclusions for the further co-operation with these countries development. This makes possible the so-called coefficient of the trade intensity (TI) computed according to the formula

$$TI = \frac{x_i}{X_{it}} : \frac{x_w}{X_{wt}}$$

where xi – export value from country A to the country B; Xit – total export value of the country A; xw – value of the world export to B; Xwt – total world export. The TI value higher (lower) than 1 testify about the relatively higher (lower) share of the trade with the given country, than this should result from the share of given country in the world trade.

Graph 1. TI coefficients for the Poland's trade with selected countries
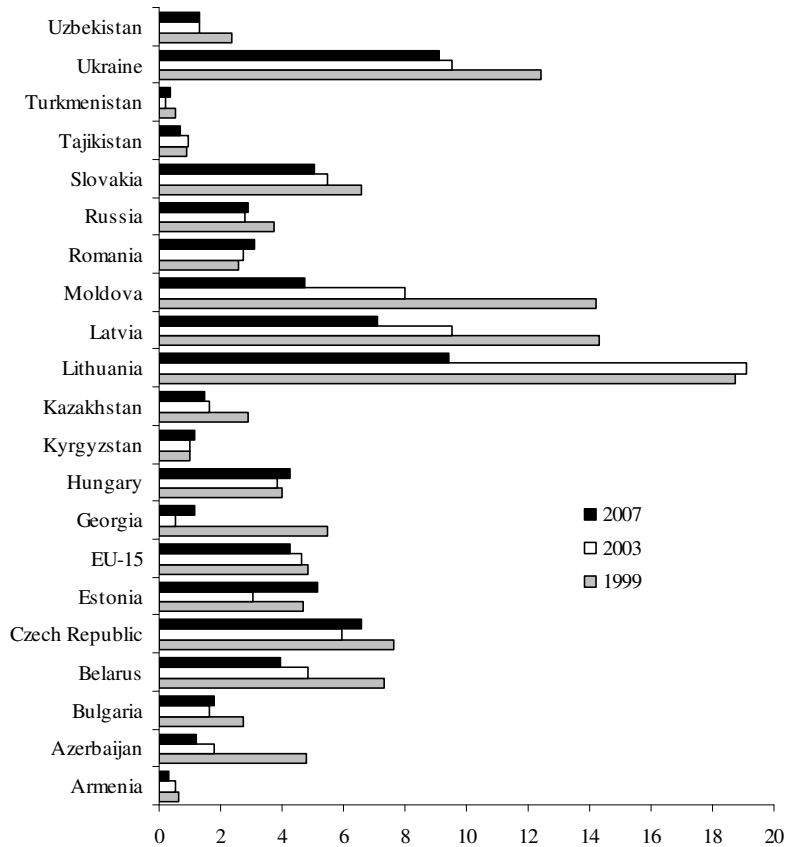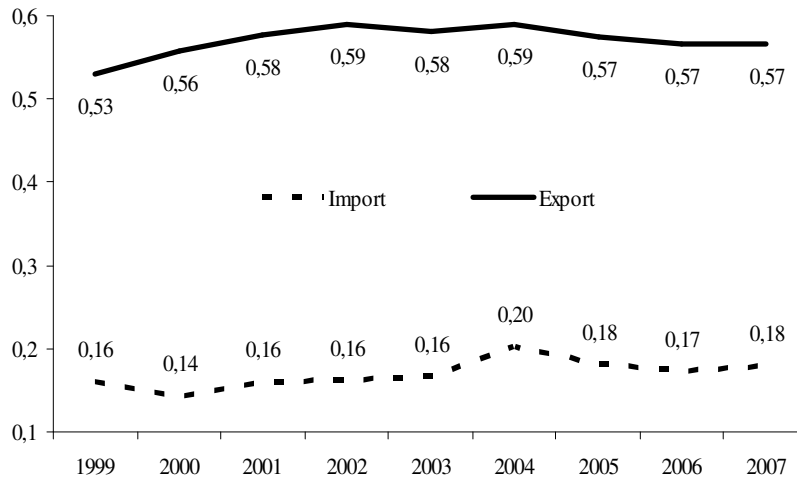

Source: own calculations on the basis of World Trade Organization, International Trade Statistics
    2008, p.181-200 and Eurostat Comext Database, date of the access 11.11.2008,
    http://fd.comext.eurostat.cec.eu.int/xtweb/.

The values of the TI coefficients testify about the existence of the very strong leaning of Polish subjects to the trade with the selected group of countries if we take into account their general position in the world trade. This is especially easily perceptible for countries situated close. On the other hand there were noted significant falls of the coefficient value in many cases. Such results in the connection with the growing part in the whole turnover of trade suggest the loss of the meaning of 'sentimental' (CMEA) factors and their replacement by typically market factors.

The trade with selected countries is as a rule highly profitable from the point of the view of the Polish current balance. Negative balances except for

Russia, Slovakia and Uzbekistan did not appear in 2007. This makes possible partial balancing of the negative trade account with countries EU-15.

Graph 2. The structure similarity index for Polish export and import for the EU and non-EU countries of Central the Eastern Europe

Source: own calculations on the basis of Eurostat Comext Database, date of the access 11.11.2008, http://fd.comext.eurostat.cec.eu.int/xtweb/.

Industrial goods overweigh in the freight structure of the trade. The major exports goods of Poland for chosen area are: machines and devices, the vehicles, articles of iron and steel and furniture. There is considerable differentiation in the case of import from EU countries where similar to export goods predominate and non-UE countries, where above than 60% of total imports is covered by materials and mineral fuels. The differentiation of the import and export structures among the EU and the rest of countries becomes especially well perceptible thanks to the computation of the coefficients of the structure similarity. So-called ESI (export similarity index) (Finger, Kreinin 1979) was chosen in this case. It is computed according to the formula

$$ESI = 100 \cdot \sum_{i} \min[X_{ia}; X_{ib}]$$

where Xia - the share of export (import) of section i in the total export (import) of the country A to / from the country Y; Xib - the share of export (import) of section i in the total export (import) of the country B to / from the country Y. The coefficient in general is suitable for comparison of any two (or

even more) structures. The value changes in the interval [0;1] and the higher it is, the higher is similarity.

Calculations prove, that there are not many principal differences for countries belonging and non-belonging to the EU for the Polish export - the similarity exceeds 50%, however the import differs diametrically.

3. The comparative advantage

The statistical analysis held in this part is based on revealed comparative advantage (RCAi) indices[25].

$$RCA_i = \frac{X_{ij}}{X_{iw}} : \frac{\sum_{i=1}^{n} X_{ij}}{\sum_{i=1}^{n} X_{iw}}$$

where X_{ij} – the value of the export of the freight group i from the country j to the given country or region, X_{iw} – the value of the world export of good i to the given country or region, $i = 1,2,..n$ – freight group. The index takes values in the interval $[0;\infty]$. RCA>1 means achieving the relative advantage in the given section, RCA<1 marks the lack of such advantage. Standarization of RCAi to RCASi was performed to make possible the interpretation of average values. This was done by the use of monotonic transformation of RCAi (Dalum, Laursen, Villumsen 1998):

$$RCAS_i = \frac{RCA_i - 1}{RCA_i + 1}$$

this index changes in the range [-1;1] and, in the distinction from classic RCA is the symmetrical measure. The negative value of the index marks the lack of advantages, positive - their achieving.

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[25] It is worth of mentioning that despite on the generality of employing *RCA* indices their theoretical bases are not convincing to the end. Hillman (Hilman 1980) on the basis of international comparisons showed that this measure could be divergent with the real advantages of separate countries.

Table 2. RCAS for the Poland's trade with selected economies

	1999	2001	2003	2005	2007
Armenia	0,08	0,08	0,12	0,13	0,12
Azerbaijan	0,17	0,22	0,27	0,25	0,25
Bulgaria	0,11	0,09	0,13	0,21	0,21
Belarus	0,32	0,34	0,36	0,41	0,44
Czech Republic	-0,03	-0,02	0,02	-0,05	-0,06
Estonia	0,25	0,28	0,28	0,25	0,25
EU-15	-0,18	-0,19	-0,18	-0,25	-0,25
Georgia	0,10	0,11	0,07	0,14	0,20
Hungary	0,03	0,06	0,11	0,09	0,11
Kyrgyzstan	0,09	0,09	0,09	0,11	0,15
Kazakhstan	0,29	0,30	0,29	0,32	0,33
Lithuania	0,40	0,41	0,42	0,33	0,30
Latvia	0,37	0,36	0,40	0,40	0,37
Moldova	0,32	0,29	0,30	0,37	0,38
Romania	0,16	0,16	0,17	0,29	0,30
Russia	0,36	0,36	0,37	0,41	0,41
Slovakia	0,15	0,17	0,19	0,20	0,17
Tajikistan	0,03	-0,01	-0,01	0,02	0,06
Turkmenistan	0,00	-0,01	0,02	0,06	0,06
Ukraine	0,36	0,39	0,39	0,40	0,39
Uzbekistan	0,09	0,08	0,16	0,11	0,13

Source: own calculations on the basis of Eurostat Comext Database, date of the access 11.11.2008,
     http://fd.comext.eurostat.cec.eu.int/xtweb/.

The negative average level of competitiveness was noted down in 2007 only in the case of Czech Republic. Czech Republic is also the only country where were lower RCAS indices in the case of whole goods than in agricultural goods. The results of computations also prove, that the trade balance does not have to reflect exactly achieved advantages.

The good example is a trade with Russia, where Poland has high negative trade balance (coming from the import of mineral fuels) and simultaneously one of the highest average levels of competitiveness achieved by the Polish economy in the selected group of countries. The trade with Czech Republic is however the example of the reverse situation - the average level of advantages is negative and Poland trade balance in 2007 was positive. It is easy to proof that even a country with low level of competitiveness will improve its trade balance if it concentrates on production and the export of these goods in which is the most competitive. This means however the national export dependence from

economic situation on a few foreign markets and its potential breakdown in the case of considerable decrease of orders from foreign recipients.

Graph 3. RCAS for the trade of Poland with the groups of countries
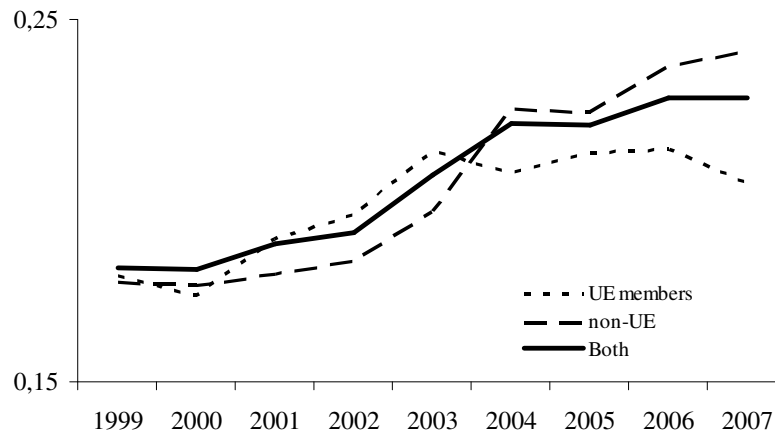
Source: own calculations on the basis of Eurostat Comext Database, date of the access 11.11.2008,
       http://fd.comext.eurostat.cec.eu.int/xtweb/.

It is interesting to compare RCAS indices for EU and non-EU countries and their changes in the time. Average level RCAS for all countries is relatively stable (+/- 5 p.p.). There was general increase of RCAS indices in both groups till 2003, and the average their values were higher for the countries which had to enter to the EU in the closest time. Since this moment the change of the competitiveness of Poland in relation to countries accessing and not to the EU goes various paths, and even in different directions – in general, advantages of Poland decrease in relation to the EU countries and they grow in relation to the rest countries. Accession of Poland to the EU did not have positive influence on its competitive position measured by RCAS, although in this case based on calculations conclusion about rapid fall of Polish competitiveness is a result of the export and import adaptation to new conditions rather than significant structural change.

Comparison of indices for the selected group of countries and EU-15 shows significant differences in levels of competitiveness of the Polish economy in relation to better and less developed economies. After the regard of the internal differentiation in the tested group the quite trivial conclusion arises - the better economically developed is the trade partner of Poland, the lower is level of Polish competitiveness in relation to it.

4. The intra-industry trade

The measurement of the intensity of intra-industry trade in the majority of cases is processed with usage of methods suggested by Grubel and Lloyd (Grubel, Lloyd 1975). Their formula is based on definition of the intra-industry trade as the difference among the global turnover of foreign branch value and the module value of difference between export and import of the articles of the same branch. The authors express the intra-industry trade in the relationship to the total turnover of the given foreign branch to obtain results comparability. Formula of the index of the intensity of the intra-industry trade IITi is then expressed as

$$IIT_i = \frac{(X_i + M_i) - |X_i - M_i|}{(X_i + M_i)}$$

This index shows the share of turnover within the intra-industry trade in general trade volume of branch and has standardized size - $IIT_i \in [0;1]$. $IIT_i=0$ means the absence of the intra-industry trade in the sector i, and $IIT_i=1$ means that export and the import of the branch i are equal, what suggests the maximally intensive intra-industry exchange. The average level of the intra-industry exchange for the given country / freight group may be computed according to the formula:

$$\overline{IIT} = \frac{\sum_{i=1}^{n} IIT_i \cdot (X_i + M_i)}{\sum_{i=1}^{n}(X_i + M_i)} = \frac{\sum_{i=1}^{n}(X_i + M_i) - |X_i - M_i|}{\sum_{i=1}^{n}(X_i + M_i)}$$

Computed indices allow to conclude, that the average level of the intra-industry trade is not significant for all countries (France-Germany can serve as the peer of the reference - more than 0,8), and that means the low level of Polish enterprises commitment in cooperation in the region. This also bespeaks about the total change in the former connections in Poland's trade – cooperation with the countries of the CMEA block disappeared entirely, and existing turnovers are the effect of the searches of the new markets rather than regaining hitherto existing.

Table 3. IIT for the Poland's trade with selected economies

	1999	2001	2003	2005	2007
Armenia	,00	,00	,00	,00	,00
Azerbaijan	,01	,00	,00	,00	,00
Bulgaria	,12	,09	,17	,12	,11
Belarus	,05	,07	,03	,04	,06
Czech Republic	,13	,16	,16	,24	,27
Estonia	,06	,15	,08	,11	,09
EU-15	,14	,19	,21	,22	,25
Georgia	,01	,01	,01	,00	,00
Hungary	,16	,19	,26	,18	,30
Kyrgyzstan	,00	,00	,00	,00	,02
Kazakhstan	,01	,00	,01	,00	,00
Lithuania	,07	,06	,07	,13	,16
Latvia	,07	,07	,07	,05	,09
Moldova	,01	,02	,01	,01	,01
Romania	,04	,10	,12	,14	,11
Russia	,02	,02	,02	,02	,03
Slovakia	,08	,09	,12	,11	,14
Tajikistan	,00	,00	,00	,00	,00
Turkmenistan	,00	,00	,00	,00	,00
Ukraine	,04	,06	,05	,05	,06
Uzbekistan	,00	,00	,00	,00	,00

Source: own calculations on the basis of Eurostat Comext Database, date of the access 11.11.2008,
   http://fd.comext.eurostat.cec.eu.int/xtweb/.

The results of calculations also show that the higher is similarity of the economic structures of Poland and its trade partner (e.g. Czech Republic, Hungary) and the smaller is distance to the given country, the higher is level of the intra-industry trade and the larger commitment in cooperation. There was also observed occurrence of the small negative correlation among coefficients RCAS and IIT (up to -0,2), testifying about certain degree of replaceability among competitiveness and cooperation, - the more competitive is Poland in the production of the certain good, the smaller is susceptibility of using the foreign factors of the production. This dependence is considerably stronger for EU countries than for third party countries (up to -0,09), and the strongest is for trade exchange of Poland with EU-15 (up to -0,38), what comes from connection with this area through FDI mainly. EU expansion in 2004 lowered the IIT level temporarily, however in the next years changes went in compliance to current trend.

Graph 4. IIT for Poland and groups of countries
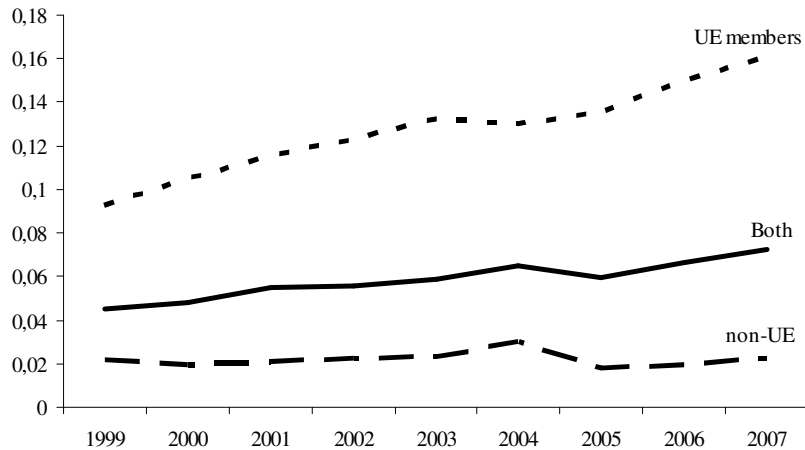
Source: own calculations on the basis of Eurostat Comext Database, date of the access 11.11.2008,
         http://fd.comext.eurostat.cec.eu.int/xtweb/.

5. Conclusion

The carried out study showed the loss of existing for many years cooperative connections among Poland and the countries of Central and Eastern Europe and former USSR. Existing turnovers are often sporadic, strength of connections - low, and the competitiveness of economies in the comparison to Poland quite small. Higher than average interest of Polish enterprises to this region is caused rather by high competition level on developed markets the of EU than former economic connections. At the same time for the majority of parameters quite visible is the difference among countries, which accessed, or aspired to the accession to European Union, and the rest of the group.

There appears tendency to levelling the degree of competitiveness and the growth of cooperation in first group, in the second one however the level of cooperation is close to zero and the level of competitiveness diminishes in relation to Poland. The initial factor endowment has made influence on cooperation in the region, which caused that all countries competed with themselves for the capital, offering instead the same factor - the labor. Russia stands out among all studied countries, which has high positive trade balance despite low trade competitiveness for the majority of goods, thanks to the export of mineral fuels. This fact proves the necessity of the careful interpretation of

RCAS. Getting the positive trade balance by Poland is the beneficial side of trade exchange with the selected group of countries. Co-operation development should lead in farther perspective (because of the low level of the turnover) to balancing the general trade balance.

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Contents