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Asymmetry of foreign trade turnover between Ukraine and Poland

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ABSTRACT

The article identifies the determinants of the asymmetry of foreign trade turnover between Ukraine and Poland based on an analysis of competitiveness indicators of the studied countries in the period 2003–2017. The emphasis is on calculation of the comparative advantages of particular commodity headings in Polish exports in the domestic market of Ukraine. Potential directions of the intensification of bilateral trade were evaluated.

Key words: asymmetry, competitiveness, foreign trade, international cooperation.

1. Introduction

Asymmetry of trade integration is caused by differences in the levels of economic development of countries, the size of the market, the degree of integration of countries into the global economy and other factors. The current structure of exports and imports demonstrates a critical technological imbalance for Ukraine: raw materials are exported from Ukraine and high technology is imported from EU countries; trade deficit maintains for most product groups; domestic businesses show limited EU market entry due to high level of non-tariff protection, primarily on agricultural products. In this regard, the experience of Poland as an EU member demonstrates the possibility of overcoming technological imbalance.

The main purpose of the empirical analysis undertaken in the article is to study the development trends of foreign trade of Poland with Ukraine in 2003–2017. This partnership is explained by these facts:

– Ukraine borders Poland. Upon its accession to the European Union, Ukrainian eastern borders will also become the borders of the European Union, which will

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undoubtedly influence the building of relations and forms of cooperation between these partners in the future;
- these are countries with unequal levels of participation in international division of labour and levels of economic development, which, in our view, will allow us to broadly verify theories of international trade and, moreover, to answer the question whether they form the basis of trade policy and to what extent;
- the hypothesis is accepted in the analysis that the development of each country's international trade, especially with its key partners, is a reflection of the static and dynamic dimensions of its economy. In other words, the development of foreign trade is a proof of the formation of international competitive position and at the same time international competitiveness of the national economy.

2. Methodical approaches

The concept of international competitiveness of the national economy has so far been ambiguously defined. Therefore, there are many suggestions and postulates measurement of international competitiveness of the national economy Broll, U., Gilroy, M., (1994), Dunning, J.H., (1992), Falvey, R.E., Kierzkowski, H., (1987), Grzywacz, W., (2001), The World Competitiveness Report 1994, (1994). The literature presents indicators of international competitiveness (competitiveness or competitive advantage) and indicators of international competitive position of the economy Misala, J., (1991, 2004).

Among the various methods for assessing a country's competitive position on the international market, ex ante competitiveness indicators (predictive modelling of economic phenomena and processes based on theoretical concepts) deserve attention. In our opinion, the greatest successes in this area of research have been achieved in Germany: Giersch, H., (1979), Horn, E.J., (1985), Kojima, K.A., (1974), Von Stackelberg, K., (1991). According to German scientists T. Griez, S. Enchel and B. Wigger (1992), the essence of international competitiveness of each national economy at any moment is to optimize the use of resources on an international scale. Scientists have suggested the Revealed Absolute Competitiveness index – RAC, based on domestic and foreign resources, consisting of two components: Revealed Absolute Internal Competitiveness (RAIC) and Revealed Absolute External Competitiveness (RAEC).

RAIC level setting depends on the internal economic performance of accessible production factors usage, due to more or less favourable exchange of the part of domestic resources for external (imported) resources. Indexes, calculated in this way, relate to the scale of the national economy. However, from a theoretical standpoint, it is possible to use them in particular directions, sectors and even particular products, under the condition of implementation of a specific database of statistics, which will

allow for comparative analysis. The absence of such base limits the range of analyses and forecasts and is a barrier to building indicators that are lower in aggregation.

The empirical analysis is based on data of Foreign Economic Activity Commodity Nomenclature on single, double, four- and nine-digit numeric expression. After all, the degree of disaggregation of data and how they are compared significantly affect the statistical picture of the phenomena and processes discussed (their trends). For example, only as deep as possible disaggregation of data can allow comparisons of the same products, and then the real level of "overlap" in the value of exports and imports can be determined, or the actual level of intra-industry trade intensity Petrose, E., (1959). Therefore, the foreign trade turnover of Ukraine is analysed on the basis of the EU data in four-stage disaggregation, which makes studied product groups meet the theoretical concept of sector in the productive industrial classification.

Based on EU statistics for the years 2003–2017, calculations have been made and the following are presented:

1) Ukraine's participation in Poland's trade turnover;

2) foreign trade balance of Poland with Ukraine;

3) changes in the share of Poland in the markets of Ukraine, calculated by the formula(1):

$$Ci = \frac{x1i}{m1i} : \frac{x0i}{m0i} * 100 \tag{1}$$

where Ci– index of change in shares;

x – export;

m- import;

i – specific product group or product;

1 – analysed period;

o – base period;

4) the commodity structure of Poland's trade turnovers with Ukraine;

5) typical structure (according to the apacity of production factors) of Poland's trade turnovers with Ukraine;

6) the balance of trade turnover of Poland with Ukraine and the balance of exports in the group of resource-intensive products;

7) Revealed Competitive Advantages indexes of Poland in the markets of Ukraine, calculated by the logarithmic formula (2) Grubel, H.G., Lloyd, P.J., (1975):

$$RCA_i = \ln\left[\frac{x_i}{m_i} : \frac{\sum x_i}{\sum m_i}\right] \tag{2}$$

where RCA_i – Revealed Competitive Advantages indexes;

x – export;

m – import;

i – specific product group or product.

The value of this formula lies in the simultaneous consistency and symmetry of the presented RCA indexes;

8) Intra-industry trade intensity indexes – IIT_i in Poland's trade with Ukraine, calculated by the formula (3) Mączyńska, E., (1999):

$$IIT_i = \frac{x_i+m_i-|x_i-m_i|}{x_i+m_i} \quad (3)$$

where IIT_i _ the Intra-industry trade intensity;

x – export;

m – import;

i - specific product group or product;

9) RCA_i and IIT_i indexes of Poland's turnovers in general, including with Ukraine by capacity codes. From a methodological standpoint, the analysis of intra-industry trade intensity is complemented by indexes of the comparative advantages of RCA_i. Such a supplement might help to determine to what extent intra-industry trade of high intensity can be a source of synergies for future export-import trade. Furthermore, it should be maintained that high levels of intra-industry trade intensity do not always keep up with a high share of the industry's exports in global exports. Therefore, when making forecasts, it is necessary to analyse the indicators of export dynamics and indicators of the level of export.

The analysis of Poland's foreign trade flows with Ukraine is supplemented by indicators of 50 most important positions (with the highest or the lowest indexes):

- in the value of export;
- in the value of import;
- in the share of trade turnover with selected countries in Poland's exports in general;
- in the value of the C_i index;
- in the competitiveness of exports calculated by RCA_i;
- Intra-industry trade intensity, expressed in IIT_iindicators.

3. Empirical analysis

The dynamics of absolute indexes of Poland's foreign trade turnover with Ukraine in 2003-2017 was generally characterized by an upward trend. In terms of the nature and trends of these indexes, their time series can be divided into 5 segments: 2003–2008, 2008–2009, 2009–2013, 2013–2015, 2015–2017. In the period from 2003 to 2008, according to Polish statistics, export from Poland to Ukraine increased at a higher rate than import from Ukraine to Poland, which led to the behaviour of the

balance of trade, which grew at almost the same pace as exports. As a result of the 2008 financial crisis, all foreign trade turnover indicators declined sharply. However, starting from 2009, the process of restoring the growth of Poland's trade relations with Ukraine began and continued until 2013. In the subsequent years, from 2013 to 2015, there was a tendency towards a decrease in Poland's foreign trade turnover with Ukraine. But in 2015, the situation changed to the opposite and lasted until 2017.

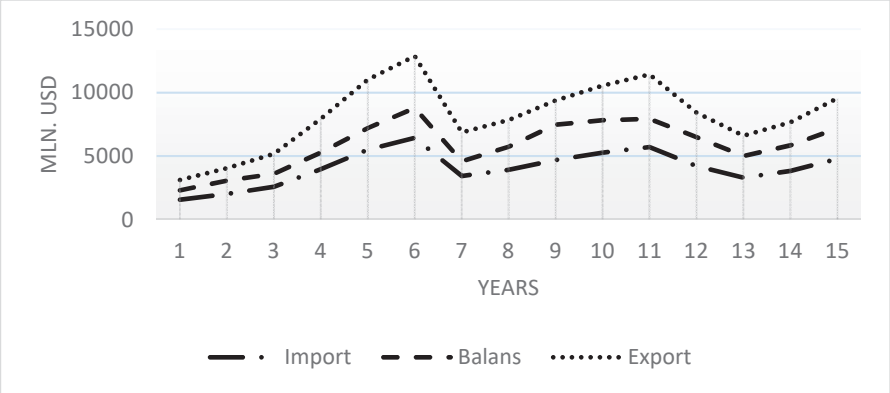

Figure 1. Dynamics of foreign trade turnover of Poland with Ukraine for 2003-2017, USD million
Source: Rocznik statystyczny handlu zagranicznego, GUS, wybrane wydania, www.stat.gov.pl

C_i indexes should be applied, taking them as an introductory analysis of a country's competitive position relative to another trading partner country.

If we analyse the dynamics of C_i indexes of Poland in general, that is Poland's trade turnovers with all their trading partners, in 2003–2017 Poland's position improved at different speeds, showing an upward trend compared to the base year (that is 2003). The export / import ratio during this period was advantageous for Poland because export growth rates were higher than imports (Table 1). Undoubtedly, this trend was influenced by favourable export / import ratios in trade with major partners.

Table 1. Dynamics of Ci indexes of Poland with Ukraine from 2003 to 2017, %

Countries	Years							
	2003	2005	2007	2009	2011	2013	2015	2017
Poland in general	100.0	111.7	107.3	116.0	113.7	125.3	128.6	127.2
Ukraine	100.0	120.9	155.2	142.0	80.1	122.8	92.7	94.6

Source: Authors' calculations according to Eurostat database.

At the same time, Poland's foreign trade turnover with Ukraine during the studied period is characterized by ambiguous dynamics. Compared to 2003, in 2004 the value of C_i of Poland with Ukraine was 7.1 pp. lower, but in the next years there was an increasing trend until 2010, when it was above 100%. However, in 2011, the situation changed dramatically to the opposite, in favour of Ukraine, and lasted until 2012. In 2013, the $\boldsymbol{C}_i$ index was in favour of Poland. However, from 2014 to 2017, it was again in favour of Ukraine.

A more detailed analysis of changes in Poland's shares in Ukrainian markets, the definition of structure and their evaluation require disaggregation of the statistical database. After all, the analysis by sections of product groups gives us an opportunity to evaluate changes – from the standpoint of the economy – whether they are positive or negative.

An analysis of the C_i indexes, which represent export-import ratios for Poland and Ukraine, makes it possible to formulate such generalized conclusions.

First, in the exchange between Poland and Ukraine, the quantitative asymmetry between export and import in certain product groups, which has increased significantly since 2003, is manifesting itself. Quantitative asymmetry is manifested in the following sections:

- basic metals and articles;
- fats and oils;
- mineral products;
- wood and wood products;
- plant-based products.

Considering the share of these products in the total exchange of Poland with Ukraine, it can be stated that they had a negative impact on the Polish balance of trade and, at the same time, a positive one on the Ukrainian balance of trade.

Secondly, at the same time, during the period there were positive structural changes in Poland's exchange between Poland and Ukraine, reflected by the increase in $C_i$indicators in the following sections:

- optical, photographic, measuring instruments and apparatus;
- machinery and equipment, electrical and electrical engineering appliances;
- sawdust, paper, cardboard and articles;
- various finished products - furniture, prefabricated buildings, toys;
- live animals and products of animal origin;
- artificial materials and articles;
- articles of stone and ceramics, glass;
- pearls, precious stones, precious metals and articles;

– chemical industry products;
– transport;
– shoes, hats.

Thus, it can be stated that, despite the positive changes, C_i indicators clearly inform that in Ukraine's exports, products with a low level of processing, labour-intensive and capital-intensive continue to prevail.

A much wider geographical diversification of Ukrainian exports could reduce the risk of fluctuations in the situation. However, the results of the analysis of the formation of competitiveness indexes for Poland and Ukraine do not confirm this. For many product groups, values of these indexes have declined due to the 2008 crisis. This is especially noticeable in the following sections: XV "Base metals and articles thereof", V "Mineral products"; IX "Wood and articles of wood"; XVII "Transport equipment"; IV "Prepared foodstuffs". Instead, for sections XI "Textiles and textile articles"; XX "Miscellaneous manufactured articles" and XVI "Machinery and mechanical appliances, electrical and electrotechnical equipment" - a characteristic wavy change in the ratio of exports and imports.

In the foreign trade turnover of Poland with Ukraine in only five sections, C_i values were less than 100%. The share in the total turnover of these sections was negligible. In the other product groups, C_i values were much higher than 100, and in some of them – even higher in a few dozen of times (for example, in the XV "Precious metals"). In many sections, C_i values were gaining wavy values and tending to decline, especially after 2008. However, in other sections, there was a clear upward trend: XVI "Machinery and mechanical appliances, electrical and electrotechnical equipment; XI "Textiles and textile articles"; XVII "Transport equipment". The persistence of trends throughout this period of course indicates the comparative advantage of Poland in these sectors, as well as the level of technological development and unequal status of the economy of Poland and Ukraine.

Summarizing the above calculations, it should not be overlooked that the informational value of C_i is limited as they relate to the exports and imports of the surveyed partners only (Poland - Ukraine). They are a measure of internal specific advantage in terms of mutual exchange. At the same time, they allow to determine the participation of these countries in the international division of labour, the level of economic and technological development. In addition, the analysis, which covers a long period (more than 5 years), allows to determine the direction and pace of structural changes in the economies of the partner countries. However, formulation of conclusions and proposals in this field requires in-depth study and analysis using other methods and criteria that will increase the plausibility, thoroughness and adequacy of the results of the study, on which the strategy and economic policy is based.

The Ukrainian industry was restructuring during the study period, moreover, at a slow pace; as well as the external trade flows were transforming, which was manifested in the gradual decline in the value of inter-branch exchange. This is reflected in a decreasing trend of absolute value of RCA, but negative values of RCA for many goods indicate a low level of competitiveness of the Ukrainian economy. The predominant reason for this situation is, as we wrote earlier, an anachronistic and clearly asymmetric assortment and species structure. Imports were dominated by transformed products with a relatively high share of value added, while exports were dominated by products with relatively low levels of processing (Table 2).

Table 2. Dynamics of RCA Poland with Ukraine by Capacity Codes 2003-2017

Product group	**2003**	**2005**	**2007**	**2009**	**2011**	**2013**	**2015**	**2017**
Raw materials	-0.87	-0.83	-0.58	-0.46	-0.39	-0.29	-0.31	-0.32
Labour-intensive goods	-	-	0.70	0.55	0.53	0.47	0.43	0.41
Capital-intensive goods	-0.24	-0.19	-0.10	-0.06	0.06	0.22	0.20	0.25
Technology-intensive products easy to imitate	-	0.04	-0.17	0.30	0.41	0.37	0.44	0.44
Technology-intensive products difficult to imitate	-	-	0.52	0.16	0.32	0.23	0.19	0.27
Non-classified goods	-	-	-	-0.17	-0.24	-0.42	-0.28	-0.26

Source: Authors' calculations according to: United Nations Database.

The intensity of Poland's inter-branch exchange with Ukraine was the highest among technology-intensive, easy to imitate and labour-intensive goods.

Poland has shown a relative advantage of many goods, for example, in the export of furniture, parts of houses, products of vine and straw, clothing and accessories, fruits and vegetables, machinery and electrical equipment and spare parts, sports equipment and toys.

At the same time, Poland has not demonstrated comparative advantages in material-intensive, capital-intensive, non-transformed land-use plants. The detailed analysis suggests that the exchange in Poland was predominantly complementary to the cross-industry type.

Indexes of the revealed comparative advantage should also be looked into from the perspective of geographical directions of foreign trade, that is Poland's trade relations with Ukraine.

Analysis of indexes of the revealed comparative advantage enables to make generalized conclusions, namely:

- the structure of RCA indicators in trade between Poland and Ukraine is inherent to countries with lower levels of economic development;
- the exchange of products was dominated by land-intensive, non-transformed and raw materials, and Ukraine has a significant comparative advantage in these products.

Therefore, it can be argued that trade relations between partner countries were determined by different product and species structure. Poland's foreign trade was clearly dominated by cross-industry exchanges, as measured by RCAs. The link between Poland's economic potential and the intensity and structure of external turnover with Ukraine is not only weak, but also heterogeneous.

Of course, the form and dynamics of the development of relations were influenced and continue to be influenced by the new geopolitical system. The intensity of Poland's trade turnovers with Ukraine was much lower than their economic potential. There could be many reasons for this, but the most important are the structural factors. It was they who had a decisive influence on the asymmetry of indicators of Ukraine's revealed comparative advantage.

However, the pragmatic value of the revealed comparative advantage indexes for creating a foreign trade development strategy is limited as they inform of the extent of the advantage or lack of it in the past and in the cross-sectoral dimension. From a methodological standpoint, this kind of analysis – as the basis of the concept of development – should, first of all, be supplemented by the indexes of the intensity of intra-industry trade.

In modern international trade, the values of specialization and intra-industry trade ("intra-industry trade" towards "two-way trade") are constantly increasing. Its essence lies in the simultaneous characterization of imports and exports by products and their components, which belong to the same industry, usually during the year Soete, L.L.G., (1990), by one country or group of countries. Intra-industry trade was studied at the 4-digit CN level of disaggregated data, aggregated to the 2-digit and 1-digit levels. An empirical analysis based on data from the Polish and Ukrainian foreign trade nomenclatures based on 4-digit CN disaggregation shows that the studied product groups in this classification correspond to the theoretical understanding of the industry in the industrial classification Petrose, E., (1959).

The intensity of intra-industry exchange increases with the positive values of IIT. The analysis of IIT indexes for Poland's trade with Ukraine in the selected years shows that the highest intensities of intra-industry trade were detected in the sections: XX "Miscellaneous manufactured articles", IV "Prepared foodstuffs", V "Mineral products", XV "Base metals and articles thereof", XIII "Articles of stone, ceramic

products, glass" and XXI "Works of art, collectors' pieces and antiques" (Table 3). The values of IIT in these sections ranged from 0.75 to 0.98. Considering the above RCA indexes, whose values fluctuated within 0.25–0.44 in 2017, we can conclude that the products of external differentiation were dominated by vertical differentiation in Poland, while intra-industry exchange of horizontally differentiated products was of subordinary importance. The turnovers were dominated by slightly transformed products, when their share in total exports was negligible.

Table 3. Dynamics of IIT Poland indicators with Ukraine by Product Groups in 2003-2017

No.		2003	2005	2007	2009	2011	2013	2015	2017
I	Live animals; animal products	0.50	0.24	0.28	0.12	0.19	0.24	0.43	0.57
II	Vegetable products	0.60	0.86	0.47	0.71	0.78	0.97	0.71	0.74
III	Fats and oils	0.46	0.31	0.04	0.05	0.04	0.10	0.13	0.05
IV	Prepared foodstuffs	0.29	0.32	0.58	0.69	0.80	0.79	0.97	0.91
V	Mineral products	0.20	0.12	0.64	0.68	0.47	1.00	0.75	0.84
VI	Products of the chemical industry	0.70	0.29	0.74	0.32	0.65	0.31	0.32	0.38
VII	Plastics and rubber and articles thereof	0.14	0.09	0.08	0.04	0.09	0.03	0.10	0.14
VIII	Raw hides and skins, articles thereof	0.72	0.29	0.38	0.43	0.34	0.40	0.19	0.37
IX	Wood and articles of wood	0.72	0.91	0.96	0.88	0.81	0.97	0.31	0.33
X	Pulp of wood, paper, paperboard and articles thereof	0.04	0.04	0.06	0.09	0.09	0.15	0.18	0.31
XI	Textiles and textile articles	0.17	0.09	0.09	0.11	0.07	0.06	0.21	0.16
XII	Footwear, headgear, etc.	0.04	0.02	0.01	0.03	0.04	0.02	0.04	0.10
XIII	Articles of stone, ceramic products, glass	0.03	0.05	0.07	0.14	0.21	0.19	0.66	0.75
XIV	Pearls, precious stones and metals, articles thereof	0.04	0.07	-	0.01	0.01	-	-	-
XV	Base metals and articles thereof	0.98	0.98	0.88	0.78	0.78	0.85	0.76	0.79

Table 3. Dynamics of IIT Poland indicators with Ukraine by Product Groups in 2003-2017 (cont.)

No.		2003	2005	2007	2009	2011	2013	2015	2017
XVI	Machinery and mechanical appliances, electrical and electrotechnical equipment	0.17	0.10	0.14	0.39	0.34	0.21	0.35	0.29
XVII	Transport equipment	0.02	0.02	0.04	0.05	0.06	0.03	0.06	0.05
XVIII	Optical, photographic, measuring, checking instruments, etc.	0.20	0.07	0.04	0.03	0.04	0.03	0.11	0.05
XIX	Arms and ammunition	0.37	-	-	-	-	-	-	-
XX	Miscellaneous manufactured articles	0.04	0.16	0.12	0.20	0.28	0.17	0.61	0.98
XXI	Works of art, collector's items and antiques	0.73	0.00	0.12	0.77	0.12	0.01	-	0.67

Source: Authors' calculations according to: Rocznik statystyczny handlu zagranicznego, GUS, wybrane wydania, www.stat.gov.pl

Thus, the structure of intra-industry trade indicators for these partners was shaped by the exchange of low-conversion, material-intensive and labour-intensive goods.

This is characteristic of the initial phase of development of intra-industry division of labor between partners, which differ in the level of technological progress, the development of system-restructuring transformation processes, as well as the level of gross domestic product per capita, which is a source of demand stimulation in intra-industry division of labor Michalet, Ch.A., (1984).

With the objective of determining the concentration of intra-industry trade, at the 4-digit CN level codes aggregated to 2-digit codes, it was showed that:

– Unfavourable trends in trade relations between Poland and Ukraine were revealed by a comparative analysis of their trade from the perspective of intra-industry division of labour. Namely: intra-industry exchange rates with values higher than 0.50 were only in 14 product groups in 2003, whereas, at the same time, IIT index was higher than 0.70 only in 8 groups. In 2017, 12 product groups' indexes were more than 0.50, and only 7 groups with an index of more than 0.70. In 2003, the number of product

groups with an index of more than 0.50 was 15, and more than 0.70 - 10; in 2017, the number of groups decreased to 13 and 7. Consequently, there has been a clear tendency for these indicators to decline for more than 14 years. Moreover, the structure of intra-industry IIT indexes encompassed, first of all, low-grade raw materials and labour-intensive products, as mentioned above. The IIT structure was conditioned by an anachronistic commodity and species structure with a clear quantitative and, above all, qualitative asymmetry.

In trade with Ukraine, only a few commodity groups have achieved intra-industry trade intensities of more than 0.85: Wood and articles of wood such as gluing and plywood, laminated timber; clothing, including women's and children's coats and kits; locomotives, in particular parts to them and to rolling-stock.

The share of the 50 product groups and products with highest IIT indexes reached about 55% of Poland's total exports. But if these groups had accounted for about 54% of exports to the EU, and especially to Germany, then their part in exchange with Ukraine would have been minimal.

The highest indicators of IIT in Poland's trade with Ukraine are typical for land-intensive animal products that are not transformed and labour-intensive products, which require hard work. However, the participation of these goods in Poland's general turnover was subordinate.

There was a noticeable convergence between the structures of imports and exports of Poland and Ukraine as an effect of the development of cooperation and partnership between these countries in the 2000s.

Adaptation of the labour model to the intra-industry division is significant not only considering Ukraine's future place in industrial and trade integration, but also because of the scale of the benefits of international division of labour within the EU (measured by GDP per capita). In addition, improving the competitiveness of the Ukrainian economy in both the export structure (transition from traditional, inter-sectoral, to modern, intra-sectoral division of labour) and in prices (reduction of interest rates and claims on speculative capital turnover) is closely linked to the improvement of balance of trade, and thus with the reduction of the foreign trade deficit.

4. Conclusions

One of the priority line of developments of Ukrainian foreign economic policy is to build relations with Poland, which is caused not only by the long tradition of Ukrainian-Polish relations, but, first of all, by the unity of political and strategic interests, active cooperation in all areas of public life of both countries. The deepening of cooperation with Poland, which has formed a qualitatively new economic system

within the EU, gives Ukraine the opportunity to use its experience to intensify its own transformation processes.

Internal and external factors of innovation remain, above all, the key source of growth in intra-industry trade intensities in Ukraine and Poland. Increasing their use will reduce not only the technological gap of Ukraine, but also the difference in gross domestic product per capita between Poland and Ukraine, thereby attracting the demand factor to the sources of intensification of intra-industry trade. Intensification of internal (sources based on accelerating market transformation processes, especially privatization and implementation of the legal and institutional market system, and increasing the share of Research & Development expenditures in GDP and accelerating the pace of technological and technological restructuring) and external innovation sources (technology import, know-how, the intense inflow of foreign direct investment and the intensification of the international division of labour with EU countries) – the only rational way of real adaptation of the Ukrainian economy and its partners to changes in the markets of the EU and the world at large.

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