Possibilities for Integration of the Eastern Partnership Countries’ Export into the EU Markets

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To implement the Eastern Partnership (EaP) framework launched in 2009, the EU seeks to bring its Eastern neighbours – Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine – closer to the European standards, promote regional relations with these countries, ensure sustainable growth of their economy, cooperate in trade area for the countries of the Eastern Partnership to become economically stronger, European countries, part of the European markets and structures. It is important for the EU that the countries neighbouring with its Eastern boarders are stable and their economies continue to develop. One of the ways to promote economic growth of a country or region is to develop its export. Geographical proximity of the markets provides the opportunity for the EaP countries to increase trade with the EU, thus creating the conditions for economic growth. The research was aimed at evaluating the possibilities for integration of the EaP countries’ export into the EU markets by identifying characteristic features of the countries’ export structure and their comparative advantages in trade with the EU. The article presents extensive analysis of export of six EaP countries, characteristic features of product specialization are identified, and comparative advantages of production by these countries and their effectiveness are identified. No similar studies have been carried out in a common context of the EaP countries till now. Export concentration (diversification), export structure similarity, the revealed comparative advantage and Lafay indices have been measured with the view towards the aim of the research. Empirical study of the export structure and comparative advantages of the EaP countries has been carried out using statistical data for the period 2005–2012 provided by Trade Map database, classification of products into product groups under the Combined Nomenclature. The results of the research have shown that current integration of the EaP countries’ export into the markets of the EU countries is not favourable enough for the countries due to irrationality of their export structure and low level of export diversification. Only Moldova’s variety of the exported products was deeper, broader and closer to the export by the EU. The results of the analysis of comparative advantages have shown that the set of product groups having comparative advantage in the export by the EaP countries to the EU is rather wide, such products have already occupied the EU markets niche, which could lead to more effective leverage of the export potential and, at the same time, create preconditions for economic growth of these countries and their export integration into the EU markets.

Key words: Eastern Partnership (EaP) countries, export integration, export commodity structure, export specialization, comparative advantage.

JEL classification: F14, F15.

Introduction

Development of international trade is a catalyst for national and regional economic growth. Different degrees of participation and directions of international trade have different effects on economic development of countries or regions. The appropriate degree of involvement in international trade and its direction is decided by a country or a group of countries on the basis the available economic potential, opportunities and economic policy objectives. Insufficient development of foreign trade may cause equipment obsolescence and technological backwardness of national production, while excessive economic openness may lead to higher degree of economic dependence on import and foreign trade conditions that may endanger national sovereignty.

Export development is one of the ways to promote national or regional economic growth. However, its long-term development depends not only on export volumes and their growth rates, but also on the qualitative structure of export (Guerson, Parks, Torrado, 2007). The latter is determined by labour productivity of the national exporters and differences between factors of production of the exported products (Kaukin, Freinkman, 2009).

The Eastern Partnership (EaP) is part of the European Neighbourhood Policy of the European Union (EU). It is important for the EU that the countries neighbouring with its Eastern boarders are stable and their economies continue to develop. Development of foreign trade between partner countries and the EU with the main focus on ex-
Export in terms of supply in these trade relations would be an important instrument of the EaP policy with the view towards bringing partner countries closer to the European standards in order to promote regional, trade relations with these countries, provide support in enhancing their economies and becoming European countries as well as part of the EU markets and structures.

Integration of export of the EaP countries into the EU markets is also significant in other important aspects. First, bringing the markets closer to each other would lead to lower environmental pollution by emissions from fuel oil combustion during transportation of goods, lower fossil fuel consumption (conservation of nature and natural resources), better quality of the transported agricultural and food products (benefit for humans), lower goods transportation costs (lower prices on goods for consumers, lower transportation costs for sellers). Moreover, geographical proximity of markets offers the possibility for the partner countries to increase trade with the EU, thus creating conditions for economic enhancement and becoming closer to European economic and organizational structure.

Eastern neighbours are attractive to the EU market with the former’s agricultural and food products, other products made of agricultural raw materials, certain earth resources etc. It is therefore important to identify the comparative advantages of goods produced by partner countries, which, if engaged, would create the prerequisites for more rapid integration of export into the EU markets. One of the key characteristics of the export potential is its product export structure – a certain combination of shares of the exported products/product groups. On one hand, rational export structure is a significant prerequisite for development of effective and mutually beneficial exchange of products between the EaP and EU countries. On the other hand, comparative advantages are not a static characteristic, and dynamic analysis of their change would be useful for formation of policy on export structure efficiency enhancement of the EaP countries.

Export structure of individual products, product groups, economic activities or sectors of countries and comparative advantages have been studied extensively by both national (Bivainis, Jasinskaite, Maciuleviciute, 2001; Pukeliene, Saboniene, 2001; Vitunskiene, Serva, 2006; Jucevicius, Vitunskiene, Sajeva, 2009; Drozdz, 2010; Travkina, Tvaronaviene, 2011; Rimkus, Karlaite, 2011; Grebliauskas, Stonys, 2012 et al.) and foreign (Liesner, 1958; Balassa, 1965; Kaukin, Freinkman, 2009; Shohibul, 2013; Vinokurov, Idrisova, Knobel, Pereboev, 2013; Ishchukova, Smutka, 2013 et al.) scientists and researchers. However, no similar studies have been carried out in a common context of the EaP countries.

The aim of the research is to evaluate possibilities for integration of export by the EaP countries into the EU markets by identifying characteristic features and comparative advantages of export structures of the countries within the context of world trade and trade with the EU.

The object of the research is the supply of goods by the EaP and EU countries in international trade. The article does not cover the demand aspect.

The aim of the research has determined the following objectives:

- to identify the prerequisites and effects of export specialization;
- to analyse export structure of the EaP countries, its dynamics and tendencies;
- to identify comparative advantages of product groups exported by the analysed countries;
- to identify the possibility for export integration of the analysed countries into the EU markets.

Research methods: systematic literature review, logical analysis and synthesis, statistical analysis methods, means of graphical imaging. Export concentration (diversification), export structure similarity, the revealed comparative advantage and Lafay indices are calculated. Empirical study of the export structure and comparative advantages of the EaP countries has been carried out using statistical data for the period 2005–2012 provided by Trade Map database, classification of products into product groups under the Combined Nomenclature. Conclusions are formulated by the method of generalization.

Prerequisites and Effects of Export Specialization

Modern theories on international trade are developed in various aspects. Such theories usually develop the principles of classical theories further, explain individual phenomena of international trade that have not been identified by classical theories for certain reasons, or identify certain theoretical contradictions that require deeper study of the phenomena and processes of international trade. In this respect, supply of goods is the research area of international trade that is under the main focus.

Under the classical theory of comparative advantage, participation of countries in international trade may have positive economic effect, i.e. benefit from trade that improves welfare of countries, contributes to their economic growth and development of free trade (Prusova, Razumnova, 2010). Nonetheless, this effect can only be achieved if national producers specialize on production and export of the goods that provide comparative advantage. Main theories of international trade that base on comparative advantages are the theory of comparative advantage by D. Ricardo and the Heckscher-Ohlin production factor proportions theory by Swedish economists E. Heckscher and B. Ohlin (Bernarontzy, Normantiene, 2009; Juozapaviciene, Eizentas, 2010). Ricardo’s theory suggests that comparative advantage results from differences in technology level and is determined by comparing relative production costs of two products produced in
two countries. According to Ricardo, national producers specialize on production and export of the goods that entail lower relative costs, in other words, the goods that can be produced at relatively lower costs in one country than in other countries. The Heckscher-Ohlin theory explains comparative advantages by the differences in proportions of factor endowments and their use for production of goods by countries. A country has a comparative advantage in production and export of the product, the production of which involves intensive use of relatively excessive and, at the same time, cheaper factors of production.

A country’s foreign trade based on comparative advantage brings benefit both to exporters and importers of the products. Formation of structure of comparative advantage-based trade is only possible when market participants are free to opt for mutually beneficial exchange conditions and intervention of the State into foreign trade is restricted (Prusova, Razumnova, 2010). The scientists believe that State intervention in the form of various trade policy measures may distort the effects of foreign trade, and such intervention should be limited and base only on existing or potential comparative advantages of production of goods by the country.

Comparative advantages of production of certain products are not a static characteristic, as certain advantages may gradually become weaker or be lost, while other advantages may be acquired (Prusova, Razumnova, 2010). Comparative advantages are subject to changes caused by emergence of new materials, new production technologies, changes of technological base or prices on the factors of production, improvement of product quality in other countries, changes inside the country or in other countries. For these reasons producers of one country may lose comparative advantage in production of certain products they once used to enjoy and be forced out by producers of another country, where more favourable conditions for the production have formed. Thus, formation of the strategy of development of a country’s foreign economic relations requires monitoring of changes in comparative advantage of production. Dynamic analysis of the change may be useful in formation of a country’s export structure performance improvement policy as well, i.e. by promoting product/product group specialization that will have the greatest effect in foreign trade.

By referring to Samuelson (1953), Kaukin and Freinkman (2009) have noted that production specialization of a country is usually explained by the fact that national export structure results primarily from the available physical and human capital, labour and material resources that are imperative for competitive production and provision of services, and national institutes. The authors believe that these factors determine relative costs of production, thus forming the set of products, production of which is competitive in the specific country. This means that essential changes to production and export structure are only possible by changing these fundamental variables in some way. Hausmann, Hwang, Rodrik (2005) have provided an alternative explanation of export specialization. According to these authors, production and export structure depends not only and not as much on the “fundamental” factors, i.e. country’s factor endowments, as on, for example, the number of entrepreneurs willing to launch production of the products for the first time in the specific country. The authors believe that there are products that have higher productivity than the country’s average, i.e. the products that generate higher expected profit per unit of investment, and their export is likely to be successful in future after reorganisation of national production.

**Research Methodology**

Empirical study of the export structure and comparative advantages of the EaP countries has been carried out using statistical data for the period 2005–2012 provided by Trade Map database, classification of products into product groups under the Combined Nomenclature (on the two-digit product code level). 99 product groups have been identified. The article presents extensive analysis of export by six EaP countries – Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine, identifies characteristic features of their product specialization (export structure rationality, uniformity and dynamics of distribution of structural parts of export, significance of structural shifts, product variety breadth), evaluates comparative advantages of the countries’ production and their effectiveness. Export concentration (diversification), export structure similarity, the revealed comparative advantage and Lafay indices have been measured with the view towards the aim of the research. These indices have been chosen for the research for the following reasons:

1) the indices provide the possibility to perform the analysis using available statistical data;
2) the indices are inter-complementary.

Trade analysts measure various indicators, i.e. indices, levels etc., to analyse countries’ foreign trade flows, structures, changes, and identify trade characteristics (Scott, 2005; Mikic, 2005; Export Trends ..., 2013). Such indicators allow identifying the most dynamic products, product groups or sectors on a global or regional market, the most dynamic markets for a country’s export, country’s dependence on regional trade, the intensity of trade with trade partners, increasing similarity between trade partners, geographical “reorientations” of export after various shocks etc.

Mikic (2005) provides the following conditional classification of the indicators into two groups:

- country’s foreign trade dependence and foreign trade performance indicators;
- export specialization and competitiveness indicators.

Indicators in the first group provide important information on a country’s foreign trade flows (export and import), e.g. their volume and value, relative weight in world trade, product and geographical structure in certain time and changes in the long run. Indicators of trade conditions provide information on a country’s foreign trade dependence. The most common indicators measured in this group are trade openness index, relative trade balance index, relative growth rates of merchandise exports and imports, export product dynamic, export diversification index, trade concentration index or Hirschman index (H), Herfindahl index of concentration (HF), trade intensity coefficient, terms of trade indices. Indicators in the second group allow identifying a country’s export specialization, the degree of production changes and competitiveness. The most common indicators measured are revealed comparative advantage index (RCA) and other indices development on its basis, competitiveness index, specialization index (SI), intra-industry trade index, also known as the Grubel-Lloyd index (IIT), trade overlap index (TO), trade complementarity index (C), export similarity index (XS).

Evaluation of foreign trade performance of the EaP countries has been evaluated in the article by measuring export structure by product groups relative to global markets and the EU single market, its dynamics and Hirschman index, while the countries’ export specialization and competitiveness have been determined by export structure similarity, the RCA and Lafay indices.

Export structure is defined as percentage of the share of individual products/product groups/sectors relative to the country’s total export. It demonstrates the level of diversification of the country’s export. The economy is considered to be diversified if an individual sector accounts for less than 50 % of the country’s total export. By contrast, the sector accounting for at least 50 % of the country’s total export value is considered to dominate the country’s export. In this case, the country is highly dependent on one sector export (Mikic, 2005). Export structure is related to a country’s natural conditions, the level of development of economy determined by natural, social and economic, as well as historical causes, specifics of the structure of economy, country’s position in the international division of labour.

One of the most common measured indices is export product/product group dynamic. According to Greblauskas and Stonys (2012), competitive advantage is indicated by higher export growth rate that provides conditions for increasing share of export market rather than by larger export volumes. Hence, the authors consider changes in the export market share to be the indicator of export competitiveness of a country. On the other hand, although certain products or product groups may account for a minor share of the country’s export, the products or product groups with a rapidly growing share in the structure must be identified for several reasons. Products/product groups demonstrating long-term growth in the share of export have the potential of eventually becoming an important source of income from the country’s export. Hence, a country should assume measures to mitigate or eliminate trade obstacles to sale of such products on foreign markets. This requires identifying products/product groups that have demonstrated the most rapid growth in export during the analysed period (Hoekman et al., 2002; Export Trends ..., 2013).

Analysis of export structure and its changes is important for several reasons. A multitude of empirical studies have shown strong positive relation between export diversification and economic growth, reduction of volatility of export revenue, increase of productivity due to spread of knowledge, increase of production volumes in other industries. Export structure or it’s diversification are very important factors of productivity and resource allocation aimed at country’s economic growth (Export Trends ..., 2013).

Production exported by a country is diversified by products/product groups in order to reduce exposure to demand shocks (Lithuanian Economic Review, 2013). Assessment of the level of export diversification involves measurement of various concentration indices. A well-known index for measurement of the scope of export concentration of country j by product/product group is the trade concentration index, or Hirschman index (Hoekman et al., 2002; Ng and Yeats, 2003). The index is calculated by the following formula:

$$H_j = \sqrt{\frac{\sum (X_{ij} - X_{ik})^2}{X_{ij}}},$$  \hspace{1cm} (1)

where: $x_{ij}$ – export value of the product/product group, $X_j$ – country’s total export value.

The value of this index fluctuates within the range from 0 to 1; however, the lower the value, the less concentrated is the country’s export. Hence, the lower the export concentration, the lower the exposure to international trade risk due to possible changes of prices on individual goods (Export Trends ..., 2013).

Export structure similarity is determined by calculating the export structure similarity index. The index is calculated by the following formula:

$$XS (j, k) = \sum [\min(X_{ij}, X_{ik}) \times 100],$$  \hspace{1cm} (2)

where: $X_{ij}$ and $X_{ik}$ – export share of product i in export of countries j and k.

The value of export structure similarity index always fluctuates from 0 to 100 %. Higher level of the index points at more similar export structures of the countries; hence, such countries are likely to be competing on a
global or local market. However, a higher level of the index may also imply limited potential of inter-industry trade on the regional markets (Roth, 2011).

A country’s production volumes can be increased in an open economy only when national producers are capable of competing with foreign producers. National producers are able to compete with foreign producers when they can offer quality products at lower price or unique marketable products to internal and foreign markets (Vinokurov et al., 2013). In other words, the country’s producers have comparative advantage in production of specific products.

According to Shohibul (2013), comparative advantage is an important notion in the modern economic theory. Being more than 200 years old, the concept of comparative advantage is considered to be the determinant of international trade specialization. The method for determination of a country’s “strong” sectors by analysing export flows was first put forward by Liesner in 1958, and later refined and popularized by Balassa in 1965. Comparative advantage of certain products/sectors of a country can be assessed by calculating various indicators. In their analysis of competitiveness of Armenia, Moldova and Tajikistan, Vinokurov et al. (2013) applied as many as five different variations of the revealed comparative advantage (RCA) index. According to the scientists, the most widely known and common method of trade data analysis allowing to determine comparative advantage of a certain product/sector of a country and assessing its export potential is calculation of Balassa’s index. This index is referred to as the revealed comparative advantage (RCA) index, as calculations are performed using available export data of the country or group of countries. The RCA index indicates the intensity of specialization of regional or world trade, and is calculated as the ratio between export share of a product in the country’s total export and export share of the product in the total regional/world export:

\[
RCA_i = \frac{\frac{X_{ij}}{NX_i}}{\frac{WX_{ij}}{WX}},
\]

where: \(X_{ij}\) – country \(i\)’s export of a product/sector \(j\), \(NX_i\) – total (national) export of country \(i\), \(WX_{ij}\) – regional/world export of product/sector \(j\), \(WX\) – total regional/world export.

The index is calculated using structural indicators of foreign trade (Vitunskiene, Serva, 2006; Drozdz, 2010). Scientists (Prusova, Razumnova, 2010; Vinokurov et al., 2013) have noted that the Balassa’s index is the extension to the elementary index of comparative advantage pioneered by Liesner (1958) and calculated as the ratio between country \(i\)’s export of product \(j\) and export of product \(j\) by group of countries \(N\):

\[
RCA_2 = \frac{X_{ij}}{\sum_{Nj} X_{Nj}},
\]

Balassa’s index is applied widely across research works for identification of the RCA. If the share of a product/sector in national export is higher than the share of the same product/sector in regional/world export, i.e. RCA\(_2\) > 1, the country is considered to have comparative advantage in production of this product/sector and is specialized in the export of such product. And, to the contrary, if RCA of a product/sector is RCA\(_2\) < 1, the country is considered to have no comparative advantage in production of this product or in this sector and is not competitive in its production or export (Vitunskiene, Serva, 2006; Drozdz, 2010).

The level of specialization of a country’s foreign trade is also calculated using the Lafay index. Compared to the classical RCA index, the Lafay index involves not only a country’s export, but also its import data, which is particularly important for assessment of the level of intra-industry trade (Drabik, Bartova, 2008). The Lafay index is calculated by the following formula:

\[
LFI_{ij} = 100 \times \left( \frac{X_{ij} - M_{ij}}{X_{ij} + M_{ij}} - \frac{\Sigma (X_{ij} - M_{ij})}{\Sigma (X_{ij} + M_{ij})} \right) \frac{X_{ij} + M_{ij}}{\Sigma (X_{ij} + M_{ij})},
\]

where: \(X_{ij}\) – country \(i\)’s export of product/product group \(j\) into a country/group of countries; \(M_{ij}\) – country \(i\)’s import of product/product group \(j\) from the country/group of countries.

The higher the value of the index, the higher is the level of specialization (Drabik, Bartova, 2008; Bojnec, Ferto, 2010).

**Empirical Research Results**

The EaP and EU countries’ endowment of productive resources, comparative advantages of production, economy and market situation and their stability in the period 2005–2012 have in one way or another shaped certain characteristic features of export specialization (depth of product specialization, export structure rationality, uniformity of distribution of structural parts of export, significance of structural shifts, product variety depth and breadth, effectiveness of comparative advantages of the product groups exported by the countries).

Several product groups dominated the structure of product groups exported by the EaP countries to the rest of the world in 2012 and accounted for a hundredth of total export by these countries (Figure 1). The value of top five exported product groups in 2012 was 40 % in case of Moldova, 50 % – Ukraine, over 60 % – Armenia, Georgia and Belarus, over 90 % – Azerbaijan. This partly implies irrational export structure (except for Moldova) and poor variety of the exported products (in Azerbaijan’s case in particular). Mikic (2005) has suggested that if the value of export of one product group is at least 50 % of the country’s total export, this product group is considered to dominate the country’s export. In this case, the
country is highly dependent on the export of one product group. Hence, it could be stated that in 2012, of all analysed countries, Azerbaijan was dependent on the export of mineral fuels and related raw and other materials. Moldova’s export structure, on the other hand, was closer to the EU countries’ structure of export to the rest of the world.

Moldova and Armenia saw the most rapid change of the relative weight of the export of the top five product groups to the rest of the world in the period 2005–2012 (reduced, respectively, by 28 and 24 % in 2012, compared to 2005), which indicates significant redistribution of structural parts of the export and more rapid penetration of the product variety into international markets. This process was running in the opposite direction in Georgia, Belarus and, in particular, Azerbaijan, where the monopoly product position dominating the export structure accounted for more than 90 % (mineral fuel and related raw and other materials). Export share of the top five product groups in the total world export during the analysed period was on average less than 50 % for Moldova, less than 60 % – Ukraine and Georgia, up to 70 % – Belarus and Armenia, 95 % – Azerbaijan.

The largest share of export to the rest of the world in 2012 was accounted for by ores, slag in Armenia (20 %), vehicles other than railway or tramway rolling stock and related products in Georgia (27 %), ferrous metals in Ukraine (22 %), beverage industry (10 %), horticultural (9 %) and electrical equipment (9 %) in Moldova, mineral fuel and related raw and other materials (36 %) in Belarus. Agricultural or food industry products also had fairly heavy weight in the structure of export of the prevailing product groups in the EaP countries during the analysed period: beverages and spirits in Armenia, Moldova and Georgia (13, 10 and 10 % respectively); horticultural products in Moldova and Georgia (9 and 4 %); cereals (10 %) and animal or vegetable fats and oil (6 %) in Ukraine (Figure 1).

The structure of the EaP countries’ export to the EU in 2012 was even more irrational than their export to the rest of the world (Figure 2). The value of top five product groups dominating the export structure in the total export was over 50 % for Moldova and Ukraine, almost 70 %–Georgia, almost 90 % – Armenia and Belarus, 99 % – Azerbaijan (top product position). This shows that integration of export by the EaP countries is not favourable enough for the EaP countries, as export structure rationality and variety of the exported products influence the countries’ economic growth in one way or another. On the other hand, internal export structure of the EU countries is much more rational. Here, the export of top five product groups to the EU countries accounted for only 43 % of the total export value in 2012.

Armenia and Belarus saw the most rapid change of the relative weight of the export of the top five product groups to the EU in the period 2005–2012. In 2012, this share reduced by 6 % in Armenia, while in Belarus it in-

![Figure 1. Share of the EaP countries’ export to the rest of the world in 2012 (top five product groups)](image)
creased by 6 % compared to 2005. This indicator saw less change in Georgia and Ukraine during the analysed period (reduced by 2 % and 1 %, respectively), and almost did not change in Moldova. Monopoly position in the structure of Azerbaijan’s export to the EU, same as in the case of export to the rest of the world, was taken by mineral fuel and related raw and other materials. The share of export of top five product groups to the EU in the total export was less than 60 % for Moldova and Ukraine, approximately 74 % – Georgia, up to 90 % – Belarus and Armenia, 99 % – Azerbaijan.

Product range exported by the EaP countries to the EU in 2012 did not differ much from the set of top product groups exported to the rest of the world (Figure 2). The largest share of the total export to the EU, as in the case of export to the rest of the world, was taken by ores and slag in Armenia (34 %), ferrous metals in Ukraine (21 %), vehicles other than railway or tramway rolling stock and related products in Georgia (17 %), mineral fuels and related raw and other materials in Belarus and Azerbaijan (as much as 63 % and 99 %, respectively). Export of agricultural and food industry products to the EU were significant as well. In the group of the analysed countries, Georgia was characterized by a fairly large share of the export of fruit and nuts, and beverages and spirits (15 % and 10 %, respectively), Ukraine – cereals and oil seeds and oleaginous fruit, miscellaneous grains, fodder (12 and 7 % respectively), Moldova – animal and vegetable fats, oils, wax, and fruit and nuts (9 % and 7 %).

In Armenia and Belarus, same as the EU, the top five product groups exported to the EU in 2012 did not include any agricultural and food industry products.

![Figure 2. Share of the EaP countries’ export to the EU in 2012 (top five product groups, Azerbaijan – top first product group)](image)

Export structure of the top product groups exported by the EaP countries to the rest of the world and to the EU was rather dynamic in the analysed period (Figure 3). Structural parts of top ten product groups exported in the 2012 changed irregularly in the period 2005–2012, except for the EU countries’ export and the unique case of the monopoly in Azerbaijan. Moreover, the share of the top parts of the export structure in the EaP countries tended to undergo redistribution during the analysed period. This redistribution happened as a trade-off, when larger parts usually increased at expense of reduction of smaller parts, except for the cases of the EU countries and Azerbaijan. This also explains the increasing concentration of export and irrationality of the export structure of the EaP countries, i.e. a tendency completely opposite to the tendency characteristic of the EU countries’ international trade. It is also important to note that in the case of the EaP countries’ export to the rest of the world, the irregularity of changes to the top parts of the export structure was not as profound as in the case of export to the EU countries.
It must be noted that in the analysed period, the EU countries’ export was dominated by particularly high-tech product groups, Georgia and Moldova’s export – also by higher value-added products, while strong positions on the top of Armenia, Azerbaijan, Ukraine and Belarus’ export structures throughout the analysed period were taken by earth resources (see Figure 1 and Figure 2). Hence, the dominance of raw product groups in the export by these countries does not promote their economic growth (considering the goal of the EU policy towards the EaP countries to bring the economies of these countries closer to the European standards in order to create prerequisites for the potential integration of these countries into the EU).

Considering the significance of structural shifts of the set of top twenty product groups in the analysed period (annually, relative to 2005), Pearson correlation ration of their export share for the compared time periods has been determined (Figure 4).

**Figure 3.** Dynamics of the EaP countries’ export structure in the period 2005–2012 (sorted by the top 10 product groups export in 2012)

*Note: the code in the diagram indicates the higher share of the 10 top product groups in the countries export structure during whole period (2005–2012).*

**Table:**

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*Note: the code in the diagram indicates the higher share of the 10 top product groups in the countries export structure during whole period (2005–2012).*
Consistently high correlation indicator in the cases of the EU, Azerbaijan and Belarus’ export to the rest of the world and the EU countries indicates that no substantial changes to the export structure have occurred in these countries during the compared periods. This tendency is also characteristic of the Ukrainian world export. This was determined by clear dominance of raw product groups in the EaP countries that did not have strong influence on the significance of the structural changes to the set of exported products.

The structure of the EU countries’ both world, and intra-EU export did not undergo any significant changes during the analysed period; however, the total weight of the top exported product groups saw more significant decline in case of intra-EU export. It must be noted that in the period 2005–2012, the EU countries’ intra-EU export structure was much more rational than their structure of export to the rest of the world, while distribution of its parts during the analysed period was much more uniform.

More notable changes to structural parts of Armenia, Georgia and Moldova’s export to the rest of world relative to the basic years have been noted in the period 2010–2012, while in the structure of export to the EU – in the period 2008–2012. The noticeable change of export structure of these EaP countries is probably related to redistribution of high-tech product groups.

Export structure has been visually characterized in the cumulative chart illustrating distribution of the increasing aggregate value of structural parts of export. Figure 5 provides graphic illustration of cumulated frequencies of the EaP countries’ export (structural parts of the top twenty product groups), which could be explained by Pareto’s 80-20 rule: 80 % of results (effects) come from 20 % of efforts (causes), while the remaining 20 % of results (problems) come from 80 % of efforts (causes). In our analysed case, 80 % share of the country’s total export value comprised of export by 20 % of product groups is the boundary that, if crossed, becomes ineffective due to the irrational export structure. Moreover, the more sudden is the “jump” of the cumulative curve, the more relative weight is provided by the product group that is the most significant in terms of export, i.e. the dominant, usually monopoly product group.

Visual analysis in Figure 5 explicitly indicates Azerbaijan being the exporter of the monopoly raw products characterized by significantly non-uniform distribution of structural parts of export both in terms of time and in terms of export scope (in 2005, the same characteristic was typical of Armenia’s world export as well). Structural distribution of Armenia and Belarus’ export to the EU has not changed much in eight years: although there was slight redistribution of the weights of the set of products, its structure remained poorly balanced in 2012, as raw product groups remained on the top of the set. Uniform structural distribution was characteristic of the intra-EU export by the EU countries both in 2005 and in 2012, and has become even more rational in the recent eight years. The closest to cumulative distribution of structural parts of the EU 27 export (both world and intra-EU) of the EaP countries is distribution of Moldova’s export structure, with its export set being based on processed products.
The level of export concentration of the EaP countries that also reveals the variety of the set of exported products has been evaluated by calculating the Hirschman index of concentration (Figure 6).
The research has shown that the level of concentration of world export by the EaP countries in the period 2005–2012 was lower than in case of the export to the EU, which indicates poor diversification of the countries’ export to the EU as well as irrational export structure. Moldova’s variety of the exported products was deeper, broader and closer to the export by the EU.

Figure 7 presents the dynamics of export structure similarity index of the EaP countries in the period 2005–2012 that indicates absence of similarity of these countries’ export structure and non-uniform change in case of both export scopes (except for the case of Azerbaijan’s export to the EU). However, it must be noted that high individual export structure similarity index was characteristic of individual product groups exported by the EaP countries during the analysed period (not presented in the article due to the large scope of calculations). The following product groups of the EaP countries shared the biggest similarity with the EU export: beverage industry products (product group 22) – in Georgia and Moldova; mineral fuel and related raw and other materials (27) – in all EaP countries except for Armenia; articles of apparel (not knitted) and clothing accessories (62) – in Armenia, Georgia, Ukraine, Moldova; pearls, precious stones, precious metals (71) – in Armenia and Georgia; ferrous metals (72) – in Armenia, Georgia, Ukraine and Belarus; copper and articles thereof (74) – in Armenia, Georgia and Moldova; electrical machinery and parts thereof (85) – in Ukraine and Moldova; vehicles other than railway or tramway rolling stock, and parts and accessories thereof (87) – in Georgia, Moldova, Belarus; aircraft (88) – in Armenia and Ukraine.

The case of export to the EU presented in Figure 7 that shows general absence of similarity between the EaP countries’ export structure and the EU’s export structure suggests that there is the potential for the EaP countries to increase their export and compete more effectively on the markets of the EU countries.

The revealed comparative similarity (RCA) and the Lafay index – an alternative to the former that also involves the weight of import in a country’s foreign trade balance – have been calculated in order to evaluate the possibilities for the EaP countries’ export to the EU. The research was conducted under certain consistency. First, product groups with RCA index over 1 were selected in the group of EU countries and the EaP countries. The selected groups were then shortlisted by comparing the values of the RCA index with the values of the Lafay index. Negative or insignificantly positive Lafay index of certain selected product groups indicated large or fair weight of import in the foreign trade of the analysed countries. Considering this fact, certain product groups “leading” according to the RCA index were eliminated from both export scopes. Figure 8 shows dynamic distribution of the RCA index of the product groups having comparative advantage and exported by the group of EU countries and the EaP countries.

The research has determined the following numbers of product groups having the biggest comparative advantage on international markets in the period 2005–2012 for the group of EU countries and the EaP countries: the EU countries – 3 and 1 (export to the rest of the world and to the EU, respectively), Armenia – 6 and 4, Azerbaijan – 1 (both cases), Georgia – 7 and 5, Ukraine – 3 and
Year 2009 was the most dynamic (due to the effect of the global crisis), when almost all product groups having comparative advantage saw significant growth in the RCA indices both for the EaP countries and the EU.

The following product groups had effective comparative advantages in export to the rest of the world in the period 2005–2012: Armenia and Georgia – metals (including precious) and articles thereof (besides individual agricultural and food product groups), Georgia (additionally) – ores and slag, fertilizers, vehicles (other than railway or tramway rolling stock), and parts and accessories thereof, Ukraine – ferrous metals, Moldova – articles of apparel, Belarus – fertilizers, vehicles other than railway or tramway rolling stock, and parts and accessories thereof, and mineral fuel and related raw and other materials (this product group remained in monopoly position in Azerbaijan both in world export and export to the EU markets).

**Figure 8.** The EaP countries’ product groups having comparative advantage and RCA index dynamics in the period 2005–2012
The analysis of comparative advantage of the EaP countries’ export to the EU has provided the facts that has had only partial match with the top product positions in the set of products exported by these countries. The list of Armenia and Georgia’s product groups that had comparative advantage in export to the EU was almost the same as in world export, Ukraine – additional groups of oil seeds and oleaginous fruit, miscellaneous grains, fodder, articles of apparel and electrical equipment, Moldova – additional groups of leather products and electrical equipment (two product groups – oil seeds and oleaginous fruit, miscellaneous grains, fodder, and beverages – did not have comparative advantage on the EU markets), Belarus – additional groups of chemical products (fertilizers and vehicles other than railway and tramway rolling stock did not have any competitive advantage in this case). Agricultural and food product groups that had comparative advantage on the EU markets should also be noted. Georgia (beverages), Moldova and Georgia (fruit and nuts) had dynamic, yet stable export position throughout the analysed period. In terms of export to the EU, Ukraine and Moldova had episodic (in individual years of the analysed period) comparative advantage in the export of cereals and fats and oils, Ukraine – oil seeds and oleaginous fruit, miscellaneous grains, fodder.

It must be noted that the set of product groups having comparative advantage in the export by the EaP countries to the EU is rather wide, such products have already occupied the EU markets niche, which could lead to more effective leverage of the export potential and, at the same time, create preconditions for economic growth of these countries and their export integration into the EU markets. Hence, the countries should reasonably promote export of the following product groups: Armenia – ores and slag, precious and non-precious metals and articles thereof; Georgia – ores and slag, fertilizers beverage industry products, fruit and nuts, Ukraine – ferrous metals, electrical equipment, article of apparel, cereals, fats and oil, oil seeds and oleaginous fruit, miscellaneous grains, fodder, Moldova – electrical equipment, articles of apparel, leather, fats and oils, cereals, fruit and nuts, Belarus – various chemical products, Belarus and Azerbaijan’s foreign trade policy should be directed towards stimulation (even acceleration) of search for and production of new products that could compete in foreign markets and help rationalize export structure of these countries.

Conclusions

The EaP and EU countries’ endowment of productive resources, comparative advantages of production, economy and market situation and their stability in the period 2005–2012 have determined the depth of product specialization, export structure rationality, uniformity of distribution of structural parts of export, significance of structural shifts, product variety depth and breadth, effectiveness of comparative advantages of the product groups exported by the countries.

Current integration of export by the EaP countries is not favourable enough for the EaP countries due to irrational export structure and poor variety of the exported products. These conditions were characteristic, in particular, of Armenia, Azerbaijan, Belarus and Georgia. The value of top five product groups dominating the export structure in 2012 was over 50 % for Moldova and Ukraine, almost 70 % – Georgia, almost 90 % – Armenia and Belarus, as much as 99 % – Azerbaijan. Noticeably more rational structure is characteristic of the intra-EU export of the EU countries. Here, the export of the top five dominating product groups to the EU countries accounted for only 43 % of the total export value. Moldova was closest to the intra-EU export structure rationality in the period 2005–2012, followed by Ukraine and Georgia. The variety of products exported by all EaP countries to the EU markets was narrower than in case of world export in the analysed period. This was particularly characteristic of Azerbaijan and Belarus’ export.

In the period 2005–2012, the structure of the EaP countries’ export to the EU did not undergo any substantial changes (changes in Armenia and Belarus were slightly more notable). High-tech product positions underwent insignificant redistribution in Georgia, Ukraine and Moldova’s export. Particularly high-tech product group dominated the EU countries’ export. Georgia and Moldova’s exports were dominated by higher value-added products, while the significant position on the top of Armenia, Azerbaijan, Ukraine and Belarus’ export structure throughout the analysed period was taken by export of earth resources.

The level of the EaP countries’ world export concentration was lower than in case of export to the EU in the period 2005–2012, which indicates low level of diversification characteristic of the countries’ export to the EU as well as irrational export structure. Product variety of Moldova’s export was deeper, broader and closer to the EU export.

The determined comparative advantages of product groups exported by the EaP countries were, in terms of their dynamics, more stable (continuous) in case of the export to the EU than in case of the world export. Moreover, the RCA indices of the product groups having these advantages were often higher than in the EU markets.

The results of the analysis of comparative advantages of product groups exported by the EaP countries to the EU have shown that their export could be increased by implementation of the means of foreign trade policy that
would help rationalize their export structure and keep the production of products having comparative advantage up to date. Hence, in order to enhance the possibilities of integration of the EaP countries’ export into the EU, it would be reasonable to stimulate production and export of the following product groups: Armenia – ores and slag, precious and non-precious metals and articles thereof; Georgia – ores and slag, fertilizers, beverage industry products, fruit and nuts; Ukraine – ferrous metals, electrical equipment, articles of apparel, cereals, fats and oil, oil seeds and oleaginous fruit, miscellaneous grains, fodder; Moldova – electrical equipment, articles of apparel, leather, fats and oils, cereals, fruit and nuts; Belarus – various chemical products. Belarus and Azerbaijan’s foreign trade policy should be directed towards stimulation (even acceleration) of search for and production of new products that could compete in foreign markets and help rationalize export structure of these countries.

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