**CAN STRUCTURAL INDICATORS OF TRADE EXPLAIN WHY EU CANDIDATE COUNTRIES ARE INTEGRATING SLOWLY?**

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## ABSTRACT

The paper discusses whether EU enlargement fatigue slowing down the EU integration process of 6 Candidate Countries (C6) can be explained by the poor economic and trade performance of those economies, especially in exchange with the EU. We comprehensively analyzed the merchandise trade of those economies with the EU in 2007-2018 using numerous quantitative techniques and applying a very high level of data disaggregation. The conclusion is that the weak trade performances of C6 are not the cause of the enlargement fatigue as these economies detected moderate structural improvements in their trade with the EU.

***Keyword:*** *EU Candidate Countries, the EU, trade structures, intra-industry trade, similarity indices.*

## Introduction

There is no doubt that there is fatigue from enlargement in the EU. However, is the objectively poor progress of Candidate Countries in the European integration a consequence of the relatively weak and slowly improving economic performance of these economies? This issue is particularly relevant to the main sphere of relations between EU (‘enlarging’) candidate countries and the EU – the trade. In addressing the question of whether the slow integration process of the EU candidate countries (‘Candidate 6’, or for short C6) can be explained by the structural indicators of trade between them and the EU, we will carry out a detailed analysis of the main qualitative and quantitative indicators of their trade with EU. Namely, notwithstanding the fact that developing relations between C6 and the EU have been covering many areas of activities, trade remains the centerpiece of bilateral cooperation and a reflection of the state of the overall economy.

Related studies have generally focused on analyzing the changes in total trade dynamics of economies of the region, and very rarely on the change in trade with the EU. Additionally, all EU Candidate Countries are not covered even the similar to the group of countries is often analyzed (members of the CEFTA, or of the Western Balkans). Analyzes of Central and Eastern European (CEE) economies are frequent, but the majority of those countries are today members of the EU and have more advanced trade structures compared to those of C6 and a thereby different set of economic problems, but their legacy can be similar to the present of C6. Furthermore, we have applied a very high level of data disaggregation (3-digit SITC level), certainly far more comprehensively than other related studies (most of the indicators obtained were calculated using 522 or 261 crude data). The clear intention of this paper is to close the described gap in the literature.

Due to the mentioned importance of this issue, the focus of this study was gathered particularly around the change of trade indicators covering trade between C6 and the EU28. We began with an analysis of the tendency of the volume (absolute and in per capita terms) of merchandise trade between these countries and the EU in 2007-2018. Then, the trend of the technological structure and factor intensity of C6’s exports (imports) to the EU, coefficients of exports (imports) concentration (in the trade with EU), the intra-industry trade and the similarity indices of trade structures between C6 and the EU were studied. Of course, obtained results are compared with those achieved by referent economies.

There are five candidate countries for the EU (Turkey that received the candidate status in 1999, North Macedonia in 2005, Montenegro in 2010, Serbia in 2012, and Albania in 2014) and one potential candidate since 2003: Bosnia and Herzegovina (B&H).

The negotiations are held with each candidate country to determine their ability to apply EU legislation and examine their possible requests for transition periods. Regarding the fulfillment of economic conditions for EU accession, it is important to notice that all three last EU enlargements, especially the one in 2007, were in many cases less economically justified and more politically motivated, and in line with the natural tendency of the old EU members to unite the continent. The expected next enlargement is obviously more subject to the otherwise rigorous EU procedures (both economic and political conditions in the candidate countries have been carefully examined) because the political will to do so is weak and public support is much lower than before.

The rest of the article is organized as follows. Section 1 surveys the literature related to our topic. The next Section presents applied hypotheses. Used methodology and data are in Section 3, followed by Section 4 (Studies where the same methodology is applied). The results and their implications are provided in Section 5, while the final section presents the conclusions and policy recommendations of the paper.

**Related Literature**

There is an extensive literature on the structural changes in CEE economies’ exports during two previous decades, but no one paper dealing with present Candidate Countries specifically. Most of the articles claim that the structural upgrade of exports has positively contributed to the overall economic performances of CEE countries.

Given the EU aspiration of C6, the analysis covering the 1995-2015 period by Prochniak and Rapacki (2019), is encouraging, as it suggests that the EU membership has significantly contributed to the acceleration of economic growth of eleven CEE economies, including their real convergence toward the level of economic development of Western Europe (EU15), with the catching up process being accelerated after their EU accession. The results indicate that those countries displayed a clear income-level convergence toward the EU15 and that variables associated with the EU membership, among others, the rising volume of international trade and foreign direct investment (FDI), turned out to be important drivers of GDP growth. As mentioned, among important sources of economic growth in the CEE economies was the expansion of foreign trade. The relevant measure of this was the dynamics of the economy's openness indicator, which clearly implies the significance of their export performances.

Bierut and Kuziemska-Pawlak (2017) showed that over the last two decades the share of CEE countries’ exports of goods in world exports more than doubled, despite the notable appreciation of their real effective exchange rates. They pointed out that technological factors had the most significant positive impact on export performance, and that improvement in the overall regulatory quality was conducive to increasing export market shares. Generally, the trade expansion is related to the inclusion of the CEE countries in the European and global value chains (GVC), due to two factors: their price/cost competitiveness (relatively low labor costs) and direct proximity to the large EU markets. Participation in the GVCs has significantly influenced the geographical and product composition of the region’s exports, with a share of non-European markets remaining low, while the EU portion becoming dominant. Yet, the position of the region in the GVCs was as the supplier of mainly machinery and transport equipment (medium-tech goods) while the share of high-tech manufacturing exports remained low. To a similar conclusion came Gilbert and Muchová (2018), who used constant market share analysis to decompose changes in the export shares of the CEE in the period since 2004 and measure changes in export competitiveness. They found that the CEE transition economies have generally increased their world export competitiveness, but these changes are driven largely by expansions of market share within the EU.

The export structure of the transition economies has undergone significant structural changes since the beginning of the transition process in terms of an increasing share of medium and high-skill and technology-intensive manufactures, as was shown in the article by Damijan et al., (2011). The impact that entry to the EU has on the trade structures of Eastern European countries, particularly the Czech Republic and Romania (from 1999 to 2009) was also explored in the study by Ivashko (2012). Romania, which entered its pre-accession period with a “developing trade structure”, experienced a drastic positive change in trade structure - finding very indicative for C6. As for EU Candidate Countries was of special importance experience of Romania, a paper by Stoenescu (2015) who analyzed the evolution of Romania’s foreign trade 2002-2014, in relation to the process of EU integration during the same period, was suggestive. He found that positive change can be linked to the country's structural transformation largely influenced by strong inflows of FDIs, mostly from the EU. Namely, Romania's foreign trade has experienced a gradual shift from labor-intensive, low in know-how, and with little valued-added products to products that require a higher value of skill, know-how, and investments (e.g. cars and automotive components).

Something a different experience of Bulgaria is studied in the paper by Lozanov and Zhivkova (2017). They analyzed the structure and geographical distribution of Bulgaria's export during the period of the country’s EU membership (2007-2016). Authors showed that the economy that produces and exports mainly raw materials and low-tech goods cannot be competitive in the EU market. Exports to EU as well as total export of such country, although impressive in volumes (e.g. Bulgaria had almost three times higher exports per capita to the EU in 2018 than the average one of C6), do not contribute to the achievement of rapid economic growth, but it hinders the optimal development of trade performances.

Regarding the significance of improving the export structure, the study by Santos et al., (2013) is indicative. Using panel data estimation to 23 of the EU members in 1995-2010, they found that economic growth was fostered through export specialization in high value-added products, such as manufactures and high-technology. Given these conclusions, the European countries should support high technology exports and reinforce the exports of Machinery and Transport Equipment, and Medical (and pharmaceutical) products, before anything else.

Closely related to strong export growth that CEE economies achieved since the 1990s is a significant increase in FDI inflows to them, as was shown in the paper by Rădulescu and Şerbănescu (2012). Consequently, the ratio of inward FDI to the CEE countries in total world FDI inflows increased more than three-fold during 1990-2010. Substantial increase in their exports was especially directed towards Western Europe as they succeeded to attract many export-oriented FDIs from this area. When it comes to FDIs, the article by Carp (2015) has clearly emphasized the correlation between FDI inflows and GDP growth rate in selected CEE countries. The results show a unidirectional causality between FDI and GDP growth in Poland, Czechia, Romania, Bulgaria, except Hungary.

Damijan et al. (2015) have examined the reasons behind the remarkable export achievements of transition economies in the last two decades. They decomposed export performances into the gains due to the advantageous access to foreign markets and export gains on the basis of internal supply capacity. Authors found that the size of the economy, inward FDI penetration (mostly in the manufacturing sector), export unit values, structural changes of CEE's exports, and the quality of institutions and infrastructure had a significant positive impact on exporting countries supply capacity (also, benefits of EU accession have been mostly exploited).

For the majority of EU Candidate Countries, findings of Chistruga and Crudu (2017) are likely of interest. According to them, continuing trade and capital flows, international labor migration, and the intensification of interdependencies in the world economy also means the increase in the gap between poor and rich countries. This development model, which is "marked" among other things by slowing the EU integration process, makes the most vulnerable small economies. To solve these issues, the authors proposed a development concept for small economies of CEE based on a comprehensive process of industrialization resulting in an export-oriented economy that would generate profits on the basis of increased competitiveness and productivity in the respective sectors.

Study covering almost all C6 economies, by Halilbašić and Brkić (2017), showed that a rapid shift in revealed comparative advantages of the Western Balkan countries (the Former Yugoslavia minus Slovenia plus Albania) and their export structure (that would bring the countries closer to the EU demand) did not happen for most of them to the extent it was expected. This is despite opposite experiences of CEE 10 in the 1990s proving that trade liberalization and dynamic adjustment process could accelerate changes in export specialization in terms of greater alignment with the needs of the EU market. The level of export product concentration was reduced but the export to the EU is still highly concentrated on a small number of product groups (largely not the ones in the production of research-intensive goods). Despite the increasing alignment of the export structure of observed economies with demand in the EU, a large inconsistency between export specialization of the WB and the needs of the EU market still exists.

Given that C6, excluding Turkey, belong to the Central European Free Trade Agreement (CEFTA), suggestive are findings in study by Petreski (2018), who asserted that the effect of the EU SAAs has been found smaller than that of CEFTA, giving some support to the notion that CEFTA might have contributed to mitigating the growing dependence of its members on EU trade. In any case, the success of CEFTA implies that if those economies want to work together with a big leitmotiv – joining the EU – there is certainly much they can do.

Generally, it is clear that most papers pointed out that CEE countries are showing the path that C6 should take, and it is clear that their experiences in trade and overall economic policy, above all in attracting export-oriented FDI, should be studied and applied as much as possible.

**Hypotheses Formulation**

This section presents the hypotheses to be tested in the study. As stated, the objective of this paper is to analyze the impact of possible C6’s trade performances’ deterioration (or stagnation) on a marked slowdown in (of) EU integration process of six Candidate Countries (or even a standstill in the EU enlargement policy). According to the previous statement, we propose the following four hypotheses:

*Hypothesis 1: From 2007 to 2018 structure of merchandise exports from C6 has not adjusted to the merchandise import structure of the EU, implying deteriorated (or stagnating) export quality of those six countries.*

To prove or reject this hypothesis we will, in the next section of this paper, use four similarity indices: Finger and Kreinin, Cosines, Bray-Curtis, and inverse Integrated Similarity Index.

Coefficients indicate the probability, i.e., the intensity of expected total bilateral trade. Potential increases in similarity (''overlap''), i.e. a better match of C’6 (merchandise) export structure with the import structures of the EU would indirectly imply the potential for further growth and qualitative improvement of merchandise exports from the observed countries and vice versa. Possible lessening of the similarity of C6’s export structure with the EU’s demand does not speak only about a divergence between C6’s exports and the demands of that market but also about a general “distancing” of C6’s exports from the imports of developed countries’ markets. A structure, favorable or otherwise, is derived from empirical analysis, which shows that most developed countries have a structure of exports and imports which is predominantly based on products of high stages of finalization (with much higher added value). Namely, once a country where a resource (or primary) products dominate exports achieves a certain level of development, it needs to diversify its export supply to include products of greater sophistication or economic growth will slow.

Ideally, home country exports should match the imports of its major trading partners. It should be noted that countries at a similar level of development typically have similar trade structures. In addition, the growing similarity of trade structures is correlated with an increase of bilateral trade (excluding other factors that may have an impact).

Given a very small share of C6’s exports in EU imports, it is clear that comparing these structures is only relevant as an indicator of their achieved improvement in exports (and indirectly of the accomplished economic development). Due to a high share of exports to the EU in these countries’ total exports, it is to be expected that the EU’s import demand itself to a large extent shapes the C6’s total export structure. It would implicate that changes that take place in the structures of C6’s merchandise exports are to a great extent a consequence of their economies’ possible adjustments to the import demands of their main trade partner - the EU.

Among other things, in an economic and monetary union, such as that within the euro area, and which the observed countries aim to enter, the similarity of the trade structures is important because a higher level of similarity may require smaller industrial relocation, makes monetary policy coordination and the definition of other common policies easier, increases resistance to asymmetric shocks, accelerates the convergence of factor prices and reduces the pressure of migration flows to the EU (Crespo and Fontoura 2005). In their other study, Crespo and Fontoura (2007) pointed out that joining the euro area may result in further convergence of export structure in the region. The sustainability of monetary union depends on the degree in which the common economic policy is in accord with that of the individual members, and this requires the similarity of economic indicators in these countries, including, among others, export structures. In that sense, the study done by Kalcheva (2006) is suggestive, since it shows the high correlation between euro area members’ external shocks. In addition, there was a little or no correlation between supply shocks in any of the ten former EU candidate countries (now EU members) and the euro area member states until 2002 (the two groups of countries have had repeated exposure to supply asymmetric shocks).

*Hypothesis 2: In the period under review the factor intensity and technological structure of EU candidate countries’ exports (and imports) to EU28 retained roughly the same share, or has shifted towards a decreased share of products at higher levels of processing, suggesting weakening (or stagnating) of C6’s export (and import) quality structure.*

This hypothesis is going to be tested according to the methodology developed by Mayer and Wood (2001) and the one developed by Munkacsi (2009), which will be explained in the Section: Used Methodology and Data.

A presumed decreasing share of products at higher levels of processing (those with higher factor intensity and advanced technology structure), in total exports, would suggest a qualitative deterioration of the exports of those economies, given the lower share of products with higher value-added. The qualitative changes in C6’s exports to the EU are measured through tendencies in the shares of skill-intensive manufactures, and then medium- and high-tech products, from 2007 to 2018, where higher-level indicates their better quality. This is especially important given that the basic condition for accelerating export growth is its structural improvement.

*Hypothesis 3: In the observed period, intra-industry trade between C6 and the EU has substantially decreased (at the best case stagnated), in accordance with divergence (at the best case non-convergence) of the two trade structures.*

To accept or reject this hypothesis the most common technique of measuring the share of intra-industry trade will be used: Standard Grubel-Lloyd index (Grubel and Lloyd 1975). It measures the degree of intra-industry trade due to product differentiation, which indicates how a country imports and export simultaneously varieties of a particular product. In the aggregate intra-industry trade index higher ratios suggest that the economies of scale and various sources of gains are being exploited (like innovation).

*Hypothesis 4: In 2007-2018 it came to the growth (or stagnation) of export (and import) concentration ratio of C6 in their**trade with the EU, implying decreasing (or stagnating) sophistication of export (and import) structure of C6.*

To test this hypothesis Herfindahl-Hirschmann index will be applied. It ranges from 0 to 1, with 0 reflecting the least concentrated export (import) portfolio and 1 the most concentrated (UNDP, 2011). The assumption about the rise of Herfindahl-Hirschmann index as one undesirable movement was taken given a comparatively low level of economic development of those countries (developing countries generally, on average, have a relatively high level of this index). In opposite, developed countries in one moment began to raise this ratio, as they are generally achieving some specialization in high value-added products thereby increasing this coefficient. Apart from that, the decline in export concentration ratios was a tendency in almost all countries in the period after World War II, especially in the last two decades of the 20th century. In addition, it is natural that smaller (as well as less developed) countries have higher ratios of exports because they can’t sufficiently diversify their export offer. When it comes to imports it is a natural tendency to have a decrease of this index, and hence its growth would represent one undesirable movement.

Additionally, in this way the set hypothesis was a consequence of the fact that about two thirds of exports (and imports) of those countries (excluding Turkey) go to the EU (the EU is in some way an approximation for more sophisticated part of their total trade), and that the EU and its diversified import demand practically shape the export supply (and also a good part of the economic policy) of these countries. Therefore, it is of great importance to empirically examine the patterns and dynamics of C6's export (and import) specialization in the trade with the EU.

**Used Methodology and Data**

We have applied four similarity indices. The Cosines method ($COS\_{ij}$) is used to determine the similarities (differences) between the two structures that are classified in the same way (e.g., the 261 elements). The case takes a vector of E, which represents the structure of exports to specific countries (i). The vector is defined by a number of elements in n-dimensional space that have the same dimensions as the vector E elements. The analog vector to E, M takes a vector that represents the structure of imports (or exports) of a particular country (j). The vector is defined by a number of elements in n-dimensional space, which have the same dimensions as the vector E elements. Provided that the participation of all elements of total exports or imports is identical (absolute amounts are not important), the two radius vectors will have identical positions in multidimensional space because they have the same coordinates, the angle between them will be 0, and the value of the cosines will be 1 (a complete identity of commodity structure). The cosines method allows us to take a more detailed look at the difference between export and import structures (merchandise groups, in our case), and we can detect merchandise groups where there is most potential for increasing exports; given, of course, real economic opportunities.

$COS\_{ij}=\frac{\vec{E\_{j}}\*\vec{M\_{j}}}{\left|\vec{E\_{j}}\right|\*\left|\vec{M\_{j}}\right|}$ (1)

or

$COS\_{ij}=\frac{\sum\_{k=1}^{}E\_{ik}\*M\_{jk}}{\sqrt{(\sum\_{k=1}^{}E\_{ik}^{2}})\*(\sum\_{k=1}^{}M\_{jk}^{2})}$ (2)

 We have also used additional three indices: Finger and Kreinin (Finger and Kreinin 1979), Bray-Curtis which is broadly used in geo-statistics and in biometrics (Michie 1982), and Integrated Similarity Indices (with inverted values because of comparation with previos coefficients) proposed by Kovach (2004). Common for all four indices is that they range from 0 to 1 - with 0 implying complete lack of similarity and 1 reflecting the countries having identical export (import) structures - that they all provide information on how well the export profile of one country matches the import (or export) profile of another country. The formules for all indicators were given in study by Nikolic (2013), as well as in numerious studies where these indicators are used. For example, Linnemann and Van Beers (1988) used used Cosines and Finger and Kreinin coefficients to determine the similarity of export and import structures. Wai-Heng (2009) analyzed the similarity of export structures in the Northeast and Southeast Asian economies, also using the Finger-Kreinin index. Benedictis and Tajoli (2004, 2008) studied the similarity of the export structures of CEE countries with the structure of EU exports, this time using the Bray-Curtis index.

The methodological problems, that is, the imperfections of the above indicators, lie in the fact that the coefficients themselves, due to the configuration of the structure, may occasionally indicate completely unexplained values in the economic sense. It is possible that more competitive economic structures may show a lower coefficient with the reference structure. This can happen if one country has a very high level of specialization in certain technology-intensive industries; while in other countries technology-intensive industries have low specialization (and a share of that SITC commodity group). In addition, there are "problems" with the external structure of imports from the EU, as it was based on a relatively high share of energy imports, which reduces the coefficients since those six economies are not energy exporters. Also, it is often impossible to detect qualitative improvements to products of the same commodity group or even to the customs nomenclature.

Yet, it may be assumed with great certainty that, with the entry of foreign companies into C6’s markets in recent decades, the quality of the goods has substantially improved, especially of those intended for foreign markets. The tendency of the share of skill-intensive manufactures, as well as the similarity indicators, often cannot point to these improvements.

Analysis of share of skill-intensive manufactures in total exports (and imports), is given in the study by Mayer and Wood (2001), and in accordance with their methodology, we have extracted the shares of skill-intensive manufacture products in C6’s exports (imports) to the EU. All (merchandise) export is divided into two broad categories: manufactured and primary. Their definition of manufactures is the one used by trade statisticians, namely categories 5±8 less 68 (non-ferrous metals) of the SITC (remaining goods are classified by trade statisticians as primary products). Then they sub-divided manufactured exports between skill-intensive items and labor-intensive items, using the classification in Mayer and Wood (1998), which was based on a review of earlier studies that ranked individual manufacturing industries by their skilled/unskilled labor ratios or other measures of skill intensity.

What is important for our analysis is that chemicals, machinery, cars, aircraft, and instruments are classified as skill-intensive, which will be used as a proxy for achieved level of export sophistication. To be more precise, this classification cover the next product groups: Chemicals 5 (without: phosphorus pentoxide and phosphoric acids 522.24, aluminum hydroxide 522.56, and radioactive material 525), Cut diamonds 667.29, Non-electrical machinery 71-74, Computers and office equipment 75, Communication equipment 76, Electrical machinery 77, Motor vehicles (parts thereof) and aircraft 781-784, 792, Scientific instruments, watches and cameras 87- 88.

Munkacsi (2009) had classified the exports, according to technology structure, into the two categories: medium- and high-tech products and all other products. He classifies the products into four categories relating to the technology level of the products. SITC categories (three-digit level) sorted as medium - and high tech are: merchandise groups 266- Synthetic fibres suitable for spinning and 267- Other man-made fibres suitable for spinning; section 5 - Chemicals and related products (without 52 - Inorganic chemicals; 551- Essential oils, perfumes; 592- Starches, inulin, wheat gluten); 653 - Fabrics, woven, of man-made textile materials; merchandise groups 671- Pig-iron; 672- Ignots and other primary forms; 678- Wire of iron and steel; sector 7 (Machinery and transport equipment); divisions 81 (Prefabricated buildings; sanitary plumbing, heating and lighting fixtures and fittings); divisions 87 (Professional, Scientific, Controlling Material); divisions 88 (Photographic Apparatus, Optical Goods, Clocks).

Of course, a limitation of any classification of manufactured exports by skill intensity is the internal heterogeneity of statistically defined industries as each industry contains many goods (final and intermediate) and many stages of production of widely varying skill intensity. There is no simple solution to this problem with existing export data, but it is vital to be aware of it in interpreting the results of statistical analysis.

Grubel-Lloyd index is expressed as the ratio of intra-industry trade to total trade. The index will be equal to zero in the absence of intra-industry trade, but to one in the absence of inter-industry trade. Thus, if the bilateral Grubel-Lloyd index is relatively large for a set of trade flow data, it can be inferred that a relatively large proportion of bilateral trade in this data set is associated with two-way trade in differentiated products (Grubel and Lloyd 1975). Among many, Grubel-Lloyd index is used also in the study by Hayakawa et al., (2017).

$GL=\sum\_{i=1}^{n}w\_{i}\*GL\_{i}=\sum\_{i=1}^{n}\frac{X\_{i}+M\_{i}}{(X\_{i}+M\_{i})}GL\_{i}=\frac{\sum\_{i=1}^{n}\left(X\_{i}+M\_{i}\right)-\sum\_{i=1}^{n}\left|X\_{i}-M\_{i}\right|}{\sum\_{i=1}^{n}\left(X\_{i}+M\_{i}\right)}$ (3)

*GL* – intra-industry trade index for total trade between the two countries;

*GLi* – intra-industry trade index for commodity class *i* (here: goods at 3-digit SITC level);

*wi –* share of trade in product *i* in the total trade;

*Xi* (*Mi*) – exports (imports) of product *i* from (to) given country to (from) a given country;

*n* – number of commodity classes (industries).

The low index value indicates the possibility of significant structural adjustment costs due to increased competition from other countries, indicating that the country is not making significant incomes from horizontal and vertical integration into the world economy and is not taking advantage of large markets and specialization in certain areas. It has been empirically proven that a possible increase in intra-industry share in total trade is an indicator of economic development (and indicator of eventually decreased the gap in technology relative to more developed countries).

The Export Concentration Ratio (Cxj), also known as the Herfindahl-Hirschmann index, is the most commonly used ways of measuring export (and import) concentration. It is the numerical expression of concentration; the higher the coefficient is, the lower the level of diversification it represents. Export concentration reflects the degree to which a country’s exports are concentrated on a small number of products (or countries). The index is the simplest and most affordable indices due to their ease of comprehension and availability of data. It is normalized because of the number of merchandise products is different between countries. The same index is, of course, applied to calculate the import concentration ratio. More recently, Herfindahl-Hirschmann index was applied in study by Márquez (2016) who performs an analysis of the concentration or diversification of the export structure of the Andean Community member countries in 2000-2015. Also, Kim (2019) traced the relationship between aid for trade and 133 aid recipients' export structure between 1996 and 2013 using the same index.

The logic of export specialization was originally developed to explain the underlying reasons for international trade and predict the trade pattern resulting from changes in factor endowment and technology allowing economies to gain from increasing specialization in activities where they have a comparative advantage under autarky. We focused on the following research goals: to assess the patterns and dynamics and degree of C6’s export specialization and to derive policy implications based on the empirical findings.

$C\_{xj}=\frac{\sqrt{\sum\_{i=1}^{}(\frac{X\_{ij}}{X\_{j}})^{2 }}-\sqrt{\frac{1}{n}} }{1-\sqrt{\frac{1}{n}}} $ (4)

Where:

i = 1…n

$n$ = number of SITC 3-digit export categories (about 260)

$X\_{ij}$ = value of export of sector ''i'' from the country ''j'' in a given year

$X\_{j}$= total export volume of the relevant country in the same year

The period from 2007 to 2018 was analyzed. The data on countries’ exports (and imports) are drawn from the United Nations Commodity Trade Statistics Database – COMTRADE (2019) covering 261 merchandise groups at the SITC 3-digit level for the years 2007 and 2018 (including 2011). We have used the structure of exports and imports by Standard International Trade Classification (SITC), Revision 4. When it comes to data refereeing to absolute values of trade we generally used EUROSTAT online database (2019), as well as national statistic sources, especially **Czech Statistical Office (2019).** As an initial year, we took 2007, when the majority of those countries were at the beginning of the EU integration process and, especially important, last year before the Great Recession. The last available year is 2018.

**Results and discussion**

The primary interest of this study is to investigate whether the slowdown or even standstill in the EU enlargement process is in any way caused by the presumed or alleged weakening or stagnating trade performances of EU Candidate Countries. Of course, the additional (implicit) goal is a comprehensive analysis of the trade structure dynamics of those countries, especially with the EU28, in 2007-2018. We will begin with the C6-EU trade dynamics.

Thanks to its close geographic proximity and ongoing integration process, it is not surprising that the EU is the main trading partners of C6. About 70% of all goods exported from those economies, excluding Turkey, were destined for the EU, with almost three-fifths coming in the opposite direction. The EU has a relatively modest share in Turkey’s export (half) and especially imports (36%). Table 5 in the Appendix provides information on international trade flows and the growth rates between the EU and C6 economies (combined and individually) in 2007-2018.

The cumulative growth of merchandise exports from C6 to the EU was 76% between 2007 and 2018, while imports from the EU increased by 40%. Among those economies, Turkey accounted for a lion share (about three-fourths) of the goods exported to and imported from the EU.

We have also introduced alternative measures for analyzing the significance of the development of trading patterns between the EU and C6. To provide comparative insight into dynamics of merchandise trade between EU28 and C6 we calculated average annual growth rate for external merchandise imports and exports of EU28 in 2007-2018 expressed in EUR, as well as for international trade expressed in EUR, but also in volume (sources: WTO, 2019; Statista, 2019; Macrotrends 2019; EUROSTAT, 2019a; EUROSTAT, 2019b). What is especially important is that detected the average export growth of C6 to EU28 (5.3%) was higher than the average growth rate of international trade in 2007-2018, which increased by rate of 4.4% expressed in EUR (and 2.3% expressed in volume). Also, the total average export and import growth rates of C6 were higher than the ones of EU28 in 2007-2018 (4.3%, 2.9%, respectively), again implying above average trade growth of these countries.

Finally, to have additional comparative insight we obtained data on export per capita to and import per capita from EU28 for C6 as well as several other (once ‘transitional’) economies. As expected, these data are disappointing, as C6 per capita export in 2018 (950 EUR) is even 14 times smaller than the one of the Czech Republic, and roughly 3.5 times than the one of Romania, while the import per capita (980 EUR) is smaller by almost 10 and more than 4 times respectively.

[Table 1 near here]

We now turn to the similarity indices. Bycomparing the merchandise export structures of C6 (as well as the export structure of the Czech Republic as a structure of aspiration)with the commodity import structures of the EU28 in 2007, 2011, and 2018, we calculated the similarity coefficients presented in Table 1. To notice again, each particular structure is consisted by 261 elements, in this case shares in total export or import.

Given that for the structure of the EU import it is possible to achieve a rapid improvement over the period under review, and thus "offset" any improvements on the C6 side, we are also trying to address this issue. To partially isolate this effect, we analyzed changes in EU imports through the tendencies of products at higher levels of processing, where a possible strong increase of it would suggest its rapid advancement, this explaining eventual lack of structural improvements in EU candidate countries similarity indices. Results we had calculated are according to expectations: there is moderate growth in import structure quality seen through the growth of skill-intensive manufacture, and medium- and high-tech, products. Namely, medium- and high-tech products portion in total external imports of the EU28 was 40.6% in 2007, slightly fell in 2011 (37.5%), and increased to 45% in 2018. The similar, generally mildly rising, the tendency is detected when skill-intensive manufactures are concerned (38.1% in 2007, 35.6% four years later, and 43.2% in 2018). So, evidently there is not a rapid but rather moderate increase of external EU’s import demand sophistication, which is a worldwide tendency, especially in developed countries.

According to Table 1, it can be seen that, between observed years, there has been a moderate increase in the similarity of the two structures in large majority of the observed cases, so that Hypothesis 1 can be rejected. The absolute level of the similarity coefficient is mostly higher than at the beginning of the period. Opposite patterns among the surveyed countries showed only in Albania and partially in Montenegro. The highest similarity is recorded, as expected for the most developed C6 country: Turkey (and to a lesser extent Serbia), while the situation is, as expected, less favorable in other EU candidate countries. It is not surprising that the similarity of the Czech Republic’s export structures and the EU import structures is the highest, because they come from the two economies with very sophisticated trade. Yet, in spite of this, in general, these results imply that the structure of C6’s exports has changed in a positive direction. Also, such a trend is detected earlier is it was shown in studies by Nikolić (2013, 2011) referring to Turkey and Serbia (both in the period 2000-2007), B&H (2005-2011), and Montenegro (2005-2012), where the rise similarity coefficients (done at 2-digit SITC data) between exports of four observed economies and EU import demand was revealed.

Generally speaking, seemingly relatively small changes of the similarity coefficients are the result of slow changes in the export structure, because more time is required for substantial economic change in the real sector, especially manufacturing industry (the merchandise export is virtually entirely yielded from it). This is especially true for economies like C6 with weak poor trading performance regarding the European context. It should be noted that the change of economic structure is the basis for resolving the problem of the foreign trade deficit and consequently wider economic issues.

[Table 2 near here]

Table 2 shows that shares of goods at higher levels of processing in C6’s exports to the EU have increased since 2007 in the large majority of the cases. In accordance with that Hypothesis 2 can be disapproved.

True, the trend of the growth of these ratios is a worldwide phenomenon, but it seems that these economies detected moderate growth of those indicators in a relatively short period. When countries with largest portion of this sort of export to the EU are concerned, Turkey and especially Serbia (whose shares of goods at higher levels of processing almost doubled), it is clear that improvement is significant. To be added, the shares of both skill-intensive manufactures and medium- and high-tech products are high in some countries while remaining low in others. For example, skill-intensive manufactures are very low (albeit strongly rising), in the smallest EU candidate economy (Montenegro), where they account for only 2.2% in 2007. A comparable situation is with N. Macedonia, while in Albania they accounted for only 4.6% and 7% in 2007 and 2018, respectively. A very similar case is with medium- and high-tech products consisting only around 5% in both Albania and Montenegro in 2007.

The results obtained by analysing the Czech trade structures shows that share of medium- and high-tech products in exports to the EU is very high and rising (almost two-thirds in 2018), which implies a high level of merchandise trade between them in highly advanced merchandise groups (also, share of imports of those goods is, as expected given sophisticated trade with the EU, very high compared to C6). So, looking at Czechia, which we used for comparison, we see an economy which strongly increased the share of goods at higher levels of processing since the 1990s and which already achieved a high level of trade sophistication with the EU in 2007 and before, certainly in a relatively short period.

When import share of skill-intensive manufactures and medium- and high-tech products are concerned, it was largely achieved higher level compared to export what is understandable given the asymmetric character of trade flow between C6 and the EU (the EU exports goods at higher level of processing to them than vice versa). This is not the case when trade between the EU and Czechia was analyzed because EU external imports is significantly more diverted to low value-added products, such as energy, than its total exports (which include also internal imports).

Certainly, the rise of the share of goods at higher levels of processing in C6’s export to the EU in 2007-2018 are good signs, but it is a small consolation given the growing trend of this kind of product in international trade. When the import share of those products is regarded, it was largely achieved higher level compared to exports what is understandable given that the EU exports more variety of products to less developed countries than it imports from them.

Given the generally increasing trend in the share of goods at higher levels of processing, we controlled the share of this product group in total exports of C6, as well as in Czechia. According to our calculation, from 2007 to 2018 all observed countries (apart from Albania) detected a moderate increase in the portion of goods at higher levels of processing in their total exports. Looking at data, Czechia has the best results, as expected, with medium- and high-tech products accounting for 67.6% of total exports in 2018, rising from 63.5% in 2007 (while in skill-intensive manufactures achieved growth from 60.4% to 65.6%). Other CEE countries (like Hungary, and to a lesser extent Romania) have a significantly higher share of goods at higher levels of processing in total export than C6 (Hungary 70.9% and Romania 53.9% in 2017). This is in spite of the fact that in the 2000-07 period three largest of C6 economies saw an increase in skill-intensive manufactures shares in their total exports, true from a very low base (Nikolić, 2013). Namely, the shares of skill-intensive manufactures in total merchandise exports moderately increased in Turkey and Serbia (since 2000, when it amounted to 24.8% and 22.5%), and B&H (since 2005, when it was 19.9%). The shares of the same sort of product in 2018 was 36% for Turkey, 37.3% for Serbia, and 22.4% for B&H.

In 2011-2018, N. Macedonia's export structure has apparently seen a strong improvement, but given the low absolute level of total exports, this change can be misleading. Namely, it is enough to increase only one or several merchandise groups in the export to obtain such growth when economies with relatively small exports are concerned. In the concrete case, the merchandise group that mostly explained probably short-living strong growth of this indicator is 598 (Miscellaneous chemical products) accounting for 21% of country total exports.

[Table 3 near here]

On the basis of our calculation of intra-industry trade, namely Standard Grubel-Lloyd index (S), between C6 and the EU in 2007-2018 we achieved results presented in Table 3 (we also get Grubel-Lloyd index weighted with merchandise groups’ trade shares labelled with ‘W’ in Table 3). Additionally, we calculated the same index for Czechia, as well as for the total trade of those economies to have better comparative insight.

There is obvious moderate growth for all C6 economies, which can be seen in Table 3 and Table 7. Based on this, Hypothesis 3 can be rejected.

Yet, empirically is detected the trend of the growth of these coefficients generally. For example, since the 1990s in European countries in transition, these indicators were also growing indicating to the positive change of their foreign trade both total and with the EU. Kawecka-Wyrzykowska (2008) showed that combined intra-industry trade index for (advanced) CEE 10 countries (which entered the EU in 2004) increased from 0.419 in 2000 to 0.508 in 2007 (achieving even 0.575, from 0.442, in Slovenia, calculated at five-digit level SITC). The evolution of trade specialization in these economies has been clearly in one direction, consisting of the increasing role of intra-industry trade. It means that these countries have made great shift in changing their production structures and making their economies more similar to those of the EU (so-called catching-up process).

Yet, it is clear that the intra-industry trade index for C6 is still relatively low indicating their unfavorable trade structures. This index is significantly lower from the same indicator for the Czechia, and it is smaller than the one for CEE 10. According to Kawecka-Wyrzykowska (2008) combined intra-industry trade coefficient of CEE 10 countries with EU25 in 2007 achieved solid growth since 2000, rising from 0.418 to 0.494.

Also, this index is mainly lower than the same index for the total trade, which is also a case when it comes to CEE 10. Yet, when the two largest of C6 are concerned, the situation is something different. Namely, in Turkey, the intra-industry trade index that we were calculated amounted to 0.404 in 2007 and 0.442 in 2018, while the same indicators for Serbia were 0.420 and 0.540. On the other hand, looking at B&H, N. Macedonia, and Czechia in 2018 the intra-industry trade indices we calculated (0.430; 0.307; 0.732; respectively) were higher than those in trade with the EU.

In spite of all previous said overall insight gives support to some positive expectations. Namely, the traditionally complementary nature of trade has become increasingly competitive. Additionally, volume and structural changes of the EU-C6 trade relations have been leading to more interdependence, although not a balanced one, deepening cooperation and developing or joining existing international production chains. As decades-long experience with the rapid growth of intra-industry trade among the developed countries shows, intra-industry trade does not only create more competition but also opens up new areas of cooperation and generates structural transformation. From the insight into export and import structures of C6 with EU, where increasing, but still small number of products groups with significant shares are identical, the process of transformation of the EU-EU C6 trade pattern - from inter-industry to intra-industry one - can be seen, which is certainly a positive development leading to more interdependence. Of course, this process is not comparable with the one seen in CEE 10, especially in the Visegrad Group, but any signs of such development, which have meaningfully advanced only in Turkey, are welcome. For example, significant shares in both imports and exports from Turkey to and from the EU are consisted from two merchandise groups: 784-Motor cars and other motor vehicles (11.6% of exports, and 5.6% of imports) and 784-Parts and accessories of the motor vehicles (4.1% and 11.8%), while division 78- Road vehicles covered 24.7% of Turkey exports to the EU in 2018 (and 11.8% imports from the EU). Other C6 economies, in spite of some achieved progress, are still far away from trade pattern characteristic for advanced countries, where trade with products attributed to merchandise groups of sector 7 is prevalent.

Closely related to this, C6’s import from the EU includes a substantial share of goods processed in the EU (so-called processing trade). According to this, a significant portion of the product coming from the EU serves domestic consumption, but another part enters the C6 production chain and will be used as imported components in manufacturing both for exports and for the respective domestic market, which is a case also in opposite direction.

Given strong importance of FDI for C6 it is worth to point to findings of a study by Lyu and Blandford (2019) analyzing the relationship between intra-industry investment (III) and intra-industry trade (IIT) for China. Authors suggest that there is a close substitution relationship between III and IIT in most industries in this country. This implies that if there are restrictions on IIT, III will increase, and given the substitution relationship between III and IIT, it also implies that if IIT is constrained by tariff and non-tariff barriers, this will lead to an increase in the level of III. One of the implications for C6, taking for granted a wider applicability of above-mention conclusions and having in mind imposed numerous non-tariff barriers especially in C6’s agro-industrial complex, this would be the sector where one would expect an increased FDI in years to come.

Certainly, intra-industry trade has in some way driven trade developments of C6 in the observed period, which is above all the consequence of increasing cumulative net inflow of FDI, largely from EU (European Union open data Portal, 2019), allowing value chains to be formed. What is crucial is that the EU-C6 trade relations certainly have a solid untapped potential for development.

[Table 4 near here]

Looking at C6 export to the EU it is obvious that Herfindahl-Hirschmann index practically stagnated, excluding incidental decrease for Montenegro and a moderate decrease for Serbia and B&H (Table 4). On the side of imports from the EU, a low and generally stagnating retained level of the concentration coefficients is evident, indicating that there has already been a dispersion of commodity imports. It is an expected tendency given the opening of these countries (diversification of import demand) in the last two or three decades and the growth of the absolute level of imports, which is in line with the increase in the purchasing power of the population. A lower level of concentration of imports than exports is a characteristic of almost all countries and is a logical result of the tendency of each economy to focus its exports on specific areas where it has comparative advantages. What Table 4 also shows is that C6 and Czechia have a higher concentration of exports to the EU than the concentration of EU exports to them, which is expected and certainly speaks of the great diversification of total EU external exports.

Returning to export concentration, the index is relatively high in Montenegro, Albania, and N. Macedonia representing poor diversification, which is expected given the small size of those economies. For example, in Montenegro very high level of export concentration ratio in 2007 (astonishing 0.784) was caused by the fact that only one merchandise group accounted for 80% of total exports (684-Aluminum), which share feel to still very high 34.2% 11 years later simultaneously decreasing this index to 0.339. In N. Macedonia a high level of this index in 2007 was caused by a large portion of merchandise group 671 (Pig-iron), but in 2018 ‘the culprit’ was another commodity group: 598 (Miscellaneous chemical products). A similar situation is in Albania where the share of 851 (Footwear) was about one quarter in both 2007 and 2018, which certainly is not a good indicator given a low level of value-added in this kind of product.

Yet, overall results are inconclusive, so that the initial hypothesis about the fall (or stagnation) of export (import) concentration ratio of those countries in trade with the EU cannot be either accepted or rejected. Namely, one can say that Herfindahl-Hirschmann level generally represents a poor diversification of C6 and that the overall development suggests that the level of exports diversification has not come to significant improvements. But, looking at data the same can be said for Czechia. This country had generally low Herfindahl-Hirschmann index in 2007 which is in line with the advanced export structure, but it recorded growth of the index thus surpassing the level achieved by Turkey, Serbia, and B&H. Of course, this kind of behavior, which is characteristic for many developed nations, is partially linked with the index itself because of its imperfectness, and thereby its dubious explanatory power.

Certainly, the relatively low value of the coefficients, similar to those of the developed countries, is not a consequence of the broad supply of the EU candidate countries’ export sector and its favorable structure (partially excluding big economy such as Turkey), but above all, it was caused by the lack of certain competing products, which would possibly have a significant share in the EU market. Virtually, there are only a few merchandise groups in their exports going to the EU market (as well as in total exports) having a significant share, and these are, as a rule, primary, resource, or labor-intensive products. High levels of export concentration detected in Montenegro, Albania, and N. Macedonia are caused by a strong share of only several commodity groups, always resource or labor-intensive ones. That is why it wouldn’t be good to see a significant increase in the specialization of those economies because, given the domestic factor availability, or production potential, it would practically mean that these countries are strongly increasing the share of certain products at the lower processing stage, which generally have a low unit value. In the long run, the preferred route is export diversification, basing exports on a large number of products of the multiple phases of finalization, and most preferably export based on new products. All these problems with the index itself are, among others, reasons to not reject nor accept the initial hypothesis.

On the side of imports from the EU, a low retained level of the concentration coefficients is evident, indicating that there has already been a dispersion of commodity imports. It is an expected tendency given the opening of these countries (diversification of import demand) in the last decades and the growth of the absolute level of imports. A lower level of concentration of imports than exports is a characteristic of almost all countries and is a logical result of the tendency of each economy to focus its exports on specific areas where it has comparative advantages. What Table 4 also shows is that EU candidate countries (and also Czechia) have a higher concentration of exports to the EU than the concentration of EU exports to them, which is expected and certainly speaks of the great diversification of total EU external exports.

Additionally, we calculated the concentration ratio of the total exports (and imports) of EU Candidate Countries, including Czechia, in 2007 and 2018. The results we obtained were expected. Namely, the concentration ratio of export of these countries to the EU is slightly higher than the concentration ratio of their total exports (excluding Albania with 0.552 in 2018), which is expected given that the smaller number of products (in this case merchandise groups) were exported to the EU. The same situation, for the identical reason, should have been with the ratio of total concentration of imports, but our results are partly unexpected because the Czech Republic in 2018 had this index higher (0.080), as did Turkey and Serbia in the same year (0.103 and 0.101), and to a lesser extent in 2007 also.

**Conclusions and policy recommendations**

The analysis conducted in the paper doesn’t accept any of four initially set hypotheses covering more referent trade indicators that seek to prove that slow EU integration process of C6 can be explained by deteriorating (or stagnating) trade performance of those economies in their exchange with the EU. True, Hypothesis 4 relating to export and import specialization in trade with the EU was not accepted nor rejected, as overall results are inconclusive.

Differently from previous literature, we apply our framework to all C6 countries, fully accounting for the potential change in trade structure indicators. We find no evidence that so-called the EU enlargement fatigue that slows down the EU integration process of C6 was associated with the dynamic and structure of C6 trade with the EU28 in 2007-2018. Contrary, those economies achieved above average growth of their merchandise export to the EU since 2007 and in the same period, large majority of the calculated trade indicators for all Candidate Countries in their trade with the EU were improved.

Our results reveal that the growth of intra-industry trade, and the similarity coefficients between C6's export and the EU import structure (as well as their reached values), are moderate. These are certainly positive signs, yet they at the same time imply that C6’s unfavourable trade structure has, in spite of that, been retained. Improved, but the comparatively poor performance of C6’s trade structure can also be followed on the basis of the relatively low but rising shares of goods at higher levels of processing.

Certainly, all of the applied methods have certain limitations. For example, the imperfection of all similarity indicators lies in the fact that the coefficients themselves, due to structure configurations, may occasionally indicate totally inexplicable values in the economic sense. But, as we are dealing with structural analysis it is clear that it can to a large extent overlooks the true state of affairs.

Aside from controlling for hypotheses, we made a comprehensive analysis of the merchandise trade of those economies with the EU in 2007-2018 using numerous quantitative techniques and applying a very high level of data disaggregation (3-digit SITC level), more comprehensively than other related studies. This hard enterprise, covering dozens of thousands of crude data, is certainly beneficial for the future decisions that policymakers have to make.

In spite of obviously positive findings related to set hypotheses, we also do find evidence about comparatively poor trade performances of those countries, which even moderately improved are not a factor pushing the case for further EU enlargement. Certainly, insight into obtained results provides a starting point in gaining a better understanding of the factors driving the improvement of trade dynamics and structure, and thereby the EU integration.

Our results yield also a number of policy implications. First, they imply that it is necessary for policymakers to undertake actions aimed to make the macroeconomic tendencies in their countries sustainable. In addition, institutional reforms are very important, and in particular - promoting economic freedom and improving the quality of governance. Also, the continuation of FDIs inflows from the EU to C6 is essential for the sustainability of and strong export growth, and thereby their income convergence to the ones in the EU. Finally, actions aimed at maintaining and if possible increasing the openness of the C6 economies and their involvement in international flows of goods, services, and capital should also be a priority for policymakers.

However, the policymakers have to cope with a number of challenges, which C6 economies are facing. Certainly, it is difficult for exporters from these countries to withstand the global competitive pressure from foreign producers, coming mostly from developing countries (mainly from those of the East and South Asia), possessing bigger and cheaper labor force. The factors of competitiveness such as highly-educated human capital and new technologies are not yet sufficiently manifested in C6’s trade performance. Additionally, due to increasing globalization, the current export specialization of those economies may not be sustainable in the mid-term.

In order to achieve better foreign trade results, C6 countries would have to attract FDI in export sectors that are capital- or skilled labor-intensive. Also, it is clear that without an additional restructuring of the economy, which would be able to supply the foreign market with more sophisticated products that would be compatible with the import demand of developed economies (especially the EU) it is not possible to sustain solid export growth and its structural improvements. A targeted industrial policy that is sector and firm-level strategies are necessary to give momentum to a shift towards knowledge and technology-intensive activities, associated with higher spill-over effects. This would require institutional infrastructure, intensified transfer of technology, investments in R&D and highly qualified human capital. The key issue for this turnaround would be in foreign capital inflows, most desirable FDIs, especially in technology-intensive sectors, like the electronics and automotive industry, which was the case in CEE economies. Of course, it is a very hard and often elusive task, considering that it is a goal of almost every country in the world.

Also, those economies need policies to increase efficiency in product markets and to strengthen institutions to foster upgrading of export quality, as it was shown that high-quality exports are less prone to be affected by price competition. C6 countries are not enough specialized in complex processes (which adds more value to output). Hence, the effort to be in a better way positioned in the global value chains (GVC) is one of the priorities. Given that CEE trade expansion was related to the inclusion of those economies in the European and global value chains, due to their relatively low labor costs and direct proximity of the EU markets, it is easy to recognize the pattern to follow. Namely, based on a country’s relative location in the overall GVC map it is possible to try detecting which policy measures are most important for a sector in which a country has a comparative advantage so it could optimize the gains from trade within GVCs. This is especially important for C6, as smaller countries just trade more in GVCs because relatively little markets have higher participation figures in GVCs than larger ones (which naturally have higher domestic production of inputs). For example, the overall participation of C6 economies in GVCs could be further enhanced by implementing the more traditional trade measures such as a smooth customs operations system or regulations in product markets in order to remove trade barriers for reaching higher gains from GVC trade. Of course, the arrival of numerous, medium-sized firms in the region basically as suppliers of components largely in the sector of machinery and transport equipment (medium-tech goods), is already an advancing process that needs to be further enhanced.

Yet, the final conclusions drawn from the study of structural changes in C6-EU trade are not as optimistic as it appears, based on assumptions refuted by the article. Fortunately, results show that the potential for far-reaching development of international trade and production networks, especially between the EU and C6, has not yet been exhausted.

**Disclosure Statement**

No potential conflict of interest was reported by the author(s).

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**Table 1.** Indices of Similarity between Exports Structure of EU Candidate Countries and the Imports Structure of the EU

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | ***Finger Kreinin*** | ***Cosinus*** | ***Inverse ISI*** | ***Bray-Curtis*** |
|  | 2007 | 2011 | 2018 | 2007 | 2011 | 2018 | 2007 | 2011 | 2018 | 2007 | 2011 | 2018 |
| Turkey | 0.419 | 0.425 | 0.460 | 0.295 | 0.267 | 0.354 | 0.289 | 0.246 | 0.348 | 0.419 | 0.425 | 0.460 |
| Serbia | 0.344 | 0.399 | 0.439 | 0.193 | 0.216 | 0.308 | 0.189 | 0.199 | 0.304 | 0.344 | 0.398 | 0.439 |
| B&H | / | 0.340 | 0.328 | / | 0.198 | 0.207 | / | 0.195 | 0.206 | / | 0.340 | 0.328 |
| Montenegro | / | 0.145 | 0.208 | / | 0.033 | 0.166 | / | 0.025 | 0.146 | / | 0.145 | 0.208 |
| Albania | / | 0.371 | 0.133 | / | 0.628 | 0.198 | / | 0.607 | 0.103 | / | 0.371 | 0.133 |
| N. Macedonia | 0.271 | 0.290 | 0.280 | 0.144 | 0.174 | 0.153 | 0.134 | 0.173 | 0.135 | 0.271 | 0.290 | 0.280 |
| Czechia | 0.471 | / | 0.497 | 0.323 | / | 0.414 | 0.319 | / | 0.411 | 0.471 | / | 0.497 |

*Source: Author’s own calculation based on the United Nation COMTRADE Database.*

**Table 2.** Shares of goods at higher levels of processing in merchandise trade of selected countries with the EU 28

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | TURKEY | SERBIA | B&H | ALBANIA | N. MACEDONIA | MONTEN. | CZECHIA |
|  | 2007 | 2018 | 2007 | 2018 | 2007 | 2018 | 2007 | 2018 | 2007 | 2018 | 2007 | 2018 | 2007 | 2018 |
| *Skill-intensive manufacture products shares* |
| Export | 39.5 | 46.7 | 21.2 | 40.5 | 20.0 | 25.0 | 4.6 | 7.8 | 4.1 | 61.5 | 2.2 | 23.8 | 59.4 | 64.7 |
| Import | 64.4 | 59.2 | 48.4 | 53.9 | 39.3 | 38.4 | 34.5 | 33.1 | 39.5 | 35.5 | 43.8 | 37.8 | 61.4 | 57.4 |
| *Medium- and high-tech products shares* |
| Export | 43.3 | 49.4 | 23.2 | 41.1 | 20.2 | 22.3 | 4.8 | 9.2 | 26.5 | 62.2 | 5.4 | 24.2 | 62.4 | 66.5 |
| Import | 67.7 | 60.0 | 54.0 | 53.5 | 40.6 | 39.4 | 35.6 | 35.0 | 44.1 | 36.6 | 45.2 | 49.8 | 63.1 | 58.2 |

*Source: Author’s own calculation based on the United Nation COMTRADE Database*

**Table 3.** Standard (and weighted) Grubel-Lloyd index of intra-industry trade of EU28 with selected countries in 2007 and 2018

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | TURKEY | SERBIA | B&H | ALBANIA | N. MACED. | MONTENEGRO | CZECHIA |
|  | 2007 | 2018 | 2007 | 2018 | 2007 | 2018 | 2007 | 2018 | 2007 | 2018 | 2007 | 2018 | 2007 | 2018 |
| S | 0.426 | 0.470 | 0.342 | 0.572 | 0.339 | 0.407 | 0.262 | 0.296 | 0.215 | 0.307 | 0.067 | 0.101 | 0.696 | 0.657 |
| W | 0,425 | 0,470 | 0,371 | 0,571 | 0,353 | 0,402 | 0,317 | 0,298 | 0,215 | 0,306 | 0,082 | 0,245 | 0.726 | 0.708 |

*Source: Author’s own calculation based on the United Nation COMTRADE Database*

**Table 4.** Exports (and import) concentration ratio (Herfindahl-Hirschmann index) in EU28 trade with for selected countries 2007 and 2018

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | TURKEY | SERBIA | ALBANIA | B&H | MONTENEGRO | N. MACED. | CZECHIA |
| 2007 exports | 0.116 | 0.135 | 0.249 | 0.152 | 0.784 | 0.265 | 0.101 |
| 2018 exports | 0.118 | 0.104 | 0.254 | 0.126 | 0.339 | 0.261 | 0.133 |
| 2007 imports | 0.075 | 0.065 | 0.076 | 0.081 | 0.129 | 0.074 | 0.072 |
| 2018 imports | 0.080 | 0.062 | 0.113 | 0.071 | 0.148 | 0.160 | 0.076 |

*Source: Author’s own calculation based on the United Nation COMTRADE Database.*