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THE STRUCTURAL CHANGES OF THE SERBIAN MERCHANDISE TRADE DURING TRANSITION PROCESS: COMPARATIVE ANALYSIS OF MAIN TRADE INDICATORS

Strukturne promene u srpskoj spoljnotrgovinskoj razmeni tokom tranzicionog perioda – komparativna analiza bitnih pokazatelja razmene

Abstract

The article discusses the structural changes in exports and imports during the transition process in Serbia. To address this issue, we calculated several indicators of the Serbian merchandise trade in the 2000-2018 period. After having computed the absolute growth of export and import and the values of intra-industry trade indices in the period under review, we compared the similarity of the export structure of Serbia and the import structure of the EU, which was used as a referent structure. To detect possible quality improvement of the Serbian trade sector, we analyzed qualitative changes of Serbia's exports (imports), through tendencies of goods at higher levels of processing, using more classifications, as such possible improvement would create important conditions for a sustainable and stronger export growth. After the calculation of trade specialization indicators, all obtained results were compared with those achieved by other Central and Eastern European (CEE) economies. The conclusion is that, despite strong Serbian export growth from 2000 to 2018 and moderate structural improvements, there are no conclusive signs of sufficient convergence to the EU import demand structure or sufficient growth of the share of goods at higher levels of processing in Serbian exports to imply the significant structural improvement of Serbia's trade, compared with CEE countries.

Keywords: *export structure, intra-industry trade, similarity indices, trade specialization.*

Sažetak

Rad se bavi strukturnim promenama izvoza i uvoza tokom procesa tranzicije u Srbiji. U tom smislu, izračunaćemo nekoliko indikatora spoljnotrgovinske razmene u periodu 2000-2018. Nakon analize apsolutnog rasta izvoza i uvoza i vrednosti pokazatelja intra-industrijske trgovine, poredimo sličnost strukture srpskog uvoza i izvoza sa referentnom strukturom spoljnotrgovinske razmene EU. Da bi se otkrilo moguće povećanje kvaliteta srpskog trgovinskog sektora, analiziramo kvalitativne promene srpskog izvoza (uvoza), kroz tendencije robe na višim nivoima prerade, koristeći više klasifikacija, čime se stvaraju važni preduslovi za održivi i jači rast izvoza. Nakon obračuna pokazatelja trgovinske specijalizacije, svi dobijeni rezultati upoređuju se s onima koje postižu ostale ekonomije srednje i istočne Evrope (CEE). Zaključak je da uprkos snažnom rastu srpskog izvoza od 2000. do 2018. godine i umerenim strukturnim unapređenjima, ne postoje konačni znaci dovoljne konvergencije ka strukturi uvozne potražnje u EU, te dovoljan rast udela robe na višim nivoima prerade u srpskom izvozu koji bi implicirao signifikantno strukturno poboljšanje trgovinske razmene Srbije u poređenju sa zemljama CEE.

Ključne reči: *struktura izvoza, intra-industrijska trgovina, indeksi sličnosti, trgovinska specijalizacija.*

Introduction

In the majority of countries in transition, the average growth rates in 2010-2018 were less than half of those detected in the 2000-2007 period. That is why income convergence has slowed, in stark contrast to the post-recession period of the early 1990s, when quick income convergence was mainly driven by a strong rise in total factor productivity. This result is achieved by changing the pattern of trade and integrating the region into the global value chains (GVCs), enabling the fast introduction of new technologies and a general improvement in economic activity. Serbia has improved its position from a very low 21% of the G7 average to almost one-third. Nevertheless, with average growth rates recorded in 2010-2018, it would take about a hundred years to reach GDP PPP per capita of the G7 - much longer than in the case of Hungary or Romania, both of which took less than three decades [6].

When it comes to the trade, which is in some way a reflection of the overall economic performance, the situation is even worse for Serbia, which despite strong growth in the last 19 years has exports and imports per capita five to ten times lower compared to the ones in advanced transition countries. As it is known, the transition process in Serbia only began at the end of 2000, later than in most other European post-communist countries, which along with the country's isolation during the 1990s may explain a large part of current problems. Therefore, the intention of this paper is to evaluate trade progress achieved in the period since 2000 and compare it with the ones achieved by other economies in the region. To address this issue, we will calculate several indicators of the Serbian merchandise trade in 2000-2019. First, the values of intra-industry trade indices as well as similarity indices of Serbia's export structure and the EU import structure were calculated, including trade concentration indicators. Then, to detect possible quality improvement of the Serbian trade sector, we analyzed qualitative changes of Serbia's exports (imports) - using more classifications - through tendencies of goods at higher levels of processing, whose eventual increase would create important conditions for a sustainable and stronger growth of exports. All obtained results were compared with those achieved by other CEE economies.

The rest of the paper is organized as follows. The section following Introduction surveys the literature related to our topic. The next section presents the dynamics of the Serbian merchandise trade and used data, followed by four sections where methodologies, major calculations, and analyses of results and their implications are provided (indices of intra-industry trade, trade specialization, convergence of the trade structures, comparative analysis of the trend of the technological structure and factor intensity of Serbian exports and imports). The final section presents concluding remarks.

Related literature

There are a lot of studies devoted to a structural change of trade performance of countries in transition, Serbia included. However, there are only few papers dealing with here proposed sets of indicators, especially analyzing them in a comparative perspective. In general, the literature dealing with the similar subject highlights six factors determining CEE countries' exports: structural changes in their exports, better access to EU markets, increased levels of productivity, imports, FDI, infrastructure quality, and the institutional environment. Damijan et al. [5], analyzing the export structure of CEE economies, found an increase in the share of medium and high-tech products and a corresponding fall in the share of resource-intensive, labor-intensive and low-tech products. Generally, there is gradual convergence with EU15 export structures, both at cross-sectoral and inter-sectoral levels, implying quality improvement. Findings in the mentioned article clearly suggest that structural upgrading of exports contributed positively to the rise of exports of those states. Very significant findings were that the share of vertical and horizontal inter-industrial trade with the EU has also increased [14], [4], [11].

Bierut and Kuziemska-Pawlak showed that in the 1995-2014 period, the share of the CEE countries' exports in world merchandise exports more than doubled. The main generator of this expansion is the inclusion of the region in the EU and global value chains (GVCs) thanks to their price/cost competitiveness and proximity of the EU markets - a trend occurring intensively in Serbia in

the last five years. Export structure points to the concept of the GVCs and the region's place in the GVCs as the supplier of mainly machinery and transport equipment (medium-tech goods), with the share of high-tech manufacturing exports remaining low. Between 1995 and 2014, the technological intensity increased, with medium-tech manufacturing exports replacing mainly labor and resource-intensive ones. Manufacturing exports technological structure is now more similar to the one in the EU15, but with the share of high-tech exports from the region remaining more than 10 p.p. lower than in more advanced EU countries. In the period under review, the six analyzed states (Czechia, Hungary, Slovakia, Poland, Bulgaria, and Romania) achieved significant growth in export market shares and considerable appreciation of their real effective exchange rates. Namely, an increase in the CEE countries' exports contributed to their GDP growth, leading to an appreciation of their real exchange rates - similarly to the Serbian dinar in the last five years - which is largely an automatic result in catching-up economies. It also means that price/cost factors, therefore, cannot be the only determinants of the region's improved export performance.

In a study by Radulescu et al. [28], by using co-integration tests and OLS panel estimations with a dataset between 2004 and 2015 for selected CEE countries (Poland, Slovakia, Bulgaria, Hungary, Czechia, and Romania), factors influencing growth of GDP p/c and economic competitiveness were found. The most important factor contributing to the increase in GDP p/c and the share of the selected CEE countries' exports in total world exports is the tertiary level of education, while it is followed by school dropout, the labor quality ratio, the share of renewable energy, and the employment rate. It is indicative that the share of the selected CEE countries' exports in total world exports displays a much greater impact on GDP p/c than vice versa. It is important to note other studies, such as one done by Basu and Das [1], who have used a nonparametric methodology to examine the relationship between skill and technology-intensive manufacture exports and GDP p/c, controlling for institutional quality and human capital in developing countries. The paper uses the database from the UN Comtrade Harmonized System (HS) four-digit level of disaggregation to provide a new system of classification of traded goods by assigning each one of them according to their skill and technology content. The analysis is done for a set of 88 developing countries from 1995 to 2007. Study supports the view that as the skill and technology content of the exports increase, the impact on GDP p/c increases positively and significantly as well, after controlling for other policy variables.

A strong industrial base is essential for achieving long-term sustainable economic growth and export competitiveness, and hence manufacturing remains a significant contributor to exports in the CEE countries. Bearing this in mind, Olczyk and Kordalska [27] compared the determinants of the international competitiveness - measured by the net exports of the manufacturing sectors in Czechia and Poland - by using the database of 13 manufacturing sub-sectors in those states in the 1995-2011 period. They researched how much foreign and domestic demand, the level of labor costs, the level of sector innovation intensity, the level of sector openness to foreign markets as well as sector labor productivity influence the changes in the trade balance. For most of the Polish and Czech manufacturing sub-sectors, the creation of the positive trade balance is determined by relative demand growth. Increasing labor productivity influences heavily a positive trade balance of Polish goods in the majority of sub-sectors, while a key factor in Czech sub-sectors is decreasing unit labor costs.

On the other hand, some authors [9] analyzed the degree of trade restructuring between the EU and the new member states during the accession process, where intra-industry trade is selected as a composite indicator of trade structure. The model showed that high shares of intra-industry trade implied lower welfare losses and less resistance to further deepening of integration in the participating countries. Iyke [12], using a new constructed measure of trade openness (which captures a country's share of trade) estimated fixed-effects regressions for a panel of 17 CEE countries over the 1994–2014 period. The results show that increases in trade openness are associated with increases in real GDP p/c growth within these countries.

## Dynamics of Serbian merchandise trade and used data

The dynamics of merchandise exports and imports of Serbia (and selected CEE countries, to compare obtained results) were expressed through the average annual growth of merchandise trade expressed in EUR. What may be seen, what is not surprising having in mind a very low base in 2000, and consequently in 2007, is comparatively looking strong growth of Serbian export (and import) in the observed period. From 2000 to 2018, the average export growth of Serbia was 12.8% (growing almost nine times), with merchandise import rising at the average growth rate of 10.5%, increasing its absolute level six times (estimate for Montenegro's share is incorporated in exports and imports in 2000). Due to a quicker growth rate from a very low base in the first years of the 21st century, the average export growth of Serbia amounted to 8.5% in the 2007-2018 period, while import has grown at an average of just 4.5% in the same period (a reason is a very strong growth in the 2000-2007 period of almost 21% on average). Assuming that Serbian export growth in 2019 will maintain the trend from the first ten months, then average export growth in 2007-2018 would amount to 8.4% (cumulatively 164%), while import would increase by 4.1% on average (cumulatively 62.4%). Under the same presumption, the average export growth in the 2000-2019 period would amount to 12.6% (rising 9.5 times) whereas import would increase 10.3% on average (growing by 6.5 times).

In the 2007-2018 period, Serbia's average export growth rate was higher than the one of EU28 (4.3%), as well as the ones of Bulgaria (7.1%), Croatia (4.5%), Hungary (4%), and Turkey (5.6%), B&H (7.9%), and North Macedonia (8.1%), but growth was achieved from a very low base. The cumulative growth of Serbian merchandise exports between 2007 and 2018 was almost 2.5 times higher (exactly 146%), B&H and North Macedonia both had export growth of 2.3 times and Turkey of 1.8 times. At the same time, export growth for Croatia was only 61%, for Bulgaria 112%, and for Hungary 53%.

To have additional comparative insight, we obtained data on export per capita for Serbia as well as for several other CEE economies. As expected, these data are disappointing, as Serbia's export p/c in 2018 is about eight times smaller than the one of Czechia and less than three-fifths of the one of Croatia, but larger than Turkey's export per capita, as well as those of B&H and Albania.

In the whole study, the period from 2007 to 2018 was analyzed, excluding Serbia where were additionally covered 2000, 2004 and 2006 (from national sources). We have used the structure of exports (and imports) by SITC (Standard International Trade Classification), Revision 4. SITC is the classification of international trade issued by the United Nations (UN). The data complying with the SITC classification are deducted from the Combined Nomenclature. On the basis of detailed nomenclatures (HS, CN), commodities are classified by SITC into rougher categories, e.g., with regard to their degree of processing.

Figure 1: Merchandise export per capita for selected countries in 2018 (EUR)
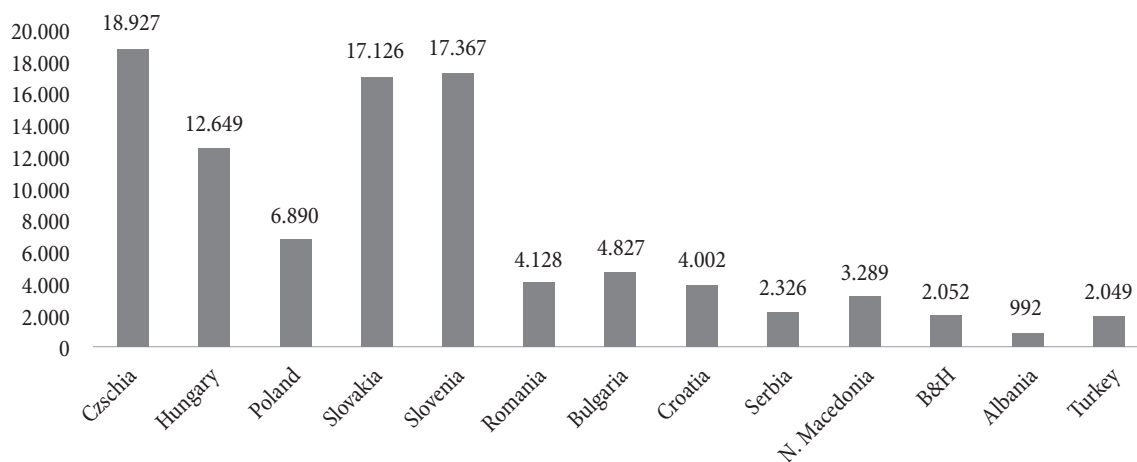
Source: Calculated on the basis of Eurostat data.

When it comes to data referring to absolute values of trade, we generally used Eurostat online database, as well as national statistic sources. The initial year is 2000, but the year that served for comparison was 2007, when Serbia was practically in an early phase of the EU integration process and, most importantly, the last year before the Great Recession. The last available year is 2018, excluding Serbia where we calculated absolute growth of trade including 2019. The data on countries' export structures are drawn from the UN Commodity Trade Statistics Database (Comtrade) covering 261 merchandise groups at the SITC 3-digit level for the years 2007 to 2018, with the Serbian export and import structure 2000, 2004 and 2006 as the only exception.

Indices of intra-industry trade

Intra-industry trade represents international trade within industries rather than between industries. Such trade is more beneficial than inter-industry trade because it stimulates innovation and exploits economies of scale. The most common, standard, indicator of measuring the share of intra-industry trade from a data set composed of both homogeneous and differentiated goods is Grubel-Lloyd index. The coefficient is given as the ratio of intra-industry trade in total trade. The index ranges from zero in the absence of intra-industry trade (and to 1 in the absence of inter-industry trade). In the aggregate intra-industry trade index higher ratios suggest that the economies of scale and various sources of gains are being exploited. Therefore, if the 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 [11].

$$GL = \Sigma_{i=1}^n w_i GL_i = \Sigma_{i=1}^n \frac{x_i + M_i}{\Sigma_{i=1}^n (x_i + M_i)} GL_i =$$

$$\frac{\Sigma_{i=1}^n (x_i + M_i) - \Sigma_{i=1}^n |x_i + M_i|}{\Sigma_{i=1}^n (x_i + M_i)} \quad (1)$$

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

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

w_i – share of trade in product i in the total trade;

$X_i (M_i)$ – exports (imports) of product i from (to) given country to (from) a given country;

n – number of commodity classes (industries).

The low value of the coefficient 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 selling products in large markets and from 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 gap in technology relative to more developed countries). For example, given very high imports of merchandise groups belonging to sector 7 (Machinery and transport equipment), the export growth of products that also belong to the same sector 7, which is expected having in mind strong increase of export-oriented FDI in Serbia in the last years, would automatically mean an increase of intra-industry trade almost by definition (of course, ceteris paribus).

Obtained results

On the basis of our calculations, Serbia's intra-industry trade in the 2000-2018 period was obtained and results are presented in Table 1. The same coefficient for the CEE economies was given in Table 2, to have a better comparative insight. Observing Standard Grubel-Lloyd index for Serbia, moderate growth is obvious, certainly with some years oscillating around trend (e.g., 2012-2014 and 2015-2017). Generally, the rising tendency of Grubel-Lloyd index is an encouraging trend.

Yet, the obtained level of intra-industry trade for Serbia, even almost constantly rising in the period under review, was the lowest among observed economies, apart from Turkey. In addition, the trend of growth of these coefficients is empirically detected generally. Namely, when CEE countries are concerned, there is obvious moderate growth in all selected economies.

Table 1: Standard Grubel-Lloyd index of intra-industry trade, Serbia's exports 2000-2018

	2018	2017	2016	2015	2014	2013	2012
standard G-L	0.540	0.516	0.502	0.521	0.498	0.507	0.504
weighted G-L	0.543	0.519	0.504	0.526	0.505	0.506	0.541
	2011	2010	2009	2008	2007	2004	2000
standard G-L	0.486	0.454	0.437	0.437	0.420	0.380	0.346
weighted G-L	0.510	0.467	0.461	0.481	0.462	0.453	0.361

Source: Authors' own calculations based on the UN Comtrade database and Serbia's Customs Administration.
Note: Standard G-L is Standard Grubel-Lloyd index of intra-industry trade. Weighted G-L is Grubel-Lloyd index weighted with merchandise groups' trade shares.

From the 1990s, in European countries in transition these coefficients were also growing, indicating the positive change of their foreign trade both total and with the EU. For example, Kawecka-Wyrzykowska [14] showed that combined intra-industry trade index (advanced) for CEE 10 countries (which entered the EU in 2004) increased from 0.419 in 2000 to 0.508 in 2007. To be added here, the index was calculated at five-digit SITC classification, which by rule decreased its values. 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 a great shift in changing their production structures and making their economies more similar to the EU economies (the so-called catching-up process).

So, it is clear that the intra-industry trade index for Serbia is still relatively low indicating its unfavorable trade structure. This index is significantly lower compared to the same indicator for most CEE countries and it is smaller than the one for CEE 10 (combined). Despite this, an 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 Serbian trade relations have been leading to more interdependence, 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.

The process of transformation of the Serbian trade pattern - from inter-industry to intra-industry one - can be seen, which is certainly a positive development leading

Table 2: Grubel-Lloyd index of intra-industry trade of selected CEE countries in 2007 and 2018

	2007	2018	2007	2018
	Standard G-L		Weighted G-L	
Bulgaria	0.440	0.592	0.469	0.597
Hungary	0.725	0.735	0.725	0.742
Romania	0.427	0.614	0.470	0.601
Czechia	0.692	0.732	0.693	0.740
Turkey	0.404	0.442	0.430	0.445
Croatia	0.429	0.611	0.545	0.653

Source: Authors' own calculations based on the UN Comtrade database.
Note: Weighted G-L is Grubel-Lloyd index weighted with merchandise groups' trade shares. In 2011 Czechia: 0.708, and in 2018 B&H: 0.430 (Weighted G-L: 0.402) and North Macedonia: 0.365 (Weighted G-L: 0.306).

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 are welcome.

Certainly, intra-industry trade has in some way driven Serbian trade developments in the observed period, which is above all a consequence of strong inflow of FDI (largely from EU), allowing value chains to be formed. Related to this is a modest growth of technological improvement in Serbian exports. Namely, as Serbia imports a very high level of sophisticated products mostly belonging to sector 7, especially from advanced EU markets, every rise of exports of the same products automatically means an increase of intra-industry trade almost by definition (of course, ceteris paribus).

Given the strong importance of FDI for Serbia, it is worth to point to the findings of a study by Lyu and Blandford [17] 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 Serbia, taking for granted wider applicability of above-mentioned conclusions, and having in mind imposed numerous non-tariff barriers especially in Serbia's agro-industrial complex, is that this is the sector where one would expect an increased FDI in years to come.

Trade concentration coefficients

The logic of export specialization was originally developed to explain the underlying reasons for international trade and to predict the trade pattern resulting from changes in factor endowment and technology. Accordingly, free trade would allow countries to gain from increasing specialization in activities where they have a comparative advantage under autarky. In pursuit of this aim, we focus on the following research objectives: to assess the patterns and dynamics and degree of Serbia's export specialization in order to find policy implications which are based on the empirical findings. It should be noted that the concentration of exports on few commodities (e.g., crude oil and natural gas) is usually considered as a potential problem for economies to sustain long-run high export growth, since fluctuations in export commodity prices may also increase volatility in export receipts of a country.

The Herfindahl-Hirschman coefficient is the most commonly used way of measuring export concentration ratio as numerical expression of concentration. The higher the index, 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. It ranges from 0 to 1, with 0 reflecting the least concentrated export portfolio and 1 the most concentrated [29]. The index has been normalized because the number

of merchandise products is different between countries. The same index is, of course, applied to calculate the import concentration ratio. We used, as usual, a 3-digit Standard International Trade Classification from the UN Comtrade database.

It should be noted here that the decline in export concentration ratios was a trend in almost all countries in the period after World War II. Also, 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, while for crude oil exporters this takes the most pronounced forms.

$$C_{xj} = \frac{\Sigma_{i=1}(\frac{x_{ij}}{x_{ik}})^2}{1 - \sqrt{\frac{1}{n}}} - \frac{\sqrt{\frac{1}{n}}}{1 - \sqrt{\frac{1}{n}}} \qquad (2)$$

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

Obtained results

Looking at Table 3, it can be seen that the value and tendency of Herfindahl-Hirschman index concerning Serbia is roughly the same during the whole period. This index practically stagnated over the observed period, especially when imports are concerned (excluding high value in 2000), while when it comes to exports, apart from artificially high value in 2003 connected with airplanes' repairs (which is posted as export and import of the same aircraft), there is also an incidental rise in 2013. But, generally, it is clear that a small change occurred over the observed 20 years.

Table 3: Herfindahl-Hirschman index, Serbia's exports and imports concentration 2000-2018

Years:	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
exports	0.089	0.080	0.078	0.098	0.077	0.101	0.102	0.088	0.087	0.065
imports	0.128	/	/	/	0.067	0.082	0.081	0.069	0.078	0.067
Years:	2010	2011	2012	2013	2014	2015	2016	2017	2018	
exports	0.077	0.075	0.068	0.114	0.106	0.091	0.086	0.081	0.080	
imports	/	0.083	0.078	0.095	0.109	0.084	0.141	0.120	0.101	

Source: Authors' own calculations based on the UN Comtrade database and Serbia's Customs Administration (2000-2006).

On the other side, sudden very high import growth of merchandise groups of 931 (Special transactions and commodities not classified according to kind) in 2016-2017 (to 16.8 and 14.4% of total Serbia's exports) may explain the solid growth of import concentration ratio in these years. However, new rules connected with accessing the EU proposed that increasing part of domestic import be put in this category, differently from practices used before.

Looking at Table 4, this index is higher for Czechia, Romania, and Hungary in 2018, representing relatively new kind of high technology export concentration in these economies. But, analyzing all data from Table 4, there are no conclusive findings (in roughly half of them the coefficient has increased and vice versa). In some, the Herfindahl-Hirschman index practically stagnated for many of those economies, like Slovenia, Turkey, Serbia, and North Macedonia when exports are concerned, and almost for all observed states when it comes to imports. Concerning import concentration, explanatory power of those coefficients is small given the global tendency of their relatively low and falling values, along with rising sophistication of (import) demand all around the world. Hence, small changes in their values between 2007 and 2018 are expected.

Table 4: Export and import concentration ratios (Herfindahl-Hirschman index) for selected CEE countries 2007 and 2018

	2007	2018	2007	2018
	Exports		Imports	
Poland	0.079	0.064	0.065	0.057
Czechia	0.096	0.129	0.071	0.080
Hungary	0.141	0.110	0.109	0.073
Slovakia	0.176	0.218	0.102	0.125
Slovenia	0.120	0.130	0.068	0.078
Turkey	0.089	0.076	0.086	0.103
Romania	0.101	0.115	0.069	0.060
Bulgaria	0.131	0.093	0.103	0.080
Croatia	0.116	0.071	0.079	0.062
Serbia	0.088	0.080	0.069	0.101
North Macedonia	0.208	0.218	/	0.114
Albania	/	0.541	/	/
B&H	/	0.106	/	0.059
Montenegro	0.784	0.339	/	0.216

Source: Authors' own calculations based on the UN Comtrade database.
Note: Data for Montenegro in the 2007 column are for 2011.

Regarding export, in some economies, it is substantially higher, especially given the relatively huge size of these economies comparing to Serbia, in 2018 than in 2007 (for example Czechia, Romania, even Slovakia) representing relatively new kind of high technology export concentration in these countries. For example, in Slovakia, which has a very high absolute value of this coefficient, this appears to be generated by the fact that only one technologically sophisticated merchandise group accounted for 23.5% of total exports: 781-Motor cars. In Romania, it was caused by the reality that only four technologically refined merchandise groups accounted for about 27% of total exports: 772-Electrical apparatus for switching or protecting electrical circuits (5%), 773-Equipment for distributing electricity (5.9%), 781-Motor cars (6.9%), and 784-Parts and accessories of the motor vehicles (9.6%). A similar situation is in Czechia, where the share of 752-Automatic data-processing machines (6.7%), 764-Telecommunications equipment (5.5%), 781-Motor cars (11.2%), and 784-Parts and accessories of the motor vehicles (7.9%) were around 30% of total exports in 2018, which is certainly a good indicator given a high level of value-added in this kind of product.

In Hungary, a still relatively high level of this index in 2018, after a decrease from its higher level in 2007, was generated by a large portion of the next six merchandise groups associated with high quality of exports: 542-Medicaments (3%), 713-Internal combustion piston engines and parts thereof (6%), 764-Telecommunications equipment (4.6%), 772- Electrical apparatus for switching or protecting electrical circuits (4.4%), 778-Electrical machinery and apparatus (3%), 781-Motor cars (9.2%), and 784-Parts and accessories of the motor vehicles (6.0%), with roughly 36% of total exports. On the other hand, merchandise groups with higher shares in Serbian export belong to less qualitative sort of export products, partly excluding 773 and 716. They are: 625-Rubber tires (3.9%), 673-Flat-rolled products of iron or non-alloy steel (3.9%), 682-Copper (3.2%), 716-Rotating electric plant and parts thereof (3%), 773-Equipment for distributing electricity (6.8%), 821-Furniture and parts thereof (2.9%), which combined accounted for nearly a quarter of total exports.

This index is very high in Montenegro, Albania, and North 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 2011 (astonishing 0.784) was caused by the fact that only one merchandise group accounted for 80% of total exports (684-Aluminum), which share fell to still very high 34.2% seven years later simultaneously decreasing this index to 0.339. In North Macedonia, 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) with 21% of total exports. A similar situation is in Albania, where the share of 851 (Footwear) was about one-quarter in 2018, which certainly is not a good indicator given a low level of value-added in this kind of product.

Yet, one can say that Herfindahl-Hirschman level generally represents a poor diversification of Serbia (legacy of the period before the 1990s), and that the overall development suggests that the level of export diversification, led by technology improvement, has not come to significant improvements. But, looking at data, the same can be said for Turkey and Croatia. Both countries had generally low Herfindahl-Hirschman index in 2018, which is also characteristic for almost all advanced countries because of wide export supply (as these economies virtually cannot concentrate their exports).

Certainly, the relatively low value of the coefficients, similar to those of the developed countries, is not a consequence of the broad supply of Serbia's export sector and its favorable structure, but above all, it was caused by the lack of certain competing products. Practically, there are only a few merchandise groups in our export going to the world or the EU market that have a significant share, and these are, as a rule, primary, resource, or labor-intensive products. The same is also the case concerning all Balkan economies, as was shown in a study by Nikolić [23], covering the 2001-2011 period. Findings from this paper showed relatively poor diversification of Balkans economies as well as a lack of significant improvements.

It is not real, nor would it be good, to see a significant increase in the specialization of SEEC economies because, given the domestic factor availability, or production potential, it would practically mean these countries are strongly increasing the shares of certain products in the lower processing stage, which generally have a low unit values. 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 with high innovative content.

Is there a convergence between the two trade structures?

We will calculate how well the export profile of Serbia matches the import profile of one developed entity - the EU – which this country wants to join and which serves as the structure of aspiration. In an ideal case, home country exports should match the imports of its major trading partners. Namely, economies at a similar level of development typically have similar trade structures, and that similarity between export and import structures is a factor that stimulates trade between them, of course, excluding other factors that may have adverse impacts.

We will compare the absolute level and trend of similarity coefficients of the export structure of Serbia with the import structure of the EU to examine if there is convergence and the level of that convergence since 2007. Potential increases in similarity ("overlap"), i.e., a better match with the merchandise import structures of the EU would indirectly imply the potential for further absolute growth and qualitative improvement of Serbian merchandise exports. 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).

Among other things, in an economic and monetary union, such as that within the euro area, and which Serbia aims 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 [9]. In other study, Crespo [4] pointed out that joining the euro area

may result in further convergence of export structure in the region. In accordance with this, Mauro et al. [19] showed that a company is ceteris paribus more competitive as a euro area member state than outside the euro area.

Given a very small share of Serbia's exports in EU imports, it is clear that comparing these structures is only relevant as an indicator of the achieved improvement in exports. Namely, once a country where 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 down. Thanks to a high share of exports to the EU in the country's total exports (about two-thirds), it is to be expected that the EU's import demand itself shapes to a large extent the Serbian export structure. It would implicate that changes that take place in the structure of Serbia's merchandise exports are to a great extent a consequence of the domestic economy's adjustments to the EU import demand.

We used four indicators of similarity: cosine and the Finger-Kreinin similarity coefficient, as well as Bray-Curtis and integrated similarity index. All applied coefficients indicate the probability, i.e., the intensity of expected total bilateral trade. Formulas for these indices were given in studies [25] and [24]. These indices are also applied in numerous papers. For example, Finger and Kreinin [10] used the coefficient (since named after them) to compare the structure of selected countries' exports in certain markets (US, six EU countries, Japan, the rest of Western Europe) in the period from the beginning of the 1960s to the mid-1970s.

Taking into account certain deficiencies of Finger and Kreinin and cosine indices (as well as integrated similarity index, that is, its inversed form), primarily the fact that they do not incorporate weights, i.e., the relative weights of the observed sectors, we will use alternative measures of similarity. This can be done using the so-called similarity matrix. We used normalized Manhattan distance with the Bray-Curtis formula (B-C jk), broadly used in geo-statistics and in biometrics [21]. To add, according to Benedictis and Tajoli [3], there are a number of advantages to the Bray-Curtis index with respect to other alternatives. This index does not require

a normal distribution of observations (it is appropriate in the presence of skewed distributions, unlike correlation), it takes into account the change of weight of sectors (it captures changes due to specific sectors). In addition, this particular index is immune to the double-zero paradox.

So, in this article, we will especially emphasize Bray-Curtis index among others because it is at a three-digit level always identical to Finger and Kreinin coefficient. The value of this indicator ranges from 0 to 1, and if the value of this index is closer to 0, the two structures are closer together.

$$B - C_{jk} = \frac{\Sigma_i |x_{ij} - x_{ik}|}{\Sigma_i (x_{ij} + x_{ik})} \qquad (3)$$

x_{ij} = part of the section of the country j (in total exports or imports) in the observed year;

x_{ik} = part of the section of the country k (in total exports or imports) in the observed year;

j, k = observed country (or country in different periods).

Obtained results

By comparing merchandise export structures of Serbia and CEE economies (as well as the U.S. export structure as a structure of aspiration) with commodity import sel of SITC (Revision 4), we obtained the similarity coefftructures of the EU in 2007-2018, at the three-digit levicients presented in Figure 1 and Figure 2, as well as in tables in Annex. Observed relatively small changes in the similarity coefficients are, in general, the result of slow changes in the structure of exports, since more time is needed for significant economic changes in the real and export sectors consequentially. Additionally, the change of economic structure is the basis for resolving the problem of the foreign trade deficit and consequently wider economic issues.

According to Figure 2 and Table 7 in Annex, it can be seen that, between observed years, there has been a moderate increase in the similarity of the two structures (Serbia-EU) in general. The absolute level of the similarity coefficient is mostly higher than at the beginning of the period.

Yet, these results also show that the Serbian export structure has the lowest similarity of all observed

structures in 2018, implying relatively low quality of its exports (Figure 3, and Table 8 in Annex). In spite of this, it has changed in a positive direction, especially after a fall in 2013. The growth since this year correlates with the beginning of strong FDI export-oriented inflows – the arrival of foreign export-oriented companies (largely those producing components for domicile firms) that improved the export offer of the Serbian economy.

According to Figure 3, it can be seen that, between the two observed years, there has been a moderate increase in the similarity of the two structures in all the observed countries, so that the absolute level of the similarity coefficient is always higher than at the beginning of the

period. It is not surprising that the similarity of the U.S. export structure and the EU import structure is the highest, because they come from the two economies with very sophisticated trade. Among CEE countries, the highest similarity is recorded, as expected, for very developed ones: Hungary and Czechia.

Of course, it is hypothetically possible that the rise in the similarity indices was caused by deterioration in the more advanced EU's import structure. To address this issue we have analyzed changes in EU imports through the tendencies of high processing products, where a possible strong decrease of it would suggest the mentioned weakening of EU's import structure – thus explaining structural

Figure 2: The trend of Bray-Curtis indices of similarity between Serbian export structures and import structures of the EU
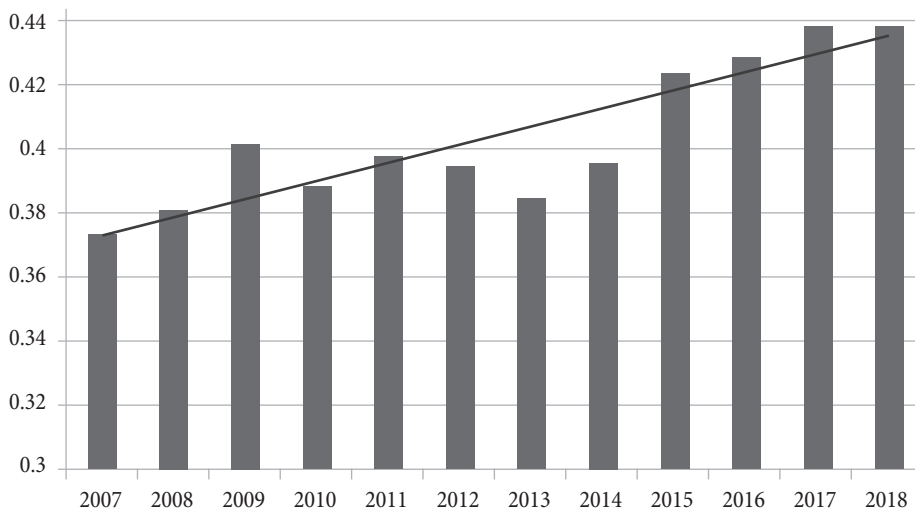
Source: Ibidem.

Figure 3: Values of Bray-Curtis indices of similarity between export structures of selected countries and import structures of the EU, 2007 and 2018
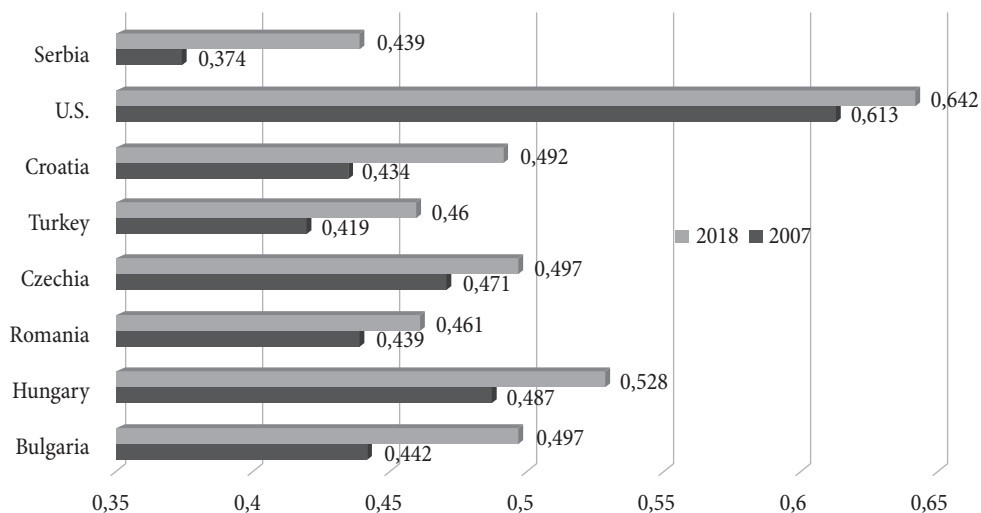
Source: Ibidem.

improvements in CEE countries' similarity indices. The calculated results are according to expectations: there is a moderate growth in import structure quality seen through the growth of skill-intensive manufactures 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 and 45% in 2018. The similar, generally mildly rising, tendency is detected when skill-intensive manufactures are concerned (34% in 2007 and 42.4% in 2018). So, evidently, there is a moderate increase in external EU's import demand sophistication, which is a worldwide tendency, especially in developed countries.

Given the high sophistication of the EU's import demand, almost every convergence to the same is almost by definition a sign of achieved progress, because of the growing share of merchandise groups 'matching' EU imports. Observing the level of similarity between U.S. exports and EU import structures - and to a lesser extent between more advanced CEE export and EU import strutures - it is evident how far Serbia is from a more advanced export structure and consequently how remote is a higher level of quality of Serbian export sector.

The technological structure and factor intensity of Serbian merchandise trade: A comparative analysis

The question arises as to whether Serbian products are becoming more competitive during almost two decades of EU integration. The best way to answer this issue is to analyze the tendency and trend of Serbian exporting products by proposed classification according to the applied technology and factor intensity, that is, by segregating (medium and) high-tech or high-skill-intensive part of domestic exports.

Given the key role of changing the nature of the skill and technological composition of products to boost economic performance – among others in a country like Serbia – the purpose of this part of the paper is to investigate the quality of domestic exports (and imports) by classifying the exported products in accordance with the applied level of skill and technology. We will use different classifications, those which were applied by

referent international organizations or referent economists. Generally, export databases are decomposed into different categories by their level of skill and technology composition. The export merchandise groups are used to calculate different indicators to indicate how countries are moving out from primary commodities to manufactures-skill and technology content sectors.

UNCTAD [29] methodology was used where we extracted high-skill and technology-intensive manufactures, covering SITC section 5, SITC divisions 75, 76, 87, 88 and SITC merchandise groups 776, 792, 891, 892, 896, 897, and 898. Then, the paper by Munkácsi [22] has been used, where he had classified the exports, according to the technology structure, into four categories relating to the technology level of the products. We first used two categories combined (medium and high-tech), generally encompassing SITC sectors 5 (Chemicals and related products) and 7 (Machinery and transport equipment), precisely encompassing SITC 266, 267, 5 (without 52; 551; 592), 653, 671, 672, 678, 7, 81, 87, and 88. In the next iteration, we extracted just high-tech products covering next merchandise divisions and groups: 54, 712, 716, 718, 75; 761, 764, a larger part of 77, and 792, 871, 874, and 881. Finally, analysis of the share of skill-intensive manufactures given by Mayer and Wood [20] was used encompassing SITC 5 (without 525), 71-74, 75, 76, 77, 781-784, 792, 87- 88. All those classifications, with an entire set of merchandise groups belonging to each of them, were given in the study by Nikolić [24], as well as in citied studies.

The same classifications were used in referent papers. Landesmann and Worz observed the export specialization of new CEE member states, and what is especially important for this article, regarding medium and high-tech products, specialization increased (which they explained by unit labor costs). Konstantakopoulou and Skintzi [15] analyzed trends of shares of high-skill technology-intensive manufactures in the euro area. In both observed periods, the pre-crisis (2000-2008) and the recession (2009-2014), high-skill technology-intensive manufactures have the largest share of exports (followed by medium-skill technology-intensive manufactures, labor-intensive manufactures and low-skill technology-intensive manufactures). The authors pointed out that the

economic crisis has not affected the ranking of the shares of the four categories. During the economic crisis, most countries retained their shares of exports of high-skill technology-intensive manufactures.

According to [7], increasing high-tech export share causes higher unit value compared with other countries. In parallel with deeper integration, the export structure also changed markedly in CEE countries – findings very indicative for Serbia. Crespo and Fontoura [4] examined the new member states' exports of products going to the EU15 in time and by cross-section. The export structure of CEE countries changed significantly – largely in Slovakia and Hungary – but the change was even greater in the Baltic economies. The Czech and Hungarian export structure was the most similar to that of old EU member states, with the Hungarian export structure resembling mainly the Austrian and German ones.

Obtained results

Regarding the Serbian export structures, products classified in all four different categories have shown rather similar tendencies in the period under review. Namely, Table 5 shows that the shares of high-tech, high-skill and technology-intensive manufactures, (combined) medium and high-tech products, and skill-intensive manufactures in Serbian exports have moderately increased since 2000. However, there are significantly different trends regarding the first two narrower categories covering more technology and skill-intensive products and the remaining two, which are

more inclusive encompassing practically all merchandise groups from SITC sector 5 and sector 7.

High-tech and high-skill and technology-intensive manufactures achieved a modest increase in their shares, and after 2004, tendency of those products has been stagnant in the best case. Given their strong importance, concerning technological and skill intensity of Serbian exports, it is not an encouraging tendency. Even worse, looking at their trends since 2008, the proportions of these types of products have been even moderately decreasing. True, they generally retained roughly the same portion in domestic exports throughout the observed period. It suggests a relatively low value of products with the largest possibility to be placed in sophisticated markets, as is the one of the EU. When it comes to the second most important classification – high-skill and technology-intensive manufactures – the situation is somewhat better because of a slightly wider coverage.

The trend of the growth of all four analyzed indicators is a worldwide phenomenon, but it seems that Serbia detected solid growth of two more covering indices (medium and high-tech products and skill-intensive manufactures) in a relatively short period, especially after 2012. Of course, obtained structure improvements in 2018 compared to the one in 2000 are moderate and still far from the level achieved by most CEE economies (Table 6) and especially developed countries. It implies an improving but weak domestic export quality in the European context.

According to Table 6, it can be seen that from 2007 to 2018, the majority of observed CEE countries detected a

Table 5: Shares of (medium and) high-tech products, high-skill and technology-intensive manufacture products, and skill-intensive manufactures in Serbia's exports 2000-2018

Years:	2018	2017	2016	2015	2014	2013	2012	2011
High-tech	7.5	8.2	8.7	7.2	6.8	6.6	8.2	6.6
High-skill and technology-intensive	12.8	12.5	12.3	12.1	11.7	12.2	13.0	12.2
Skill-intensive manufactures	36.7	36.6	37.7	36.9	37.6	38.9	29.7	24.2
Medium + High	38.4	38.4	39.4	39.0	40.0	41.2	32.6	26.5
Years:	2010	2009	2008	2007	2006	2005	2004	2000
High-tech	7.2	8.6	8.3	6.4	5.6	/	5.0	6.0
High-skill and technology-intensive	12.9	13.0	14.2	13.5	13.3	/	14.4	11.0
Skill-intensive manufactures	23.9	23.7	25.1	23.4	21.5	/	21.7	21.5
Medium + High	26.1	26.8	28.3	25.4	22.9	/	23.7	23.6

Source: Authors' own calculations based on the UN Comtrade database and Serbia's Customs Administration (2000, 2004, and 2006).
Note: High-skill = high-skill and technology-intensive manufactures; Medium + High = (combined) medium and high-tech products; High-skill tech-intensive = high-skill and technology-intensive manufactures.

moderate share increase in all four categories of products. Hungary has the best results, as expected, with medium and high-tech products accounting for 70.5% of exports in 2018 and with high-tech products achieving even one-fifth of country exports. Czechia has similar results, with medium and high-tech products amounting to 67.6% of its exports in 2018, while high-skill and technology-intensive manufactures were almost 25%. The findings for those two countries, in particular, imply their higher innovation capacity, which was translated into five or seven times higher per capita exports than Serbian one. True, the problem with Hungary is virtually stagnating structure at a high achieved level, while all other observed economies detected solid improvements.

As expected, those countries have a higher share of high processing export products than Serbia, excluding Bulgaria, which has a somewhat worse structure, but a 90% higher absolute level of exports, while Croatian export per capita is higher by one-half, but with modestly better quality (structure).

The Romanian text-book example of success was very indicative. It strongly improved export quality in the period under review, at the same time achieving its strong absolute growth. The structure is improved also in Turkey, but the average growth rate is significantly slower (5.6%) than Serbian one, while export per capita is lower by one-fifth.

In summary, Tables 5 and 6 showed that the share of products at higher levels of processing in almost all observed economies virtually always increased in the observed period. Generally, these are good signs, but it is a small consolation for Serbia, given the worldwide growing trend of this kind of products in world trade, and regarding the higher achieved level of other CEE countries.

In addition, as is expected, CEE countries (like Hungary and Czechia) have a higher share of high processing export products than Serbia and Turkey, for example, despite the fact that in the 2000-2012 period, most Balkan economies saw an increase in medium and high-tech products share in their total exports, but from a low base [24].

When the import share of all four categories of products is regarded, it largely achieved a higher level compared to exports, which is understandable given that the EU, the dominant trading partner of all those countries, exports more this kind of product to less developed countries than it imports from the same (see Annex, Tables 9 and 10). In addition, an increase of the share of all four observed import categories is detected in Serbia, as well as in remaining observed countries during the period under review. Of course, improvement in import structure is associated with the import of necessary equipment for investment (almost exclusively belonging to the sector 7, which, as a rule, affected the improvement of structures) as well as with rise of purchasing power of population in those countries during transition process, including Serbia, which is connected also with facilitation of borrowing both for companies and consumers.

Concluding remarks

To address the issue of the structural changes in exports and imports during the transition process in Serbia, we have calculated several indicators of the Serbian merchandise trade in the period since 2000, and especially from 2007, beginning with its absolute growth expressed in EUR. We have computed several indicators of the Serbian merchandise trade. First, the value of intra-industry trade indices, trade specialization coefficients, as well as similarity indices of

Table 6: Shares of (medium and) high-tech products, high-skill and technology-intensive manufacture products, and skill-intensive manufactures in total exports of selected CEE countries 2007-2018

	2007	2018	2007	2018	2007	2018	2007	2018	2007	2018	2007	2018
	Bulgaria		Hungary		Romania		Czechia		Turkey		Croatia	
High-tech	7.3	10.4	29.3	24.4	6.4	9.1	20.5	22.4	4.5	3.9	10.5	13.3
High-skill tech-int.	10.8	13.8	31.6	27.2	8.7	10.9	22.6	24.9	9.2	8.1	14.6	18.2
Skill-intensive	22.5	30.6	66.8	68.8	35.8	53.2	60.0	65.1	34.0	46.5	29.5	35.1
Medium + High	24.2	33.0	68.3	70.5	40.6	56.0	63.5	67.6	39.6	49.4	42.0	39.4

Source: Authors' own calculations based on the UN Comtrade database.
Note: High-skill = high-skill and technology-intensive manufactures; Skill-intensive = skill-intensive manufactures; Medium + High = (combined) medium and high-tech products, High-skill tech-int. **=** high-skill and technology-intensive manufactures.

Serbia's export structure and the EU import structure, which was used as a referent structure, were calculated. To detect possible quality improvement of the Serbian trade sector, we analyzed qualitative changes of Serbia's exports (imports), through tendencies of goods at higher levels of processing, using more classifications, whose possible improvement would create important conditions for a sustainable and stronger export growth. All obtained results were compared with those achieved by other CEE economies. The research results as presented in the paper should be viewed with caution due to the limitations of the applied methods, especially similarity indicators.

Serbia detected a very strong export growth since 2000 or 2007, true from a very low base. Since 2000, a solid structural advancement has been achieved, measured through a share of goods at higher processing levels, and then looking at the rise of intra-industry trade and similarity indices (true, with stagnant export specialization coefficients). However, the same results are far better when other CEE countries are concerned, almost in every of the mentioned measurements. It means that Serbia is lagging behind all the economies we are trying to compare with. So, despite strong Serbian exports' growth from 2000 or 2007 and moderate structural improvements, there are no conclusive signs of sufficient convergence to the EU import demand structure or sufficient growth of the share of goods at higher levels of processing in Serbian exports to imply the significant structural improvement of Serbia' trade, compared with CEE countries.

Yet, it may be assumed with great certainty that, with the entry of foreign companies into Serbian markets in recent decades, especially in the last five years, the quality of the merchandise export has substantially improved, especially of those intended for foreign markets. Namely, the country's integration into GVCs is vivid, and improvement in Serbia's industry was proved, among others, in an article by Nikolić [26]. Finally, to be noted here, the tendencies in intra-industry trade, shares of goods at higher levels of processing, as well as the similarity indicators, though all slightly improved in the period under review, often cannot indicate the full extent of these improvements.

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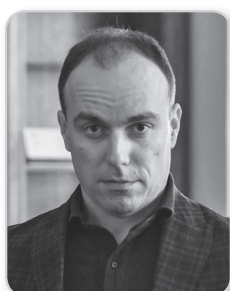
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ANNEX

Table 7: Indices of similarity between export structures of Serbia and import structures of the EU

	Bray-Curtis	inverse ISI	Finger-Kreinin	cosines
2007	0.374	0.189	0.374	0.193
2008	0.381	0.163	0.381	0.172
2009	0.402	0.242	0.402	0.257
2010	0.389	0.202	0.389	0.211
2011	0.398	0.199	0.398	0.216
2012	0.395	0.183	0.395	0.210
2013	**0.385**	0.188	**0.385**	**0.192**
2014	0.396	0.226	0.396	0.229
2015	0.424	0.320	0.424	0.320
2016	0.429	0.360	0.429	0.360
2017	0.439	0.344	0.439	0.346
2018	0.439	0.304	0.439	0.308

Source: Authors' own calculations based on the UN Comtrade database.

Table 8: Indices of similarity between export structures of CEE countries and import structures of the EU

Indicators/ Countries	Bray-Curtis	cosine	inverse ISI	Finger-Kreinin	Bray-Curtis	cosines	inverse ISI	Finger-Kreinin
	2007				2018			
Bulgaria	0.442	0.278	0.278	0.442	0.497	0.365	0.364	0.497
Hungary	0.487	0.425	0.423	0.487	0.528	0.437	0.437	0.528
Romania	0.439	0.306	0.304	0.439	0.461	0.354	0.353	0.461
Czechia	0.471	0.328	0.319	0.471	0.497	0.414	0.411	0.497
Turkey	0.419	0.295	0.289	0.419	0.460	0.354	0.348	0.460
Croatia	0.434	0.273	0.273	0.434	0.492	0.414	0.404	0.492
US	**0.613**	**0.452**	**0.433**	**0.613**	**0.642**	**0.630**	**0.630**	**0.642**

Source: Authors' own calculations based on the UN Comtrade database.

Table 9: Shares of (medium and) high-tech products, high-skill and technology-intensive manufacture products, and skill-intensive manufactures in Serbian imports 2000-2018

	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2000
High-tech	11.0	10.1	10.2	10.7	10.7	10.6	11.0	10.6	9.4	9.6	10.5	11.6	7.1
High-skill tech-int.	19.2	19.1	19.4	21.0	21.0	21.0	22.1	20.8	19.2	19.6	21.0	22.3	21.0
Skill-intensive	39.2	37.8	38.4	42.0	38.8	42.6	38.9	37.1	29.9	32.3	40.3	42.3	36.2
Medium + High	40.9	39.5	40.6	44.2	40.6	44.5	41.3	39.3	32.7	35.1	43.3	45.4	38.4

Source: Authors' own calculations based on the UN Comtrade database and Serbia's Customs Administration (2000, 2004, and 2006).
Note: High-skill = high-skill and technology-intensive manufactures; Skill-intensive = skill-intensive manufactures; Medium + High = (combined) medium and high-tech products; High-skill tech-int. = high-skill and technology-intensive manufactures.

Table 10: Shares of (medium and) high-tech products, high-skill and technology-intensive manufacture products, and skill-intensive manufactures in imports of selected CEE countries 2007-2018

	2007	2018	2007	2018	2007	2018	2007	2018	2007	2018	2007	2018
	Bulgaria		Hungary		Romania		Czechia		Turkey		Croatia	
High-tech	10.0	12.1	25.8	22.8	12.4	14.7	21.3	24.6	10.8	11.7	16.0	12.5
High-skill tech-int.	15.5	19.2	24.8	24.1	17.9	20.3	27.0	29.3	20.3	25.2	19.7	21.5
Skill-intensive	36.6	37.9	57.5	59.4	46.6	50.9	53.7	58.6	42.1	57.4	40.1	40.1
Medium + High	40.6	42.3	59.0	61.2	51.5	54.0	56.1	60.7	45.8	60.0	48.8	43.1

Source: Authors' own calculations based on the UN Comtrade database.
Note: High-skill = high-skill and technology-intensive manufactures; Skill-intensive = skill-intensive manufactures; Medium + High = (combined) medium and high-tech products; High-skill tech-int. = high-skill and technology-intensive manufactures.