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IS THERE A TRADE CONVERGENCE BETWEEN SOUTH EAST EUROPEAN AND CENTRAL EUROPEAN ECONOMIES?

ABSTRACT: *Given the importance of trade performance to overall economic fundamentals, the question arises as to the extent that South East European Countries (SEEC) have successfully followed the successful transition path of Central and Eastern European Countries (CEEC). To address this issue, we use similarity indicators to calculate possible convergence between the export structures of SEEC and CEEC from 2007–2008 to 2018–2019. We then compute the value of the similarity coefficients of SEEC and CEEC export structures and compare them with EU import structures, and intra-industry trade for both SEEC and CEEC. Next, we calculate the qualitative changes of both SEEC and CEEC merchandise trade through the tendency of technology-intensive products. The results of these two groups are compared to determine whether SEEC trade performance is converging to that of the CEEC. The results show structural improvements and an above-average increase in SEEC trade since 2007. However, given the simultaneous, moderate qualitative trade progress in the CEEC, the convergence between these two groups is insufficient to close the gap in the foreseeable future.*

KEY WORDS: *trade structures, convergence, South East European Countries, Central European Countries, similarity indices, intra-industry trade.*

JEL CLASSIFICATION: F14, F15, C44

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1. INTRODUCTION

The aim of this paper is to investigate convergence between the merchandise trade structures of South East European countries (SEEC) and Central and Eastern European countries (CEEC), especially in the period since 2007 when European Commission statements (European Commission 2019) indicated that SEEC had achieved some progress. Additionally, it analyses the pace of change from 2007 to 2019 by applying different statistical indicators to determine the differing progress of the economies belonging to these two groups. For example, if medium- and high-tech products in SEEC have increased and therefore narrowed the 'qualitative gap' with some of the Central European economies, it is regarded as a sign of convergence.

To avoid excessively deviating or divergent results in one year – which would become inexplicable – we deployed the additional years of 2008 and 2018 to serve as a kind of control variable.

To determine which countries constitute South East Europe and Central and Eastern Europe we draw on a study by Leitner & Holzner (2008) who, analysing economic inequality in the transition economies of Central, Eastern, and South East Europe, define SEEC as Albania, Bosnia and Herzegovina (B&H), Bulgaria, Croatia, North Macedonia, Romania, Serbia, and Montenegro, and the CEEC as the Czech Republic, Hungary, Poland, Slovakia, and Slovenia. The South-East European Cooperation Process offers a more inclusive definition and includes Turkey in its membership. Since we consider the analyses of Turkey and UNMIK-Kosovo* (hereinafter Kosovo) to be very important, especially given the former's potential EU candidate status, we include these two SEE countries so that we cover five CEEC and ten SEEC.

2. RELATED LITERATURE

There are no studies that specifically compare those particular regions, but there are many articles dedicated to the trade structure dynamics of CEEC and SEEC. Few studies look at SEEC separately, especially in the context of the trade indicators which are applied here. Despite using different methods and covering different periods, the bulk of the abundant empirical literature – some of it listed

below – confirms the convergence of CEEC towards Western Europe while providing crucial findings and a model for SEEC.

Kaitila (2013, p. 12, 21–22) analyses EU countries' specialisation in value-added exports and manufacturing and their degree of structural similarity using the similarity index developed by Finger and Kreinin (1979), which is also used in this paper. The convergence of GDP growth rates with similarity in exports is also scrutinized, showing different results for the exports of 10 ex-transition countries that reflect their degree of successful economic transformation. In the 1999–2010 period, the author discovers a dramatic increase in similarity coefficients for the Baltic countries, Bulgaria, and Romania. Linnemann and Van Beers (1988, pp. 447–449) apply practically the same methodology to examine the similarity of export and import structures. They use two similarity coefficients, Finger and Kreinin and Cosines, also used in our paper. Integrated Similarity Indices are also used in some articles (for example, Kovacs 2004, p. 12), and are also applied in our paper. Kovacs points out that the Europe-wide convergence in trade structures together with real economic convergence is to be expected, because countries at a similar level of development will have similar trade structures. The Bray-Curtis index, used in this article, has also been deployed in previous papers (for example, De Benedictis & Tajoli, 2003) to detect possible structural convergence between the EU and accession countries (Poland, Hungary, Romania, and Bulgaria), showing how their export structures have changed with respect to the EU export structure. Generally, the results support the view that the evolution of trade patterns is in line with the evolution of other economic indicators – a finding important for our research.

The transformation of CEEC and SEEC export structures and their possible structural convergence with other EU members has also been a subject of interest (Fontoura & Crespo 2007, 2005, pp. 13–14). Fontoura & Crespo show that in the period 1995–2001 the export structure of these economies was transformed: the share of unskilled labour-intensive products declined and technology and skilled labour-intensive products grew. Hungary was the most dynamic economy in this respect, as reflected in its significant and increasing share in high-technology and high-skill industries (the same goods classification is used in this article), followed by Czechia and Slovakia, while most of Bulgaria's and Romania's labour-intensive exports were concentrated in low-skill sectors. The decisive shift from unskilled

labour to skilled labour-intensive and technology-based products was largely due to FDI activity, mostly thanks to their economic geography, that is, their centrality.

Kaminski & Ng (2001) study the dynamics of intra-industry trade in transition countries in 1993–1998, using the standard Grubel Lloyd index, also used in this article. They find that intra-industry trade increased in all countries apart from Bulgaria, Lithuania, and Latvia. The highest increase in the value of the index was registered in Estonia, followed by Slovakia, Czechia, Romania, and Poland. This was a very important topic in 2001, as it was often argued that deeper EU integration would not increase the risk of external macroeconomic shocks due to the high level of intra-industry trade. However, the new EU members from 2004 lagged unambiguously behind: their Gruber-Lloyd coefficients were lower by 0.15–0.20 percentage points on average, excluding the results achieved by Czechia, a country already at the level of the old EU member states (Ševela 2005, pp. 200–201).

3. DATA AND METHODOLOGY, AND DYNAMICS OF SEEC TRADE SINCE 2007

This study analyses the period from 2007 to 2019. Additionally, we analyse absolute trade growth for 1994–2000 and 2000–2007. The initial year is 2007 because it was the year before the Great Recession and the final year of the period of transition in CEEC. Another reason that we took 2007 as our starting point is that we expected the two groups of economies to take a somewhat different path from that point on. The last year with available data is 2019.

The data on the countries' export and import structures are taken from the United Nations Commodity Trade Statistics Database (COMTRADE 2020), covering 261 merchandise groups at the three-digit-level Standard International Trade Classification (SITC), Revision 4. For data on the absolute values of trade we also used the UN COMTRADE database (2020), as well as national statistical sources, as was the case for Kosovo, Czechia, and Slovenia for 1996–2000. For comparative insight into the dynamics of SEEC and CEEC merchandise exports we calculated the average annual growth rate for international trade expressed in current US dollars.

Previous studies do not offer quantitative comparisons, the only exception being the intra-industry coefficients provided by Kawecka-Wyrzykowska (2008).

Calculations presented by other authors cover different periods and are therefore not fully comparable with this study. In addition, they are usually based on different data sources or are presented at different levels of aggregation.

What is especially important is that SEEC's average export and import growth in 2007–2019 was significantly higher than the average growth rate of international trade, which increased at a rate of only 2.2% in volume and 2.5% expressed in USD, largely due to the dramatic decline in 2009 and a moderate decrease in 2019 (WTO 2020; WTO 2009). Also, the SEEC average export growth rate was higher than that of CEEC, especially for Hungary (2.1%) and Slovenia (2.9%), again implying the above-average trade growth of these economies from a comparatively low base. There are exceptions: in Montenegro exports declined, and Croatia showed only modest growth of both exports and imports (2.7% and 0.7% respectively). The cumulative growth of SEEC merchandise exports between 2007 and 2019 shows roughly the same picture: generally, it increased by almost three-fifths in this period, while growth in CEEC was more modest, with the same indicator for Hungary being only 29%. Regarding imports the general picture is different, as SEEC recorded slower growth than their northern counterparts due to balance of payment limitations and excessive trade imbalances until the Great Recession.

The initial transition phase was a very important moment in this large disbalance in absolute trade performance, especially the period 1994–2000 (and several years before), when CEEC – excluding Slovenia, whose trade practically stagnated – roughly doubled their exports and imports in only six years. In the same period, SEEC merchandise exports practically stagnated, excluding modest growth in Turkey and Romania, while Serbia, Montenegro, and B&H experienced very disappointing economic conditions during the 1990s. In the second phase (2000–2007) almost all of the observed economies experienced very high export and import growth, fuelled by large capital inflows, which ended with the Great Recession. In the third phase, which is the object of this study, SEEC recorded faster export growth than their CEEC counterparts, but this modest difference was not enough to significantly improve their relative position. Most SEEC are small and open economies and, apart from domestic demand, their economic growth is mainly driven by export performance. Import growth was very low due to financing problems.

Table 1: Average annual growth of CEEC and SEEC merchandise trade (current USD)

	1994–2000	2000–2007	2007–2019	Cumulative 2007–19	Per Capita 2019	1994–2000	2000–2007	2007–2019	Cumulative 2007–19	Per Capita 2019
	EXPORTS					IMPORTS				
Czechia	12.8	22.6	4.2	64.5	18.558	13.7	20.2	3.6	52.8	16.664
Hungary	17.5	18.9	2.1	29.0	12.630	14.1	16.7	1.7	23.1	12.067
Poland	10.3	23.9	5.1	80.5	6.654	14.4	19.2	3.5	50.2	6.516
Slovakia	10.1	25.4	3.7	55.2	16.602	11.6	24.5	3.6	53.7	16.773
Slovenia	1.0	17.2	2.9	41.5	18.065	1.3	16.5	2.2	29.5	18.347
Romania	9.1	21.4	5.6	92.0	4.024	10.7	27.1	2.7	38.2	5.031
Bulgaria	–0.4	21.2	5.0	80.0	4.813	6.4	24.5	1.8	23.9	5.369
Croatia	0.7	15.8	2.7	38.0	4.161	7.1	18.5	0.7	8.4	6.829
Serbia	/	28.1	6.9	122.5	2.819	/	27.8	3.1	44.1	3.838
N. Macedonia	1.9	14.2	6.5	114.1	3.448	4.0	14.0	5.1	81.2	4.544
B&H	/	/	3.9	58.4	2.008	/	/	1.2	14.8	3.406
Albania	5.5	22.4	8.0	152.3	944	3.8	21.3	2.9	40.6	2.052
MNE	/	/	–3.3	–33.3	666	/	/	–0.6	–6.9	4.252
Kosovo	/	/	5.5	90.3	239	/	/	5.1	81.5	2.180
Turkey	7.2	21.5	4.4	68.6	2.175	15.1	17.8	1.8	23.7	2.530

Notes: Slovenia, N. Macedonia, and Albania for 1995–2000; Bulgaria for 1996–2000.

Source: Authors' own calculation based on the United Nations COMTRADE database (2020); Kosovo Agency of Statistics (2020); MONSTAT (2020); Institute of Statistics, Albania (2020); UN Data – A World of Information (2020).

Finally, to provide additional comparative insight, we obtained data on per capita exports and imports for all these economies in 2019. These data are disappointing, even for the three most advanced SEEC (Romania, Croatia, and Bulgaria), as exports per capita in 2019 were roughly four times lower than in the three best-performing CEEC, Czechia, Slovakia, and Slovenia. For per capita imports the situation is somewhat different because almost all SEEC have large deficits. Generally, the low level of per capita exports (and, to a lesser extent, per capita imports) indicates unfavourable trade and reflects the overall economic performance of SEEC.

When it comes to the used Regarding methodology, we first applied four indicators of similarity: Cosines, the Finger-Kreinin similarity coefficient, Bray-Curtis, and the Integrated Similarity Index. The coefficients indicate the probability of expected total bilateral trade, i.e., the intensity. For both CEEC and SEEC the analyses encompass the following years: 2007, 2008, 2018, and 2019. We used the structure of exports and imports according to the SITC at the three-digit level, covering 261 merchandise groups for both imports and exports for every year.

The main aim is to reveal possible convergence between 2007 and 2019 of the export structures of SEEC and CEEC, and consequently to determine the extent to which SEEC have successfully followed the transition path of the CEEC, especially regarding trade performance. To this end we compared the absolute level and trend of the similarity coefficients of the export structures of the 10 SEEC with those of the export structures of the 5 CEEC. Increased similarity or overlap indicates a better match between merchandise export structures and suggests a positive change in the trade structure of SEEC, given the more advanced export structure of CEEC. The second goal of this part of the paper is to analyse how well the export profile of SEEC matches the import profile of the EU. Increased similarity – i.e., a better match with the merchandise import structure of the EU – would indirectly imply the potential for further growth and qualitative improvement of SEEC merchandise exports and the opportunity for these economies to make the best use of their comparative advantages.

The Finger and Kreinin (FKISij) coefficient (Finger and Kreinin 1979, pp. 906–907) estimates export similarity by computing the relative importance of various merchandises in the export structure of pairs of countries, and then using a filtering technique.

$$FKIS_{ij} = \sum_{k=1} min\,(E_{ik}, M_{jk}) \tag{1}$$

where *k* is an item in SITC, *k = 1 ... 261* (for three-digit classification), *Ei* is the exporting country, and *Mj* is the importing country.

Additionally, as a kind of control variable we used three more methods that are coefficients: the Cosines index, normalised Manhattan distance with the Bray-Curtis formula, broadly used in geo-statistics and biometrics (Michie 1982, pp. 661-667), and the Integrated Similarity Index, that is, inverse values (Kovacs, 2004). All these indices are used in international trade analyses. Apart from the cited articles of the authors who developed them, Nikolić (2013, pp. 11–14) provides the mathematical formulations of these indicators. Since the Bray-Curtis index (*B-C jk*), whose mathematical expression is provided below, truncated at three decimals, is always identical to the Finger Kreinin coefficient, we did not show it in our tables, but it played a controlling role in our study.

$$B-C_{jk}=\frac{\sum_i \left|x_{ij}-x_{ik}\right|}{\sum_i \left(x_{ij}+x_{ik}\right)} \tag{2}$$

where x_{ij} is the share of the product group in the total exports or imports of country j in the observed year, x_{ik} is part of the section of country k (in total exports or imports) in the observed year, and j, k is the observed country (or country in different periods).

If the index value is 0, the two structures are totally different, while when the two structures are identical the maximum value is 1. The Finger and Kreinin index, as well as the other three coefficients, provides information on how well the export profile of one country matches the import profile of another country. Calculating the index over time shows whether the trade profiles of trade partners are becoming more or less compatible, with more compatibility implying higher competitiveness.

These indices have methodological problems. Due to structure configurations, coefficients may occasionally indicate totally inexplicable values in the economic sense. For example, in this study this is the case with the inexplicably low similar indices of Slovakia's exports and EU imports.

Given the key role in boosting economic performance of upgrading skill levels and products' technological composition, we investigated the quality of SEEC exports by dividing them into medium-tech and high-tech or high-skill-intensive categories. We used the same four categories as in Nikolić (2020), applied by

economists and international organisations such as UNCTAD. Generally, export databases were decomposed into different categories based on skill level and technology composition. The 261 export merchandise groups were used to compute different indicators – including high R&D investment and high technology intensity – to indicate how countries are moving from primary commodities to skilled manufacturing and technological sectors, including high-tech products. Among others, we used the shares of high-skill and technology-intensive manufactures (H-S&T-I), as defined by UNCTAD (2019). Additionally, qualitative changes in SEEC exports were measured through tendencies in high-tech products (H-T) and combined medium- and high-tech products (M&H-T), both given by Muncacsi (2009), and through shares of skill-intensive manufactures (S-I), the methodology developed by Mayer and Wood (2001 pp. 9–10), where a higher level usually indicates better quality. A detailed explanation of all four classifications is also given in Nikolić (2020, pp. 3462–3463), but what is common to all of them is that they are based on the extraction of a high number of SITC technologically sophisticated and factor-intense merchandise groups, divisions, and sectors. These classifications have been used in numerous studies (Crespo and Fontoura 2007; Fabrizio et al. 2006; Lall 2000; Landesmann and Wörz 2006).

To measure intra-industry trade we used the well-known Standard Grubel-Lloyd index (Grubel and Lloyd 1975, pp. 21–23) given in Formula 3. It measures the degree of intra-industry trade due to product differentiation in economies of scale, indicating how a country simultaneously imports and export varieties of a particular product. The index is expressed as the ratio of intra-industry trade to total trade. The coefficient will be zero in the absence of intra-industry trade and one in the absence of inter-industry trade.

$$GL_j = \frac{\sum_{i=1}(X_{ij} + M_{ij}) - \sum_{i=1}\left| X_{ij} - M_{ij} \right|}{\sum_{i=1}(X_{ij} - M_{ij})} \tag{3}$$

where *GLj* is the intra-industry trade index for total trade between the two countries, and *Xij* (*Mij*) is exports (imports) of product *i* for country *j* where *i* (sector, merchandise group) = *1…N*.

4. RESEARCH RESULTS

4.1. Convergence or divergence between SEEC and CEEC

The results presented in Table 2 are based on our calculation of the similarity between SEEC and CEEC export structures in 2007–2008 compared with 2018–2019.

Table 2: Similarity between SEEC and CEEC Export Structures, 2007–2019

Country:		Czechia			Poland			Slovenia		
Index:		Finger	Cosines	i ISI	Finger	Cosines	i ISI	Finger	Cosines	i ISI
ROM	2007	0.505	0.533	0.533	0.552	0.630	0.623	0.495	0.448	0.445
ROM	2008	0.547	0.579	0.579	0.558	0.645	0.638	0.501	0.481	0.480
ROM	2018	0.630	0.779	0.777	0.593	0.761	0.720	0.564	0.646	0.646
ROM	2019	0.631	0.779	0.776	0.591	0.749	0.716	0.560	0.572	0.565
TUR	2007	0.482	0.563	0.562	0.559	0.642	0.640	0.436	0.556	0.547
TUR	2008	0.468	0.511	0.511	0.554	0.610	0.603	0.437	0.515	0.514
TUR	2018	0.497	0.622	0.593	0.559	0.646	0.644	0.515	0.644	0.621
TUR	2019	0.500	0.602	0.567	0.566	0.645	0.645	0.529	0.562	0.518
MAC	2007	0.226	0.115	0.101	0.226	0.146	0.121	0.225	0.120	0.111
MAC	2008	0.238	0.147	0.134	0.283	0.190	0.165	0.247	0.172	0.162
MAC	2018	0.315	0.198	0.184	0.352	0.309	0.232	0.276	0.174	0.159
MAC	2019	0.320	0.204	0.190	0.348	0.304	0.236	0.280	0.165	0.156
SRB	2007	0.434	0.301	0.300	0.495	0.409	0.408	0.470	0.336	0.330
SRB	2008	0.459	0.330	0.330	0.514	0.411	0.410	0.484	0.352	0.349
SRB	2018	0.488	0.507	0.487	0.569	0.590	0.585	0.515	0.545	0.529
SRB	2019	0.474	0.431	0.415	0.575	0.569	0.565	0.488	0.426	0.403
KOS	2007	0.208	0.119	0.107	0.220	0.135	0.114	0.209	0.120	0.113
KOS	2018	0.249	0.148	0.147	0.304	0.273	0.240	0.255	0.181	0.179
CRO	2007	0.292	0.146	0.145	0.342	0.194	0.198	0.292	0.132	0.132
CRO	2008	0.446	0.278	0.244	0.487	0.425	0.409	0.480	0.313	0.312
CRO	2018	0.484	0.398	0.376	0.572	0.564	0.563	0.580	0.625	0.597
CRO	2019	/	/	/	/	/	/	/	/	/
BUG	2007	0.397	0.190	0.186	0.448	0.343	0.327	0.393	0.205	0.204
BUG	2008	0.419	0.223	0.216	0.452	0.341	0.320	0.404	0.253	0.250
BUG	2018	0.471	0.303	0.297	0.510	0.447	0.437	0.482	0.423	0.417
BUG	2019	0.476	0.322	0.313	0.515	0.451	0.446	0.489	0.454	0.433
ALB	2011	0.217	0.140	0.125	0.217	0.136	0.109	0.232	0.134	0.120

ALB	2018	0.069	0.025	0.014	0.099	0.052	0.021	0.076	0.038	0.017
MNE	2011	0.115	0.025	0.016	0.114	0.034	0.019	0.116	0.052	0.040
MNE	2018	0.182	0.133	0.123	0.213	0.164	0.123	0.305	0.385	0.351
B&H	2008	0.424	0.376	0.375	0.492	0.535	0.526	0.468	0.419	0.419
B&H	2011	0.356	0.266	0.266	0.452	0.504	0.485	0.444	0.443	0.440
B&H	2018	0.396	0.300	0.303	0.488	0.580	0.556	0.439	0.364	0.363
B&H	2019	0.403	0.310	0.307	0.490	0.586	0.567	0.436	0.318	0.312

Table 2 cont.

Country:		Hungary			Slovakia		
Index:		Finger	Cosines	i ISI	Finger	Cosines	i ISI
ROM	2007	0.458	0.442	0.412	0.553	0.492	0.461
ROM	2008	0.493	0.494	0.481	0.576	0.533	0.497
ROM	2018	0.639	0.804	0.804	0.228	0.154	0.151
ROM	2019	0.630	0.808	0.807	0.581	0.645	0.561
TUR	2007	0.424	0.399	0.383	0.489	0.620	0.565
TUR	2008	0.412	0.354	0.345	0.471	0.526	0.490
TUR	2018	0.481	0.623	0.608	0.503	0.673	0.540
TUR	2019	0.473	0.620	0.598	0.493	0.640	0.481
MAC	2007	0.203	0.078	0.075	0.282	0.158	0.157
MAC	2008	0.223	0.115	0.113	0.297	0.210	0.209
MAC	2018	0.294	0.208	0.185	0.287	0.116	0.116
MAC	2019	0.295	0.197	0.178	0.293	0.110	0.110
SRB	2007	0.376	0.214	0.205	0.451	0.283	0.257
SRB	2008	0.414	0.267	0.256	0.476	0.314	0.286
SRB	2018	0.518	0.554	0.545	0.448	0.502	0.411
SRB	2019	0.493	0.486	0.476	0.455	0.376	0.296
KOS	2007	0.173	0.074	0.073	0.192	0.071	0.071
KOS	2018	0.207	0.126	0.123	0.210	0.081	0.079
CRO	2007	0.295	0.136	0.135	0.265	0.088	0.084
CRO	2008	0.392	0.212	0.211	0.438	0.226	0.219
CRO	2018	0.502	0.725	0.692	0.444	0.321	0.253
CRO	2019	/	/	/	/	/	/
BUG	2007	0.379	0.213	0.213	0.442	0.263	0.258
BUG	2008	0.399	0.241	0.241	0.435	0.272	0.269
BUG	2018	0.504	0.384	0.382	0.411	0.209	0.179

BUG	2019	0.510	0.394	0.388	0.420	0.213	0.171
ALB	2011	0.170	0.070	0.070	0.200	0.110	0.110
ALB	2018	0.071	0.066	0.035	0.069	0.024	0.019
MNE	2011	0.120	0.020	0.020	0.120	0.030	0.030
MNE	2018	0.190	0.168	0.150	0.172	0.118	0.118
B&H	2008	0.340	0.234	0.230	0.378	0.214	0.202
B&H	2011	0.350	0.280	0.280	0.400	0.250	0.250
B&H	2018	0.347	0.292	0.293	0.361	0.173	0.155
B&H	2019	0.350	0.296	0.289	0.361	0.166	0.142

Source: Authors 'own calculation based on the United Nations COMTRADE database (2020) and Kosovo Agency of Statistics (2020).

Table 2 shows that between the observed years there was a moderate increase in the similarity between SEEC and CEEC in a large majority of the analysed cases. The absolute level of the similarity coefficient is mostly higher in 2018 and 2019 than in 2007 and 2008. However, regarding the Slovakia anomaly, with motor vehicles constituting more than one-quarter of merchandise exports, when Slovakia's export structures are matched with SEEC the results in roughly half of the cases showed opposite patterns. There is a significant decline in the similarity between the export structures of Bulgaria and B&H, with similar coefficient levels to the export structures of Turkey and North Macedonia oscillating or, at best, stagnating. Among other surveyed pairs of countries, Albania recorded a decrease in the observed coefficients regarding all five CEEC. Additionally, B&H's export structure also fell compared to that of Slovenia and Czechia (and the already-mentioned Slovakia). However, the overall picture is clear: since 2007 the similarity between the export structures of SEEC and CEEC has shown a solid growth.

The greatest similarity is recorded for Romania, while Croatia, which also recorded a strong rise in export similarity with all CEEC, is the most economically developed SEEC. A solid growth of similarity indices was also detected in Serbia and Bulgaria. The situation is, as expected, less favourable in other SEEC: Montenegro, Kosovo, and North Macedonia recorded growth but their coefficient levels remained low, and Turkey achieved a substantially higher similarity level but recorded only a modest increase after 2007.

In general, these results showed that SEEC export structures have converged with those of CEEC, implying their improved quality. However, SEEC are still a long way from the trade performance of CEEC, which is evidenced by looking at the similarity between the export structures of CEEC economies. In 2007 and 2018–2019 Czechia and Poland show a high level of similarity and even a mild negative tendency.[1] A similar conclusion can be drawn from the similarity between the export structures of Poland and Hungary, which are high and modestly rising.[2] It is unsurprising that these export structures are more similar to each other than they are with the SEEC because the exports of CEEC economies are more sophisticated.

After this analysis, the question remains of whether SEEC's moderately positive direction is sufficient to constitute a turning point in the development of this group of countries. To address this issue, we will compare the export structures of all ten SEEC with the import structure of the EU, their main trading partner.

4.2. Comparison of SEEC and CEEC export and EU import structures

By comparing the merchandise export structures of SEEC and CEEC (as well as the US as an aspirational export structure) with EU merchandise import structures in 2007–2008 and 2018–2019, at the three-digit level of SITC (Revision 4), we obtained the similarity coefficients presented in Table 3.

1 Finger-Kreinin was 0.668 in 2007, 0.644 in 2018, and 0.637 in 2019; Cosines also decreased slightly from 0.776 to 0.738 and 0.724, and inverse ISI was 0.771 in 2007, 0.682 in 2018, and 0.671 in 2019.

2 Finger-Kreinin was 0.587 in 2007, 0.618 in 2018, and 0.604 in 2019. Cosines were 0.642, 0.696, and 0.725, while inverse ISI amounted to 0.603 in 2007, 0.692 in 2018, and 0.663 in 2019.

Table 3: Similarity between CEEC and SEEC Export Structures and EU Import Structures, 2007–2019

	Finger	*Cosines*	*i ISI*	*Finger*	*Cosines*	*i ISI*	*Finger*	*Cosines*	*i ISI*	*Finger*	*Cosines*	*i ISI*
	2007			*2008*			*2018*				*2019*	
POL	***0.449***	***0.307***	***0.296***	***0.439***	***0.274***	***0.251***	***0.521***	***0.384***	***0.370***	***0.525***	***0.403***	***0.394***
CZE	***0.471***	***0.328***	***0.319***	***0.472***	***0.309***	***0.294***	***0.497***	***0.414***	***0.411***	***0.507***	***0.455***	***0.448***
HUN	***0.487***	***0.425***	***0.423***	***0.488***	***0.390***	***0.389***	***0.528***	***0.437***	***0.437***	***0.539***	***0.463***	***0.460***
SVK	***0.418***	***0.260***	***0.252***	***0.413***	***0.220***	***0.219***	***0.462***	***0.319***	***0.282***	***0.451***	***0.321***	***0.268***
SVN	***0.393***	***0.262***	***0.263***	/	/	/	***0.464***	***0.360***	***0.453***	***0.463***	***0.372***	***0.362***
TUR	0.419	0.295	0.289	0.398	0.245	0.235	0.460	0.354	0.348	0.483	0.412	0.406
ROM	0.439	0.306	0.304	0.442	0.304	0.293	0.461	0.354	0.353	0.467	0.378	0.377
BUG	0.442	0.278	0.278	0.433	0.265	0.264	0.497	0.365	0.364	0.502	0.394	0.393
CRO	0.434	0.273	0.273	0.426	0.227	0.225	0.492	0.414	0.404	/	/	/
SRB	0.374	0.193	0.189	0.381	0.172	0.163	0.439	0.308	0.304	0.440	0.301	0.300
MAC	0.271	0.144	0.134	0.270	0.157	0.156	0.280	0.153	0.135	0.281	0.164	0.141
KOS	0.165	0.076	0.072	/	/	/	0.204	0.106	0.103	/	/	/
ALB	/	/	/	0.371	0.628	0.607	0.133	0.198	0.104	/	/	/
B&H	/	/	/	0.297	0.133	0.130	0.328	0.207	0.207	0.324	0.211	0.211
MNE	/	/	/	0.145	0.033	0.025	0.208	0.166	0.146	/	/	/
USA	**0.613**	**0.452**	**0.433**	**0.600**	**0.430**	**0.385**	**0.642**	**0.630**	**0.630**	**0.650**	**0.673**	**0.673**

Note: Data for Albania and Montenegro in the 2008 columns are for 2011.

Source: Authors' own calculation based on the United Nations COMTRADE database (2020) and Kosovo Agency of Statistics (2020).

Table 3 shows that between the two pairs of observed years there was a moderate increase in the similarity of the two structures in almost all cases, so that the absolute level of the similarity coefficient is nearly always higher than at the beginning of the period. As expected, we detected a modest fall in similarity and other indicators in most cases in 2008 due to the Great Recession. In general, these results show that CEEC and SEEC export structures have changed in a positive direction. In CEEC, as expected, the greatest similarity was recorded for the most highly developed countries: Czechia and Hungary. It is also unsurprising that US and EU import structures are the most similar and are even becoming more so, because these are the most sophisticated economies.

These results also show that in 2007 and 2008, SEEC export structures had a significantly lower similarity level than those of the CEEC and, especially

important in 2018 and 2019, they imply that SEEC exports are low quality in the European context. Yet, despite this, there are some positive changes. Excluding Albania, where a decline was detected, and N. Macedonia, with indices that were rather stagnant and then rose slightly, the similarity between the export structures of all other SEEC and EU import structures increased. This trend has been detected previously in the studies of Nikolić (2011, 2013) on Turkey and Serbia (both for the period 2000–2007), B&H (2005–2011), and Montenegro (2005–2012), which reveal rising similarity coefficients (with 2-digit SITC data) between the exports of the four observed economies and EU import demand.

It is hypothetically possible that the rise in the similarity indices was caused by deterioration in the more advanced EU import structure. To address this issue, we analysed changes in EU imports through the movement of technology-intensive products, where a strong decrease would suggest a weakening of the EU import structure and thus explain the rise in SEEC and CEEC similarity indices. The results are as expected: there is moderate growth in import structure quality seen through the growth of skill-intensive manufactures and medium- and high-tech products. The share of medium- and high-tech products in the total external imports of the EU28 was 40.6% in 2007 and 46% in 2019. A similar, generally mild rising tendency was detected in skill-intensive manufactures (34% in 2007 and 43.4% in 2018). Evidently, there is a moderate increase in the sophistication of external EU import demand, which is a global tendency, especially in developed countries.

In the technology context, the results are indicative. Given the high sophistication of EU import demand, every convergence with it is a sign of progress almost by definition because of the growing share of products (merchandise groups) 'matching' EU imports. However, looking at the level of 'overlapping' characteristics in US export and EU import structures – and, to a lesser extent, between CEEC export and EU import structures – it is clear how distant the turning point for SEEC is.

Generally, the growth of SEEC similarity indices relative to both the EU and the CEEC correlates with the beginning of strong export-oriented inflows of FDI – the arrival of foreign export-oriented companies, mostly producing components for parent companies – which, to meet the demand of the sophisticated EU

market, improved the export offer of SEEC economies. This tendency is closely connected with the partial involvement of SEEC economies in global value chains (GVCs).

4.3. Technological-structure and factor-intensity CEEC trade trends

In the export structures of most of the 15 observed economies, all four product categories show similar tendencies in the period under review. Table 4 shows that the shares of high-tech, high-skill, and technology-intensive manufactures, (combined) medium- and high-tech products, and skill-intensive manufactures in the exports of 13 of these 15 countries have moderately increased since 2007–2008, the exceptions being Albania and Kosovo, where all these categories recorded a decrease.

The trends of the first two narrower categories covering more technology- and skill-intensive products differ significantly from the remaining two, which are more inclusive and encompass practically all merchandise groups from SITC sector 5 (Chemicals and related products) and sector 7 (Machinery and transport equipment). In some of the economies, high-tech and high-skill and technology-intensive manufactures only modestly increased their shares, or even showed a decrease, as in Turkey and Montenegro (or stagnated, as in B&H). Serbia experienced a slight decline regarding high-skill and technology-intensive manufactures.

Given the importance of technology- and skill-intensive exports, these results are not encouraging. Even worse, for practically all SEEC the share of these types of products in 2007–2019 was low compared to that of their CEEC counterparts. Generally, the low level of this type of product suggests the relatively low value of goods with the best chance of placement in sophisticated markets such as the EU. Given that these groups of products are mainly those that have the largest innovation content (R&D) and potential, the implication is that the performance of the SEEC export sector in this important domain is weak.

Table 4: Share of medium- and high-tech products, high-skill and technology-intensive manufacture products, and skill-intensive manufactures in CEEC and SEEC exports, 2007–2019

	2007	2008	2018	2019	2007	2008	2018	2019	2007	2008	2018	2019	2007	2008	2018	2019
	High-Tech				High-Skill Tech-Intensive				Skill-Intensive Manufactures				Medium + High			
POL	***9.7***	***11.3***	***11.9***	***12.6***	***14.6***	***16.5***	***18.6***	***18.2***	***44.8***	***45.9***	***44.4***	***44.7***	***49.8***	***50.8***	***48.4***	***48.9***
CZE	***20.5***	***20.6***	***22.4***	***23.5***	***22.6***	***23.1***	***24.9***	***26.0***	***60.0***	***58.4***	***65.1***	***66.0***	***63.5***	***61.8***	***67.6***	***68.7***
HUN	***29.3***	***30.0***	***24.4***	***25.3***	***31.6***	***32.1***	***27.2***	***27.5***	***66.8***	***65.8***	***68.8***	***70.0***	***68.3***	***67.3***	***70.5***	***71.7***
SVK	***17.6***	***20.3***	***18.4***	***18.0***	***20.2***	***22.4***	***19.4***	***18.5***	***56.5***	***57.4***	***64.5***	***66.6***	***60.8***	***61.3***	***67.5***	***69.5***
SVN	***14.7***	***16.2***	***20.3***	***23.8***	***18.0***	***19.6***	***22.6***	***26.0***	***53.9***	***54.2***	***58.9***	***58.4***	***57.1***	*57.3*	***62.0***	***61.3***
TUR	4.5	3.7	3.6	4.1	9.2	8.1	10.9	11.8	34.0	31.6	36.0	36.2	39.6	38.0	39.3	39.4
ROM	6.4	8.8	9.1	9.8	8.7	11.3	10.9	11.7	35.8	38.2	53.2	53.8	40.6	43.0	56.0	56.4
BUG	7.3	7.7	10.4	10.6	10.8	11.4	13.8	15.2	22.5	23.2	30.6	32.1	24.2	24.4	33.0	35.1
CRO	10.5	11.3	13.3	/	14.6	14.4	18.2	/	29.5	30.9	35.1	/	42.0	44.9	39.4	/
SRB	6.4	8.3	7.5	8.2	13.5	14.2	12.8	12.1	23.4	25.1	36.7	36.9	25.4	28.3	38.4	38.8
MAC	2.9	3.1	4.1	4.2	4.4	5.4	25.0	25.2	7.9	8.9	34.9	36.1	27.2	22.2	58.3	60.5
KOS	2.2	/	1.7	/	9.8	/	7.1	/	14.3	/	10.0	/	27.1	/	27.1	/
B&H	/	3.8	3.2	3.8	/	10.9	10.3	10.9	/	23.8	21.5	23.8	/	22.5	20.5	22.5
ALB	/	2.2	0.1	/	/	2.4	0.1	/	/	4.4	0.4	/	/	12.2	2.0	/
MNE	/	3.3	0.7	/	/	6.4	1.0	/	/	9.9	15.4	/	/	12.0	16.6	/

Notes: Data for Albania and Montenegro in the 2008 columns are for 2011. There are no data for Albania and Montenegro in 2019; data for Croatia are only partial and hence inadequate.

Source: Authors' own calculation based on the UN COMTRADE database (2020) and Kosovo Agency of Statistics (2020).

It should be noted that the growth trend of all four analysed indicators is a worldwide phenomenon, but SEEC recorded solid growth in the two more inclusive indices (medium- and high-tech products and skill-intensive manufactures) in a relatively short period. However, compared to the improvement in export structure in 2007– 2008, that in 2018–2019, even if solid, is still far from the level achieved by most CEEC, implying that although SEEC export quality might be improved in the European context it is still inadequate.

Table 4 shows that between 2007–2008 and 2018–2019, most of the observed CEEC moderately increased their share in most of the four product categories. As expected, Hungary achieved the best results, with medium- and high-tech products accounting for 71.7% of exports in 2019 and high-tech products making up as much as one-fifth of the country's exports (although their share was even larger in 2007). Czechia has similar results, with medium- and high-tech products amounting to 68.7% of its exports in 2019 and high-skill and technology-intensive manufactures 26%. The findings for those two countries in particular demonstrate their higher innovation capacity, which translates into three or more times higher exports per capita than in SEEC. Hungary's problem is its virtually stagnating structure at the high level it has achieved, which is also the case for Poland, while the other three observed CEEC improved somewhat.

Among SEEC, as expected, the Romanian by-the-book example of success is very indicative. Romania radically improved its export quality in the period under review and also achieved strong absolute growth. The structure of all four categories substantially improved in Bulgaria (and, incidentally, to a large extent in North Macedonia), as well as in Serbia where skill-intensive manufactures and medium- and high-tech products achieved strong growth in the analysed 12 years. The export structures of Turkey and B&H, and to some extent Montenegro, were practically stagnant in the observed period, while until 2018 Croatia achieved modest positive improvements in all categories except medium- and high-tech products.

In general, CEEC have a significantly higher share of technology-intensive product export than SEEC. Regarding convergence, the only exception is Romania, with its shares in the two most inclusive product groups: in 2019 its skill-intensive manufactures and medium- and high-tech products were

substantially higher than Poland's, while its high-tech and high-skill tech-intensive products remained well below those of Poland.

In summary, Table 4 shows that in almost all of the economies the shares of technology-intensive products were constantly increasing in the observed period. Generally, this is a good sign, but it is small consolation for SEEC, given the growing trend of this kind of product in international trade and the significantly better results of CEEC.

4.4. Intra-industry trade

The standard Grubel-Lloyd index was calculated for 2007, 2008, 2018, and 2019. We calculated the same coefficients for CEEC to allow comparison and prove possible convergence. The obtained results are presented in Table 5.

Table 5: Standard Grubel-Lloyd index for selected CEEC and SEEC

	2007	2008	2018	2019
Poland	***0.624***	***0.640***	***0.682***	***0.682***
Czechia	***0.692***	***0.694***	***0.732***	***0.745***
Hungary	***0.725***	***0.714***	***0.735***	***0.738***
Slovakia	***0.546***	***0.569***	***0.639***	***0.605***
Slovenia	***0.653***	***0.662***	***0.728***	***0.753***
Turkey	0.404	0.415	0.442	0.465
Romania	0.427	0.468	0.614	0.595
Bulgaria	0.440	0.439	0.592	0.611
Croatia	0.429	0.515	0.611	/
Serbia	0.420	0.434	0.540	0.535
B&H	/	0.398	0.430	0.426
N. Macedonia	/	0.289	0.365	0.355
Kosovo	0.085	/	0.127	/

Source: Authors' own calculation based on the United Nations COMTRADE database (2020) and Kosovo Agency of Statistics (2020)

The SEEC intra-industry indices suggest moderate growth with an unquestionable growing tendency, which is a good sign. CEEC also showed moderate growth in practically all the selected economies in all observed years.

However, despite almost constantly rising in the period under review, the SEEC level of intra-industry trade was significantly lower than that of the CEEC.

Additionally, we empirically detected a general growing trend of these coefficients. Since the 1990s these indicators have also been growing in European transition countries, suggesting a positive change in both their total foreign trade and their trade with the EU. For example, Kawecka-Wyrzykowska (2008; p. 15) shows that the combined intra-industry trade index for the 10 advanced CEE countries that joined the EU in 2004 increased from 0.419 in 2000 to 0.508 in 2007 (the index was calculated at the five-digit SITC level). The evolution of trade specialisation in these economies has clearly been one-directional, consisting of an increasing role for intra-industry trade. This shows that these countries have drastically shifted their production structures and made their economies more similar to EU economies as part of the so-called 'catching-up' process.

However, it is clear that the SEEC intra-industry trade index is still relatively low, indicating unfavourable trade structures. These indices are significantly lower than the same indicators for all CEEC. Some small SEEC economies, like Kosovo, have a very low level of intra-industry trade – a corollary of its inadequate trade diversification, which is a natural consequence of the small size of its overall economy.

However, three SEEC have achieved significantly better results: Romania, Bulgaria, and Croatia increased this index very rapidly and became comparable with Slovakia in 2019 (admittedly, Slovakia is not a good example for comparison because its trade structure is atypical, as mentioned above). Romania has already been recognized as the champion among SEEC, with Bulgaria substantially increasing its intra-industry coefficient over the last decade.

Although all SEEC lag behind their CEEC counterparts, our overall findings support positive expectations. The volume and structural changes of SEEC trade relations have led to increased interdependence, deeper cooperation, and the development of existing international production chains. Thus, the transformation of the SEEC trade pattern from an inter-industry to an intra-industry model is evident – a positive development that has resulted in increased interdependence, even if it is not comparable with the CEEC.

5. CONCLUDING REMARKS

The evidence presented in this study shows that the transformation of SEEC export structures has resulted in a convergence towards the corresponding CEEC structures and EU external import structures. SEEC displayed a clear-cut export convergence towards both the CEEC and EU import demand structures in 2007–2019. The process of catching up with the CEEC, and also with the EU, was expressed in a quality upgrading of SEEC total exports, which can be traced through increasing shares of technology-intensive products. Furthermore, intra-industry trade growth showed a positive trend in all SEEC.

However, despite the above-average increase in SEEC trade since 2007 and solid structural improvements, and because of solid CEEC performance over the same period, the signs of convergence between the two groups of countries are not sufficient to close the gap between them in the foreseeable future. The considerable economic gap between the two groups of economies is mirrored in their foreign trade structure and volume of exports (absolute and per capita). The difference between SEEC and CEEC in the quality of trade is expressed through a lower share of technology-intensive products, substantially smaller intra-industry trade coefficients, and significantly lower similarity with external EU import structures.

It is obvious that since the 1990s the SEEC have not succeeded in replicating the rapid adjustment of the CEEC export structure to the EU market. The SEEC did not come close to the CEEC achievement of a large reduction in the share of unskilled labour-intensive products and a substantial growth in technology and skilled labour-intensive goods, and the same applies to the integration of SEEC in GVCs. That is especially important given that CEEC exports – and, to a lesser extent, SEEC exports – are influenced by different forms of integration, such as the integration of production fragmentation with processing trade ability to foster both convergence and divergence in trade structures. The main reason that CEEC trade specialisation evolved so quickly to match that of Western partners was strong FDI inflows, which was not replicated to the same extent in SEEC.

The analysis of the dynamics of the SEEC specialisation and its convergence with EU import structures and CEEC export structures shows that the process of re-shaping SEEC trade patterns has been long and will have to continue. The

research revealed that the SEEC that are EU members (Croatia, Bulgaria, and especially Romania) are the most advanced according to the analysed indicators, evidencing the significance of being a member of the EU and the associated FDI inflows; that is, integration in GVCs. For example, Romania has a significant and increasing share of technology-intensive products, the highest coefficients of intra-industry trade, and the highest similarity indices. Countries that are in an advanced phase of the EU integration process and the larger and more developed SEEC economies – Turkey and Serbia – perform better according to the obtained indicators (these two economies are also – as expected – the most integrated in GVCs). Hence, our analysis also indicates that the countries with less convergence and lower quality trade structures are those considered not ready for EU accession or are still in the initial phases of the EU accession process. This supports the view that trade patterns develop in parallel with the evolution of other economic indicators. There are reasons to assume that the trade adjustment process is incomplete and that with EU accession (discounting the three SEEC that are already EU members) there will be further restructuring of export-oriented manufacturing in the SEEC as the deeper economic integration affects the structure of exports and production through lower trade and investment costs. Trade integration, especially through the process of EU accession, and globalisation have had a positive effect and continue to influence economic and trade performance in SEEC and CEEC alike.

Our results have a number of policy implications. Catching up is not an automatic process and policymakers need to make real convergence tendencies sustainable. Institutional reforms are very important for achieving this goal. Continued FDI inflows, largely from the EU, along with further integration in GVCs, are essential to sustain trade convergence. SEEC should keep their economies open to trade and FDI, as openness acts as a catalyst for innovation and technological progress, helps attract capital, and positively influences productivity and competitiveness.

This paper contributes to a better understanding of trade convergence patterns in peripheral European economies, providing policymakers with useful insights into the role of different trade components in the convergence process. The SEEC face several challenges in the convergence process, including reinvigorating and sustaining investment – especially export-oriented FDI – and enhancing institutional quality and innovation. The CEEC experience of the trade

convergence process could be useful in SEEC policymaking. Domestic policymakers should pay attention to these challenges in an effort to continue, and possibly accelerate, the process of catching up with the EU and, indirectly, with the CEEC. Consequently, if similarity in trading structures is to be a criterion of a country's readiness to join the EU – or an indicator of expected adjustments – the method for measuring similarity and convergence is a subject that should also be scrutinized.

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