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Changes of the Visegrad Group countries' foreign trade since their accession to the EU[1]

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Abstract
The aim of this article is to identify the most important changes in Visegrad Group (V4) countries' trade, with particular stress on changes in Poland's foreign trade. In the pre-accession period, the V4 group had high expectations of accelerated trade development due to the prospect of completely free access to the huge market of the enlarged European Union (EU). This analysis has demonstrated that the fastest growth of V4 countries' trade occurred in their relations with partners from outside the EU, and not in intra-EU trade (especially in the first period after accession). Poland recorded the highest increases in trade with almost all partners of V4 countries. Two identical products (cars and their parts) were at the forefront of export and import in all V4 countries, both in 2004 and 2023, and their share has increased. An important driving force behind the growth of trade of the V4 countries and the increase in benefits from international exchange has been their inclusion in global value chains. Recent shocks in the global economy have highlighted not only positive but also negative effects of producers' high involvement in global value chains.
Keywords: Visegrad Group (V4), V4 trade, European Union (EU), EU accession

Zmiany w handlu zagranicznym krajów Grupy Wyszehradzkiej od czasu ich akcesji do UE

Streszczenie
Celem artykułu jest identyfikacja najważniejszych zmian w handlu krajów Grupy Wyszehradzkiej (V4), ze szczególnym uwzględnieniem zmian w handlu zagranicznym Polski. Przed akcesją do UE grupa V4 miała duże oczekiwania co do przyspieszenia rozwoju handlu, zwłaszcza ze względu na perspektywę

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całkowicie swobodnego dostępu do ogromnego rynku rozszerzonej Unii Europejskiej (UE). Analiza wykazała, że najszybszy wzrost wymiany handlowej krajów V4 nastąpił w ich relacjach z partnerami spoza UE, a nie w handlu wewnątrzunijnym (zwłaszcza w pierwszym okresie po akcesji). Polska odnotowała najwyższe wzrosty w handlu z niemal wszystkimi partnerami krajów V4. Dwa tożsame produkty (samochody oraz ich części) znajdowały się na czołowych miejscach listy zarówno eksportu, jak też importu krajów V4 w 2004 r. i 2023 r., a ich udział wzrósł. Istotnym motorem wzrostu handlu krajów V4 i zwiększenia korzyści z wymiany międzynarodowej stało się włączenie ich do globalnych łańcuchów wartości. Ostatnie wstrząsy w gospodarce światowej uwidoczniły nie tyko pozytywne, ale i negatywne skutki dużego zaangażowania producentów w globalne łańcuchy wartości.
Słowa kluczowe: Grupa Wyszehradzka (V4), handel krajów V4, Unia Europejska (UE), akcesja do UE

The 20th anniversary of four Visegrad countries' presence in the EU raises questions about the results achieved. The subject of the analysis are changes in foreign trade of V4 partners. The country's foreign trade results are important because they reflect, although only very roughly and to an incomplete extent, the structural changes and international competitiveness of a given economy. Thus, the **research question** addressed in this article is as follows: what have been the most important changes in V4 countries' trade since the EU accession, and in particular – how has Poland performed in comparison to its partners from the region.

In the pre-accession period, the V4 countries had high expectations of accelerated trade development (and related benefits), especially with the then EU-15 countries, due to the prospect of eliminating the still existing barriers and free access to the huge market of the enlarged EU (almost 0.5 billion customers).[2] For the same reason, the other outcome of accession was to be closer trade relations among V4 countries. Moreover, improvement of trade balances was expected (UKIE 2003: p. 48–55).

Based on knowledge about the mechanisms of trade integration and the expectations formulated in the pre-accession period, **three hypotheses** have been formulated and verified:

H1: Due to the new opportunities created by joining the single European market Visegrad countries expanded their trade faster within intra-EU relations than with partners outside the EU.

H2: Improving the conditions of trade among the V4 countries – as a result of their simultaneous accession to the EU – resulted in an increase in the importance of the V4's mutual trade, at the expense of a decline in the significance of other partners in their trade.

H3: Deficits in trade with partners from the EU, characteristic during the transformation period of V4 countries and still present in the first years of accession, were transformed in the next years into surpluses. This change reflected a fact that a number of goods produced in V4 countries have become good enough to face stiff competition on the single market.

The starting point for these considerations is a brief review of literature on V4 trade changes, followed by a short overview of sources of data and methods applied. Next, the

[2] "Free trade for industrial commodities had been long in place. Most of the restrictions on agricultural and food industry products had also been already removed by 1 May 2004" (Richter 2012: p. 7). Still, trade boom was expected.

analysis of dynamics of V4 trade and resulting changes in the degree of openness of V4 countries is presented. Against this background, the significance of V4 countries' trade in various dimensions is analysed (in their mutual relations, in intra-EU and extra-EU trade). The follow-up sections inform about top export and import products, trade balances and involvement of V4 countries in global value creation chains. The analysis closes with summary and conclusions.

1. Literature review

It is impossible to compare the results of this research with other papers, because the literature on V4 countries' foreign trade changes following their accession to the EU is very scarce and usually treats the V4 countries as a group (Ambroziak et al. 2021) or presents individual V4 countries separately, basing on different methodologies. Research conducted a few years after accession highlighted the faster growth of trade between the V4 countries with non-EU partners than within the EU (Richter 2012). This phenomenon was different from expectations before accession, when it was forecasted that trade with the EU-15 would develop the fastest. Attempts to explain the causes of this phenomenon have not yielded clear results. Richter (2012) suggested that the higher growth rate of trade with countries outside the group than with the EU-15 countries resulted mainly from the decisions of foreign investors who significantly expanded their activities in the new EU Member States and tended to optimise their benefits within the network of subsidiaries in different parts of the world. Fast trade growth was noticed also by the European Commission in its study prepared in 2009 on the occasion of 5th anniversary of 2004 enlargement of the EU. Among the achievements of the new partners, the study stressed the considerable increase of these countries' market shares in the EU and in the world economy (European Commission 2009: p. 32).

Polish extra-EU trade was analysed by Ambroziak (2022) against the background of other V4 countries (in the period 2004–2019). Based on the calculation of various indicators, the author came to the conclusion that greater similarity to the EU average appeared in V4-extra trade, as "an effect of EU integration and higher diversification in the mix of partners from outside the EU" (Ambroziak 2022: p. 117).

A comparative analysis of changes in V4 trade and changes in openness of the V4 economies was conducted by Kovárnik and Hamplová (2016: p. 240–246) but it concerned the period 2000–2015. The subject of the analysis was also the growing share of the V4 group in global value chains (GVC), which was studied by Cieślik et al. (2016). According to the authors of the study, this phenomenon was a result of liberalisation processes and integration within the EU.

One of the analysed phenomena in V4 trade was the scale and nature of intra-industry trade (IIT). Kawecka-Wyrzykowska et al. (2017) calculated horizontal and vertical IIT indices in 1995–2014 for all 10 countries of Central and Eastern Europe, which joined the EU in 2004. One of the conclusions was that the fastest increase of IIT was "in the countries with the lowest IIT indices at the beginning of the period under study (the low base effect). Those included: Romania, Bulgaria, Latvia, Lithuania and Poland" (Kawecka-

Wyrzykowska et al. 2017: p. 68). Still, in the last year covered by the study (i.e. in 2014), the highest levels of IIT indices were recorded by Czechia, Hungary, Poland and Slovakia.

The article by Jámbor (2015) is concentrated on determinants of intra-industry trade (IIT) in agri-food products between the Visegrad countries and the EU in the period 1999–2013. The results demonstrated that IIT analysed was mainly of a vertical nature. One of the latest analyses of V4 trade is that published in 2023 by Pochmara and Michałek. Using the synthetic control method (SCM) approach, the authors found a positive impact of accession to the EU on the V4 countries' trade performance 15 years after accession (see: Pochmara, Michałek 2023).

2. Materials and methods

Space limitations in this publication allow trade values and indicators to be calculated for two critical years only, 2004 and 2023. The main source of data was Eurostat statistics (unless otherwise mentioned), which ensured comparability of the situation in countries analysed. According to this database, export (extra-EU and dispatches within the single European market, called here intra-EU export) is presented by final destination of the goods. For import (extra-EU import) the EU statistics show the country of origin. Goods coming from other partners of the EU (called here intra-EU import) are grouped by the country of consignment of the goods, even when the goods originate in third countries (Eurostat 2011: p. 8–10).[3]

Due to the large and different – in some periods – impact of price changes on the trade values of individual countries and commodity groups, the level of calculated indicators is less important in this analysis, than the trends in their changes, both over time and in comparison to the other analysed countries. The number of countries covered by the analysis corresponds – according to Eurostat approach – to the actual number of the EU Member States (e.g. 25 members in 2004–2006, 27 members in 2007–2012, 28 members in 2013–2019, and 27 members since 2020). The study is an empirical research project using basic statistical measures to compare trade changes within the period adopted and within various dimensions of trade.

3. Dynamics of V4 trade

In the whole period 2004–2023, an impressive trade development of V4 countries' trade was recorded (see: *Table 1*).[4] Their total export increased from EUR 189 bn in 2004 to EUR 847 bn in 2023 (4.5 times). The increase of import was slightly lower: from EUR

[3] These rules, especially for imports, are sometimes different than those applied in national statistics. For example. in Polish statistics registered by the Central Statistical Office (pl. *Główny Urząd Statystyczny*, GUS) import, including goods from other EU Member States, is classified by country of origin. Taking into account the dominant share of intra-EU acquisition in Polish import, Eurostat and GUS import statistics differ quite significantly.

[4] Let's add that some of the fastest growth rates for trade in goods were recorded in almost all Member States that joined the EU in 2004 or later.

201 to 806 billion, it is 4 times. The exception was Slovakia, where total import increased slightly faster than export. The data in *Table 1* indicate that these increases were definitely higher than in other EU countries (EU-23). The export and import of other countries (EU-23) increased only twice (so, trade flows increased twice less than the export of the V4 countries). The high dynamics of export growth reflected a clear improvement in the competitiveness of products manufactured in the V4 countries.

Trade changes did not take place at a constant rate of growth throughout the period analysed and were not the same in all 4 countries. However, they were characterised by many common trends. The rapid development of trade in the V4 began already before accession to the EU and was largely motivated by the desire of V4 producers to adapt as best as possible to the expected improvement of trade conditions associated with tougher competition on huge single European market. The phenomenon of very rapid growth in trade lasted until 2008. A year later, there was a visible decline in trade dynamics, resulting from the global economic crisis.

The next major trade collapse occurred in 2020 due to the closure of many economic sectors in the wake of COVID-19 and affected almost all EU members. In the next two years all countries of the EU, including V4 members, very quickly rebuilt and developed their trade in all directions analysed here. Annual increases, especially of intra-and extra-EU import and intra-EU export, exceeded 20% and even 30% in 2021–2022. Such a sharp acceleration in turnover primarily reflected huge growth in the prices of many products, especially energy raw materials and food. It was a reaction of world markets to Russia's policy of limiting fuel supplies since the second half of 2021. A year later, the export value of all V4 countries remained more or less at the 2022 level or increased slightly, and imports generally decreased by several percent. These phenomena, in turn, resulted from a reduction in the price level of key products on world markets (sometimes it was a return to the pre-crisis price level).

Table 1: Dynamics of total trade of V4 countries in 2004–2023 (EUR bn, %)

	2004 EUR bn	2023 EUR bn	2023 index (2004=100, %)	2004 EUR bn	2023 EUR bn	2023 index (2004=100, %)
Country	**Export**			**Import**		
Czechia	55.4	236.7	427	56.3	214.0	380
Hungary	44.7	148.8	333	48.6	144.2	297
Poland	60.6	353.0	583	72.1	342.3	475
Slovakia	28.4	108.5	382	24.0	105.0	438
Total V4	189.1	847.0	448	201.0	805.5	401
Total EU-27	3 024.8	6 658.0	220	3 020.9	6 518.0	216
EU-27 – V4 = EU-23	2 835.7	5 811.0	205	2 819.9	5 712.5	203

Source: author's own calculation based on Eurostat (2011) and Eurostat (2024a).

Table 2: Dynamics of intra-EU trade of V4 countries in 2004–2023 (EUR bn, %)

Country	2004 EUR bn	2023 EUR bn	2023 index (2004=100, %)	2004 EUR bn	2023 EUR bn	2023 index (2004=100, %)
	Export			Import		
Czechia	48.3	192.9	399	45.2	155.7	345
Hungary	37.1	117.2	316	33.3	100.1	301
Poland	48.5	263.4	543	54.3	231.1	426
Slovakia	19.4	83.9	433	18.9	83.4	441
Total V4	153.3	657.4	429	151.7	514.3	339
Total EU-27	2 071.2	4 102.3	198	1 993.4	3 999.8	201
EU-27 – V4 = EU-23	1 917.9	3 444.9	180	1 841.7	3 485.5	189

Source: author's own calculation based on Eurostat (2011) and Eurostat (2024a).

Table 3: Dynamics of extra-EU trade of V4 countries in 2004–2023 (EUR bn, %)

Country	2004 EUR bn	2023 EUR bn	2023 index (2004=100, %)	2004 EUR bn	2023 EUR bn	2023 index (2004=100, %)
	Export			Import		
Czechia	7.1	43.9	618	11.1	58.3	525
Hungary	7.6	31.6	416	15.3	44.1	288
Poland	11.9	89.5	752	17.8	111.3	625
Slovakia	3.0	24.6	820	5.1	21.6	424
Total V4	29.6	189.6	641	49.3	235.3	477
Total EU-27	953.0	2 555.6	268	1 027.5	2 517.6	245
EU-27 – V4 = EU-23	923.4	2 366.0	256	978.2	2 282.3	233

Source: author's own calculation based on Eurostat (2011) and Eurostat (2024a).

Through the whole period analysed, extra-EU27 trade (export, as well as import) of V4 countries increased more than their intra-EU trade, except for Hungary's and Slovakia's intra-EU import, which grew a little faster than extra-EU import. Thus, the first hypothesis has not been confirmed. The country that registered the biggest trade increases in total export and import was Poland (see: *Tables 1–3*). Poland was also the best performing V4 country as regards intra-EU export and extra-EU import. In intra-EU import and extra-EU export Poland was overtaken by Slovakia.

4. Changes in the degree of openness of the conomies of the V4 countries

One of the effects of the impressive dynamics of trade turnover of the V4 countries was the increase in the openness of their economies measured by the share of the sum of export and import in GDP (see: *Table 4*). It was highest in Poland, partly due to the so-called base effect (the increase occurred from the lowest Poland's level among V4 countries). However, the Polish economy is still one of the least open among the EU countries. The highest levels of rates have been recorded for years in Slovakia and Czechia.

Table 4: Shares of foreign trade (export+import) in GDP in 2004 and 2022 and their changes (%)

Country	2004	2022	2022 index (2004=100, %)
Czechia	113	152	135
Hungary	123	187	152
Poland	71	124	175
Slovakia	140	204	146
EU-27 average	71	106	149

Source: World Bank Group (WWWb).

Impressive trade growth made also that V4 countries increased their shares in world trade (*Table 5*), except for Hungary. The biggest increase of the share in world export and import took place in Poland. As a result, the rank of all V4 countries on the list of world exporters has improved but to varying degrees.

Table 5: Share of Visegrad countries in world trade in 2004 and 2022 (% and rank)

Country	Export		Import	Export		Import
	2004			2022		
	%	Rank	%	%	Rank	%
Czechia	0.8	33	0.7	1.0	31	0.9
Hungary	0.6	36	0.6	0.6	35	0.6
Poland	0.8	31	0.9	1.4	24	1.5
Slovakia	0.3	49	0.3	0.4	40	0.4

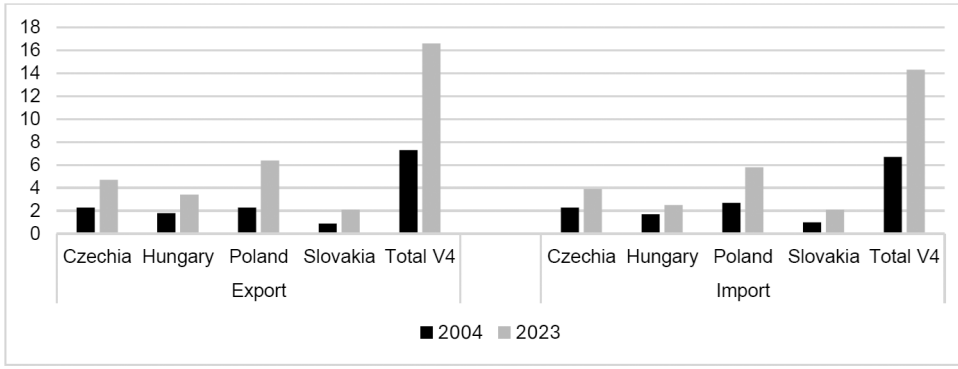
Source: WTO 2005: p. 21; WTO 2023: p. 60.

5. Significance of V4 in intra-EU and extra EU trade

The position of V4 in EU trade has strengthened (*Figures 1–2*). In EU export and EU import (both, intra and extra), the V4 position in 2023 was approximately twice as strong

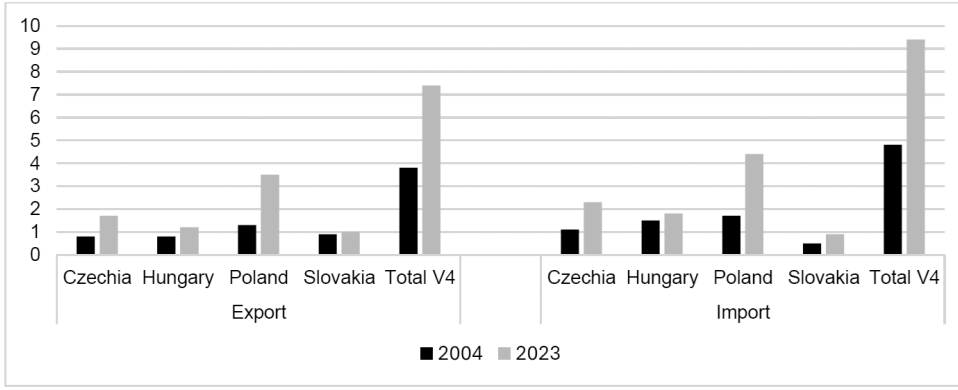
as in 2004. This improvement took place mainly at the expense of the lower share of France, Germany and Italy.

Figure 1: Share of V4 countries in intra-EU export and import in 2004 and 2023 (%)



Source: author's own calculation based on Eurostat (2024a).

Figure 2: Share of V4 countries in extra-EU export and import in 2004 and 2023 (%)



Source: author's own calculations based on Eurostat (2024a).

The main driving force behind these changes was Poland. Due to the large scale of its trade (compared to other V4 partners), as well as the above-mentioned highest growth dynamics, it obtained the largest shares in extra and intra trade of the EU in 2023 (see: *Figures 1–2*). The lowest share increases in the period 2004–2023, both in intra-EU and extra-EU, were recorded by Hungary, which was the result of the previously analysed slower turnover dynamics of this country. On this basis, it can be concluded that Hungary integrated relatively the slowest with the EU economy, as well as the world economy. However, the lowest level of this integration (the country's share in intra-EU and extra UE trade) through the whole period analysed was in Slovakia (in extra-EU export this share has hardly improved). This country, despite a faster – than Hungary – growth rate

of turnover with other members of the EU and with partners outside the grouping, was not able to significantly strengthen the very weak trade ties with EU partners that existed at the threshold of EU membership. The increased shares (although to varying degrees) of all V4 countries in both directions of EU trade (export and import), covering their trade within the EU and their turnover with third countries suggest a relatively strong competitive position of V4 in EU and in international trade.

6. Significance of intra-EU and extra-EU trade in V4

Presented below *Tables 6–7* demonstrate the opposite situation as compared to the one discussed in the previous section, namely the significance of intra-EU and extra-EU trade in individual V4 countries. The proportion of trade that was accounted for by intra-EU flows decreased by several percentage points in all V4 countries but remained dominant and in 2023 was lowest in Poland (74.6% in export and 67.5% in import) and highest in Czechia's export (81.5%) and Slovakia's import (79.4%).

Table 6: Significance of intra-EU and extra-EU exports in total export of V4 in 2004 and 2023 (EUR bn and %)

	Extra-EU export	Intra-EU export	Total export	Share of extra-EU export in total export	Share of intra-EU export in total export	Extra export	Intra export	Total export	Share of extra-EU export in total export	Share of intra-EU export in total export
	1	2	3=1+2	4=1:3	5=2:3	6	7	8=6+7	9=6:8	10=7:8
	EUR bn			%	%	EUR bn			%	%
Country	2004					2023				
Czechia	7.1	48.3	55.4	12.8	87.2	43,9	192.9	236.8	18.5	81.5
Hungary	7.6	37.1	44.7	17.0	83.0	31,6	117.2	148,8	21.2	78.8
Poland	11.9	48.7	60.6	19.6	80.4	89,5	263.4	352.9	25.4	74.6
Slovakia	3.0	19.3	22.3	13.5	86.5	24,6	83.9	108.5	22.7	77.3
Total V4	29.6	153.4	183.0	16.2	83.8	189.6	657.4	847.0	24.6	75.4
EU-27	953.0	2071.2	3024.2	31.5	68.5	2555.6	4102.3	6657.9	38.4	61.6

Source: author's own calculation based on Eurostat (2011) and Eurostat (2024a).

Poland was also – among the V4 – the country least dependent on imports from other EU countries (*Table 7*). In 2023, intra-EU market became less important than in 2004 (by around 9–10 percentage points) for all V4 imports, mainly to the benefit of the increased supplies from China, USA and some developing countries.

Table 7: Significance of intra-EU and extra-EU import in total import of V4 in 2004 and 2023 (EUR bn and %)

	Extra-EU import	Intra-EU import	Total import	Share of extra-EU import in total import	Share of intra-EU import in total import	Extra-EU import	Intra-EU import	Total import	Share of extra-EU import in total import	Share of intra-EU import in total import
	1	2	3=1+2	4=1:3	5=2:3	6	7	8=6+7	9=6:8	10=7:8
	EUR bn			%	%	EUR bn			%	%
Country	2004					2023				
Czechia	11.1	45.2	56.3	19.7	80.3	58.3	155.7	214.0	27.3	72.7
Hungary	15.3	33.3	48.6	31.5	68.5	44.1	100.1	144.2	30.6	69.4
Poland	17.8	54.3	72.1	24.7	75.3	111.3	231.1	342.4	32.5	67.5
Slovakia	5.1	18.9	24.0	21.2	78.8	21.6	83.4	105.0	20.6	79.4
Total V4	49.3	151.7	201.0	24.5	75.5	235.3	570,3	805.6	29.2	70.8
EU-27	1027.5	1993.4	3020.9	34.0	66.0	2517.6	3999.8	6517.4	38.6	61.4

Source: author's own calculation based on Eurostat (2011) and Eurostat (2024a).

The overall importance of intra-EU trade was greater for the V4 countries in their export than their import.

7. Significance of mutual trade in V4 countries[5]

7.1. Top export markets

In the entire analysed period Germany was the biggest export market for goods of V4 countries especially (see: *Tables 8–9*). The only country, in which the share of other members of the V4 group increased significantly, was Hungary. However, export to other V4 partners played an important role only for Slovakia and Czechia (26.4% and 18.6% of total sales in 2023, respectively). Throughout the entire period, Czechia was a more important destination market for Slovakia than the other way around. The importance of export to other V4 partners was lowest in Poland (9–11%). At the same time, the importance of new partners from outside the EU has increased in some countries, e.g. of the USA in Polish export.

Generally, there was an increase in the importance of V4 partners as sales markets for V4 countries, but in the case of Czechia and Poland it was small. The share of other V4 members in Slovak exports practically did not change in the analysed period of 2004–2023. Therefore, the second hypothesis was partially confirmed.

[5] This section is based on: https://trendeconomy.com/

Table 8: Top export markets for V4 countries in 2004 (%)

Czechia		Hungary		Poland		Slovakia	
Main customers	**% of export**	**Main customers**	**% of export**	**Main customers**	**% of export**	**Main customers**	**% of export**
Germany	36.0	Germany	31.0	Germany	29.0	Germany	25.0
Slovakia	8.2	Austria	7.2	Italy	6.1	Czechia	14.1
Austria	5.9	UK	5.6	France	6.0	Austria	7.1
Poland	5.2	France	5.6	UK	5.4	Italy	6.6
France	4.7	Italy	5.5	Czechia	4.3	Poland	6.3
UK	4.7	Netherlands	3.7	Netherlands	4.3	Hungary	5.9
Netherlands	4.3	Romania	3.2	Russia	3.9	France	3.9
Italy	4.2	Poland	3.1	Sweden	3.5	Netherlands	3.4
Hungary	2.7	USA	3.0	Belgium	3.2	USA	3.2
Belgium	2.7	Slovakia	3.0	Hungary	2.6	UK	3.1
-	-	Czechia	2.9	Slovakia	1.9	-	-
V4 total	**16.1**	**-**	**9.0**	**-**	**8.8**	**-**	**26.3**

Source: https://trendeconomy.com/

Table 9: Top export destinations for V4 countries in 2023 (%)

Czechia		Hungary		Poland		Slovakia	
Main customers	**% of export**	**Main customers**	**% of export**	**Main customers**	**% of export**	**Main customers**	**% of export**
Germany	32.0	Germany	26.0	Germany	27.0	Germany	20.0
Slovakia	7.7	Italy	5.8	Czechia	6.3	Czechia	12.0
Poland	7.3	Romania	5.3	France	6.2	Poland	7.3
France	4.9	Slovakia	5.0	UK	4.9	Hungary	7.1
Austria	4.2	Poland	4.6	Italy	4.6	France	5.3
Italy	4.0	Czechia	4.5	Netherlands	4.6	Austria	5.1
UK	3.8	France	4.2	Ukraine	3.3	Italy	4.9
Hungary	3.6	Austria	4.0	USA	3.1	USA	4.5
Netherlands	3.4	USA	3.8	Slovakia	2.7	UK	4.3
-	-	-	-	Hungary	2.4	China	2.7
V4 total	**18.6**	**-**	**14.1**	**-**	**11.4**	**-**	**26.4**

Source: https://trendeconomy.com/

7.2. Top import sources

The biggest supplier was – like in the case of export – Germany (see: *Tables 10–11*). In recent years, Germany's role as a source of import of goods has decreased, which can be attributed to the growing importance of supplies from China, as well as to the increase in the value of import of energy raw materials from various non-EU countries. The other big change consisted in a radical decrease of Russia's position: from the second or third biggest supplier of V4 countries in 2004 to insignificant partner. Czechia appeared to be the second most important supplier for Slovakia (mostly due to historically strong ties between both partners, when they belonged to one state Czechoslovakia). Hungary recorded the highest increase (twofold) of the share of import from V4 partners. As a result, intra-V4 import in Hungary became almost 3 times higher than in Poland, which was the least dependant country on supplies from other V4 partners.

The share of imports from other V4 countries slightly increased in Czechia and Slovakia, and decreased in Poland. Thus, the importance of supplies from the V4 bloc has not changed significantly, except for visible increase in Hungary.

Table 10: Main suppliers of V4 in 2004 (% of total import of a V4 country)

Czechia		Hungary		Poland		Slovakia	
Main supplier	**% of import**	**Main supplier**	**% of import**	**Main supplier**	**% of import**	**Main supplier**	**% of import**
Germany	31.0	Germany	29.0	Germany	24.0	Germany	20.0
Russia	5.7	Austria	8.3	Italy	7.9	Czechia	12.7
Slovakia	5.4	Russia	5.6	Russia	7.2	Russia	10.7
China	5.1	Italy	5.6	France	6.7	Italy	4.8
Poland	5.0	Netherlands	4.9	China	4.6	Poland	4.1
Italy	4.8	China	4.8	Czechia	3.6	Austria	3.9
France	4.5	France	4.6	Netherlands	3.5	Hungary	3.6
Netherlands	4.0	Poland	3.2	UK	3.3	France	3.3
Austria	4.0	Japan	3.0	Sweden	2.7	China	3.3
Japan	3.1	Czechia	2.9	Hungary	2.7		
Hungary	2.2	Slovakia	2.2	Slovakia	1.8		
V4 total	**12.6**	**-**	**8.3**	**-**	**8.1**	**-**	**20.4**

Source: https://trendeconomy.com/

Table 11: Main suppliers of V4 in 2023 (% of total import of a V4 country)

Czechia		Hungary		Poland		Slovakia	
Main supplier	**% of import**	**Main supplier**	**% of import**	**Main supplier**	**% of import**	**Main supplier**	**% of import**
Germany	20.0	Germany	22.0	Germany	20.0	Germany	14.5
China	17.6	China	6.7	China	12.2	Czechia	10.1
Poland	8.0	Austria	6.1	Italy	5.0	China	7.4
Slovakia	4.4	Poland	5.8	USA	4.5	Poland	5.9
Italy	3.9	Slovakia	5.4	Netherlands	3.9	Korea	5.6
France	2.9	Korea	5.4	France	3.4	Hungary	5.2
USA	2.8	Czechia	5.4	Czechia	3.3	Russia	4.3
Hungary	2.7	Netherlands	5.0	Korea	2.9	Vietnam	4.0
Austria	2.6	Russia	4.2	Norway	2.6	Italy	3.3
Netherlands	2.6	Italy	4.1	Saudi Arabia	2.2		
				Hungary	1.6		
				Slovakia	1.6		
V4 total	**15.1**	**-**	**16.6**	**-**	**6.5**	**-**	**21.2**

Source: https://trendeconomy.com/

8. Top export and import products

8.1. Top export products

Throughout the analysed period, there was a high concentration of V4 export on several most important products. In 2004, the first 9 commodity items accounted for 36–38% of total export in Hungary and Slovakia. In the Czech Republic and Poland, the corresponding rate was lower (28–29%), but still quite high. By 2023, this phenomenon has intensified in Slovakia and in Czechia (to 49% and 38.5% of export, respectively). Moreover, in Slovakia it resulted from a huge export increase of one item, i.e. motor cars (SITC 8703) to 28%(!) of the country's export. This situation, on the one hand, reflects the high competitiveness of these products on foreign markets (obtained very often within GVC), but on the other hand, it poses a threat to the export volume in the event of a deterioration in the economic situation on recipient markets. The risk is even greater because the largest recipient of these parts are companies from one country: Germany. Let's add that throughout the membership period, the dependence on export of several main products was relatively the lowest in Poland.

Motor cars (SITC 8703) and their parts (SITC 8708) have become top items in export of V4 countries, in particular in Slovakia and Czechia and to a lower extent – in Hungary and Poland. In addition, two other products were high on the list of main export items in all V4 countries in 2023. These were insulated wire (SITC 8544) and monitors and projectors (SITC 8528). Further 3 items were present in export of 3 or 2 countries: computers (SITC

8471), combustion piston engines (SITC 8408) and seats (SITC 9401). In the last few years, batteries for electric cars have appeared in the export of all V4 countries, except Slovakia. Poland has become a real giant in this field, taking second place in the EU in export (the first exporter is Germany).

From the point of view of the dynamics of changes taking place, one of the most characteristic phenomena is that in the first years of membership, coal and briquettes (SITC 2701) occupied a quite important (9th) position in Polish export. However, at the beginning of this decade, Poland imported coal. Coal export has decreased dramatically and recently includes almost exclusively coke, used to produce steel. Poland is the only country in V4 group, where a relatively strong position is occupied by food industry products (1.4%). These are cigars and cigarettes (SITC 2402).

8.2. Top import products

In 2004, nine main products accounted for 22–28% of total import of V4. Similarly to export also in V4 import, a relatively strong and similar position in import was occupied by various types of the motor vehicles and their accessories. They accounted from 6% of import in Hungary to 17% in Slovakia. Both products retained their high position in 2023. These shares (similarly to export) were related to the participation of V4 companies in the supply chains of the automotive industry, cooperating mainly with German companies.

A relatively strong position was occupied in all V4 countries in 2004–2023 by 3 fuels: petroleum oils, crude (SITC 2709), petroleum gases – LPG (SITC 2711) and petroleum oils, not crude (SITC 2710). Those 3 fuels made 5.7%, 7.1%, 10.8 and 11.0% of import, respectively for Czechia, Hungary, Poland and Slovakia. They reflected lack of domestic supply of those energy sources. In the whole period, top import of all four V4 countries included also medicaments (SITC 3004) and computers (SITC 8471).

8.3. Technologically advanced products

The share in the export of technologically advanced products is important for the long-term improvement of the country's position in foreign trade. These goods have the highest added value, which allows the seller to get the best price and the demand for them is growing the fastest. Comparable data from the World Bank indicate that in 2007 (the first year, for which such statistics are available) the poorest situation in terms of export of technologically advanced products was in Poland and Slovakia: only 4% and 5% of their export. Hungary had the highest rate – 26%, clearly ahead of its V4 partners. In Czechia it amounted to 15%.

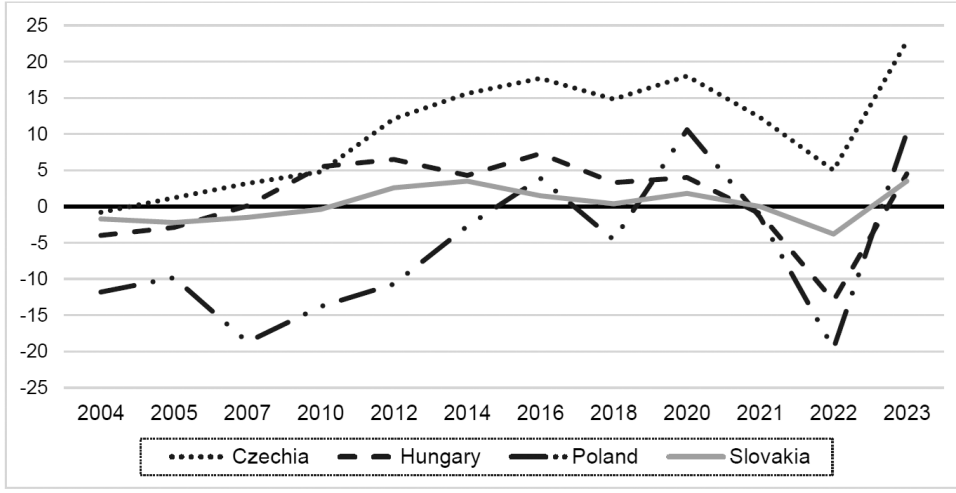
Changes in the following years were significantly different in individual V4 countries. In Hungary, there was a systematic decline of this indicator, down to 16% in 2021. In 2022, this trend was reversed and technologically advanced products reached an 18% share in export. Czechia, starting in 2007 with a rate three times higher than in Poland and Slovakia, achieved the best result among all V4 countries at the end of the analysed period – 21%. In Poland and Slovakia the increase of the share in question was relatively

the fastest. However, due to the fact that it took place from the lowest level, in 2022 this share was still low, reaching 11% of total export in Poland and 8% in Slovakia (World Bank Group WWWa).

9. Trade balances[6]

In the first years after joining the EU, the V4 countries recorded deficits in their trade, especially with partners from outside the group. The situation was different in Czechia, which had a small surplus of import over export only in 2004. Deficits persisted the longest in Poland, up to 2012, and then appeared every few years (see: *Figures 3–4*). The source of deficits was primarily trade with third countries, which in almost all years resulted in negative balances in the V4. High and increasing deficits in extra-trade of V4 reflected such factors as: a need of imports of key resources not offered by EU partners (e.g. energy resources, other necessary raw materials, agricultural products of the southern climate zone), import of accessories within global value chains, huge import of cheaper foreign products for consumption (first of all from China), etc.

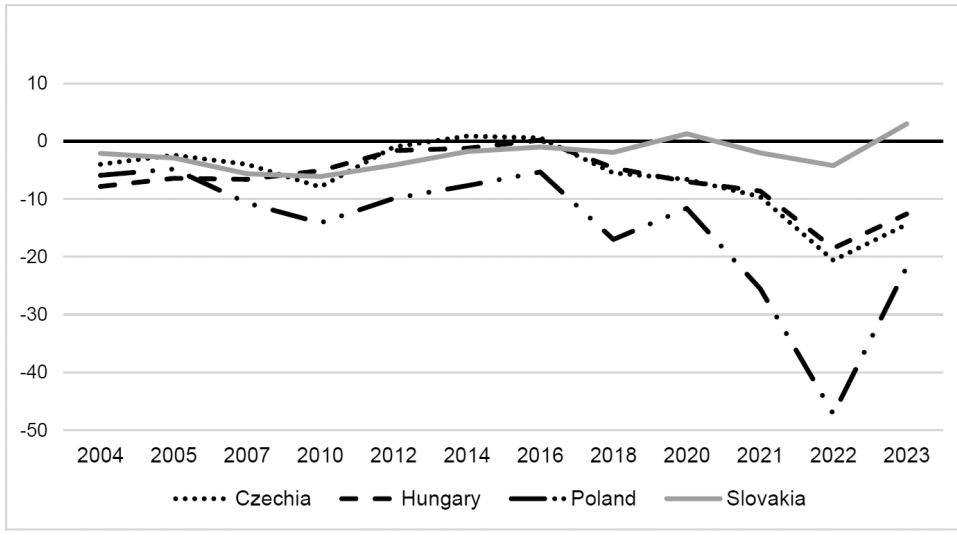
Figure 3: Total trade balances of V4 countries (EUR bn)



Source: author's own calculation based on Eurostat (2024a).

[6] This section is based on Eurostat (2024b). Let's stress once again that the trade balance situation was different, when calculated by national statistical offices because of different rules of classification of trade (first of all, of imports) than the Eurostat rules (see footnote 3). For example, according to Polish Statistical Office (GUS), Poland recorded deficit in trade with other EU Member States only in 2004 and in the next years, the trade surplus was recorded all the time. In turn, in 2018, Poland had a positive trade balance with Germany according to data from the GUS, but negative according to the German Federal Statistical Office (Destatis). The main reason was differences in the presentation of export and import data used by the statistical offices of both countries. The different PLN to EUR conversion rates adopted by both offices were also important (see: Ambroziak et al. 2022: p. 12).

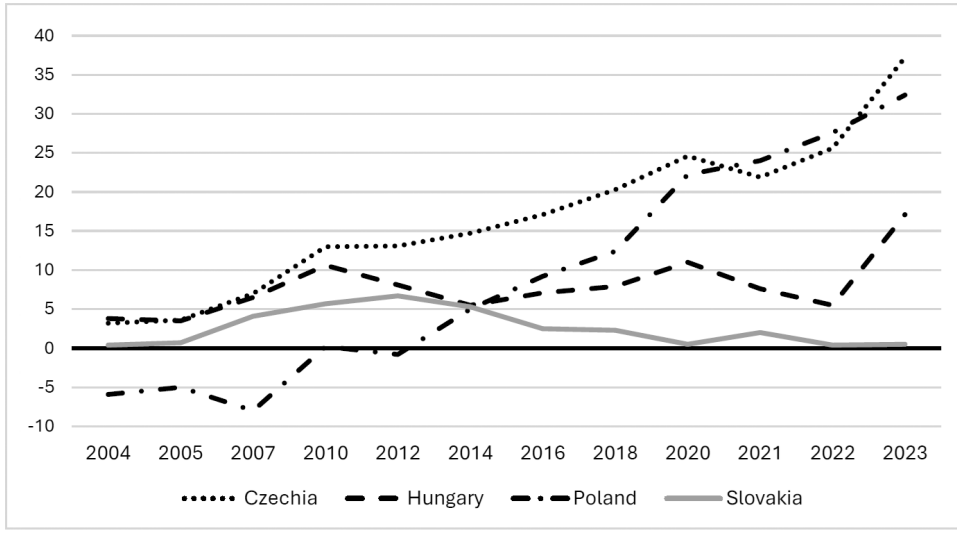
Figure 4: Extra-EU trade balances of V4 countries (EUR bn)



Source: author's own calculation based on Eurostat (2024a).

The situation in intra-EU trade was completely different. In this area, V4 countries registered structural surpluses, except for the first few years in Poland (*Figure 5*). These surpluses generally showed an upward trend. In 2022 huge negative balance occurred in extra trade of all V4 and it was due mainly to the increased value of energy import resulting from high prices for energy. The deficits were so big that they outweighed surpluses in intra-EU trade and total flows closed with deficits (except for Czechia) – *Figure 3*.

Figure 5: Intra-EU trade balances of V4 countries (EUR bn)



Source: author's own calculation based on: Eurostat (2024a).

In general, it can be said that the transition from deficits to surpluses in the intra-EU trade of V4 countries reflects their improved competitiveness in a demanding single European market. This analysis supports the third hypothesis.

10. Participation of V4 countries in global value chains (GVC)

A large part of V4 trade is organised by multinational companies, which have invested big funds in the region since the transformation of V4 countries at the beginning of the 1990s. Foreign investors from developed countries (in particular from Germany, which has become the biggest investor) have contributed significantly to include companies operating in the V4 region (own affiliates and also local companies) into global value chains (GVC), which have been developing rapidly in the world economy since the beginning of the 1990s (the process was slowed down by the COVID-19 pandemic, which started in Europe at the beginning of 2020). The unbundling of production and exchange continued on an unprecedented scale. As a result, many parts and components crossed the borders of countries several times and were registered each time as a "new" trade flow. The greater was the share of intermediate goods in trade, the greater was the probability that the value of trade calculated according to traditional statistical method (it is in terms of gross value) would be overestimated. Intermediate goods and services exported, e.g. to Germany, were used by German enterprises to produce final goods, which were sold partly on the German market and partly on the export markets of foreign recipients. In this way, part of the added value created, for example, in Poland, which went to Germany, was sold on and consumed by end recipients in other countries, inflating the value of Polish export to Germany. At the same time, this value was not included in Polish export to countries, which is reached via Germany. Similar dependencies also occurred on the import side. Thus, one of the effects of the dynamic development of GVC has been the overstatement of the value of export and import recorded in the traditional way (as gross value, i.e. the value of intermediate goods used plus the newly added value).

An analytical tool that eliminates this weakness of statistics in gross terms and provides an accurate indication of the scale of actual trade linkages within global supply chains is an analysis of trade in terms of added value (covering only a new added value arising at all stages of the manufacturing chain of the final product). This method has been available for a relatively short time, i.e. since analysts developed global input-output tables. The World Input-Output Database (WIOD) is the first public database that provides the opportunity to analyse the consequences of fragmentation of world trade. Updating these tables is, however, time-consuming and they are published with a few years delay.

Using WIOD, Polish Economic Institute (PEI) experts calculated that in 2018, Germany's share in Poland's gross imports (traditional statistics) was higher by 2–3 percentage points than in imports determined on the basis of statistics in terms of added value (Ambroziak et al. 2022: p. 32). This situation indicated that part of the German added value included in Poland's imports did not reach final recipients in Poland, but was exported to other countries after appropriate processing.

Overestimation of the volume of exchange according to the traditional approach in statistics (gross value), compared to exchange measured by added value, also affects the trade balance and the assessment of the scale of benefits from exchange. Calculations by PEI experts indicate, for example, that in 2018, Poland had a surplus in trade in goods and services with Germany. In gross terms, its value amounted to nearly USD 10 bn, while in terms of added value it was almost half as much. The same authors calculated that in 2018, the share of foreign added value in total Polish exports of goods and services was 31%. Thus, the domestic added value in the production process in Poland accounted for only approximately 70% of the proceeds from Polish exports. Among the V4 countries, Poland was relatively the least involved in GVC. In 2018, the foreign contribution accounted for as much as 48% of Slovakia's gross exports, 46.3% of Hungary's exports and 42.2% of Czech exports. Exchange with Germany was of major importance in the V4 countries' ties within the GVC. According to PEI calculations, the added value generated in Germany accounted for 10.1% of Hungarian and 9.6% of Czech gross exports. In Slovak exports, this share was 9.1%, and in Poland it was the lowest, at 6% (Ambroziak et al. 2022: p. 31–36).

The deepening specialisation within GVC raises doubts about the balance of its effects on the partners of such cooperation. On the one hand, the effect of this process is an increase in the benefits in the form of greater scale of production and reduced average costs, improved efficiency, easier access to foreign supplies of intermediate goods, as well as to sales markets, etc. At the same time, however, this development increases countries' dependence on the economic situation abroad and on decisions made by foreign investors that do not necessarily take into account the needs of the regions and countries, in which they operate. These negative implications of deep specialisation of production on a global scale were sharply revealed by the COVID-19 pandemic, when many supply chains were interrupted (including such important sectors as the production of medicines and of electronic products). The reasons for interruptions of GVC were lockdowns intended to prevent the spread of the virus and also conscious decisions of politicians and managers of large corporations who wanted to weaken their competitors in this way. The risks associated with excessive international specialisation of production have been reinforced by embargo of many countries on deliveries of majority of Russian products. One of minor manifestations of the negative consequences of high dependance on foreign deliveries was the suspension of car production in Poland by *Volkswagen* for several weeks in 2022 due to the breakdown in the production of electrical cables previously supplied by a factory in Ukraine. Greater risks regarding the security of countries are associated with a strong dependence on the import of certain raw materials (especially rare earth raw materials), as well as some intermediate goods, e.g. semiconductors (their key supplier on a global scale is Taiwan), active substances used in the production of medicines (approximately 80% of their demand in the EU is covered by China). In response to these risks, some countries are introducing programs that will reduce their dependence on imports of key raw materials and semi-finished products. An example of such action at the EU level is the new industrial policy, adopted

in 2023. Its aim is, among others, to: improving the competitiveness of the EU industry of emission-neutral technologies, better use of the EU's research and scientific potential to develop technologies that reduce dependence on the import of critical raw materials, increasing the resilience of the economy to future challenges, etc.

Conclusions

In the whole period 2004–2023, an impressive trade development of V4 countries' trade was recorded. Somehow surprisingly, export to third countries developed at a faster rate than export to other EU Member States, and in import it was true for Czechia and Poland. This situation occurred mainly in the few years before the accession and immediately after it (until 2008, i.e. the economic crisis in the world). Thus, the results of the study have confirmed only partially the first hypothesis about faster development of intra-EU export than of extra-EU export in V4 countries. The faster development of extra-EU trade reflected probably mainly the low base effect, it is much lower value of trade with non-EU partners than within the EU in 2004. To some extent, the relatively fast growth of extra trade resulted from decisions of transnational corporations, which started to invest into V4 economies much more than before and included companies in Central Europe into their global value chains. Also, local producers from the V4, modernising their production plants and sometimes bearing high costs of this restructuring, tried to find new markets (or strengthen their existing position) in order to maximise the economies of scale. A certain role was also played by the transfer of production of entire products (or the "dirtiest" phases of production) outside the EU, including to China, where environmental protection standards were much lower and, therefore, production costs were lower. Among the V4 countries, Poland's trade has grown the fastest since accession. Poland also recorded by far the largest increase in export to non-EU countries (7.5 times). The country whose trade developed relatively slowly was Hungary.

EU Member States have been the most important trade partners of all V4 countries and their share has been all the time much higher than the share of third partners: around 70–80%. The significance of EU partners has, however, decreased. At the same time, the V4 countries have become more important partners in EU trade, almost doubling their position. The increased shares (albeit to varying degrees) of all V4 countries in both directions of EU trade (export and import), covering their trade within the EU and their turnover with third countries suggest a relatively strong competitive position of V4 countries in EU and in international trade.

In the whole analysed period Germany was the biggest trade partner for all V4 countries, exceeding the share of the next partners several times. The significance of mutual trade of V4 partners has increased since 2004, although this increase was small, except for Hungary. Export to other V4 partners played an important role only for Slovakia and Czechia and import from V4 was important for Slovakia and Hungary. Thus, the second hypothesis on the increased role of mutual trade for V4 countries has been confirmed only partially.

A characteristic feature of the V4 trade commodity structure was that two products: motor cars (SITC 8703) and parts of motor vehicles (SITC 8708) occupied leading positions in their export and were only slightly behind in import. This situation was largely related to the V4's presence in the automotive industry supply chains, cooperating mainly with German companies. The other observation is that all V4 countries had quite similar list of top products in their export. In terms of import, the situation was similar. The same important products in all V4 countries' import were cars and parts of motor vehicles.

In the first years after joining the EU, the V4 countries continued to register deficits in their total trade turnover. A few years after accession to the EU, the deficit occurred only in V4 trade with partners from outside the EU (except for the crisis year 2022). The situation was worse in Poland, which needed a couple of years more to get rid of deficits in intra-EU trade. In general, the third hypothesis about the shift from deficits to surpluses in intra-EU trade has been confirmed.

Based on this general analysis of the main trends in the foreign trade of the V4 countries, it can be said that within a relatively short period (within a dozen or so years since the beginning of their transformation), these countries have significantly restructured their economies and rapidly developed their trade with EU and other partners. The openness of V4 countries increased impressively, which contributed to an increase in GDP and employment, as well as the quality of life and a significant reduction in the income gap compared to the EU average. The presented indicators justify the conclusion that Poland coped relatively best among the V4 group after accession. This is evidenced, among others, by the fastest growth in export and import in intra-EU trade and in extra-EU import and biggest improvement of country's position in intra- and extra-EU trade, as well as in international trade.

The trade successes of the V4 countries are due to many factors that deserve separate analysis. However, there is no doubt that these include, first of all, accession to the EU and the related improvement in trade conditions (thanks to the adjustment of national laws to the EU *acquis communautaire*, which regulates the principles of operation of the single European market in a uniform or similar manner in all EU Member States) and a significant enlargement of the market (almost 0.5 billion consumers, until Brexit). Moreover, a large inflow of foreign investments and the modernisation of many companies thanks to them, the previous adaptation effort undertaken by many companies since the beginning of the transformation to cope with competition in the market economy, support from European funds, visible improvement of infrastructure, etc.

Despite many undoubted trade successes, it should be noted that V4 countries' export is dominated by labour- and capital-intensive products, and in more technologically advanced industries, companies from the Visegrad Group countries most often play the role of sub-suppliers for foreign companies. The relatively low share of technologically advanced products threatens the prospects for export development in the coming years. The cost and price advantage, which has so far been an important source of competitiveness of goods from the V4 countries, is being exhausted. Therefore, the challenge for these countries remains to increase the role of technologically advanced

goods (and services) in export, the demand for which is growing the fastest, and the sale of which offers the greatest benefits. The identification of such goods and possibilities of their production in V4 countries is an important topic of further research.

Relatively high dependence of V4 countries on participation in GVC has brought a number of advantages, but it is also risky for the future development. Decisions on the production and export specialisation are taken by foreign companies and reflect their preferences (first of all, achieving higher profits), but they are not always compatible with national or regional priorities. Foreign investors may decide to move quickly to other locations, despite creating unemployment or depriving the country of an important product. Moreover, high dependence on GVC reflects involvement mainly in technologically low supplies and does not necessarily encourages a focus on production of more technologically advanced parts/supplies. One conclusion for policy makers is to create favourable conditions for development of national R&D, better legal rules for cooperation between scientists and producers, also incentives (within the allowed instruments) to promote prospective types of production (first of all related to green economy and achievement of climate neutrality by 2050, which has become the priority for EU policies).

Further research is needed to better diagnose the current situation (including dependence on the import of critical raw materials and intermediate goods), indicate the desired directions of intra-EU cooperation and prospective directions of specialisation of European companies.

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