POST-COMMUNIST EUROPEAN COUNTRIES IN GLOBAL VALUE CHAINS

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Abstract. *Transformations and integration processes of post-communist European states have resulted in changes in the production process across borders. The main objective of this article is to present the positions of post-communist states in terms of cross-border input–output linkages. The analysis takes advantage of both the conventional methods of comprehensive study of global value chains and the advanced methods and measures examining the role of Central and Eastern Europe in global value chains in general and in sectoral terms. Findings of the study suggest that more integrated are countries with grater connections to Western European countries, especially Germany; a large share of exported goods from the post-communist states passes through GVCs in Western Europe, and exporters from post-communist states are usually located more in downstream segments of production than in upstream markets.*

Key words*: Central and Eastern Europe, post-communist countries, foreign trade, global value chains*

1. Introduction

Since the early 1990s, post-communist European countries have achieved similar development goals. Democratization, integration with the European Union (EU), the development of bilateral and multilateral relations, and the economic and political transformation of financial systems, particularly banking, were the most popular achievements of long-term development strategies of the analyzed countries. However, these objectives were achieved by different methods and measures (Bilenko, 2013). One of the transformation priorities was the reorientation of foreign trade to Western Europe. The liberalization of foreign trade in the analyzed countries has allowed a relatively rapid formation of new trade rules in Central and Eastern Europe. Trade between the post-communist countries moving from the Council for Mutual Economic Assistance (Comecon) bloc to the EU allowed for an accelerated integration of economies. Although the liberalization of foreign trade does not have to be a factor that accelerates the pace of social and economic development in developing counties (Rynarzewski, 2013) (Drozdz, Miškinis, 2011), in the case of European post-communist countries the intensification of foreign trade has helped to boost the economic growth and development.

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The article presents the transformation of foreign trade in the post-communist countries that have become new members of the EU[1], with a special focus on the role of these countries in global value chains (GVCs) as a result of the liberalization process and integration with the EU. The article evaluates the position of these countries in the global vertical specialization. The paper adopts a highly selective methodology to locate each country in global value chains (upstream or downstream segment / market) and to compare them with the selected countries. The analysis covers the period from 2000 to 2009. In order to ensure the uniformity of results, the study was based on data compiled by international organisations. The termination of the study in 2009 is a result of the lack of relevant data. Data on Trade in value added statistics are collected from the OECD-WTO tables and the World Input-Output Database. Both databases provide information till 2009.

The article consists of the introduction, two sections, and conclusions. Firstly, it discusses the role of post-communist European states in GVCs, using simple and conventional assessment methods. In the second section, a more advanced approach is adopted in order to place each country in the global vertical specialization. The paper concludes with several remarks on the foreign economic policy implications for the future.

2. The position of post-communist European states in global value chains – a simple assessment

The economic transformation and the gradual integration of post-communist European countries with the European Union market have resulted in their joining and participating in GVCs. The region has become one of the most important links in the European production model (Dicken et al., 2011). The omnipresent delocalisation and fragmentation of production have not left this region unaffected. These phenomena have created a foreign trade structure and geographical directions of trade exchange in the analyzed countries (IMF, 2013). The liberalization of foreign trade and capital flows among old members of the European Union (EU-15) and the new ones from Eastern and Central Europe and their increasing role in the GVCs have significantly influenced the international economic relations in the region.

Two decades of political, economic, and social transformations in Eastern and Central Europe have resulted in the process in which foreign enterprises from the EU decide to profit from the region's comparative advantages. Investing in post-communist states has made it possible to decrease the production costs of foreign investors (*efficiency-seeking investment*), especially labour costs (Proksch, 2003). Although, in comparison with the EU-15, the United States, Japan or Australia, workforce productivity in Eastern

[1] Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia.

and Central European states is much lower[2], the wages per hour are also much lower than the average set by developed countries from the European Union[3]. The cost factor, diversified economy, integration with the EU, development strategies that put stress on innovative sectors of the economy (Giedraitis, Rasteniene, 2009), the lower risk of conducting business, and a relatively well-developed infrastructure, as a well as very advanced liberalisation have resulted in an increased interest among foreign investors in investing their capital in Eastern and Central Europe. Only after the wave of privatisation of state-owned enterprises had passed, the foreign investment began to flow. The most popular were 'greenfield' investments. As a result, the analyzed countries have become the region to which many foreign corporations from Western Europe shifted the first parts of their production (e.g., assembly) and then the whole factories and manufactures[4]. Also corporations outside the European market (Asian and American companies) were interested in investing in post-communist states. They perceived them as a great opportunity to enter the advanced Western European market (Cieślik, 2012)[5]. The leaders of the investment goals of foreign companies were Poland, the Czech Republic, and Hungary[6]. Eventually, the flow of FDI to Eastern and Central European regions resulted in the internationalization of their production, joining the GVCs and the new international division of labour.

Leaving aside the influence of the redistribution of income among countries with different levels of development, which has already been discussed on numerous occasions in the academic literature concerning the results of globalisation, the introduction of international fragmentation of production has made it possible to boost selected branches of the post-communist countries' economy in which they already had a comparative advantage or at least a fair chance for increasing international competitiveness (Feenstra, 1998). Even though the analyzed countries joined globalization rapidly, they still hold lower positions in competitiveness rankings. In 2012, the leader among European

[2] For example, in 2010, the productivity in Poland was 26 percent of the average productivity in the EU-15, in the Czech Republic 66 percent of the productivity of the average employee in the EU-15, in Hungary 61 percent, in Bulgaria only 32 percent of EU-15 productivity. In 2012, these productivities rose slightly, and a Polish average employee productivity amounted to 67 percent of the average in the EU-15, a Czech employee to 67 percent, a Hungarian employee 65 percent, and a Bulgarian to 43 percent (Eurostat, 2014).

[3] For example, in 2012, in the EU-15 countries the average hourly earnings were €38.6, in Poland €10.4, in the Czech Republic €13.3, in Hungary €11.4, and in Bulgaria €5.0. The most expensive from the analyzed countries was Slovenia where the average hourly earnings were €20.1 (Eurostat, 2014).

[4] The first post-communist economy which opened its market for foreign capital flows during the privatization process was Hungary (Sass & Kalotay, 2012).

[5] The foreign corporations' intentions were very different from those of European companies. The main incentive for capital flows from non-European countries was not the access to the local markets, but access to the EU market and the omission of the customs areas (Ambroziak, 2013).

[6] By the end of 2012, more than 29 percent of cumulative foreign investments of all regions of Eastern and Central Europe had flown to Poland, almost 16 percent to the Czech Republic, more than 14 percent to Hungary, and more than 11 percent to Romania (UNCTAD, 2013).

TABLE 1. **Share of trade turnover with the EU of post-communist states in 2012 (percent)**

Country	Export	Import
Bulgaria	58.4	60.6
Czech Republic	80.9	75.1
Estonia	66.0	80.0
Lithuania	60.5	56.8
Latvia	63.5	78.1
Poland	75.7	74.7
Romania	70.2	73.5
Slovakia	83.9	74.0
Slovenia	68.8	67.2
Hungary	75.8	70.2

Source: author's own study on the basis of Eurostat, 2014.

post-communist countries in the World Economic Forum was Estonia (34). Poland was the 41st, after the Czech Republic (World Economic Forum, 2013).

The EU remains the most important trading partner of the analyzed countries. On average, over 70 percent of trade of these countries is carried out within the EU (Table 1). The most important trading partner for most of the post-communist states is Germany. Only in the cases of Latvia and Lithuania, Germany was not the most important export market in 2012. Germany remains also one of the leading import partners for all the analyzed countries. Accordingly, trade relations with countries outside Europe are limited. Due to the global crisis, the foreign trade of post-communist European countries has suffered a decline as a result of the weakening domestic demand in the EU states. Nevertheless, the states under analysis have not decided to re-direct trade flows towards the emerging economies such as the Asian or African developing countries. The most important commercial contractor from outside the EU is Russia. In the cases of Lithuania and Latvia, Russia is the leading trading partner. However, it should be noted that the Russian market for all post-communist states is more important as a source of energy commodities than a target for export of goods and services.

It should be noted that there are serious methodological difficulties with determining the place of a given country in value networks. One of the reasons for these problems is the lack of a unified method of value-added measurement and the lack of latest data concerning the value-added flow in international exchange. When attempting to determine the place of post-communist European states in GVCs, we should analyse their values added in foreign trade. The first symptom indicating that a country has joined the GVCs can be a decrease in the share of domestic value added in gross exports. This automatically implies an increase in foreign value added and stronger links with the GVCs. For the analyzed countries, it is hard to present a uniform trend in this respect. Generally, all new EU members' share of domestic value added embodied in their gross export was lower than the EU average. Closest to the EU average are Poland, Latvia, and Romania, what may indicate that most of their export is self-subsisting. Nevertheless, this assumption is exaggerated, because a high share of the domestic value added may indicate also low linkages to global production networks. Between 2000 and 2009, we observed a decrease in the relation of domestic value added to gross export only in four countries (Czech Republic, Latvia, Lithuania, and Poland) (Fig. 1). However, this highly simplified analysis does not solve the problem of determining the position of a country in GVCs.

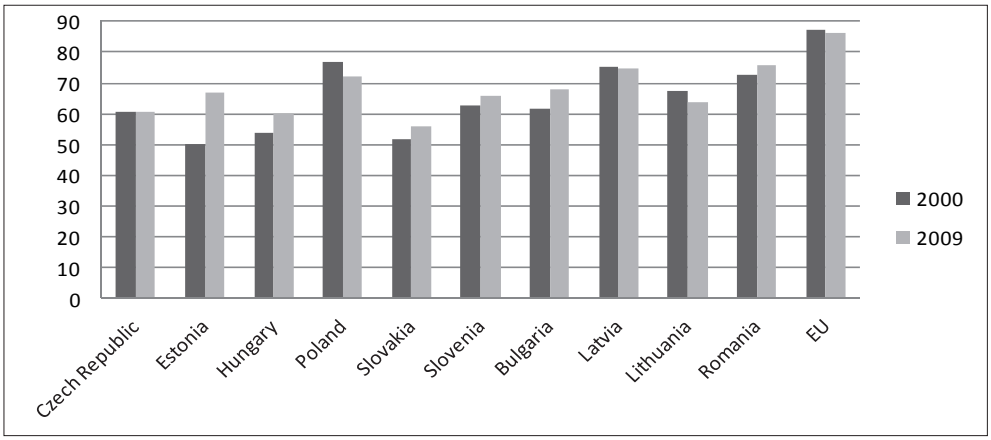

FIG. 1. **Domestic value added in gross export of European post-communist countries and the EU in 2000 and 2009 (percent)**

Source: author's own study on the basis of OECD, 2014.

The actual changes in Eastern and Central European states' value added in exports should be examined in relation to individual sectors of the economies or commodity groups. For example, the automobile industry in Hungary and the Czech Republic has recently been the aim of FDI. This sector has been the leader among all branches in terms of foreign capital flows. This proves a strong internationalization of automobile sectors in these two countries and their integration with global production. However, this tendency does not correspond to changes of the domestic and foreign value added. In both states, the domestic value added embodied in the gross export of automobile industries increased between 2000 and 2009 (OECD, 2014).

When we examine the share of foreign value added included in the products exported by European post-communist states, we can see that the dominating element is the value added from highly developed countries, especially from the EU-15. It means that a large part of Eastern and Central European countries' export is integrated into the European Union's value chains. This phenomenon can be observed especially in Slovakia, the Czech Republic, and Hungary. In these three states, more than 40 percent of foreign value added embodied in the total export originates from the EU-15 countries. In the case of the Baltic States, especially Lithuania, the links in the European chains are not as strong as in other countries. Lithuania's export is more connected to the Russian Federation and Asian markets (OECD, 2014).

An important indication of participation in GVCs is the share of imports used (directly and indirectly) for the current production of goods and services for export (so-called re-exported intermediates), as it provides us with the information on the position of the analyzed countries in GVCs. In 2009, intermediates re-exported by Eastern and Central

European states varied between 32 percent (Romania) and 67 percent (Slovakia) of the total intermediate imports. Lithuania's share of re-exported intermediates in 2009 was also high – more than 60 percent. This percentage is quite significant as compared with the United States or Japan (approximately 20 percent), but it is still below the values achieved by Luxembourg, Singapore or Taiwan (approximately 70–80 percent); they are largely based on imported parts which are then assembled and exported as final products. Developed countries with expanded domestic markets, such as the United States or Japan, rely more than developing countries on their own assembled parts, what explains the gap in the share of re-exported intermediates between developed economies and post-communist states. Between 2000 and 2009, re-exported intermediates by European post-communist states as a percentage of total intermediate imports increased slightly, which implies a deterioration of the region's position in the level of advancement of production as compared with 2000 (Feenstra, Hanson, 1999) (OECD, 2014) (Fig. 2).

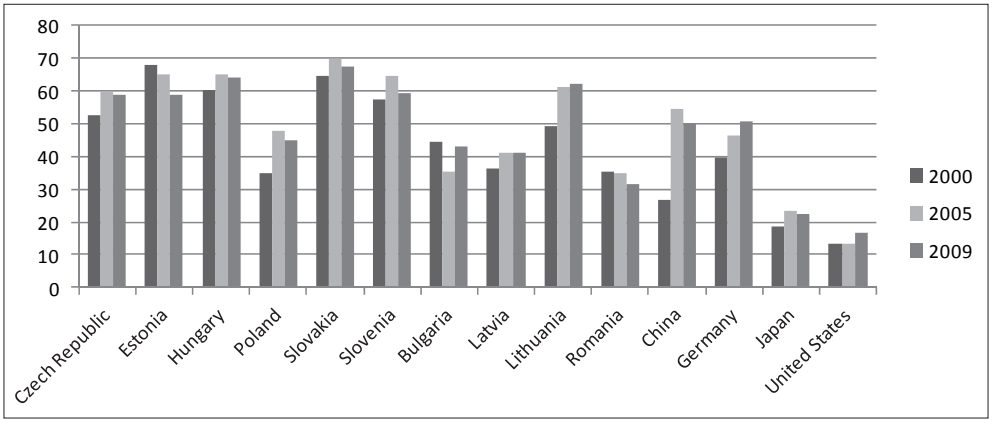

FIG. 2**. Share of re-exported intermediaries in total intermediate imports of selected countries in 2000, 2005, and 2009**

Source: author's own study on the basis of OECD, 2014.

Due to the fact that transport equipment (especially automobile industry) and electronic and optical equipment are characterised by the highest level of foreign value added embodied in many European post-communist countries' exports, it is worth analyzing changes in the share of value-added in these two sectors. These branches are also considered very attractive to foreign investors, especially in Slovakia, the Czech Republic, Hungary, and Poland (Table 2). Transport equipment holds an important position in the export structure of most of the analyzed countries in terms of revealed comparative advantages[7]. In turn, the group of electronic and optical equipment has been improving its position in

[7] In order to express the relative comparative advantage of a given commodity group in exports, it is most appropriate to calculate the international specialisation index. For this purpose, we have used the revealed comparative advantage index (Balassa, 1965). Generally, countries export primarily the products in which they have a comparative advantage.

TABLE 2. **FDI inflows to electronic and optical equipment and transport equipment in selected countries in 2002 and 2012 (as % of FDI inflows to manufacturing)**

	Electronic and optical equipment		Transport equipment	
	2002	2012	2002	2012
Slovakia	10*	19**	9*	19**
Hungary	24	12	24	11
Czech Republic	17	30	16	29
Slovenia	11***	8	11***	8
Poland	14	17	13	14
Estonia	2*	6	2*	6

* 2003; ** 2011; *** 2006.

Source: author's own calculation on the basis of (OECD, 2014).

terms of revealed comparative advantages for the last years. Considering the transport equipment industry, in 2009 the foreign value added was largest in Slovakia, Hungary, the Czech Republic, and Slovenia. The largest world automobile corporations have located their factories in these countries. The same countries, except Slovenia, are characterized by a great share of foreign value added embodied in exports of electronic and optical equipment. The analyzed countries were also characterised by a higher index of the number of production stages than other states in the analyzed sectors. This signifies a considerable internationalization of these two branches, their dependence on foreign components and, consequently, strong links within GVCs (OECD, 2014) (Fig. 3, Table 3).

3. The role of post-communist European countries in global value chains – an advanced approach

A more complex method of measuring European post-communist states' participation in GVCs is a decomposition of the value added in gross exports, followed by determining the foreign value added in total gross domestic exports and the domestic value added in exports of the trade partners of a country. The adopted methodology is based on the approach elaborated by researchers from the National Bureau of Economic Research. According to the NBER methodology, total exports consist of four components: each country's domestic value-added embodied in exports of final goods and services that become part of direct import; a country's domestic value-added embodied in exports of intermediate inputs used by the direct importer to produce final goods and services for its domestic market; a country's domestic value-added embodied in intermediate exports used by the direct importer to produce goods and services for export to third countries (including Central and Eastern European countries); value-added from trade partners embodied in a post-communist country's total exports (Koopman, et al., 2010). These

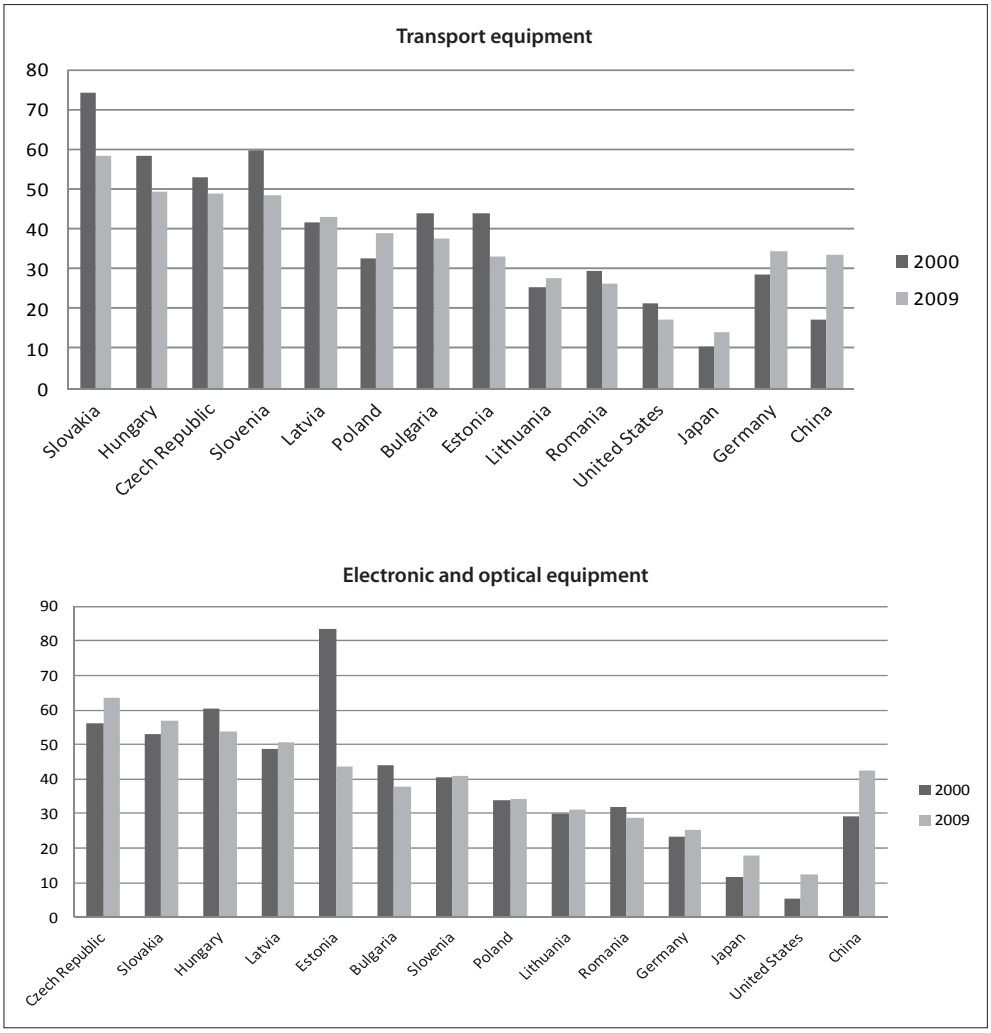

FIG. 3. **Percentage share of foreign value added in post-communist states' individual sectors in 1995 and 2009**

Source: author's own study on the basis of OECD, 2014.

methods describe the position of country in the downstream and upstream relations in GVCs. A higher value of the domestic value added in the exports of trade partners indicates a more advanced position of a country in GVCs, i.e. the country's movement towards upstream segments. With an increasing value of the share of foreign value added embodied in total domestic exports, we should expect the country's position in GVCs to deteriorate, i.e. to move towards downstream markets. In this section, the decomposition of the value added in the analyzed states and selected sectors was carried out. Due to length limits of the publication, the analysis presents only the results of calculations.

TABLE 3. **Indices of the number of production stages in transport equipment and electronic and optical equipment in selected countries in 2000 and 2009**

	Transport equipment				Electronic and optical equipment			
	Index of the number of production stages, international		Index of the number of production stages, domestic		Index of the number of production stages, international		Index of the number of production stages, domestic	
	2000	2009	2000	2009	2000	2009	2000	2009
Slovakia	1.8	1.6	1.2	1.4	1.3	1.4	1.4	1.5
Hungary	1.4	1.3	1.4	1.3	1.2	1.5	1.3	1.4
Czech Republic	1.2	1.3	1.6	1.7	1.4	1.4	1.3	1.2
Slovenia	1.4	1.2	1.4	1.4	1	1	1.4	1.4
Latvia	0.9	1	1.6	1.5	1.7	1.1	1.1	1.3
Poland	0.8	1	1.6	1.7	0.6	0.8	2.5	2.7
Estonia	0.8	0.8	1.4	1.5	1	1	1.3	1.3
Lithuania	0.6	0.7	1.3	1.4	6	0.7	1.5	1.4
Romania	0.7	0.6	1.6	1.5	0.5	0.6	1.6	1.7
Bulgaria	0.9	0.8	1.5	1.9	1	0.9	1.4	1.7
Germany	0.7	0.8	1.9	2	0.9	1	1.5	1.4
China	0.4	0.5	2.8	3.1	0.3	0.9	1.7	1.6
United States	0.5	0.5	2	1.8	0.3	0.4	2.1	2.1
Japan	0.2	0.3	2.7	2.6	0.1	0.3	1.5	1.5
EU	0.3	0.3	2.3	2.4	0.3	0.4	2	2

If the value of the index is close to zero, the intermediaries stem from the domestic market. If the index value is close to one, the intermediaries originate from a foreign market. The sum of domestic and international production stages is the length of GVCs across sectors.

Source: author's own study on the basis of (OECD, 2014).

The analysis of the decomposition of value added includes, apart from the post-communist states, also the EU-27, Germany, the United States, Japan, and China as important links in GVCs. The results of the study show that the shares of value added from trade partners embodied in a country's total exports are very diverse. The largest share of foreign value added embodied in total domestic exports in 2009 was in Slovakia (more than 44 percent), while the lowest share of this type of value added was in Romania (24 percent). This means that in these states a considerable part of exports relies upon the foreign value added. These shares may be compared to those of the EU-27, the United States or Japan, where the value added from trade partners embodied in total exports is relatively low, but we should be cautious about these comparisons. Developed countries with extended domestic markets and large economies are more self-sufficient, which results in a lower share of foreign value added embodied in their exports. A positive trend is observed in the share of domestic value added contained in exports of European post-communist states' trade partners. Most of the analyzed countries exceeded the EU-27 average; however, these shares were still below the level achieved by the United States

or Japan which may be treated as a model. An especially high "value added from country embodied in trade partners' total exports" characterized Latvia and the Czech Republic in 2009 (29.8 and 22.2 percent, respectively. Even Poland exceeded the EU average, and Lithuania was very close to this average value. We observe a high degree of participation in GVCs in the analyzed countries and a great importance of participation in GVCs for a national economy (Table 4).

In fact, the results of the study show bidirectional links of the analyzed states in vertical specialisation, although with a stronger tendency to hold lower positions in GVCs than developed countries, especially in the more technologically advanced sectors of the economy[8]. The greater prominence of downstream relations is proven by the indicator of the relative position in GVCs. The higher the value of the indicator the higher the country's position within GVCs (upstream segment) should be. The borderline value between segments is 1. As a result, European post-communist states are positioned much lower in GVCs than the United States, Japan, and even the EU average. The indicators of these countries' relative positions in GVCs rank from 0.40 for Lithuania to 0.96 for Romania. It is an alarming fact that many of the European post-communist states' positions in GVCs have been rapidly deteriorating in the recent years. Only the Czech Republic, Estonia, Hungary, and Romania slightly improved their positions. This indicates that the whole region's role as a link in the chain of production of the global economy is decreasing. It is worth mentioning that in 2000 Latvia was the only country that crossed the borderline and entered the upstream markets. However, Poland was placed exactly at the borderline that year (Table 4, Fig. 4).

On the one hand, we observe a great share of European post-communist states in downstream segments in relation to well-developed countries. This means that the region of Central and Eastern Europe is an importer of foreign value added. On the other hand, moving toward the EU average of domestic value added embodied in trade partners' exports testifies to the fact that the region is entering the upstream in the cross-border production process.

[8] According to a number of international rankings, e.g., the ICT Development Index (International Telecommunication Union, 2011), the Global Innovation Index (Boston Consulting Group, 2012), or the Innovation Union Scoreboard (UNU-MERIT, 2013), Central and Eastern European states hold lower positions than Western European countries. This means that the field of technological development still needs improvements. The study of the position of Central and Eastern European states in GVCs shows that the region is still perceived as a supplier of low- and middle-processed products rather than a high-tech manufacturer. We observe the above-mentioned phenomenon in the post-communist states that have taken advantage of FDI flowing to more advanced sectors (e.g., automobile). We can attempt to explain the lower technological advancement of post-communist countries by their low share of expenses on research and development. By comparison, the average for the EU-27 in this regard was 2.03 percent GDP in 2012, and for Poland it was only 0.77 percent of GDP. The analyzed countries rank far behind Western Europe in terms of patents, total R&D personnel, and R&D personnel per capita (Eurostat, 2014).

TABLE 4. **The degree of participation of selected countries in GVCs in 2000 and 2009**

	Value added from trade partners embodied in total exports (of country total exports)		Value added from country embodied in trade partners' total exports (% of country total exports)		Degree of participation in GVCs (% of country total exports)		Importance of participation in GVCs for the national economy (% of country GDP)
	2000	2009	2000	2009	2000	2009	2009
Czech Republic	39.18	39.39	22.2	23.0	61.38	62.39	25.80
Estonia	50.06	33.22	18.7	21.3	68.76	54.52	24.85
Hungary	46.19	39.91	17.2	18.7	63.39	58.61	25.40
Poland	23.33	27.89	24.1	20.5	47.43	48.39	10.84
Slovakia	48.26	44.35	21.2	17.9	69.46	62.25	30.77
Slovenia	37.52	34.40	20.6	18.2	58.12	52.60	26.15
Bulgaria	38.13	32.14	20.2	15.7	58.33	47.84	15.35
Latvia	24.62	25.18	29.8	24.3	54.42	49.48	10.69
Lithuania	32.56	36.05	17.7	14.1	50.26	50.15	26.00
Romania	27.39	24.18	20.8	21.9	48.19	46.08	13.32
EU-27	12.63	13.62	18.0	17.8	30.63	31.42	4.29
China	18.81	32.63	13.8	13.4	32.61	46.03	11.84
Germany	24.40	26.64	24.4	22.8	48.80	49.44	17.34
United States	8.88	11.29	31.1	28.5	39.98	39.79	4.02
Japan	9.91	14.79	26.1	33.0	36.01	47.79	5.87

Value added from trade partners embodied in country total exports = backward indices x gross export.
Value added from country embodied in trade partners total exports = forward indices x gross export.
Degree of participation in GVCs – to what extent countries are participating in GVCs; the GVC participation index adds the foreign value-added in exports and the share of domestic value-added in exports of intermediate inputs used for exports in third-countries.

Source: author's own calculations on the basis of OECD, 2014.

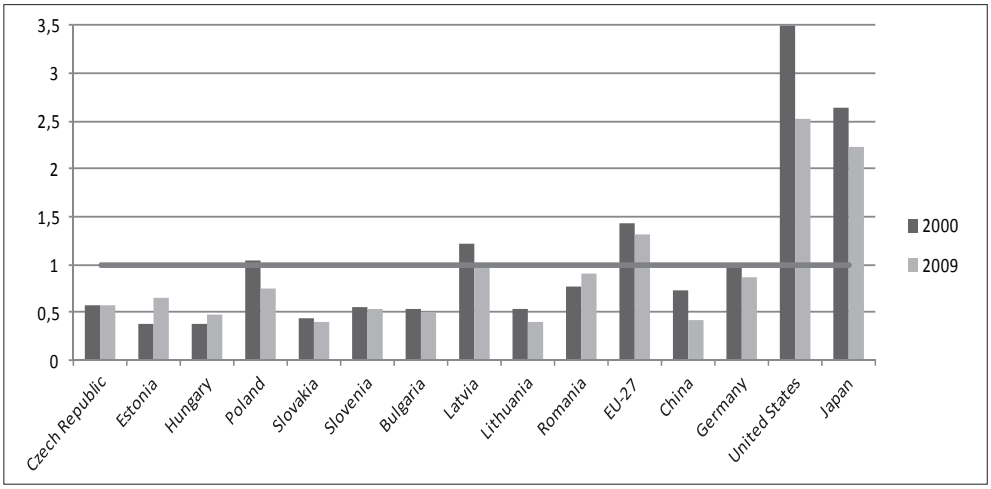

FIG. 4. **Relative position of European post-communist states and selected countries in GVCs in 2000 and 2009**

Relative position in GVCs was calculated on the basis of the relation between the value added of a country embodied in trade partners' total exports and the value added of trade partners embodied in a country's total exports.
The higher the value of the index, the more upstream the country exporters are situated in GVCs.

Source: author's own calculations on the basis of OECD, 2014.

DIAGRAM 1. **European post-communist states and selected countries in GVCs regarding the production of transport equipment as well as electrical and optical equipment (data of 2009)**

Arrow up – upstream segment/market.
Arrow down – downstream segment/market
Research covers the countries available in the OECD Statistics database. The bases for creation of GVCs were the relative positions of chosen states in the industry.

Source: author's own calculations on the basis of OECD, 2014.

At this point, it is also worth looking closer into the situation of Germany. It has a relatively high percentage of foreign value added contained in exports, GVCs are of great significance in its national economy, and the share of imports for the current production in its exports is much higher than in other developed countries. The primary reason for this fact is the specific role played by Germany as a middleman in the trade of intermediate goods, mainly with the countries of Central and Eastern Europe. A particularly pronounced vertical integration between the post-communist countries and Germany can be observed in more advanced products. These strong relations between the countries are the consequence of differences in labour costs and workforce qualifications, as well as of sectoral and cultural similarity and geographical proximity (IMF, 2013).

We could also try to identify the position of European post-communist states depending on the place they occupy in each sector. Two most internationalized branches have been selected for this analysis: transport equipment and electrical and optical equipment. Theoretically, according to OECD classification, these sectors belong to medium and high-technology industries. However, it should be noted that in practice these branches in the analyzed states focus more on assembling imported parts than on manufacturing from the scratch. In the production of transport equipment, five of ten post-communist countries ranked in the upstream production chain (Czech Republic, Romania, Hungary, Slovakia, and Poland). The automotive industry is the domain of the states of Central and Eastern Europe, which are in the lead of the supply network. In the recent years, it has become the driving force

behind exports and has attracted considerable foreign investments to these countries. The transport industry in the Baltic States, Slovenia, and Bulgaria does not have such a long tradition as a result of which these countries are positioned low in GVCs. The commodity group of electrical and optical equipment, in turn, has traditionally been the domain of the "Asian Tigers", and many years will pass before the European post-communist states' economy achieves a comparable level of technological advancement. Hungary and the Czech Republic held the highest positions in this industry in 2009, unfortunately, far behind the developed Asian countries (Diagram 1).

4. Conclusions

The European post-communist states have completely transformed their economies and as foreign trade structures. The trade policy of the analyzed countries favours a greater integration with global economies, especially with the EU markets. The synchronization of economic activity between countries of Central and Eastern Europe and the EU-15 has resulted in more correlated business cycles (Iossifov, 2014). Due to a close integration of EU markets, post-communist countries have become important links in cross-border production process. We also observe stronger connections in terms of trade and capital flows in advanced sectors and, consequently, the growing interdependence among these markets. A large share of exports from the Central and Eastern Europe region passes through EU-15 production chains. However, this is some type of the hub-and-spoke model, where the 'hub' are the EU-15 states and the 'spokes' are post-communist countries. To decrease this dependence, the post-communist European region should not only concentrate on the euro area market, but also shift its interests in emerging markets to Asia, Africa, or Latin America (Liberska, 2013).

The study leads to the following conclusions. First, the degree of post-communist states' participation in GVCs is diverse. More integrated are countries with greater connections to Western European countries, especially Germany. Second, a large share of exported goods from the post-communist states passes through GVCs in Western Europe. Third, exporters from Central and Eastern Europe are usually located more in the downstream segments of production than in the upstream markets. Fourth, the present study has some limitations deriving from data accessibility. Attempting to examine changes in the value added of international trade, the author has referred to the available data. Since 2009, trade trends have been unfavourable for most of the EU countries, so this analysis should be broadened by this period. Applying these years to the study might change the results. The conclusions consider only the first of the catastrophic years, and the results of the survey need to be treated with precaution.

To sum up, despite this negative aspect of the dependency and the exposure to shocks from the EU-15 markets, the analyzed countries are expected to continue the model of

integration with the EU economy in the future, especially in terms of GVCs. However, the processes of integration in foreign trade and cross-border production process will likely proceed with varying intensity.

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