Economic upgrading: global value chains participation and multinational enterprises

Artur Klimek

Wroclaw University of Economics and Business

Very preliminary draft – please do not cite

Abstract: This paper links global value chains (GVC) integration and operations of multinational enterprises (MNEs) in the context of upgrading host economies. Economic upgrading is referred to as higher proportion of domestic value added as a buyer (backward GVC links) as a result of foreign direct investment (FDI).

The particular attention is paid to the impact of GVC on selected Central and Eastern European (CEE) economies. An econometric model is estimated using panel data relating to 44 sectors for four CEE economies over the period 1995-2018. A primary source of data is the latest edition of the TiVA (Trade in Value Added) database published at the end of 2021. We combine it with various country-specific characteristics as well as measures pertaining to MNEs.

1. Introduction

Participation in international economic flows proved to have a positive impact on economies centuries ago (e.g. (Smith 1776), (Ricardo 1821)). However, the way of participating evolved over time. First it took a form of trade, later foreign direct investment (FDI), then global value chains (GVCs). This is a new way of looking at classical flows of trade and capital. Particularly important is that GVCs bind flows of intermediates, finished goods, and services at various stages of value chains with flows of capital – FDI. The approach to effects of global flows should change as the approach to flows has changed from trade in finished goods to trade in tasks (Grossman and Rossi-Hansberg 2008). The GVC-FDI nexus has been highlighted in the study of the European Commission and FDI has been referred to as "a proxy of GVC participation" and regional perspective on GVCs was analysed "always through the lenses of FDI" (Comotti, Crescenzi and Iammarino 2020, 9).

Participation in global value chains (GVC) has been considered as a more favourable source of upgrading for countries, especially those of lower level of development. There are several arguments supporting this proposition. First of all, participation in the GVC is a long-term opportunity for cooperation. It stems from the micro foundations of GVC, where firms are not randomly selected and easily changed as sides investment significant efforts into establishing the cooperation. Therefore the stability of firm-to-firm relations increases the stability of the economy. Moreover, even if the contact between a foreign lead firm and a local contractor is cancelled the established links in a country allow to start cooperation with another firm, thus avoiding moving to another country. All in all the stage of GVC remains in the same economy. Secondly, thanks to the fragmentation of production, it is enough for a country to specialise in one of the stages in order to participate in the GVC. It means that local participants do not need to organise the overall flows of value designed to create a final product.

However, we should also address the issue of potentially negative impact of participation in GVC. The key element is trapping economies in activities of lower value added. Lack of incentives to create own GVC may mean that firms participating in existing GVC may only execute activities assigned by a lead firm. Another element are limited linkages to domestic economies. This may actually increase the propensity of participating countries to remain dependent on foreign links and technology thus increasing the issue of middle income trap (Knez 2022).

Thus the question that arises is about the impact of GVC on participating economies. In this respect we should focus on various forms of economic upgrading. It can pertain to the quality of exported items. It can also mean higher productivity and higher employment. It can also refer to industrial upgrading (Tian, Dietzenbacher and Jong-A-Pin 2021). Industrial upgrading is defined as "the process by which economic actors – nations, firms and workers – move from low-value to relatively high-value activities in global production networks" (Gereffi 2005, 171). However (Gereffi 2019), used this definition to discuss economic upgrading in a broader sense. His approach in spite of mentioning "nations" (which might be also understood as economies) focused on predominantly on firms. Firm-level approach to improving position in GVC includes the dimensions such as: product upgrading, process upgrading, functional upgrading and intersectoral upgrading (Humphrey and Schmitz 2002). We argue that these are different dimensions and the sum of positive effects for firms in an economy is not translated into positive economy-wide effects.

We take into consideration selected CEE economies, which have been important recipients of FDI since the beginning of their transformation in the 1990s. The selection of CEE economies is also justified by the high level of intensity of FDI in those economies. It is translated into significant position of MNCs in those economies. FDI has been considered a driving force for economic upgrading of CEE economies and the impact of foreign investment has been in general positively assessed. Moreover, policies of CEE economies have been designed to provide incentives to foreign investors in their operations in those countries. One of the expected elements has been to increase the exports of host economies. In gross terms, foreign firms are responsible for the majority of exports in CEE economies. However, the question which has to raised is about the local contents of this exports and what is the role of MNCs. It means that foreign firms are responsible for significant proportion of production or sales, however it has not been studied with respect to GVC and value added in those economies.

Moreover, the link between FDI and GVC has not been explicitly addressed with respect to the specific setting. CEE is unique by its geographic position and historical evolution of links with Western Europe. Therefore the issue worth addressing is how global are GVC (Los 2015) and what is the character of CEE participation. We assume that CEE are attached to regional GVC hubs. Strong ties to large European economies of Germany, France or the United Kingdom should significantly influence the participation in GVC. Therefore the most important question is to what extent GVC influence economic upgrading of the countries. At the moment we know

that CEE economies are important recipients of FDI and participate in GVC, but we do not know how these two elements simultaneously contribute to the economic upgrading. There is also a question if participation in GVC may help to overcome the medium income trap.

The paper is aimed at contributing to the literature in three areas. First, we want to clarify the link between GVC and FDI in the context of economic upgrading. In spite of an intuitive link between investments by foreign-owned firms and GVC, there is a very limited and inconclusive evidence on the economic performance of participating economies. The link has been mainly overlooked or FDI was studied in separation from GVC. On the one hand, it was taken for granted that MNC are important for establishing GVC. They were treated as the central element. On the other hand, the studies have not focused on the relationship in a direct way. Therefore we aim at verifying the role of MNC in GVC, but from the perspective of economic upgrading. Second, we add to the discussion regarding the effects on GVC participation. It is crucial to investigate the effects of FDI on domestic value added. This issue is important from the policy point of view as FDI is expected to boost transition of CEE economies toward higher value added activities. In the end, we want to empirically investigate the impact on selected CEE economies using latest available date on trade in value added.

The rest of the paper is organised as follows. Section 2 provides insights into the economic upgrading through participation in GVC, but also draws on earlier findings regarding FDI. This section also deals with earlier findings regarding participation of CEE economies in GVC. Section 3 delivers some stylized facts regarding FDI and GVC participation in selected economies. Section 4 provides information of the econometric strategy. Section 5 provides results of the estimation. Section 6 contains concluding remarks.

2. Previous theoretical and empirical contributions

The role of GVC in the global economy evolved since the notion was introduced in 1990s. Since then many contributions have dealt with various aspects of GVC. It was supported by the analytical apparatus developed thanks to introducing input-output tables (see e.g. (Timmer, et al. 2015)). Such a new empirical approached allowed also for investigating the upgrading effects for economies participating in GVC.

We should first explain what do we mean by the economic upgrading through GVC. It is predominantly understood as a greater proportion of domestic value added in exports of an economy. (Los and Timmer 2018) provide an explanation of the value added in exports

depending on its use: value added consumed abroad, value added in exports and value added used in the final stage of production.

(Tian, Dietzenbacher and Jong-A-Pin 2021) provide evidence that GVC participation has different effects on developing and developed economies. Backward GVC participation helps developing countries thanks to accessing sophisticated inputs. Developed countries gain more from forward participation. The case of Poland and other CEE economies is distinctive as we study medium income countries. From the empirical point of view it is important to relate the level of development of partner countries and measure the importance of bilateral flows. However, we choose the industry dimension therefore we lose the possibility to link it the level of development of partner countries. (Pahl and Timmer 2020) referred to contribution of GVC to economic upgrading as "mixed-blessing hypothesis". It means that foreign firms working with specific technologies may not provide many opportunities towards economy-wide effects.

Another fundamental issue which needs to be addressed in the relationship between FDI and GVC. Earlier studies on economic upgrading through GVC participation included FDI, however treated it as one of the factors behind the economic policy of a country (Kummritz, Taglioni and Winkler 2017). Moreover, they were measured on the country level, but in this paper we focus on FDI in particular sectors. Actually the GVC are closely related to FDI. Because of the need to trade in intermediates the FDI flourished as MNC had to build presence abroad. Indeed the FDI-trade nexus is frequently not about the final goods (then computing the economic impact would be straightforward and derived from gross trade). It has been related to the organisation of supply chains within MNC. According to (Baldwin and Venables 2010) MNCs can organize GVC in the form of snakes (sequential production) and spiders (production hubs).

FDI has been considered frequently as a factor influencing the level of participation of an economy in GVC, however not from the economic upgrading perspective. Indeed FDI policies towards more openness support further engagement of developing economies in GVC (OECD 2015). Moreover, the relationship may be the other way round. Participation in GVC has been considered as a factor attracting FDI to an economy (Martínez-Galán and Fontoura 2016).

Foundations to economic impact of GVC can be traced to the earlier discussion regarding the effects of FDI in host economies. One strand of the literature focuses on effects of FDI on the productivity, technology transfers. Naturally, there are many inconclusive results depending on

the analytical approach as well as data availability. The effects on one of the economies of Central and Eastern Europe were presented by (Javorcik 2004). She studied the results for relatively small and open Lithuanian economy.

On average the vertical linkages through FDI has been considered as significant for host economies (either as buyer or supplier) (Havranek and Irsova 2011a), however insignificant for horizontal linkages (Havranek and Irsova 2011b). The findings are important for analysis of GVC, which has been predominantly focused on vertically-linked FDI. (Alfaro and Charlton 2009) studied the role of vertical linkages in FDI. Their findings regaring the importance of vertical FDI in overall flows of FDI point that the role of FDI in GVC is greater that anticipated by the earlier evidence that majority of FDI is of horizontal nature.

The crucial element in the discussion on FDI and GVC are MNCs. Anyway the analytical approach to FDI and MNCs activities present significant discrepancies (Cadestin, et al. 2018). FDI is a flow or stock of capital. It is not always about actual business operations, but also about taxation or round-tripping (Adarov 2021). MNCs report sales, assets or liabilities. These differences influence the analysis with respect to GVC.

Moreover, the reach of GVC may be greater than just boundaries of a MNC. Firms participating in GVC do not have to be a part of MNC (irrespective of the level of control by the headquarters). Purely domestic firms may also operate within GVC and provide inputs, which can be either used by affiliates of MNC in the same country or exported to affiliates of a MNC in third countries. It means that much of GVC may also take part outsides boundaries of a lead firm. This is also a main hurdle in the analysis of the relationship. However, lead firms try to establish operations in key economies of the value chain in order to oversight the operations. Another element is the orientation of MNC towards market or sourcing. The conceptual approach was provided by (Davis and Markusen 2021). However, they have not focused on the upgrading effects of GVC. They rather focused on presenting the new reality of FDI and MNC in the GVC framework. Therefore economic upgrading through GVC is a multifaceted issue and FDI may be linked with it, but the direct relationship is not expected. However, the relationship is important for assessing effects for participating economies.

The link between GVC and FDI is sensible, but it is not a fixed relationship. We do not aim at analysis of operations of MNCs in GVC, but to establish a link between flows and stocks of foreign capital behind the establishment of MNCs and economic performance of countries. The

channels of participation may be through backward and forward linkages. Backward participation means providing access to technologically sophisticated and quality intermediates. Forward participation means organising foreign demand for intermediates and finished goods produced in host economies. However, in this paper the type of participation is not a central point as we focus on the effects of FDI on overall GVC participation.

Some approaches to GVC and FDI took a form of case studies, which allowed for in-depth analysis of a country or firm. The analysis of investments of Samsung in Vietnam concluded that policies may support building some linkages between local firms and the lead firm, however not of a direct type, but rather through various layers of suppliers (Yee-Siong, Kokko and Seric 2019). Such findings are valuable from the perspective of potential upgrading effects of GVCs as local firms do not need to obtain a very high level of capabilities to become direct suppliers, but may still cooperate with the lead firm through arrangements with other firms. On the other hand, the fact that a typical GVC consists of many layers also hinders direct interaction between lead firms and local partners, thus confining them to lower value-added activities.

There is a strong link between CEE and Western EU economies with respect to technology transfers through GVC. It takes the form technology embedded in inputs imported from parent economies (ECB Working Group on Global Value Chains 2019). Importantly, the same study suggested limited quality upgrading of intermediates exported to parent economies. Therefore the links as buyer are expected to be main elements of positive changes due to GVC participation. The productivity increase slowdown in CEE economies was at the same time related to drop in technology creation in parent economies, but more importantly from CEE perspective – limited absorption capacity. It means there are limits to positive influence of GVC participation and we cannot expect linear changes if the value of foreign inputs rises.

In the context of GVC and value added trade an issue of monetary policy in stimulating international competitiveness of CEE economies emerges. For a long period of time it has been argued that independent exchange rate policies sometimes aimed at depreciation of local currencies help exporters. However, if more value added has been imported into the economies such claim have little substance. The macroeconomic impact of GVC for CEE may be also revealed in working conditions. The greater involvement in GVC in CEE economies with large tradable sectors caused worsening working conditions measured as the prevalence of temporary work (Nikulin and Szymczak 2020).

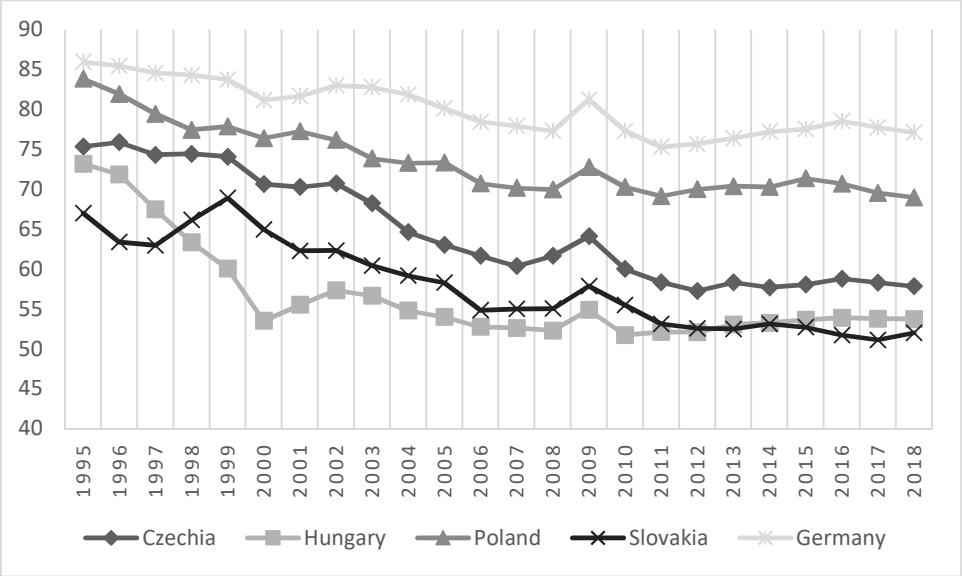
3. Stylized facts regarding GVC and FDI in selected CEE economies

The main research question is to what extent FDI is related to the domestic content in exports of selected CEE economies. Therefore the starting point should be presentation of the development of the indicator in selected economies. In general, all CEE economies present downward sloping trend line for their domestic value added (DVA) (fig. 1). The decreasing domestic content means that exports of those countries consist of higher foreign value added.

(Hagemejer and Ghodsi 2017) studied the position of CEE economies in GVC with particular attention on the results of European integration and concluded that CEE converged with the trend of moving downstream observed in Western European economies. It was against the major trend in other emerging economies (especially Asian), which moved more upstream in GVC. The authors also mentioned the role of foreign direct investment in CEE in contribution to GVC, however the explicit evidence for the relationship has not been provided. The role of CEE in GVC has been frequently assessed as highly dependent on Western Europe. This has been confirmed both on the country-level, but also in some industry-level studies. (Sturgeon and Van Biesebroeck 2011, 181) put Eastern Europe together with Mexico as "dependent appendages of adjacent regional production systems". It was also confirmed that many value chains exclude local participation, but are purely designed for the purpose of processing foreign content.

We also present the value for the main trading partner of those economies as well as the core of European GVC hub – Germany. The slope for the economy was also negative, however the decreasing of the domestic content less steep. Over the studied period the value for Germany decreased of 8.9 pp, while that of Hungary of almost 20 pp. Hungary and Slovakia reported the lowest values for domestic content – slightly above 50%. The largest economy in the sample reported smallest negative change in DVA and at the same time remained the most dependent on the domestic contents in exports. Actually, the result of Poland resembles more that of Germany, than other CEE economies.

Figure 1. Share of DVA in gross exports of selected countries

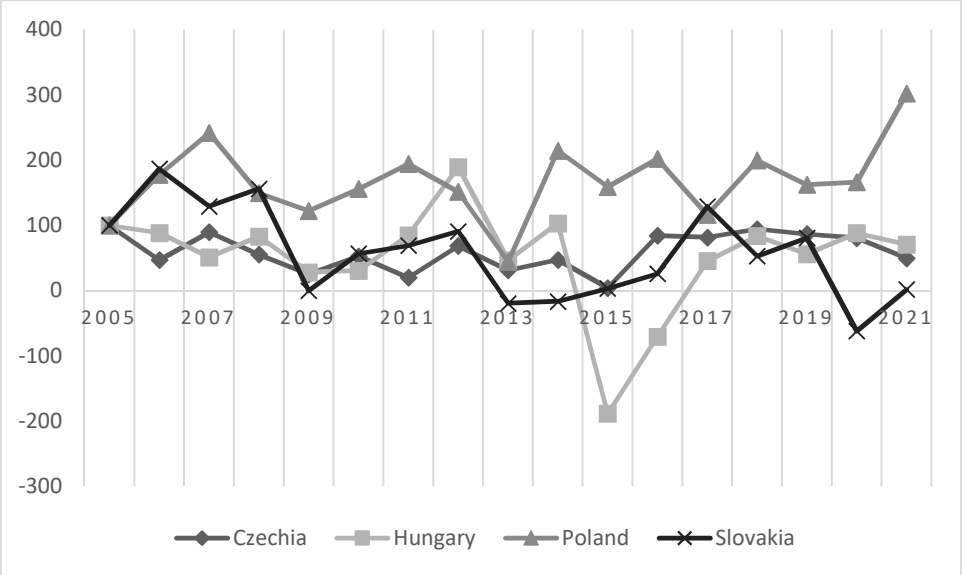


Source: own elaboration based on OCED data

The countries under consideration have been allocated to different categories with respect to the level of participation in GVC (Comotti, Crescenzi and Iammarino 2020). Poland has been put in the group of "Forward GVC participation" meaning lower foreign value added in exports and higher domestic value in other countries exports. Czechia was considered as "High GVC integration" with both high level of foreign value added in exports and high domestic value added in other countries exports. Slovakia and Hungary were engaged in "Backward GVC participation" meaning that they are highly dependent on foreign inputs, however contribute relatively little to other countries exports. One of the factors behind the pattern is the size of an economy as larger economies can source more locally, while smaller economies are more dependent on foreign inputs. Naturally, this is not the only factor and technological sophistication of industrial production should be also considered. Additionally, countries may move along the value chains. Another approach distinguished four main groups of economies participating in GVC (The World Bank 2020). Over the period of 1990-2015 Poland moved from the group "Limited manufacturing" to "Advanced manufacturing", while Czechia after completing the same stage upgraded in 2012 to the group "Innovative activities". Importantly the indicators were based among others on the share of domestic value added in exports.

The value of global FDI rebounded to pre-pandemic results in 2021, however it was mainly in higher income economies. Particularly the emerging and developing economies faced lower dynamics when it comes to greenfield projects (OECD 2022). Among the CEE countries the evidence in mixed (fig. 2). Over the period of time 2005-2021 most countries did not report dynamic changes in the flows of capital. In general the values oscillated close to the levels of year 2005. The position of Slovakia deteriorated significantly in this measure, while Poland in year 2021 reached the value three times that of 2005. It means we can observe divergence in the dynamics of selected economies.

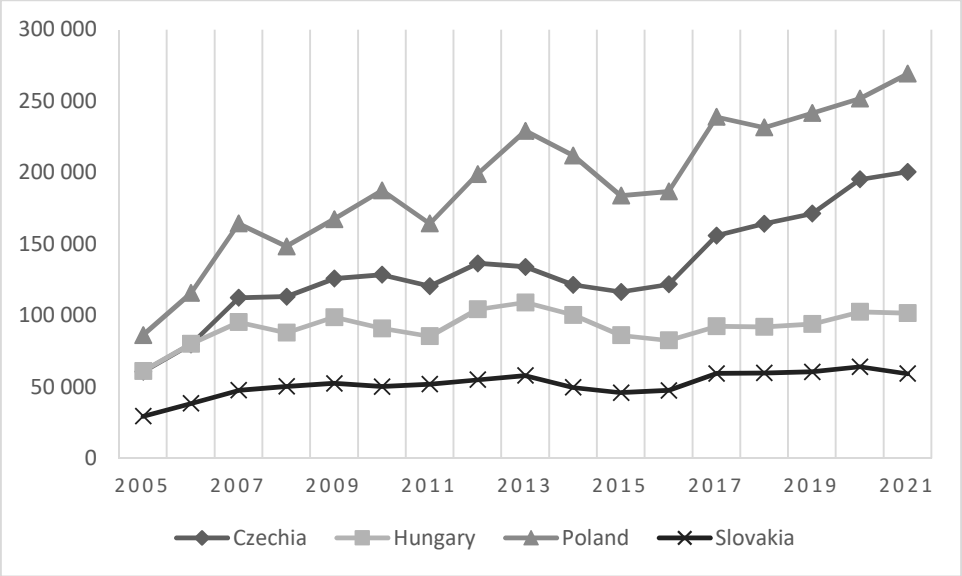
Figure 2. Dynamics of FDI inflows to selected CEE economies (2005 = 100)



Source: own elaboration based on OCED data

It has been long argued that FDI stocks present better illustration of the long term capital engagement than FDI flows. Therefore our attention will be on the long term trend in building the FDI stocks in selected countries (fig. 3). In spite of the volatility of FDI flows presented earlier, there is a clear upward trend when it comes to the stock of FDI. Naturally, there are large differences in absolute values between the analysed countries mostly due to the absolute differences in size of particular countries.

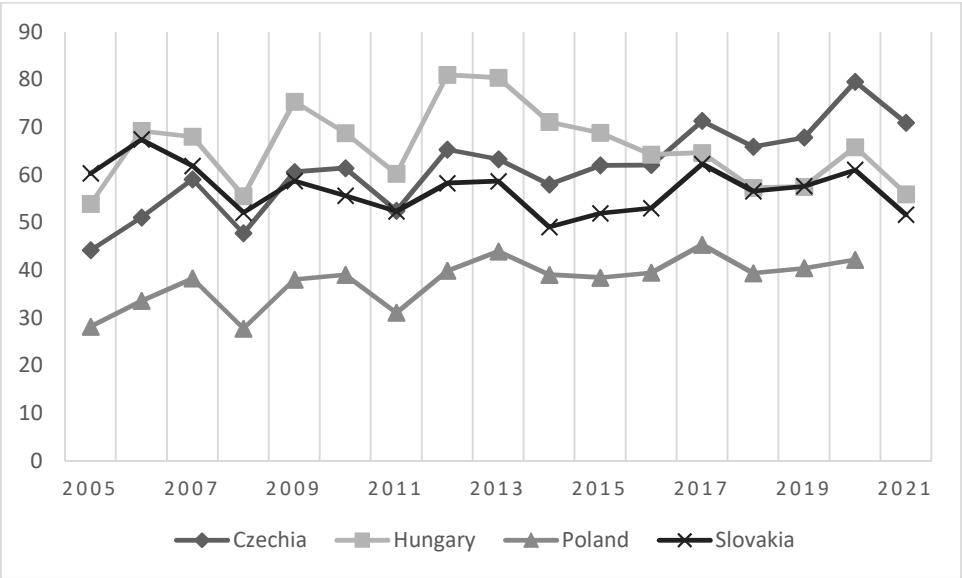
Figure 3. FDI stocks in V4 economies (in USD millions)



Source: own elaboration based on OCED data

A pretty reverse order can be seen when FDI stock is related to the size of an economy (fig. 4). We could also conclude that in the beginning of the analysis the economies presented perfectly reverse order, however the position of particular countries evolved over time. The largest economy in the sample – Poland – has the lowest FDI intensity. Then smaller economies are most robust in this respect. Czechia presents particularly strong position and it should be also considered together with the high absolute value. It confirms high level of integration into global economy, but also high level of dependence of activities by foreign investors.

Figure 4. FDI stock as a share of GDP



Source: own elaboration based on OCED data

The main aim of the study is to investigate the impact of FDI on the rise of domestic content in exports. The issue is particularly important as FDI may influence the local content in two opposite ways. On the one hand, it is expected that foreign firms invest in a host economy to access local resources. Thus the local content of export should be positively influenced by the presence of foreign firms. On the other hand, MNCs use vast international production networks and operations in a host country may heavily depend on imported content. Therefore, an investment may increase the foreign content in exported items.

It is directly related to the position of the country in the GVC. More upstream position means that more inputs should be provided locally. In the case of downstream position of the country, the foreign content accumulated through many prior stages of production abroad influence low level of local content.

4. Data and empirical specification

Particular attention is paid to the level of participation in GVC of selected Central and Eastern European (CEE) economies. A primary source of data for the analysis is the latest edition of the TiVA (Trade in Value Added) database published by OECD at the end of 2021. We combine it with various measures pertaining to GVC participation and presence of MNEs (FDI flows and stocks). The panel of data consists of 44 sectors for four CEE economies in the case of GVC participation over the period 1995-2018 and 30 sectors for FDI over the period 2005-2018. Sectoral discrepancies between GVC and FDI data led to the reduction from 44 to 30. Agriculture and mining, manufacturing, services were included.

We estimate a standard fixed effect model for the panel data. The measure of economic upgrading and dependent variable is the domestic value added generated in sector *s* of country *c* in year *t*. Rising domestic value added means that a country contributes more of domestic content to GVC. The baseline specification incorporates the foreign value added (FVA) in sector *s* of country *c* in year *t* and further specifications included FDI measures.

$$DVA_{sct} = \alpha + \beta_1 FVA_{sct} + \beta_2 FDI\_flow_{sct} + \beta_3 FDI\_pos_{sct} + \varepsilon_{sct}$$

All variables were transformed into natural logarithms. The empirical specification is in line with the approach presented by (Kummritz, Taglioni and Winkler 2017).

The value of FVA presents the position of a sector as a buyer of foreign value. From the perspective of the paper, the indicator should be linked to operations of foreign-owned firms. It

suggests that MNCs incorporate foreign value added in their exports. It can be also interpreted that MNCs organise their GVCs and trade takes place within them.

We consider both flows and stock of FDI. We relate the annual flows of value added across borders, what suggests that the main explanatory variable are FDI flows. Anyway we should also consider that value added in the economy may the result of accumulated operations of MNC, therefore FDI stock should be also explored with respect to GVC.

We do not assume that FDI is directly responsible for lower or higher value added. FDI should be treated as links to GVC. Anyway the relationship may be twofold. On the one hand, positive value of coefficients for the variable FDI may be interpreted as higher value of domestic value added being a result of operation of firm the economy. Then the impact on economic upgrading is positive. However, we should also analyse the coefficients for FVA. When FDI is negatively related to DVA it may be interpreted that foreign links in GVC are strong and that they replace domestic value added in the economy. We do not assume the causal relation, but rather coexistence of some trends. There is also a question to what extent we can expect spillover effects to positively influence the economy.

5. Empirical results

A fixed-effects model using panel data of country-sectors in the 4 countries was estimated. The baseline specification included the impact of foreign value added on the domestic value added. The results were highly statistical significant and positive (tab. 1). It can be interpreted that higher value imported to the country influences the higher value of domestic value in exports. This is the first variable associated with the impact of flows of foreign intermediates. This result is in line with the findings of (Kummritz, Taglioni and Winkler 2017).

However, we are mostly interested in verifying the impact of FDI on the domestic value added. In this case the results are mixed. When it comes to the flows of FDI, there is no statistical significance of the coefficient. However, the stocks of FDI positively influenced the level of DVA. The magnitude of the coefficient for stocks of FDI is, however, moderate indicating significantly lower impact on DVA than access to foreign inputs. Anyway we should not only measure FDI in quantitative terms but also treat it as facilitator for organising GVC.

The positive value for FVA indicates strong links between V4 economies and other participants of the GVC. We analysed here are links to all countries in the world as data do not allow for selecting some groupings, e.g. the EU.

We need to notice that the baseline specification (1) was estimated using the full sample of the period of year 1995-2018. The results for FVA still holds for the smaller sample (2) for the period of time 2005-2018. It is important as the analysis encompasses both periods before the accession of the analysed countries to the EU and period of presence within European structures.

Table 1. Estimation results

VARIABLE	1	2
FVA	0.831 ***	0.674 ***
	(0.004)	(0.013)
FDI_FLOWS		0.002
		(0.001)
FDI_POSITION		0.005 **
		(0.003)
CONSTANT	1.916	2.873
	(.021)	(0.084)
R-SQUARE	0.902	0.701
OBS.	4,224	1,142
NO. OF GROUPS	176	120

The economies under consideration have been treated as a group and this is justified by their complementary roles in GVC. However, significant differences have been identified in FDI positions and GVC participation between the seemingly similar economies. Therefore, it is important to disintegrate the group into particular economies and run the empirical analysis on this level.

The coefficients for FVA were positive and highly statistically significant for all economies in the sample (table 2). However, the importance of FDI coefficients was limited. Again, stocks have more significant relationship with the domestic content, however only in the case of Czechia and Hungary. The coefficient for FDI flows occurred statistically significant only in the case of Czechia. These two economies were also described as closely integrated with GVC. It means that higher level of integration into GVC may support the volume of domestic value added in exports.

Table 2. Estimation results – particular CEE economies

VARIABLE	CZ_GVC	CZ_FDI	HU_GVC	HU_FDI	PL_GVC	PL_FDI	SK_GVC	SK_FDI
FVA	0.787 *** (0.006)	0.574 *** (0.0297)	0.792 *** (0.008)	0.628 *** (.024)	0.796 *** (0.008)	0.724 *** (0.022)	0.928 *** (0.011)	0.712 *** (0.031)
FDI_FLOWS		0.005 * (0.003)		0.002 (0.002)		-0.003 (0.002)		0.005 (0.004)
FDI_POSITION		0.019 ** (0.008)		0.012 ** (0.005)		0.002 (0.003)		0.004 (0.006)
CONSTANT	2.139	3.376	1.915	2.872	2.460	3.028	1.360	2.455
R-SQUARE	0.947	0.654	0.913	0.701	0.915	0.822	0.878	0.693
OBS.	1,056	245	1,056	329	1,056	288	1,056	280
NO. OF GROUPS	44	30	44	30	44	30	44	30

The results regarding CEE economies, both individual and treated as a group revealed several findings. First of all, there is a limited role of FDI in increasing the domestic content in exports of the economies. It means that presence of foreign firms is not translated into more domestic content. There are two main reasons of the situation. First of all, MNC create their own GVCs and organise them towards greater efficiency, thus significance of FVA is rising. The second suggestion is that MNC do not build many links with the local economy, thus the impact of FDI is limited. This is a negative outcome from the perspective of economic upgrading. It means that foreign firms are not important agents in changes of the positions of analysed economies.

Interestingly, the economy which was described as highly integrated into GVC that is Czechia reports the most significant contribution of FDI to domestic value added (Comotti, Crescenzi and Iammarino 2020). Poland has been described in the study as forward contributor to GVC. The lack of significance of FDI variables can be interpreted as the contribution mostly by firms not assigned as a result of FDI.

6. Conclusions

This paper focuses on the contribution of international flows to the economic upgrading of CEE economies. The measure of economic upgrading is the level of domestic value added in exports of particular CEE economies as well as for those economies treated as a group. Such an approach is justified by the linkages between selected CEE economies in GVC.

The most important variable in explaining domestic contribution to GVC were flows of foreign inputs. It confirms that the economies under consideration are integrated with GVC and adding domestic content to imported intermediaries is their main way of exporting.

The variables of interest – FDI stocks and flows – have moderate and mixed impact on the level of domestic content in analysed economies. Several conclusions may be drawn from the empirical analysis. First, stocks of FDI have moderate and positive impact on the economic upgrading of host economies. On the other hand, flows of FDI due to their volatility are not statistically significant in explaining economic upgrading. These results can be interpreted that the level of participation in GVC is a result of long term accumulation of capital in the form of FDI, not its flows in particular years.

Second, particular CEE economies present different role of FDI in economic upgrading depending on different level of FDI intensities. In general, higher level of FDI stocks to GDP is translated into positive and more statistically significant effects of presence of foreign-owned firms. However, the analysis of particular economies provided statistically significant coefficients only for Czechia and Hungary.

The FDI impact on economic upgrading may be both direct and indirect. In this study, mostly indirect effect may be derived. It means that FDI may contribute by providing access to foreign inputs, thus enabling the local contribution in exports. Without the FDI many international links would not have emerged, thus there would be no room for domestic contribution. However, the direct impact of FDI on improving the state of host economies has not been established. On the other hand, the lack of statistical relationship between FDI and DVA means that GVC are not of an intra-firm types, but involve many contributors not linked through ownership.

We do not capture if the GVC links are within the boundaries of firms. It is important from the policy perspective as attracting FDI is not the only way of contributing to GVC. Actually the role of FDI in quantitative terms was limited. However, we also need to indicate the opportunities created by FDI for participation in GVC.

References

Adarov, A. "Interactions Between Global Value Chains and Foreign Direct Investment: A Network Approach." *wiiw Working Paper 204*, 2021.

Alfaro, L., and A. Charlton. "Intra-Industry Foreign Direct Investment." *American Economic Review, Vol. 99, No. 5*, 2009: 2096–2119.

Baldwin, R., and A. Venables. "Spiders and snakes: offshoring and agglomeration in the global economy." *NBER Working Paper No. 16611*, 2010.

Cadestin, C., K. De Backer, I. Desnoyers-James, S. Miroudot, M. Ye, and D. Rigo. "Multinational enterprises and global value chains: New Insights on the tradeinvestment nexus." *OECD Science, Technology and Industry Working Papers, 2018/05*, 2018.

Comotti, S., R. Crescenzi, and S. Iammarino. *Foreign direct investment, global value chains and regional economic development in Europe (Final Report).* Brussels: European Commission, 2020.

Davis, R. B., and J. R. Markusen. "What do multinationals do? The structure of multinational firms' international activities." *The World Economy (in press)*, 2021.

ECB Working Group on Global Value Chains. "The impact of global value chains on the euro area economy." *Occasional Paper Series No 221*, 2019.

Gereffi, G. "Economic upgrading in global value chains." In *Handbook on Global Value Chains*, by S. Ponte, G. Gereffi and G. Raj-Reichert, 240-254. Cheltenham/Northhampton: Edward Elgar Publishing, 2019.

Gereffi, G. "The global economy: organization, governance and development." In *The Handbook of Economic Sociology*, by N. J. Smelser and R. Swedberg, 160–182. New Jersey: Princeton University Press and Russell Sage Foundation, 2005.

Grossman, G. M., and E. Rossi-Hansberg. "Trading Tasks: A Simple Theory of Offshoring." *American Economic Review, Vol. 98, No. 5*, 2008: 1978–1997.

Hagemejer, J., and M. Ghodsi. "Up or Down the Value Chain? A Comparative Analysis of the GVC Position of the Economies of the New EU Member States." *Central European Economic Journal, Vol. 1, Issue 48*, 2017: 19-36.

Havranek, T., and Z. Irsova. "Determinants of Horizontal Spillovers from FDI: Evidence from a Large Meta-Analysis." *CNB Working Paper Series, 7/2011*, 2011.

—. "Estimating vertical spillovers from FDI: Why results vary and what the true effect is." *Journal of International Economics, Vol. 85, Issue 2*, 2011: 234-244.

Humphrey, J., and H. Schmitz. "How does insertion in global value chains affect upgrading in industrial clusters?" *Regional Studies, Vol. 36, Issue 9*, 2002: 1017-27.

Javorcik, B. "Does Foreign Direct Investment Increase the Productivity of Domestic Firms? In Search of Spillovers through Backward Linkages." *American Economic Review, Vol. 94, No. 3*, 2004: 605-627.

Knez, K. "Domestic Supplier Spillovers of Global Value Chains in Central and Eastern European Countries." *MPRA Paper No. 112391*, 2022.

Kummritz, V., D. Taglioni, and D. Winkler. “Economic Upgrading through Global Value Chain Participation. Which Policies Increase the Value Added Gains?” *The World Bank Policy Research Working Paper, WPS8007*, 2017.

Los, B., and M. P. Timmer. “Measuring bilateral exports of value added: a unified framework.” *NBER Working Papers no. 24896*, 2018.

Martínez-Galán, F., and M. P. Fontoura. “Foreign Direct Investment determinants revisited in the context of Global Value Chains.” *Working Papers Universidade de Lisboa, WP15/2016/DE/UECE*, 2016.

Nikulin, D., and S. Szymczak. “Effect of the integration into Global Value Chains on the employment contract in Central and Eastern European countries.” *Equilibrium. Quarterly Journal of Economics and Economic Policy, Vol. 15, Issue 2*, 2020: 275–294.

OECD. *FDI in figures.* OECD, 2022.

OECD. *Participation of Developing Countries in Global Value Chains. Implications for Trade and Trade-Related Policies.* OECD, 2015.

Pahl, S., and M. P. Timmer. “Do Global Value Chains Enhance Economic Upgrading? A Long View.” *The Journal of Development Studies, Vol. 56, No. 9*, 2020: 1683–1705.

Ricardo, D. *On the principles of political economy and taxation.* London: J. Murray, 1821.

Smith, A. *An Inquiry into the Nature and Causes of the Wealth of Nations.* London: W. Strahan, 1776.

Sturgeon, T. J., and J. Van Biesebroeck. “Global value chains in the automotive industry: an enhanced role for developing countries?” *International Journal of Technological Learning, Innovation and Development, Vol. 4, Nos. 1/2/3*, 2011: 181-205.

The World Bank. *World Development Report 2020: Trading for Development in the Age of Global Value Chains.* Washington: The World Bank, 2020.

Tian, K., E. Dietzenbacher, and R. Jong-A-Pin. “Global value chain participation and its impact on industrial upgrading.” *The World Economy, Vol. 45, Issue 5*, 2021: 1362-1385.

Timmer, M. P., E. Dietzenbacher, B. Los, R. Stehrer, and G. J. de Vries. “An Illustrated User Guide to the World Input–Output Database: the Case of Global Automotive Production.” *Review of International Economics, Vol. 23, Issue 3*, 2015: 575-605.

Yee-Siong, T., A. Kokko, and A. Seric. “Linking FDI and local firms for global value chain upgrading: Policy lessons from Samsung mobile phone production in Viet Nam.” *UNIDO Inclusive and Sustainable Industrial Development Working Paper Series, WP 5*, 2019.