

‘Space-time dents’ in global value chains – The Hungarian case

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ABSTRACT

The paper takes a special perspective to summarise what researchers have revealed on global value chains in Hungary. The ‘space-time’ structure is how the ‘force field’ of the amount of value added is shared and how the process it creates characterises specific global value chain networks. There is a growing literature that reveals the ‘dents’ of the GVC force field: the uneven distribution of value-added content, and mainly the controversial possibilities to upgrade in the network. Hungary is a typical example of a semi-peripheral or integrated periphery country. The paper discusses the lessons of different global value chain relations of the country in different geographical environments in terms of the two dimensions of ‘space’ and ‘time’; that is the potential and structure of value added and its dynamics, as well as compares them through an automotive industry case study.

KEYWORDS

global value chains, integrated periphery, upgrading, automotive industry

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1. INTRODUCTION

Recently, one of the most important novelties in science is that the over a century old theoretical hypothesis of Einstein has been empirically proven: gravitational waves ripple in the Universe.

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Great mass makes torsion in the fabric of space-time and the (asymmetric) change of its shape results in changes in the force field that spreads over the universe. The point is that it is not the change that runs through the system but the system itself changes (Kitchin 2021).

Let us use the gravitational waves as a metaphor for international economics, since the literature on the controversial effects of and on the upgrading strategies in global value chains is dynamically growing. Social theories of the 19th century already criticised the emerging capitalist systems, even if these seemed to consummate the aims of the Enlightenment and the civil revolutions (Bratton – Denham 2014). By the end of the century several critical approaches revealed the uneven structure and the dents of the world economic ‘space-time’, where the emerging monopolies, great powers and the monopolisation of different factors of production entail asymmetric performance (value added) and possibilities of production (Foster 2014).

The post-war global theories, mainly from the developing countries’ perspective, extended the social critique to the world system (Dirlik 1994). However, the birth of the global age in its strict sense, based on the microelectronic revolution starting in the 1980s, married the neoliberal course, and hence the space-time of the world economy appeared plain again. In addition, participating in the global production networks was considered to be advantageous for all. ‘The end of history’ became the slogan of the era. No wonder that export-oriented growth and the boosting role of foreign direct investments (FDI) received priorities in economic policy, mainly in former Socialist and the emerging economies (Heredia 1997).

The returning crises of the global age (financial crises, dotcom crisis, 2008 crisis) draw attention again to the uneven effects, possibilities and performances in production networks. The smile curve has become a foundation stone of the emerging global value chain (GVC) literature, which highlights the different value-added phases of the production process and their sequence in time (Baldwin – Ito 2022). Debates started if a former less developed country should keep its traditional, relatively higher value-added industries and should remain closed to the world economy, or rather destroy them and join production in GVCs, and hence the world economy, though at a much lower value-added, and in a way not necessarily compatible with the local economic system (Cattaneo et al. 2013; Urata – Baek 2021). Recently the Covid-19 and the Russia-Ukraine war induced lock-downs and reshoring have given rise to new research owing to the ‘ripples’ and ‘dents’ of global value chain force fields (Marvasi 2023).

Finishing the metaphor, here the main force of the GVC ‘space-time’ is the mass and the creation process of value added, and we expect that its uneven and sometimes monopolistic structure determines the performance and the future path options of the participating companies and countries. This is what this paper is looking for, linking the research papers in this special issue.

This volume contains eight studies on different segments and aspects of global value chains. The papers emerged and were polished in discussions in regular workshops and conferences, and as a consequence the authors were aware of the other studies, and they indirectly refer to each other. Even if there are overlapping problems, issues and analyses, as well as the topics are complements to each other, they do not cover the complete field, and the special issue does not aim to make a comprehensive review of GVCs.

Table 1 summarises the space and time relation of the papers in this special issue. It reveals that there are certain focus points that determine value added as the ‘gravitation power’ of a GVC participant. These are summarised further in Fig. 1.



Table 1. Space and time dimensions of the papers in this special issue

Research paper topic in terms of GVC	Absolute space from Hungary (geographic)	GVC space (structure)	Case study	GVC time (dynamics)	Absolute time (time series)
Hungarian-Czech automotive industry	Czech Republic	Participation, industrial structure, direct backward and forward links	Automotive industry		Time series 2000–2018
Supply chain agility	Czech Republic	Logistics	Automotive industry	Agility proactive and reactive strategies	
Knowledge spillover	Visegrad countries	Knowledge stocks	Automotive industry	Innovation spillover	
Downstream in EEU	Eastern Europe	Downstream structure	Automotive industry		Time series 1990–2015
EU industrial policy on headquarter and factory economies	European Union	Value addition activities Servitisation Digitalisation & automation 'Colour' of investment Sustainability	Automotive industry	Value chain dynamics	
Trade relations with China	China	Participation, industrial structure, direct backward and forward links			Time series 2000–2018
Inflationary exposure	Global	Price elasticity			Time series 2018–2022
Sustainability	Global		Fashion industry	From below From above	

Source: authors.

The absolute level and the possibility to produce added value are dependent on the type of industry, on its technological structure and on the position in this network (smile curve) as well as on the knowledge content and its spillover capabilities (amount and speed). At the same time, the value-added potential is influenced by the quantity and price changes that create the value. This sensitivity (elasticity) is an important characteristic of the input-output tables where the direct and more importantly the indirect value-added networks can be detected.

However, the participation and positions in GVCs are dynamic, since both the participants and the surrounding environment can consciously change them. An example of the former is



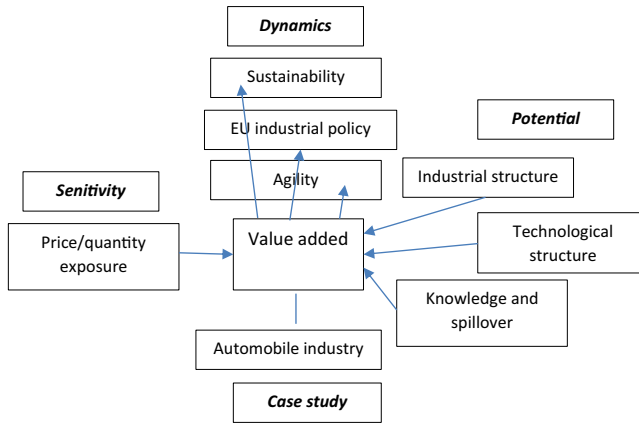


Fig. 1. Determining dimensions of value added as 'gravitational force'

Source: authors.

supply chain agility, and of the latter, EU industrial policy. In addition, paradigms and new trends can influence the restructuring of GVCs, such as present-day trends in sustainability and social responsibility. All these dimensions can be discussed in a case study, since most of the research papers refer to the automobile industry as the most influential and typical industry in recent Hungarian (and Central and Eastern European) economic history.

Four dimensions set up the structure of the present overview: value added potential and sensitivity, dynamics as well as a case study. The paper concludes with a synthesis where the 'space-time dents' of the Hungarian participation in global value chains are articulated in terms of their relationship with the country's position in the semi-periphery.

2. VALUE ADDED POTENTIAL

Value added is a key concept in the analysis of global value chains. One of the key analytical tools, the smile curve (Shih 1996) depicts instructively the difference in the value added activities involved in global value chains and their sequence in time as well as their potential geographic dispersion. Its core hypothesis is that the various functions of the value chain differ in terms of their value added generation potential. Activities at the beginning (for example R&D and design) and the end (for example marketing, distribution, after-sale services) of the smile curve represent the highest value added, while those in the middle, i.e. production activities, assembly, represent the lowest value added. Empirical analyses reinforce the existence and characteristics of the smile curve (see e.g. Stöllinger 2021).

Articles in this special issue call the attention to the differences between industries in terms of their value added composition and distribution between the various activities involved (see e.g. the clothing industry in Dobos (2023) or the articles on the different aspects of the automotive industry). Gáspár et al. (2023a), comparing the Czech and Hungarian automotive GVC positions, rely on the analysis of the factors which cause changes in the GVC participation and the GVC



positions of the two countries. The GVC position (downstream or upstream) of a country's industry and its changes over time are also connected to value added. [Antrás \(2019\)](#) found that on average downstream industries are more unskilled-labour intensive than upstream industries, thus the related value added is also lower. [Megyeri et al. \(2023\)](#) analyse 162 investment projects in the automotive industry, differentiating between headquarter and factory economies. [Baldwin and Lopez-Gonzales \(2015\)](#) introduced the notions of headquarter and factory economies, whereby headquarter economies arrange the production networks and factory economies provide the labour for these networks. According to [Megyeri et al. \(2023\)](#), lower value-added productions are relocated to factory economies in Central and Eastern Europe while the higher value-added manufacturing remains in headquarter economies of Western Europe. Relocations affecting electronic vehicle production capacities do not alter the picture. On the other hand, competitiveness requirements induce the investor firms to develop their facilities in Central and Eastern European countries, which overall results in increasing value added.

Furthermore, the establishment of stand-alone large automotive R&D centres in Central and Eastern European countries also leads to higher local value added (reinforced not only by [Megyeri et al. 2023](#), but also by [Otsuka et al. \(2023\)](#) and [Gáspár et al. \(2023a\)](#)), however, these are more or less working independently of local production units and carry out rather 'extended workbench type R&D activities ([Szalavetz – Sass 2023](#)). The previously described case of measuring automotive value added calls our attention to the remaining methodological problems and to the fact that the data contain averages, from which the individual company cases can deviate to a great extent, raising the value of detailed company case studies.

In spite of all the methodological problems and data shortcomings, the available datasets open avenues for research in many other areas. A good example of this is [Koppány et al. \(2023\)](#), who turned the analysis of available value added data upside down. The idea is straightforward: it is not only parts and components or final goods or services, which 'flow' through global value chains, but also their prices travel from country to country. They linked two datasets and through that decomposed inflation elasticities into local, simple, and complex global value chain effects. Their novel approach makes it possible to differentiate the sources (countries and industries) of price transmissions through global value chain linkages. Their case study of Hungary could identify at least a part of the sources of the high inflation rate characterising the economy, namely energy prices from Austria, Germany and Russia.

3. THE DYNAMICS OF THE VALUE-ADDED POTENTIAL

The potential how much value added a participant is able to contribute to the global value chain is determined by the quality of the company or country as well as by the nature of its relations; however, it is open to changes. Partly the strategic foresight activities and the power of the agent may keep up the position in looming prospects and crises; partly the economic policy of the embedding macroeconomic institutions may cause a shift in the network structure.

[Krenkova et al. \(2023\)](#) discuss how to enhance supply chain agility by the development of logistics. Agility in general is the capacity to adapt in a speedy manner to changes when conditions require it. Since our age is mostly characterised by high volatility, uncertainty, complexity and ambiguity (VUCA), in the case of agility a company can react/proact to unpredicted changes with positive outcomes ([Swafford et al. 2006](#); [Çankaya 2020](#)).



The authors find that agility results in flexible solutions, switching to alternative solutions under disruptions. It is related to resilience, which, in case of disruption, is the ability to return to the original state or to move a new, more desirable one (Al Naimi et al. 2022). Agility seems to be an important factor to develop resilience.

Krenkova et al. (2023) study sourcing and manufacturing of global value chains by questionnaires, and measure agility in four dimensions, combining Li et al. (2008) and Christopher et al. (2004). Hence, they distinguish mainly the strategic, operational and episodic design levels and virtual, process integration, network-based, or market-sensitive solutions. These options differ by the scale of decision impact but should be adapted at the same time. With the different combinations, proactive and reactive approaches emerge (Tsai – Lasminar 2021). Proactive strategies adjust to the challenges in the external environment and introduce new ideas. Reactive response refers to the adaptive capabilities of companies. These behaviours are further distinguished by the speed and the cost of response.

The empirical research of Krenkova et al. (2023) has revealed that the decisions both in backward and forward directions are influenced by the whole global value chain network. In addition, they found large determinism of OEMs, which distort the costs and risks of the proactive and reactive responses. They suggest employee training and process development in accordance with business intelligence.

The study of Otsuka et al. (2023) highlight the importance of knowledge in value added creation and upgrading, both in terms of its stocks as well as its flow over global value chain participants. They ask to what extent global value chains contribute to innovation in the Visegrad Four (V4) countries.

As a starting point, in terms of innovation, they distinguish four main upgrading dynamics: process upgrading, product upgrading, functional upgrading and intersectional upgrading (Humphrey – Schmitz 2002). By reviewing the literature, they find that intangible assets protected by intellectual property rights as well as R&D have an increasing role in upgrading capacities. However, in the V4 countries, neither the stock (or the creation of stock) nor the flow are appropriate, neither in terms of quantity, nor, more importantly, of booming potential. Even if the massive inflow of FDI and joining the global production networks contributed to the market transition and to the change of the industrial structure, the local firms of the V4 countries are far less innovative than those of the EU core economies. This is probably due, as Lee and Gereffi (2021) conclude, to upgrading being a result of combining many elements of innovation on a broader basis of capabilities, rather than just vertical knowledge transfer in the production chain.

The stock of knowledge is the basis of flow over countries and industries through global value chain channels. Otsuka et al. (2023) define knowledge spillover as the external effect of an existing pile of knowledge; knowledge created in the past can be utilized for future research or research in other sectors/countries. Even if the area is young in research, some mechanisms for spillover are emerging, such as personal interaction where tacit knowledge is transferred and mutual dependence to encourage the sharing of know-how (Piermartini – Rubionova (2021)). GVCs are found to have a positive effect on knowledge spillover; however, mainly in cases where developing countries have partners in the developed world, or if the market relationship is stable and durable, or in the case of inter-industry relations.

Otsuka et al. (2023) find that the innovative assets and capabilities are controversial in the V4 countries. It seems that the multinational subsidiaries located in the V4 – mainly in digital



communication such as Siemens or Ericson and pharmaceutical companies such as Sanofi or Richter (the latter Hungarian owned) – patent the research and development results mostly in their headquarters (home) country. The intellectual capabilities of subsidiaries are lagging behind. In addition, the local suppliers are provided with the knowledge and information that is necessary for the stable procurement. All in all, they find that local firms in the CEE merely rely on the ‘doing-using-interacting’ (DUI) type of innovation activities or on process innovations that may not bring patentable results. In terms of Hungary, the research indicates that the innovation system has improved but the innovation performance did not. The good numbers of sales impacts are the results of the high-tech export performance of the foreign multinationals in Hungary, while the number of innovators and the human resource wealth reflect huge gaps in European comparison.

In their paper, [Megyeri, Pelle and Tabajdi \(2023\)](#) turn their attention to how the macro-economic side influences the behaviour of global value chains and their participants, in terms of the industrial policies in the European Union. The authors give an overview of the challenges and responses of the EU. The so-called European Disease was one of the major challenges in the 1980s when the EU lost its competitiveness in classical manufacturing markets against the emerging South-East Asian tigers, while it was not yet competitive in the technologically advanced areas of the microelectronic revolution. The widening process of the 2000s increased the uneven structure of the integration, which was deepened by the 2008 crisis. The COVID-2019 and the 2022 Russian invasion of Ukraine broke up the global value chains and questioned the built-up production networks. The authors conclude that the European Commission was quick in calling for the strengthened resilience of European value chains ([EC 2020b](#)).

Some of the regional influences represent global forces. For instance, the European Green Deal launches a new industrial strategy for a globally competitive, green and digital Europe. In addition, sustainability as an umbrella issue appears in many ways to influence the behaviour of global value chain participants. As [Megyeri et al. \(2023\)](#) add, sustainability is more and more involved as an internal target for companies and industries. However, the role, the position and the ownership in the global value chain determine the execution of sustainable values and the efficiency of their economies. Leading companies of the networks reflect better results and initiative role, while the second and third level suppliers of lower value added are just there to execute and deliver actions, which gives little motivation and impetus to meet values for long run existence.

[Dobos \(2023\)](#) discusses the fashion industry, as one which was originally organised at the global scale, and that contains serious environmental and social problems regarding sustainability. She reveals that there are two influencing forces, one from above in terms of regulations, and one from below by NGO activities to change consumer habits. However, she finds, neither of them is sufficient and powerful enough. Uneven legislative processes, lobbying, corruption and short-run interests shift governments from effective control and initiation. From the buyer side, the changing pattern of consumption does not solve the ‘non-consumption’ efforts, which draw the attention to the real needs. In addition, most of the problems emerge in the less developed and less regulated phases of the global production network. [Dobos \(2023\)](#) argues that transparent, sustainable operation would be beneficial, since the core companies in Europe and the USA are willing and tend to adapt sustainable measures.



4. THE AUTOMOTIVE INDUSTRY – AN ANALYTICAL FOCUS

The automotive industry is one of the most frequently analysed industries from the point of view of GVCs. One reason for that is that over time, this industry has become the most important manufacturing sector not only in Hungary, but also in other countries of the Central and Eastern European region (Czechia, Romania, Slovakia). These countries have attracted a large amount of FDI in the automotive industry, thus the leading players are foreign-owned subsidiaries of large (first of all German, but also other, including non-European) OEMs and important supplier firms (Natsuda et al. 2022; Szabo et al. 2023). Domestically owned companies do not figure highly among the local players (Molnár et al. 2020; Gerócs 2022), with the possible exception of Czechia (Pavlínek 2020). Thus, the four mentioned economies, including Hungary, belong to the integrated peripheries or semi-peripheries of automotive production (Pavlínek 2022; Szalavetz – Sass 2023).

The importance of the automotive industry and its GVCs in the CEE region are reinforced by the articles of this special issue as well: five out of the eight articles either concentrate on this industry or use it for illustrating various GVC-related aspects and issues. Two articles compare Czechia and Hungary, two other articles compare a larger number of economies from the Central and Eastern European region, while one investigates important policy-related problems at the EU level.

Gáspár et al. (2023a) compare the participation of the Czech and Hungarian economies in automotive GVCs. Besides presenting the most important characteristics of GVC-participation, they rely on a dynamic approach when assessing the most important factors which influenced the automotive GVC development paths of the two countries. Interestingly enough, this latter resulted in a similar position by the end of the analysed period for the two countries, when compared to other CEE economies. However, the underlying factors are different and the changes and U-turns are much larger in the case of Hungary than in Czechia. There are three main factors in that respect. First, there are changes in already existing capacities, which mainly result in upgrading over time, more rapidly in Czechia and more slowly in Hungary. This can be partly attributed to the fact that in Czechia domestically-owned companies upgrade more than in Hungary, where upgrading rather characterizes foreign-owned units. Second, a rather neglected aspect is the appearance of ‘new players’, which may affect significantly the indicators of the industry. This is the case in both countries, though newcomers, such as Daimler-Mercedes in 2012, cause bigger changes and U-turns in Hungary than newcomers in Czechia. New players of lesser importance, such as suppliers, which replace traditional local suppliers, may also influence the GVC position of the countries. Here we can find some CEE and some non-European companies taking over the supplies from local companies, especially in Hungary. However, a common characteristic is that influential newcomers are rather foreign-owned in both countries.

Křenková et al. (2023) concentrate on another aspect of the automotive industry GVCs: agility and resilience in times of war. An interesting finding is that the impacts of the Covid-19 pandemic made companies more aware and resourceful in finding solutions to newly emerging problems – such as those connected to Russia’s invasion in Ukraine. Furthermore, interestingly enough, in the reactions and solutions applied by firms, no significant difference between Czech and Hungarian firms can be found, which underlines that, in spite of different dynamisms in GVC positions, day-to-day challenges demand similar solutions and “agility”.



It is not only Czechia and Hungary, but also numerous other economies in the Central and Eastern European region, for which participation in automotive GVCs has become one of the key points of the economies. Thus, it is of crucial importance how this type of participation in GVCs impacts the local economy. [Otsuka et al. \(2023\)](#) analyse GVC-related knowledge spillovers in the Visegrad economies (Czechia, Hungary, Poland and Slovakia). According to their results, in this area, the positive impact of GVCs is limited: international knowledge spillover contributes very little to innovation in the four economies. The reasons for the limited knowledge spillovers connected to GVCs can be found mainly in the strategies of multinational companies, who locate low value-added production and little, mainly supportive R&D to the analysed countries. Even these R&D activities are strictly kept within the network of the multinational firm, while the limited capabilities of local firms inhibit their R&D and the absorption of these limited spillovers. The detailed case study of the Hungarian automotive industry reinforces and nuances this finding. As a result, local firms in the Visegrad countries have become dependent on peripheral products and technologies.

[Vakhal \(2023\)](#) extends even further the region analysed, investigating GVC participation across Central and Eastern Europe. He also used the automotive industry for a case study. His analysis demonstrated the importance of “own” brand and “own” market, as he showed Romania is an outlier in the region with a much higher multiplier effect of the automotive industry compared to other countries. This relies on the fact that the main customers for locally produced cars are domestic households, as according to the data presented, almost half of the value added produced by Romanian car assemblers is consumed by Romanian final users. This results in a higher multiplier effect of the industry in regional comparison.

[Megyeri et al. \(2023\)](#) go to an even higher level: to that of the European Union. They show the GVC-related developments of the two emerging categories of “headquarter” and “factory” economies within the EU – though it is important to note that the dividing line is blurred between these two categories. The automotive industry is used as a sectoral case study. Partly reinforcing the findings of [Otsuka et al. \(2023\)](#), they show the investment strategies of multinational companies, OEMs responding to digitalisation and sustainability challenges, called for by EU bodies, but the limited spillovers coming from these in the factory economies. Thus, industrial policies of the factory economies should be adapted to these new circumstances, even if the manoeuvring room of industrial policies has been considerably reduced in the GVC era.

5. SYNTHESIS AND CONCLUSIONS

All of the papers discussed find that Hungary and most of its East Central European peer countries have a relatively low share in globally produced value added contents. As [Vakhal \(2023\)](#) summarises, Central and Eastern European countries have become deeply integrated in the international production networks in recent decades; however, their permanent trade deficits indicate that the corporate chain-integration has controversial impacts on wages, employment, growth, productivity, and local value-added export. Locally owned companies are mostly specialised in the assembly of manufactured products exported to developed countries, with low value-added content at the end of the production process. He distinguished different paths that integrate GVCs, like the Baltic, Balkan and V4 states, among them Hungary. While services – with low import needs, high local value added and intensive export – became the key industries



in the Baltic states, the V4 countries, formerly relatively highly industrialised, based their integration mainly on FDI flow in the manufacturing industry, which changed its ownership and technological structure.

Not only the developed country relations reflect asymmetry, analysing the global value chain structure of Hungary to China, an emerging economy, show a similar pattern [Gáspár et al. \(2023b\)](#). There is a dynamic semi-final product flow towards China, while its structure varies by the native Chinese companies and by those, mainly foreign multinationals who carry out export processing activities in China. In terms of Chinese companies there is a radical fall back of formerly dominant computer and electronic products of Hungary, which give space to automobile components and related products of electronics and mechanics towards China, and basic metal, textile and machine products as imports. The foreign multinationals in China mainly exchange computer and electronics in intra-industry trade, while the trade in automotive semi-finals and machines is dynamically extending.

The automotive industry, which has created a high level of integration for Central and Eastern European countries, and among them Hungary, into global (or rather regional) value chains, is a good candidate for GVC analysis. In a nutshell, the findings of the articles reinforce the integrated periphery/semi-periphery status of the countries of the region in automotive GVCs, the consequences of which are limited and slow upgrading, limited spillovers to the local economy, ambiguous experiences with R&D, the importance of “own” brand and “own” market (largely missing from the region), and the imperatives for economic and industrial policy, if governments want to help their economies to break free from this problematic situation.

These features make a pattern of the ‘space-time’ structure of the global value chains with the ‘dents’ in them, which is described in the literature as semi-periphery. In terms of global production networks [Kozma \(1998\)](#) already in the 1990s highlighted that the difference between centre and periphery is not purely the development level in terms of GDP, and thus semi-periphery is not purely being “in-between”. It is rather the complex power – by efficiency of the factors of production and by intensity of global network relations – that enables influencing price levels, company behaviour, market structures and economic policy that differentiates centres and periphery. In addition, the essence of the semi-periphery is being “on-the-move”: the constant struggle to upgrade.

The concept of semi-periphery has emerged in the global value chain literature as well, and it has been further polished. Among the studies [Otsuka et al. \(2023: 2\)](#) recall [Pavlínek \(2018\)](#) and [Krpec and Hodulák \(2019\)](#), who “introduced the concept of the integrated periphery as a transitional phase for countries that are willing to develop their economy based on FDI and accession to GVCs, from a peripheral status towards the core.” They distinguish semi-periphery and integrated periphery, where the latter refers to a position in the GVC that is dependent and subordinate. In addition, it is characterised by worse local capabilities and research and development (R&D) spending than semi-peripheries. Furthermore, competitiveness comes from the permanently low-level labour cost. One important consequence, [Otsuka et al. \(2023\)](#) add, is the weaker innovation potential and activities in comparison not only with the centre but also with the semi-peripheral countries. Their study proves that intangible assets protected by intellectual property rights are increasingly being monopolised in the global value chains. This trend is becoming stronger with the emergence of the new industrial revolution.

[Megyeri et al. \(2023\)](#) also base their study on the core-periphery division by the research of [Grodzicki and Geodecki \(2016\)](#). In terms of global value chains, periphery appears in relatively



simple tasks even in the production of complex goods, while they define the core as places where there are opportunities for further upgrading and specialisation in high value-added activities. They find that the European networks are very clearly divided into the North-Western core and Southern Europe as well as rich and poor Central Eastern Europe. Even if the economic structure does not differ that much, owing to the ownership of capital and technologies, GVC performance and strategic options of upgrading differ. The main question they think is not the efficiency of the FDI-led development and participation in the value chains, but – as this model is coming to its end in the 2020s – what future strategic paths the (semi-)peripheral economies can work out.

In terms of global value chain cores and peripheries Megyeri et al. (2023) distinguish headquarter and factor economies, with reference to their role in the production process; the former provide high level physical and human capital and arrange the production network, the latter contributes with labour and low value-added activities (Baldwin – Lopez-Gonzales 2015). They find that this distinction is strengthened by the spread and implementation of Industry 4.0 technologies and working methods, by the servitisation of industries, as well as the relocation necessities in the uncertain and risky world economy.

The readers of the special issue may choose how to study the research papers. One option is reading single papers; they are complete in themselves, discuss unique topics, and give a deep insight into special fields of global value chains. Another possibility is to follow the overlapping concepts of these studies discussed in this paper. This provides an intellectual adventure and may provide new insights for the reader, possibly ones that we have not yet revealed. Have a good journey.

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