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Attracting and hosting foreign direct investment in digital transformation time. The case of post-transition economies

Przyciąganie i utrzymanie zagranicznych inwestycji bezpośrednich w czasach transformacji cyfrowej. Przypadek gospodarek po transformacji

Abstract

This research touches upon the challenges related to attracting and retaining foreign direct investment (FDI) in times of digital transformation. Foreign direct investment (FDI) has been crucial for post-transition dependent market economies (DMEs), and was critical during the transformation processes. This study takes the perspective of the host economies, and in particular, the (post) transition V4 countries. The focus of this research is on the antecedents of investment-attractive locations in the Industry 4.0 era and the factors that have determined this attractiveness during the digital transformation. This paper is based on a critical literature review and in-depth expert interviews. The authors put forward three research proposals that stipulate the necessity of assuring absorption capabilities, embeddedness and upgrading, the importance of state intervention and incentives, the need for new regulations, and a digital ecosystem. The study indicates that in the realm of Industry 4.0, firms investing abroad need to look for locations rich in knowledge. Knowledge pools embedded in a particular location play the most important role in luring foreign investors.

Keywords: foreign direct investment (FDI), Industry 4.0, digital transformation, post-transition economy.

JEL: D02, F23, F68

Streszczenie

Prezentowany artykuł dotyczy wyzwań związanych z przyciąganiem i utrzymywaniem zagranicznych inwestycji bezpośrednich (ZIB) w czasach transformacji cyfrowej. Zagraniczne inwestycje bezpośrednie mają kluczowe znaczenie dla gospodarek po transformacji, dla których ZIB okazały się krytyczne w procesach dochodzenia do gospodarki rynkowej. W prezentowanych badaniach przyjęto perspektywę gospodarki przyjmującej – (po)transformacyjnych krajów V4. Badania koncentrują się na antecedenjach atrakcyjności inwestycyjnej lokalizacji w erze Przemysłu 4.0 oraz czynnikach determinujących atrakcyjność miejsc w czasach transformacji cyfrowej. Niniejszy artykuł opiera się na krytycznym przeglądzie literatury i wynikach pogłębionych wywiadów eksperckich. Autorzy przedstawiają trzy propozycje badawcze, które określają konieczność zapewnienia zdolności absorpcyjnych, zakorzenienia i modernizacji; niestabnące znaczenie interwencji państwa i zachęt, rosnącą obecność nowych regulacji i pojawienie się cyfrowego ekosystemu w kraju przyjmującym. Badanie wskazuje, że w dziedzinie Przemysłu 4.0 firmy inwestujące za granicą muszą szukać lokalizacji obfitujących w wiedzę.

Słowa kluczowe: Przemysł 4.0, zagraniczne inwestycje bezpośrednie, transformacja cyfrowa, gospodarka potransformacyjna.

JEL: D02, F23, F68



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1. Introduction

This research touches upon the challenges of attracting, maintaining, and retaining foreign direct investment (FDI). This is especially critical for transition and dependant market economies (DMEs), where FDI has proved critical in the transition and transformation processes (Nölke and Vliegthart, 2009).

There is a lot of discussion concerning the impact of Industry 4.0 (I4.0) on MNEs. These are the main drivers of change and are primarily responsible for reconfiguring global value chains (GVCs). However, the place of FDI during digital transformations is often neglected (Kano *et al.*, 2020). GVC architecture of global relations stresses the acute need to refocus the attention from a purely vertical policy to attract FDI to a horizontal one that embraces the inconsistencies and trade-offs of broad GVC policies (Pietrobelli *et al.*, 2021). In this respect, 'GVC value capture' is relevant, as it is aligned with the classic policy of attracting and embedding more advanced and valuable FDI. This research takes the perspective of the host country during its post-transition stage. The reassuring statements from regional economies regarding their 'path dependency and history of success', which bodes a bright outlook for future FDI, alternate with gloomy predictions of being 'the calm before the storm'. This paper identifies the key challenges involved in making a location more attractive to investment in the I4.0 era, and proposes certain measures to achieve this. This is crucial from the standpoint of countries that dependent on an influx of foreign investors, e.g. Poland. This study therefore has both normative and positive narratives. On the one hand, it diagnoses and assesses the current situation, in this case, the opportunities and risks that affect attractiveness, and on the other, it offers recommendations to optimise this attractiveness. In this way, this paper addresses the big questions (Buckley *et al.*, 2017) viz., those that are *phenomena-driven, require interdisciplinary approaches, span multiple levels of analysis, and involve interactions between business, government, and society in the global environment.*

The adoption of digital technologies is bound to profoundly affect international production, although it is not at all certain how. This is, causing a great deal of uncertainty (Butollo, 2021). Moreover, the COVID-19 pandemic is likewise impacting FDI flows (Global Investment Trend Monitor, 2020). According to early estimates, the virus could have reduced FDI flows by as much as 40% in 2020–2021. Efforts to mitigate the pandemic have had devastating effects on global investment flows all over the world. The importance of providing the most conducive conditions to attract valuable FDI therefore cannot be overestimated.

This study touches upon the attractiveness of post-transition economies such as the Visegrád Group (V4) of countries. Poland is slowly transitioning from being an FDI recipient to becoming a FDI donor, as predicted by Dunning's Investment Development Path (IDP), i.e., the country is currently in the third IDP stage. It is neither a purely emerging nor a genuinely developed economy (communist footprint/legacy – Rašković *et al.*, 2020). On the other hand, FDI is also being transformed as a result of digital technologies (lighter footprint).

This paper is explorative and normative. It identifies the key aspects of hosting another wave of FDI while providing guidelines on formulating FDI policy. The con-

siderations presented herein may help identify the sorts of investments that be best for post-transition economies, as well as the benefits that can be obtained in addition to capital flow, including the acquisition of advanced technology, before examining the ways that post-transition economies can attract FDI. This paper is structured as follows. Section 2 reviews the literature. This covers the key aspects while looking for the determinants of host country FDI attractiveness. Section 3 presents the methodological framework deployed by the main discussion that has come out of the qualitative studies, viz. in-depth interviews conducted within the International Visegrad Fund project. These are focused on the attractiveness of post-transition countries to foreign investors in the digital transformation era. Section 4 presents the key conclusions.

2. Literature Review

The literature reviewed here concerns the crucial determinants of host country attractiveness for FDI in the I4.0 era, viz., profile and strategy, the role of policy and regulations, digital maturity, and the importance of retention and upgrading.

2.1. Profile and Strategy of FDI

As argued by Bettiol *et al.* (2020) there is no clear evidence that I4.0 technologies play any role in reconfiguring international activities. Reshoring seems to be more a by-product of adopting I4.0 than a result of any motivation to invest in those technologies. The different level of internationalization matters when it comes to the motivation to adopt I4.0 technologies. Global competition is one of the most compelling reasons.

Kaltenecker and Kahle-Piasecki (2019) argue that I4.0 would affect each of the Ownership-Location-Internalisation (OLI) advantages and hence it would inevitably influence the nature of international expansion. These authors review the extant literature and cite studies that point out the likely modifications to the structure, scale, pattern, and other FDI characteristics brought about by I4.0.

Chiarvesio and Romanello (2018) studied the interface between GVC and I4.0, although they do not elucidate how new technologies can impact a firm's ownership, location, and internalization advantages. Buckley and Strange (2015) argue that MNE strategies are changing as new technologies enable value chains to be more disaggregated and geographically dispersed. The recognition that I4.0 has a huge positive impact on OLI is shared by Chiarvesio and Romanello (2018), who claim that new digital technologies can disrupt the nature of GVCs and impact anyone captures the added value within those chains. Alcácer *et al.* (2016) demonstrated the mutual interdependencies between I4.0 and FDI. In particular, they show that the Internet of Things influences the competitive advantages of places (L advantages), of firms (O advantages), and the governance structure of IB networks (I advantages). Rehnberg and Ponte (2018) stress the disintegration of production thanks to 3D printing which raises the issue of the nature of L advantages. As they reveal, the adoption of 3DP in the aerospace industry has been accompanied by a corresponding decrease in the number of first-tier suppliers, thereby indirectly changing the I advantages.

Castellani and Latoratori (2019) showed that MNEs have a different propensity for co-locating their R&D labs with their production plants. By using a comprehensive statistical analysis of firms' behaviour, they reveal that the tendency to co-locate is heterogeneous across companies. This tendency is more pronounced for firms with less international experience, lower geographical dispersion, and lower shares of intangible assets. These findings therefore confirm the presumption that co-location can substitute a firm's ability to coordinate complex activities and structures and that businesses less dependent on codified knowledge can co-locate R&D and production facilitate knowledge transfer.

Despite the growing ephemeral nature of FDI, a study by Stallkamp (2019) acknowledges the importance of 'having boots on the ground'. It demonstrates that despite the pervasive use of advanced digital technologies, which is fundamentally transforming international expansion, MNEs and FDI still require some sort of physical presence in foreign markets. This is critical in order to properly understand and subsequently adapt to local needs and tastes. Stallkamp thus questions the common narrative of a purely global digital firm that can smoothly and swiftly serve the world.

A study by Rademaker and Kolbjørnsrud titled 'Automation and Location Decisions in International Operations' (Nominee: FIU/AIB Best Theory Paper Award, AIB Miami 2020 conference mimeo) proposes a framework of how automation influences locational choices in international operations. The authors distinguish between two types of automation, viz., physical and information processing, and examine the effects of each on demand-side and supply-side factors, as it these that will influence locational choices. They also identify various international mobility barriers and explain how these moderate the relationship of automation on location choice.

2.2. Digital Maturity

The ongoing industrial revolution may signify the relevance of the broader advanced digital competencies possessed by society as a whole in defining attractiveness to foreign investors. These include technical infrastructure, laws safeguarding rights and obligations under I4.0, the labour market, training, and skills. A study by Shaer *et al.* (2020) reiterates the importance of location in the digital era and stresses the characteristics of the novel lead market which can exist independently across countries. This requires different demand-side and supply-side factors, as not all users offer equal demand-side advantages. The current focus on supply-side locational advantages may wane and we may witness a rise of demand-side opportunities. Improvement through user interactions, interactions across countries, and lead markets will emerge as new locational advantages in the digital era. Currently, locational advantage research ignores the role of demand-side advantages in the digital era.

A recent study on the demand for digital skills in Slovakia, conducted in the context of FDI and GPN, by Drahokoupil and Fabo (2019) differentiated between occupational structure and skill content within each occupation. Hence, this study not only accounts for the kinds of workers that are hired, but also the specific skills that are required. The results demonstrate that although foreign firms and those with mixed ownership tend to advertise for higher-skilled occupations as compared

with domestic companies, their specific skill requirements for these jobs are lower than in similar jobs in domestic companies. Specifically, foreign firms only demand higher skills in some blue-collar jobs (assembly and component manufacturing), but in the case of white-collar occupations, domestic companies are more likely to require digital skills. These findings confirm that Slovakia is an integrated peripheral country. There is a significant MNE presence, but few complex activities, and therefore limited potential for technology transfers.

Kleineick *et al.* (2020) used a multilevel model to assess the importance of national and regional characteristics to MNEs when making location decisions. The results suggest that greenfield sites and M&As are similar in their location determinants, although the former have a stronger correlation with highly educated populations. This suggests that policy aimed at attracting FDI should primarily reinforce the regional economic system in terms of market opportunities, local labour force quality, and regional labour market functioning. This focus on the features of the local economy should lead to the attraction of specific kinds of inward foreign direct investment (IFDI) that properly can match the regional economic structure in terms of competencies and interfirm linkages, thereby generating additional local economic benefits.

Technologically strong start-ups, coupled with a new culture of innovation, are predicted to play an increasingly prominent role in determining FDI attractiveness. Nambisan, Zahra and Luo (2019) argue that the digital platforms ecosystem (DPE) significantly influences the international operations and activities of MNEs. DPEs affect shared resources and hence the internationalisation options, i.e., the connectivity and thus the knowledge sharing and generating options. They additionally provide flexibility and fluidity, which affects new ways of creating and capturing value.

2.3. Retention and Upgrading

The absorptive capabilities of host countries are what will define the attractiveness of post-transition economies. Depending on the nature and purpose of the FDI, technological distance can either encourage or discourage the flow. It can be hypothesised that the greater the technological distance, the greater the benefits, although host country firms need to reveal absorptive capacity if they are to reap these benefits. Hence, technological similarity is more likely to foster FDI in the I4.0 era. So even if a greater technological distance can be bridged by leapfrogging, certain conditions have to be met for this to materialise. It can be argued that the greater the maturity and readiness (the less the technological distance), the greater the FDI flows.

A paper by Ly *et al.* (2018) sheds new light on the importance of linguistic and technological similarities for FDI. An analysis of more than 71,000 pairs of FDI relationships revealed that language is positively associated with a high level of FDI. Technological disparities impede the flow of FDI between countries, and information flow is crucial for large FDI influxes. Information flow diminishes the negative impact of technological distance. The authors found that technological differences between countries hinder FDI. However, these results are also specific to the income levels of the source countries. According to the literature, MNEs from low-income countries prefer dissimilar economies for investment when they go searching for

technology and markets (Cuervo-Cazurra and Genc, 2008). MNEs from high-income countries, by contrast, take a more conservative approach to investments, preferring a smaller technological distance, the same (or similar) language, and the same level of technological development. MNEs from low-income countries have less stringent expectations regarding the surrounding environment.

Drawing on the logic of place-based approaches, and survival analyses on data collected across 31 provinces of China, Tang and Beer (2021) found that regional technician supply (RTS) and regional intellectual property flexibility (RIPF) help regions retain foreign investors. Being two pillars of regional innovation, RTS and RIPF could contribute to the value creation of FDI, thereby helping regions retain FDI. However, RTS is less likely than RIPF to retain foreign subsidiaries with large R&D expenditures. RTS on the other hand increases both FDI and the innovative capacity of a region.

Host economies depending on FDI would mainly value the technology obtained through FDI, as this would translate into economic growth. Crucial aspects would be the readiness to absorb it, to fully benefit from it, and make them work for the whole economy. Hence, issues such as interoperability, and the similarity or maturity levels of firms would determine the chances of benefitting from I4.0.

2.4. Policy and Regulation

Digital transformation in post-transition economies entails adjusting policy in favour of FDI. This includes modifying industrial, educational, and research policies. The key aspects in terms of shaping FDI policy ('how to attract FDI?') might encompass both specific tailor-made incentives and e.g., educational or labour market policies. Digital transformation embodies the integration of digital technologies in all businesses. It is characterised by connectivity, complexity, and convergence. It is not unidirectional, as it involves the active participation of consumers as co-producers and implies a plurality of approaches making the study of IB more diverse and less predictable. It therefore has implications for policymakers in that it identifies inconsistent pace-changes and reactions, and highlights the need for horizontal, ecosystem-based, connected policies.

According to Bianchi and Labory (2018a, 2018b), industrial policy has to facilitate the structural changes and mechanisms of productive transformation. This may include reshaping global value chains and assisting the emergence of new ones. This implies coordinated multilevel governance. In this light, territories should help mobilise both tangible and intangible resources to create hubs of a digital and globalised world.

Given the growing perception and need for adequate rules and regulations to govern business activities in digital data-driven time, attractiveness to investors was bound to be defined by regulations, including the new EU law on the common digital market and AI currently being discussed/implemented. In 2021, the European Commission (EC) published a Digital Compass to help advance EU ambitions for a digital transformation by 2030. This will be built on: 1) ensuring that more people possess basic digital skills; 2) providing sustainable digital infrastructure; 3) promoting digital transformation of private businesses and public services; and 4) encouraging cooperation between Member States. According to the experts,

however, any coherent strategy should be built on the four pillars of ethics, social fabric, the economy, and security (Demertzis, 2021). In February 2020, the EC unveiled the European Data Strategy. It is intended to increase the use of the growing amount of data in the EU economy, and to create a legal framework to facilitate the use of and access to data (Makowska, 2021). By creating a single data market, the EC is aiming to increase innovation and economic growth in a highly competitive international environment. The single data market is intended to facilitate the attainment of European data ‘sovereignty’ (availability and usability in the economy and society, while maintaining control over them).

While Europe seems to have all the key ingredients necessary for innovation, such as a skilled workforce, research infrastructure, and robust institutions, more efforts are needed to mobilise and channel them into the real economy if the continent is to avoid falling behind in the I4.0 era (Adarov and Stehrer, 2020). The experts argue that developing a start-up ecosystem that in any way resembles Silicon Valley requires pro-competitive regulations and policies that tackle barriers to entry and provide incentives to adopt new technologies and invest in ICT capital. No less critical are the removal of the bottlenecks of overregulation and barriers to entry, and the harmonisation of regulations across countries. This implies massive complementary public infrastructure investment.

Technology companies – the key I4.0 players – all initially focused on a particular IT segment, but have gradually expanded beyond this core business (Śleszyńska, 2021). The Big Tech giants are constantly on the lookout for innovative start-ups that could pose a threat to them in the future. They acquire them, suck out their know-how and spit out the unnecessary rest. In this way, they simultaneously enter new and promising market segments (most often related to AI), eliminate competition, and acquire engineering talent. The business models of digital platforms revolve around the mining and monetisation of their users’ data. The ongoing evolution of Big Tech could elevate digital giants to the status of utilities. We would then be dealing with a new generation of ‘too big to fail’ companies, i.e., companies that, because of the systemic nature of their business, have to be bailed out by governments when faced with a crisis. Demonopolisation is necessary to protect the market from stagnation due to a lack of competition, consumers from being restricted to a single supplier and forced to accept its conditions, and governments from blackmail (Śleszyńska, 2021). As desirable as it might be to break up the technology oligopoly, legislation has not kept up with the expansion of technology companies. This is especially problematic, as killing competition is not the only sin of digital monopolies. For years, they have resorted to regulatory and taxation arbitrage, i.e., moving to jurisdictions with light legislative and fiscal burdens. The EU is working on an intra-EU regulation that would oblige companies to make data available anonymously, so that the databases necessary for machine learning and AI development can be built.

The design and implementation of policy always imply some level of State intervention. In the case of a digital transformation, voices calling for this to be limited to raising awareness and improving absorptive capacity compete with campaigns for more state involvement, particularly in the light of political pressure for reindustrialisation, coupled with generous policy support, in advanced economies (Szalavatez, 2020).

EU policymakers should prevent dependence by diversifying modular technologies (FT, 02.12.2019) and instead of resorting to autarky, EU policy should be about levelling the global playing field, which should however not lead to artificial protection from the creative destruction process. This policy should empower EU firms to become global leaders. As the 'picking winners' approach has been proven ineffective, complementary horizontal and targeted elements are necessary. The horizontal approach should safeguard adequate conditions for economic activities around digital platforms. Single market rules must detect and redress harmful abuses in the new techno-global environment without jeopardising the efficiencies generated by the network effect of the platform. Targeted measures should not be confined to selecting a few 'winners', providing them with public money and shielding them from competition. Rather funds need to be earmarked for a broader set of interconnected firms in the selected areas.

The worldwide collapse of the market for key semiconductors in many industries (due to COVID) and the need to rapidly create production capacity and guarantee strategic autonomy (sovereignty which must be distinguished from protectionism, according to Commissioner T. Breton) has brought about a return to favour of policies and instruments to support investment in strategic areas, including the relaxation of state aid rules and other active aid methods (federal and regional incentives were also introduced by the US administration to attract investments by TSMC or Samsung) (Słojewska, 29 November 2021).

3. Methodological Framework

This research is generally framed within the seminal OLI paradigm, which explicitly stresses the location dimension, along with strategic coupling and global production network (GPN) (Dunning *et al.*, 2008). The OLI paradigm highlights the three advantages of ownership (O), location (L) and internalization (I) that can be employed by firms to expand abroad. In the context of this paper, the location-specific (L) advantages are dominant. These comprise resources, networks, institutional structures, and other factors characteristic of particular countries (Rugman and Gestrin, 1993). Location advantages are also at the centre of the GPN approach. This is a useful tool for analysing worldwide production processes, as it integrates the idiosyncrasies of individual firms (e.g., ownership) with regional aspects (local authorities, business environment, etc.) and allows for strategic coupling.

The literature review was conducted manually and subjectively without the assistance of any applications or software. Despite the limitations of this approach, which however, ensured the selection of publications that were strongly contextualised and important in terms of the subject matter, the literature that formed the basis for the review included scientific articles, book chapters, monographs, and reports, studies and analyses from think-tanks, public authorities and other analytical or research institutions.

The aim was not to conduct a bibliometric, comprehensive review of as much of the extant literature as possible, but to focus on that most closely related to the issues

at hand. The review was guided by searches that combined keywords such as I4.0, fourth industrial revolution, digital transformation, FDI, attractiveness, host locations, CEE, Poland, and which gave preference to impactful journals such as *International Business Review*, *Journal of International Business Studies*, or *Competitiveness Review*. It also browsed public documents and reports by relevant Polish authorities.

It was decided to skip focusing on the classic FDI determinants in favour of new ‘digital’ factors in order to adequately emphasise the peculiarities of the new context. This decision was also necessitated by space limitations and length constraints.

The desk research method is a narrative literature review (Gancarczyk and Bohatkiewicz, 2018), a qualitative, and critical analysis of available studies that allows for identifying the pluralities of a given phenomenon. This paper draws on interpretative synthesising and evaluating of available data and sources. This is consonant with recent calls for more interdisciplinary cooperation between economic geography, international business, and innovation scholars as advocated by Mudambi, *et al.*, (2018).

In addition to the critical literature review, this paper draws on the results of a previous qualitative study, *viz.* in-depth interviews conducted as part of the International Visegrad Fund project (ID#21920068). The sample includes academics, business figures, and experts (governmental dedicated agencies; technology directors and product managers from MNEs and SMEs; professors, scholars, economists from renowned universities, think-tank analysts, senior fellows, freelance researchers). The interviews were conducted from November 2019 to March 2020, either as F2F or as phone calls (due to COVID-19).

This paper takes some first steps towards developing a comprehensive set of propositions concerning host country attractiveness for FDI in the digital age, and discusses key ideas in this area, thereby promoting a promising research agenda for the future.

4. Results

4.1. Context of the Study – post-transition FDI dependent Economy

CEE countries have been long seen as attractive locations for FDI. Since the transformation process, they have regarded as heavily dependent on the inflow of foreign capital. Except for Poland, FDI stock accounts for more than 50% of GDP (Éltető and Antalóczy, 2017). Globalisation processes, including fragmentation, modularisation, and spatial concentration of economic activities, have modified international production, which has been predominately organised via GVC and has also reached the new EU member states. The pull forces of these transition or transformation economies consisted primarily of a low-cost highly qualified labour force, and a business-friendly and politically stable environment. Digital transformation may facilitate further integration of ‘factory economies’ in the GVC (Szalavetz, 2020). Reurink and Garcia-Bernardo (2020) argue that the FDI attraction profiles of Hungary, Czechia, Bulgaria, Romania, Slovakia, and Po-

land revolve primarily around offshoring manufacturing by MNEs. Hence these countries are labelled as manufacturing centres that have managed to attract a degree of mainly low value-adding activities. Only Czechia and Hungary have been able to attract a small number of R&D activities. Analysis conducted by Gubik *et al.* (2020) states that the FDI stock of Asian investors in the V4 region is significantly higher than the data on direct investors would indicate, suggesting that companies go through intermediary countries before the investment reaches its final destination.

Poland is a post-transition economy and the largest recipient of FDI among the new EU member states in the CEE region. The country proved immune to the 2008+ global financial crisis. It has well-developed institutions that reduce the risk of IFDI, although its national innovation capacity is ranked low. It is therefore particularly important to explore the impact of digital transformation on the attractiveness of such a post-transition economy.

4.2. Digital Maturity

The new strategy tabled by the Polish government assumes that businesses can be encouraged to invest more in research and development or innovative projects that will facilitate an innovative transformation (Godusławski, 16 September 2020). This requires a skilled workforce. Therefore, an employer who needs, e.g., programmers, robotic engineers, or biotechnologists, will be able to count on a reduction in labour costs. A company that incurs significant R&D expenditures will be compensated with the personal income tax (PIT) levied on the salaries of such 'innovative employees'. This pillar of the strategy also includes the solution already known, viz. the relief on expenditures related to robotisation. In addition to this, relief will also be granted for prototypes of products previously unknown on the market and for those that stand out from those already available.

The 'Digital V4' project might pave the way for further integration in this respect (Kucharczyk, 2020). Digital Poland, has invited counterparts from the Czech Republic, Slovakia and Hungary, representing the largest digital sector companies in these countries, to cooperate. Using the Visegrád Group formula, the Digital V4 project was initiated to jointly create a single policy to support the development of digitisation of the V4 countries. The signatories want their common voice to be heard in the EU. Digital V4 is also intended to be an advisory base for the governments of V4 countries, as well as a place for exchanging experiences. It will focus on the future of modern technologies and the direction of their development. These include the digitisation of the economy, 5G, building a strong Union through a single digital market, cyber security, and the development of start-ups and small businesses. That is why the present authors formulated Research Proposal 1.

Research Proposal 1 – In attracting and hosting FDI in the realm of the I4.0 digital ecosystem and education/competencies come to the forefront.

4.3. Retention and Upgrading

Scholars surveyed for the International Visegrad Fund project reckon that *‘from our Polish perspective, it is necessary to build an awareness among managerial staff, and to incur huge expenditures on new technologies, but also to be able to plug into the new infrastructure. Only some Polish companies have made the necessary investments, have scaled up, have the right managerial staff and can operate in these realities’*. Over the medium term, large companies generally want to provide opportunities to work together with small and medium-sized partners, but changing the mentality of managers and making it possible to be served by appropriately qualified employees is going to require a huge investment. For many small and medium-sized companies in Poland, this is an insuperable obstacle. For branches of foreign companies in Poland that deal with business process outsourcing and shared services centres (SSC/BPO), robotic process automation (RPA), which will enable people performing simple activities to be replaced with algorithms, may be a severe long-term threat. Industry spokespeople are saying that nobody has been retrenched, but nobody is being employed either. And the slowdown in employment is evident. The only way out of this challenging situation is to focus on handling more complex, more complicated processes. The experts surveyed for the International Visegrad Fund grant often claimed that *‘The problem facing Poland is lack of scale. We have some islands of success, we have outstanding IT specialists, but these are isolated cases’*. Still, many companies and many employees remain in their comfort zone and do not feel the need to step outside it. It is necessary to change this mindset and create an ecosystem propitious to I4.0 so as to make the country attractive to a new kind of investor. *Firstly, it is necessary to adapt what is on offer to the stages of development. The critical start is to raise awareness; to make businesspeople aware of their needs in order to trigger their inventiveness. Secondly, real assistance in assessing digital maturity is a necessity. Thirdly and finally, it is essential to build competencies. However, it is also essential to look ahead, to react to new challenges, to create soft and hard competencies, and to provide opportunities for testing, simulating, demonstrating, and conducting pilot studies.* All these are key components of I4.0, where it is not a product that is being offered, but a whole package, including services, where information is integrated, and the partners are in some way permanently bound. The digital competencies of society as a whole have to be enhanced.

Digital transformation stresses that FDI has to be embedded in a post-transition economy, so that it can be used to develop domestic companies and investments and ensure ever increasing positive benefits. Prof. Chlebus from the Wrocław University of Technology is a member of the Council of the Future Industry Platform. He stressed that I4.0 is primarily about digitisation: *‘The results will not be satisfactory until we have digital models for managing processes, offices, work, warehouses, and supplies. In our country, the problem is that the most advanced companies in this area are global companies. Moreover, the network of sub-suppliers for these companies works to different standards. Integrating our methods of operation, models, and tools should be transferred to small and medium-sized enterprises’*.

The experts surveyed for the International Visegrad Fund project, were of the view that whether these new technologies (i.e., artificial intelligence [AI], additive manufacturing [AM], and virtual reality [VR]) are the preserve of a few large MNEs etc. or in the hands of several actors (and therefore dispersed and more readily available) is a major issue. Moreover, it is crucial to safeguard the spillover of these incoming technological solutions. Unfortunately, Poland is still regarded as an assembly plant, and our place in global value-added chains is not the most attractive in terms of the classic factors that determine attractiveness. *In essence, we do something relatively fast, efficient, cheap, and of good quality. However, if we take into account the horizontal integration within the value-added chain, the requirements of the end-user cause a certain degree of process coupling and mutual information flows, so far-reaching integration, compatibility, interoperability, and data exchange become crucial.*

Many MNEs are implementing an information exchange policy. While this coupling is integrated forwards, it is unfortunately not yet integrated backwards. Meanwhile, many countries (e.g., Germany) have their own unique official strategy, but also create alliances that are intended to encourage smaller companies to participate in the digital revolution and get them involved in the transformation. Ensuring compatibility is crucial, as small and medium-sized enterprises are the backbone of European economies.

In Eastern Hungary, as is the case elsewhere in CEE, internationally competitive manufacturing companies have emerged almost exclusively as a result of FDI (Nagy, *et al.*, 2020). When it comes to implementing I4.0, Hungarian-owned companies face many difficulties, whereas enterprises with foreign interests continue to be the engine of development, driven from the 'outside'. This duality is also reflected in space – relative prosperity is visible in the 'automotive' Northern Transdanubia region and Budapest and its consumer market. Thus, Research Proposal 2 is presented below.

Research Proposal 2 – In attracting and hosting FDI in the realm of I4.0, ensuring absorption capabilities, embeddedness, and upgrading are key.

4.4. Policy and Regulation

The experts surveyed for the International Visegrad Fund project were of the view that a dedicated national programme of digital education may be necessary. Talents still play an essential role and access to talent is critical as it is through them that radical innovations can be created. The cost of labour is decreasing and losing relevance, whereas competencies and skills are becoming critical. A special magnet for investors seems critical. Over 20 tax and regulatory changes and simplifications have been introduced to help Poland attract capital and to support domestic businesses and help them expand abroad (Godusławski, 16 September 2020). The government wants to move forward and use the pandemic to improve the business environment in the country. The idea is not only to bring production to Poland but also to use the growing potential to take over services from other countries. However, the goal

is for investors, through tax and regulatory incentives, to consider new projects. In general, the strategy is based on four pillars. The first will be the repatriation of Polish capital. The next two pillars will contain ideas that the government has already announced, e.g., the Estonian corporate income tax (CIT) and relief for robotisation. There is also meant to be relief for prototypes and support for employing innovative workers. To gain capital or competitive advantage, there will be relief for stock exchange debuts, indirect tax support for foreign expansion, and consolidation relief for mergers. This strategy for attracting capital has the working title 'Polish Economic Centre of Europe'. It is a collection of ideas that are being worked on in the Ministry of Finance and the Ministry of Development. Currently, over 20 changes in regulations are planned. Some are being created with foreign investors in mind. The intention is to improve conditions for doing business so as to encourage them to implement new projects in Poland. However, there are also initiatives for domestic capital. In May 2021, the Ministry of Finance presented a tax relief package under the Polish Deal programme (Tronowicz, 2021). As part of the package, the ministry has proposed tax relief in several areas, including R&D (to supporting conceptual work on products), prototyping, robotisation, and employing innovative workers and specialists. The Ministry of Finance also proposes IP box relief, i.e., a lower rate of taxation on the income from the commercialisation of intellectual property rights. In the case of the production of intellectual property, e.g., registration of patents in Poland, the rate of taxation on the profits from their commercialisation will be reduced from 19% to 5%. Tax deductions are available for the purchase of new robots (Grednys, 3 January 2022), staff training, and the purchase of intangible assets needed to implement industrial machinery. In addition, the provisions of the relief for prototypes and the support of innovative employees have applied since 1 January 2022. Manufacturing companies that want to improve their manufacturing processes can deduct 50% of the deductible costs incurred for robotisation from their tax liability. These measures are intended to convince large investors that Poland is where they will transfer production from the Far East and where they will locate research centres. The Ministry intends to accelerate the development of I4.0. The Industrial Policy of Poland was devised in consultation with industry figures and experts. Their input was used in drafting the White Paper on Industrial Development (2021). This document enumerates the strengths of Polish industry, including growing exports, location of production plants and distribution centres, highly qualified engineers, and many small and medium-sized enterprises that have the potential to apply new technologies and manufacturing techniques. Weaknesses include low recognition of Polish brands in the world, the financial condition of companies, low capitalization of entities, lack of money for investment, and insufficient cooperation between companies and R&D centres. Opportunities for Polish industry include interest on the part of foreign investors in starting up production in Poland, the development of automation technology, the digitalisation of processes, and the high quality of technical education in Polish schools. Excessive regulations, a shortage of skilled workers with secondary technical education, and the concentration of knowledge and capital around a few companies complete the list of threats. The digital transformation

of Polish industry will benefit from the network of Digital Innovation Hubs and the emerging European Digital Innovation Hubs. DIHs and eDIHs are to focus on helping companies develop a digital transformation plan, providing access to expertise, and setting up conditions for testing and experimenting. The Industrial Policy assumes that awareness of digitalisation, automation, and ways of financing the transformation will increase with the assistance of the Regional Councils of the Future Industry Platform established by the PPP (<https://przemyslprzyszlosci.gov.pl/future-industry-platform-the-mission-and-contact/>). The Industrial Policy of Poland also lists those areas of the Future Industry Platform (FIP) related to digitalisation. These include raising competencies using a series of training sessions in the field of 4.0 technologies or digital transformation processes, thematic webinars, online courses through the E-learning of the Industry of the Future, development of the knowledge base on technologies and industry, and demonstrations of technologies in the fields of predictive maintenance, 3D printing and AR. The FIP is tasked with advising businesspeople and conducting technology and implementation audits, performing digital maturity scans, and developing a digital transformation plan. Another tool for industrial development is the Factory of the Future competition. This promotes good practices in digitising production. The Digital Platform is another FIP initiative to support companies in technological and organizational development. The service will facilitate establishing working relationships with partners, acquiring knowledge, and searching for financing mechanisms.

The experts surveyed in the quoted International Visegrad Fund project were of the view that *'State policy should be modified and adjusted accordingly and a lot has changed recently in Poland in this respect'*. In addition to R&D incentives and concessions, an 'IP box' has been introduced. This makes it possible to apply for a reduced rate of tax on income earned from the ownership of intellectual property rights obtained from research and for tax deductions for outlays on improving innovation. This is intended to not only encourage and reward conducting research and generating new knowledge, but also its active use and commercialization in Poland.

A European cloud infrastructure is a tool for realising this plan. In October 2020, 27 EU countries signed a declaration on the development of cloud services for the private sector and public administration. They agreed on the need for the EC to prepare a list of principles, standards and norms for these services (Cloud Rulebook) and to launch European platforms to facilitate their acquisition (Cloud Marketplace). The EC has published a draft regulation on the Data Governance Act (DGA). This sets out the principles and guidelines for developing a new data brokerage business model that could unlock the potential of the vast amounts of non-personal data generated by companies and individuals. The regulation is intended to allow businesses to share their data without fear of misuse or loss of competitive advantage. The DGA is designed to encourage 'data altruism' among companies and individuals by providing secure rules for sharing data for the common good, e.g., for non-commercial medical research. The DGA also includes a proposal to create an advisory body, the European Data Innovation Council. Implementing the EU strategy of a single data market requires the involvement of the member states and the EC in building a culture of trust in sharing data between companies with

the participation of the public sector. In addition to improving the level of digital competence in business, this is a precondition for realising the concept of European Data Spaces. For Poland, the Single Data Market is an opportunity for domestic companies to develop, but it requires that the pace of digitalisation of enterprises be accelerated beforehand so that they can fully benefit from the liberated data. It is necessary to provide public and private financial resources for this purpose, and to increase the digital competence of the general public, so as to increase the demand for digital products.

The experts surveyed in the International Visegrad Fund project were of the view that *'only by accessing databases and improving machine learning, can we move to a higher level of Artificial Intelligence. Disproportions and imbalances will increase, and asymmetry will deepen. Actually, access to data is just as important as technology. The common strategy of buying "start-ups", due to their attractive advanced technology, makes these strong players even more potent because their competitive advantage is grounded in the large amounts of data they possess. At some point, these monopolies will have to be broken up'*. There is an ongoing discussion on how to limit the influence of large corporations, but their lobbying and market power are extensive. It can be hoped that this proceed in the right direction and that there will be a shift towards a more equal distribution. It is in the interest of the EU to reduce these disparities and inequalities. However, these issues need to be put in order – a new concept requires new laws and regulations. There have been attempts to create national champions, but there have also been others to prevent the abuse of market dominance. Measures are being implemented to promote strong companies as a counterbalance to American and Chinese concerns, and to prevent abuse of monopoly power. The European Digital Single Market is an attempt to protect the public, while generating high growth and improving competitiveness by working on digital tax and accessibility to data (the scale and network effects). The intentions of politicians regarding the regulations are good but very difficult to implement. These regulations will also define attractiveness in the I4.0 era.

The decision of the VV Group, to invest in a battery factory in Martorell, Catalonia, Spain, was impacted by a Spanish government initiative, known as Strategic Projects for Economic Recovery and Transformation (PERTE¹), designed to assign a more prominent role to Spain in developing the e-mobility technology chain (Walewska, 2021). In the same way, the Polish government wants to have its Commissioner for Foreign Investment in Poland, as it is hoping to attract more investment (Skwirowski, 19 January 2021). The Commissioner's basic task would be to coordinate and facilitate the influx of foreign investment into Poland, and in particular, to improve the conditions for realising this investment. The draft regulation for appointing the Commissioner explains that attracting foreign investment is a complicated, multi-faceted process. Fiscal incentives and additional forms of support in the form of state aid are not without significance for creating conditions conducive to investing in Poland. The government explains that these areas are currently within the competencies of various ministries.

¹ 'Proyectos Estratégicos para la Recuperación y Transformación Económica'.

The EU needs a more targeted strategy to increase its presence in the strategic and thriving semiconductor industry. No economy can hope to achieve full independence in this industry. Ensuring a sustainable supply through diplomatic means should therefore be a priority (Poitiers and Weil, 2021). The foregoing justifies the formulation of Research Proposal 3.

Research Proposal 3 – In attracting and hosting FDI in the realm of I 4.0, the unabating relevance of state intervention/incentives and the growing presence of new regulations come to the forefront.

5. Discussion and Conclusions

Attracting valuable and technologically advanced investment that can be adequately embedded in the local economy should be a priority. The diminishing role of classic efficiency seeking and market-seeking FDI observed due to digitalization coexists with the increasing importance of knowledge as a key factor in drawing foreign investment. It is therefore speculated that FDI in the digital era will be guided by access to high-quality knowledge hubs, such as clusters (UNCTAD WIR 2017). In light of this upcoming or even progressing transformation, the attractiveness of countries or regions to foreign investors needs to be reevaluated.

Digital advances might facilitate overcoming the various liabilities faced by foreign investors like the outsidership, newest or classic foreignness liabilities. They would further enhance the meaning of internationalization as collective cross-border activities undertaken by a wide array of actors (Coviello *et al.*, 2017). In particular, the strength of CEE countries lies in their talent pool, competitive wages (salary costs 60% lower than in Western Europe), automotive manufacturing, R&D maturity (still room for growth), well-developed infrastructure, and government support (tax breaks). Arranging and implementing the whole package of parallel changes necessary to launch I4.0 takes time and a certain scale has to be achieved to make a locale attractive.

The experts also highlight the sequential aspect of I4.0. *'First of all, I4.0 is a new technology, and it is all about using sensors, AR, or 3D. This technology affects the structure of the factory, and it can be compared to the changes introduced by electrification. Thus, I4.0 is firstly a new technology, but its application brings about the reconstruction of the whole cycle and production process'*. This cross-linking, with devices being connected by sensors, forcibly adjusts the setting of the whole process, thereby modifying the business model. These initial technological changes, resulting in new models, require significant changes in human resources policy, education and training. Germany shows that this sort of adjustment is time-consuming and that the introduction of I4.0 requires a whole package of parallel changes. A complementary factor in the introduction of I4.0 is intangible capital, additional training, and expenditures on R&D and software. On balance, whether I4.0 is a deterrent or an opportunity for foreign investors is going to depend on how ready the country is, i.e., how digitally mature its business sector is, and how large its absorption capacity

is. The conditions to benefit from I4.0 are up to us – ‘Fortune favours the prepared’. The technical infrastructure in Poland is poorly developed, and our robotisation and automation rates are below the EU average. Change requires funds. It is necessary to invest, develop and implement vocational training, and work closely with vocational schools and universities. Legislative incentives are also necessary, as are horizontal and comprehensive actions. The examples of other countries indicate that I4.0 is being introduced slowly and requires appropriate preparation. It must be skilfully implemented; piloting and testing are essential. There is no single universal factor determining the attractiveness of a location, and a lot depends on the industry. I4.0 needs complementary measures, including wise innovation, and a well thought out education and science policy (Pawlak, 2020). CEE countries face similar challenges and have similar economic ambitions. Therefore, they could and should join forces to accelerate the development of a ‘regional technology hub’. Similarities make it easier to act in concert, but rivalry is very likely, as competition is inherent to these countries. It is worthwhile having a strategy while trying to work together, and perhaps develop a particular specialization inside the group.

The inquiries not only helpful in describing the facts and diagnosing the current challenges, but also in detailing normative aspirations in order to outline the desired situation. The need to shift attention to digital maturity/I4.0 readiness as factors determining attractiveness for IFDI, as well as boosting OFDI, is evident. This has practical implications for managers and decision-makers.

The world is entering an ‘Age of Disorder’ in which several factors are colliding to roll back globalisation. Petricevic and Teece (2019) claim that the VUCA international context, in which neo-techno-nationalism plays a prominent role (Shim and Shin, 2016) leads to conditions of ‘bifurcated governance’ and ‘decoupling of value chains’ with cascading effects forcing active MNEs to reconsider and reconfigure their global operations.

Nevertheless, according to scholars surveyed for the International Visegrad Fund project, *‘For the Visegrád Group, I4.0 could be a chance to move from the “cheap labour” league to a whole new level’*. We need to talk not only about attracting foreign investment, but also to look at I4.0 as an opportunity to enter a higher level of competitiveness and development – and to build new competitive advantages.

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