

Changes below the still surface? Regional patterns of foreign direct investment in post-crisis central and eastern Europe

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1. Introduction

In the past two decades foreign direct investment (FDI) has played a transformative role in central and eastern Europe (CEE).¹ The massive inflow of FDI, especially since the late 1990s, has turned these former communist countries into highly internationalised economies that are now deeply embedded into global markets and value chains. Four central and eastern European states – Czechia, Hungary, Poland and Slovakia (also commonly referred to as the ‘Visegrad group’) – stand out from central and eastern Europe in that, on the one hand, they have garnered the bulk of foreign investment and, on the other hand, they have introduced the most generous investment incentive schemes. In this vein, these countries’ development strategies have been based mainly on attracting FDI. Foreign-owned enterprises are now responsible for a large part of domestic output and exports and economic growth has also to a great extent become dependent on sustained foreign capital inflows.

Although foreign investments have contributed to the restructuring and modernisation of domestic economies, they have also involved some less favourable consequences. For instance, excessive reliance on FDI has rendered central and eastern European economies vulnerable to external economic shocks, such as the global financial and economic crisis in 2007–2008, which caused a sudden and lasting decline in inward FDI. Furthermore, the spatially divisive character of FDI inflows has led to a steep rise in internal regional disparities: foreign investors have consistently preferred to set up their businesses in the most developed regions of Czechia, Hungary, Poland and Slovakia, while the backward areas were left without any significant foreign investment activity. From

1. In the present chapter ‘central and eastern Europe’ is understood to include the following countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czechia, Estonia, Hungary, Kosovo, Latvia, Lithuania, Macedonia, Montenegro, Poland, Romania, Serbia, Slovakia and Slovenia.

a territorial point of view, this has also resulted in asymmetrical regional integration into global markets. The prosperous areas, which are well-endowed with FDI, have established multiple ties to external markets, whereas the underprivileged ones have remained fairly isolated in this respect.

In light of the above, the economic crisis offers a compelling context for studying the regional and sectoral distribution of FDI in central and eastern Europe. This is because any crisis-related changes in investors' location preferences or in their sectoral composition have far-reaching implications for the long-term feasibility of domestic economic strategies relying on foreign capital inflows. First, it has not yet been examined in the literature whether the decline in FDI has also involved a shift in foreign investors' location preferences. In other words, it remains to be determined whether the same regions remained the preferred target of foreign investors after the crisis as before or whether previously neglected areas began to attract more FDI. Second, although several scholars have analysed the sectoral aspects of recent FDI inflows, the post-crisis regional distribution of foreign investments by economic activity has remained relatively unexplored. By comparing the pre- and post-crisis trends in foreign investments, this chapter aims to investigate the regional and sectoral aspects of FDI in the four central and eastern European countries mentioned above. More specifically, it seeks to identify the post-crisis location patterns and sectoral attributes of foreign capital inflows and to draw inferences concerning their potential territorial and economic consequences. Given the predominantly exploratory nature of the analysis, it is mainly descriptive and does not seek to establish causal relationships. Nevertheless, it does aim to find a link between the crisis and the regional and sectoral patterns of inward FDI in central and eastern Europe.

The structure of the chapter is as follows. Section 2 formulates the research questions and briefly reviews the relevant literature on the determinants of the location choices of foreign investors and the consequences for regional development and territorial disparities in central and eastern Europe. The text then goes on to introduce the data along with a detailed discussion of methodological issues and concerns. The empirical analysis is on two parts. The first compares the pre- and the post-crisis location preferences of foreign investors, while the second discusses the sectoral aspects. The final section draws conclusions and formulates some further implications of the empirical findings.

2. The role of FDI in central and eastern Europe and its spatial consequences

In the 1990s, most foreign investors were motivated by market-seeking considerations and entered central and eastern Europe by purchasing existing facilities through privatisation. Nevertheless, FDI inflows remained fairly low in this period (Sinn and Weichenrieder 1997) because in the early years of the transition from a command to a market economy only Hungary opened up to FDI, while the governments of Czechia, Poland and Slovakia proved reluctant to allow substantial foreign involvement in their domestic economies and restricted the participation of foreigners in the privatisation process (Sass 2003; Vachudova 2005). However, the strategy of building national capitalism soon collapsed, most conspicuous in the Czech financial and economic crisis in 1997. Pressure from the European Union and international financial institutions to involve FDI in the process of economic transformation (Medve-Bálint 2014), and the frequent interaction of domestic leaders with 'liberal'-minded EU officials (Bandelj 2010) eventually triggered a shift in economic strategies: by the end of the decade all the central and eastern European governments had changed their attitudes toward FDI.

As a consequence, since the early 2000s these countries have uniformly sought to attract foreign investors (Drahokoupil 2009a). These attempts proved highly successful. By 2013, the four countries held 63.8 per cent of the total central and eastern European inward FDI stock² and their per capita FDI stock was nearly five times the 2000 level.³ This is notable even from a global perspective because other emerging markets – such as Mexico, Russia or Brazil – which have recently also been preferred targets of foreign investors, have not matched this performance.⁴ Foreign-controlled enterprises therefore enjoy a dominant position in the central and eastern European economies: their share in total production value ranges between 40 and 60 per cent.⁵

2. At the same time, the Visegrad 4's share of FDI stock from total CEE FDI stock is proportional to their share in total CEE GDP (61.2 per cent in 2013, expressed in PPP; author's own calculation based on World Bank data).
3. In 2000, FDI stock per capita in the Visegrad countries was 1,830 USD (in 2005 prices), whereas this figure reached 8,868 USD in 2013 (in 2005 prices; author's own calculation based on UNCTAD data).
4. In 2013, Brazil's FDI stock per capita stood at 3,110 USD, Mexico's was 2,735 USD, while Russia's figure reached 3,466 USD (in 2005 prices; author's own calculation based on UNCTAD data).
5. In 2012, the share of foreign-controlled affiliates in the total production value of the national economy (excluding the financial sector) was 38 per cent in Poland, 48 per cent in Czechia,

Such an influential position of FDI in national economies that are not tax havens is almost unprecedented globally. This is why the central and eastern European countries have recently gained growing attention especially among those scholars who share concerns about the massive presence of FDI in these states. For instance, Šćepanović (2013) argues that the remarkably strong and relatively rapidly established presence of foreign investors in the domestic economies represent a ‘hyper-integrationist’ development model, which is characterised by a central role of foreign capital that substitutes rather than promotes the development of domestic capabilities. Other scholars emphasise the excessive dependence on external resources by referring to the Visegrad countries as ‘dependent market economies’ (Nölke and Vliegenthart 2009) or FDI-based market economies (Myant and Drahoukupil 2011).

In order to assess the spatial consequences of the dependence on FDI, it is important to reflect on those key structural characteristics that have prevailed in central and eastern Europe since the late 1990s. First, most of the foreign capital entered after the shift in domestic FDI policies had taken place. While in the 1990s privatisation was the main channel of FDI, since the early 2000s greenfield foreign investment has played a decisive role, also because large-scale privatisation had come to an end by then (Antalóczy and Sass 2001; Jensen 2006). In contrast to privatisation FDI, greenfield investors are mobile in that they seek to locate in the most cost-efficient places with the highest expected return on the invested capital. It follows that they are flexible in choosing their location: they carefully screen several potential sites before making a decision on where to set up the new business. In these circumstances, incentive schemes, which decrease the costs of investment, may notably influence the greenfield investors’ location choice. The domestic policy shifts that involved the promotion of FDI thus met the needs of foreign greenfield investors. In addition, because the central and eastern European countries have similar industrial profiles and offer similar advantages in terms of cheap, skilled labour they have been competing for the same foreign investments, predominantly in the complex manufacturing sector where their comparative advantages are greatest (Bohle and Greskovits 2012).

58 per cent in Hungary and 60 per cent in Slovakia (author’s own calculation based on Eurostat Structural Business Statistics).

The above features (domestic economic strategies relying on FDI, increasing role of greenfield investors and comparable cross-country location advantages in manufacturing) have generated fierce investment competition across central and eastern Europe. In fact, the outbreak of a 'bidding war' (Drahokoupil 2009b) was almost over-determined by the above conditions because, as Oman (2000) suggests, such an outcome most often occurs between countries with similar socio-economic backgrounds, which is the case with central and eastern Europe. As a consequence, the governments adopted increasingly generous incentive schemes in an attempt to compete away external investments from their regional rivals (Drahokoupil 2009a).

Although this practice violated the EU's competition law, which prohibits the provision of targeted aid to investors, incentives may still be compatible with EU regulations if they promote the development of an economically backward area.⁶ By EU standards the entire territory of central and eastern Europe qualifies as backward and thus the European Commission approved most of the incentive schemes and also set regional state aid ceilings which determined the highest maximum level of state aid to be provided in a given region.⁷ By doing so the EU limited but at the same time also legitimised investment competition.

From a territorial perspective, the quest for foreign investors involved an unintended side-effect. The externally set regional state aid ceilings did not differentiate among the central and eastern European regions according to their relative development positions within national economies. In other words, nearly the same level of state aid was applicable in the relatively more developed as in the less advanced regions. In the end, contrary to the intention of EU lawmakers, regional state aid ceilings have promoted investments in the more prosperous central and eastern European areas instead of attracting foreign capital to the backward ones (Medve-Bálint 2015). This is because in order not to lose prospective investments to neighbours, central and eastern European governments had to offer the best locations in the most developed areas and the maximum possible level of incentives to greenfield investors. External investors thus were able to cherry-pick the

6. Article 107(2) and 108(3) of the Treaty on the Functioning of the European Union.

7. Regional aid maps and the corresponding legislation are available at the European Commission's dedicated webpage:
http://ec.europa.eu/competition/state_aid/regional_aid/regional_aid.html

most advantageous locations while also benefiting from tax allowances and other subsidies in return for their investments.

The territorial distribution of aided FDI has reinforced the spatially divisive flow of investments which, otherwise, is a natural phenomenon in capitalist economies. Various branches of location theories (Hirschman 1958; Marshall 1920; Myrdal 1957; Porter 1990) that take a firm-centred perspective commonly predict that economic activity will show uneven spatial distribution: geographical clustering accumulates knowledge and skills and it fosters innovation through spillover effects, which is beneficial for firms competing in global markets. Locating in central places is advantageous according to the theory of new economic geography (Krugman 1991, 1993) and endogenous growth theory (Lucas 1988; Romer 1986) as well. Both approaches refer to increasing returns and agglomeration effects that jointly produce concentration of capital, labour, technology and knowledge in certain preferred locations, which may lead to spatial structures with few well-developed, central places and several backward, peripheral ones.

It has been well-documented that in central and eastern Europe foreign investors matched the expectations derived from location theories: they have consistently preferred to establish their businesses in the metropolitan and industrial areas and in those closer to western European markets, whereas regions with peripheral locations and lower levels of urbanisation have been mostly avoided by FDI (Brown et al. 2007; Chidlow et al. 2009; Fink 2006; Pavlínek 2004; Petrakos et al. 2011; Smętkowski 2013). It is ironic that FDI promotion, which, according to European law, should have generated investments in backward areas, has reinforced the above mechanisms in central and eastern Europe.

It follows that leading regions with considerable FDI inflows and well-established linkages to global markets have experienced higher economic growth than the less attractive areas (Capello and Perucca 2015). At the same time, the growth performance of these countries have been determined mainly by the economic success of the few leading regions that have attracted the bulk of foreign capital. This also implies that, while reliance on FDI inflows has rendered Central and eastern Europe vulnerable to external shocks (Myant and Drahekoupil 2012; Smith and Swain 2010), precisely those regions were the most exposed to the crisis where the presence of foreign-owned enterprises was the strongest. However, as Capello and Perucca (2015) argue, these places may also

have been capable of a quick recovery because of their capacity to flexibly adjust their economic systems to changing external contexts. Against this background this chapter seeks to explore the consequences of the crisis for FDI inflows by comparing the post-crisis location and sectoral patterns of foreign investments with the pre-crisis period.

Based on the above considerations four expectations are formulated. First, the territorial distribution of foreign investments may show lower concentration in the post-crisis period because the anticipated cost savings associated with cheaper labour available in the backward areas may have obtained more significance for efficiency-seeking greenfield investors that needed to drive down their costs even more to match the lower overall demand in the global markets. Second, regarding the sectoral composition of FDI a decline can be expected in capital-intensive manufacturing investments that may have been postponed because of the unfavourable market conditions. Third, the post-crisis sectoral distribution of FDI across central and eastern European regions may either show similarity or difference to the pre-crisis years: it needs to be explored whether the crisis has brought a shift in this respect or whether most of the regions received FDI with a sectoral composition similar to the pre-crisis period. Finally, if leading regions have indeed been the most affected by the crisis, then growth differentials between advanced and less prosperous areas may have been lower in the post-crisis period. Backward areas may have benefited in that they might have experienced higher growth rates than regions with an abundance of FDI. If this holds, then the crisis may have lowered regional disparities in central and eastern Europe to a certain extent.

3. Data sources and data issues

The following analysis relies on data drawn from the Amadeus database, which is a collection of comprehensive information about more than 21 million companies across Europe. This dataset is ideal for comparing the pre- and the post-crisis regional and sectoral patterns of foreign investors because it contains ownership information as well as data on location, year of incorporation, economic activity and total turnover. Thus it makes it possible to create a pre- and a post-crisis sample of foreign-owned companies classified according to their industrial segment and location. The analysis rests on the comparison of a pre- and a post-crisis sample of foreign enterprises in each of the four central and eastern European countries.

The samples consist exclusively of foreign-owned companies that satisfy one of the following conditions: the ultimate owner is located in another country or a foreign shareholder holds at least a 10 per cent stake. Only those firms were included in the samples whose foreign owner's resident country is identified in the Amadeus database. Furthermore, a threshold of 1 million euros in latest reported operating revenue (turnover) was applied in order to filter out both inactive and very small entities. Based on the year of incorporation, the companies were grouped into a pre-crisis and a post-crisis sample. The pre-crisis sample includes firms that were incorporated between 1999 and 2008, while the post-crisis sample includes those enterprises that were established between 2009 and 2014.

Furthermore, each firm was classified according to its economic activity and location. For every company the database contains a description of its primary activity based on national industry codes. This information was re-coded according to the main sections of the International Standard Industrial Classification (ISIC, rev. 4).⁸ In this vein, 18 main groups of economic activities were created, ranging from agriculture through manufacturing to services. As for the location of the foreign-owned companies, the NUTS 3 territorial administrative regions in Czechia (districts or *kraj*), Hungary (counties or *megye*) and Slovakia (districts or *kraj*) and the NUTS 2 regions⁹ in Poland (voivodships or *województwo*) served as the basic units for territorial groupings. Table 1 shows the final number of foreign-owned firms in each country sample.

Table 1 Number of foreign-owned firms in the country samples

	Number of regions	Firms in the pre-crisis sample (1999–2008)	Firms in the post-crisis sample (2009–2014)
Czechia	14	2,921	1,097
Hungary	20	551	107
Poland	16	4,487	708
Slovakia	8	2,422	1,143
Central and eastern Europe	58	10,381	3,055

8. For a full description of ISIC codes please consult the United Nations' dedicated webpage: <http://unstats.un.org/unsd/cr/registry/regdnld.asp?Lg=1>

9. The NUTS classification is the territorial statistical nomenclature of the European Union (Nomenclature of Territorial Units of Statistics). It was introduced in the early 1980s in order to obtain comparable regional statistical data across the EU.

Although the firm-level data are fully comparable, the low number of foreign enterprises in the Hungarian samples – which is due to the low availability of financial data for companies registered in Hungary – raises concerns about the coverage of the dataset. For this reason, the Hungarian data rather serve illustrative purposes and the comparison of the samples in the other three countries constitute the core of the analysis.

A fairly problematic aspect of the Amadeus dataset is that it only reveals the location of the headquarters of firms, which may not correspond to the actual site of production or business activity. In other words, headquarters and branch plants where the actual production takes place may not be in the same place. This represents a distortion for the regional disaggregation of the data because foreign companies may tend to register their headquarters in more developed metropolitan areas or in capital cities, while pursuing their business elsewhere. In this respect, the samples may underestimate the number of foreign companies in non-metropolitan regions. It would therefore be desirable to estimate the extent of discrepancy between the registered headquarters and the real site of business activity. However, it is not possible to account for this potential bias because relevant information is missing from the database. Furthermore, the business registers of the national statistical offices also indicate the headquarters of the enterprises instead of the site of the branch plants.¹⁰ This implies that cross-checking the different official records would not solve the issue.

Nevertheless, the over-representation of foreign firms in capital cities may be an indicator of so-called ‘branch plant syndrome’, which refers to regions hosting manufacturing plants controlled from remote headquarters. In her seminal book, Massey (1984) argued that branch plants are responsible for maintaining regional disparities because they typically represent the lower end of value chains and are associated with the exploitation of investment incentives, low R&D, limited backward linkages and few spillover effects to the host regions. Although in the contemporary global economy the relationship between branch plants and headquarters is changing, a recent study (Sonn and Lee 2012) concluded that most of the negative consequences identified by Massey

10. The only international firm-level database that offers information on the actual location of business activity is FDImarkets (<http://www.fdimarkets.com/>) maintained by the Financial Times. However, in many instances information on the location of firms is missing from this dataset and thus relying on this source would also raise concerns about data quality.

still hold. In this respect, the regional bias in the data seems to confirm concerns about FDI-based development in central and eastern Europe.

Despite the potential problems with data coverage, the Amadeus database is commonly used for regional comparisons. For instance, Casi and Resmini (2010) relied on this dataset to identify the determinants of foreign direct investment in the NUTS 2 regions of the European Union. In a more recent work, the same authors repeated their analysis (Casi and Resmini 2014) and sought to determine simultaneous country- and regional-level effects that shape the distribution of FDI in European regions. Another related study (Villaverde and Maza 2015) also drew on Amadeus data to explore the determinants of FDI in the NUTS 2 regions between 2000 and 2006. Country case studies have also taken advantage of this dataset: Jensen (2004) investigated the localised spillovers in the Polish food industry at the NUTS 2 level and, in a similar vein, Monastiriotis and Jordaan (2010) analysed local and regional productivity spillovers in Greece at the NUTS 3 level. Although most of these authors acknowledged the potential bias that stems from the overrepresentation of firms registered in the more prosperous metropolitan regions, they did not provide remedies for the issue. Similar to the above-listed works, the current analysis also bears the risk of analysing slightly distorted regional-level data and thus the results need to be interpreted with caution.

4. Pre- and post-crisis regional distribution of foreign-owned companies

The number of foreign-owned companies in the region and their latest reported operating revenue serve as the key indicators for a comparison of pre- and post-crisis territorial patterns of foreign investment. Both measures have to be taken into account to obtain a balanced view because it may be the case that in one region there are a few large foreign companies with high operating revenue, whereas in another region there are mainly small or medium-sized firms with low aggregate turnover.

The Herfindahl index, which is a widely used indicator of concentration, is suitable for estimating the territorial density of both the number of foreign-owned companies and their operating revenue. The index falls between 0 and 1, where higher values represent greater geographical concentration. For instance, if all the regions within a country have an

equal share of the total number of foreign firms or of total operating revenue, then the index would be equal to 0. Conversely, if only one region receives all foreign investors and produces the entire turnover, then the value of the index would be 1.

Table 2 shows the concentration indices in each country for each sample and for both indicators. For the purpose of this chapter the direction of change across the two periods is more relevant than the values themselves. In this respect, the table provides a straightforward picture. Both the distribution and the operating revenues of the post-crisis foreign firms show greater geographical concentration than in the case of foreign companies in the pre-crisis samples. On the one hand, foreign firms that entered central and eastern Europe after the global economic crisis are territorially more concentrated than those established in the previous period. In other words, fewer regions received a higher proportion of the newly established foreign firms after the crisis than before. On the other hand, the operating revenue produced by the foreign-owned firms incorporated after the crisis also demonstrates stronger territorial concentration than in the case of those foreign enterprises that were established before 2009.

Table 2 Territorial concentration of foreign-owned companies and their operating revenue in central and eastern Europe before and after the economic crisis (Herfindahl index)

	Regional concentration of foreign-owned companies		Regional concentration of operating revenue (turnover)	
	Pre-crisis	Post-crisis	Pre-crisis	Post-crisis
Czechia	.268	.384	.215	.295
Hungary	.373	.443	.304	.529
Poland	.211	.263	.166	.214
Slovakia	.232	.253	.219	.309

It is important to note that the calculation of the concentration index for operating revenue is based on firms' latest reported operating revenue. For most enterprises the latest available financial data are for 2012. It follows that higher post-crisis Herfindahl indices mean that the turnover of those foreign-owned enterprises that commenced their activity in or after 2009 is territorially more concentrated than for those firms that were already active before the crisis. To put it differently, post-crisis foreign firms produce a higher share of their total turnover in fewer

regions than those companies that were established before the crisis. In short, the territorial distribution of the operating revenue is more balanced in the pre- than in the post-crisis samples.

Nevertheless, the greater post-crisis geographical concentration of foreign-owned enterprises and their operating revenue does not necessarily mean that the same regions that had been the preferred targets of foreign investors before the crisis have also benefited from post-crisis trends. What is more, the territorial concentration of the firms and their operating revenue may, at least in theory, reflect different spatial processes: several scenarios are possible, at least hypothetically. Based on the literature and on the above figures the first and most likely possibility is that both the foreign companies and their turnover are concentrated in the same regions in both periods. A less likely alternative is that although in each period the geographical clustering of the firms and the turnover are strongly related to each other, different regions benefited from the spatial concentration before and after the crisis. A third possibility is that the concentration of the firms and that of turnover are not related to each other. This would be the case if in several regions there was a high number of foreign firms with relatively little cumulative operating revenue but, at the same time, there were also regions with a few large foreign-owned companies that produced the bulk of total turnover. To put it differently, if the geographical clustering of firms were distinct from the territorial concentration of operating revenue, then some regions would appear to be attracting exclusively small foreign enterprises, while others would have a few large foreign companies.

In order to determine which of the above scenarios has prevailed in central and eastern Europe, first it has to be assessed whether the regional concentration of firms corresponds to the regional concentration of operating revenue. A region's share of the total number of pre- and post-crisis companies and, similarly, the regional shares of total turnover produced by those companies are the two indicators relevant for this exercise. A strong correlation between the two measures would indicate that there is a high correspondence between the geographical concentration of the firms and their turnover.

However, as expected, the four capital city regions are strong outliers: in both periods they secured the vast majority of foreign firms and have been responsible for the lion's share of total operating revenue. Prague in Czechia, Budapest in Hungary, Mazowiecki in Poland and Bratislavsky

in Slovakia took the highest share of both the companies and the turnover and their role is so decisive in the samples that they strongly determine the correlation coefficients.¹¹ For this reason, the following calculations exclude the capital city regions and refer only to the remaining 54 central and eastern European regions.

In both periods the regional shares of foreign-owned companies and of turnover show a robust association with each other. In fact, the two measures are strongly correlated in the pre-crisis sample ($\tau = .654$, $p < .001$, $N = 54$) and in the post-crisis sample, too ($\tau = .679$, $p < .001$, $N = 54$).¹² Thus even after excluding the capital city regions, there remains a high level of correspondence between the regional concentration of foreign firms and the regional concentration of turnover produced by them. A visual inspection¹³ of the association between the two measures also reveals that there is relatively little deviation among the regions; there are only a few outliers. This suggests that overall the composition of foreign firms with high and of low revenue is fairly well-balanced within the central and eastern European regions.

A notable exception is Nitriansky in Slovakia, which deserves further discussion. The district lies on the Hungarian border and has the highest proportion of minority ethnic Hungarians among the Slovak regions.¹⁴ Especially in the pre-crisis period, the region's share of the total number of foreign companies (13 per cent) substantially exceeded its share of total turnover (6 per cent). In the post-crisis era the situation was similar but the difference between the two figures (20 per cent of all foreign companies and 15 per cent of total turnover) was somewhat smaller. The reason for this peculiar case is that Nitriansky is the preferred target of those Hungarian entrepreneurs who wish to take advantage of the lower

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11. In the pre-crisis sample Prague takes 49 per cent of all the foreign-owned companies in Czechia and 41 per cent of the total operating revenue produced by them. The corresponding pre-crisis shares for the other three capital city regions are the following (the first figure in the brackets represents the share of the total number of foreign-owned firms, while the second figure stands for the region's share of the total operating profit produced by the firms): Budapest (59 per cent and 51 per cent); Mazowiecki (42 per cent and 33 per cent); and Bratislavsky (42 per cent and 37 per cent). The following figures show the post-crisis shares of each region: Prague (60 per cent and 48 per cent); Budapest (65 per cent and 72 per cent); Mazowiecki (48 per cent and 39 per cent); and Bratislavsky (43 per cent and 51 per cent).
 12. Because of the relatively low number of observations and the non-normal distribution of the data, Kendall's tau-b (τ) was calculated, which is a nonparametric test of association.
 13. See Appendix 1 for the corresponding plots.
 14. According to the 2011 census, 24.6 per cent of Nitriansky's population was Hungarian (Slovak Statistical Office).

Slovak taxes and establish their business in Slovakia. In the pre-crisis sample nearly one-third (29 per cent) of all the foreign companies incorporated in this region had a Hungarian owner and in the post-crisis period this was even more dominant: more than 60 per cent of the newly incorporated foreign firms involved Hungarian ownership.

However, relative to the other foreign-owned enterprises in the region, these companies are small¹⁵ and are active almost exclusively in the retail and transportation sectors. Almost two-third (63 per cent) of the firms with Hungarian ownership established before the crisis belonged to the wholesale and retail trade or to the transportation and storage sector and the figure is essentially the same (60 per cent) in the post-crisis sample, too. At the same time, the composition of the other foreign-owned companies is different: 42 per cent of them belonged to the manufacturing sector in the pre-crisis period and only 34 per cent were pursuing business in retail or transportation. After the crisis a profound shift took place and the share of newly incorporated manufacturing companies fell to 14 per cent, while the retail and transportation segment climbed to 47 per cent among the firms without Hungarian ownership. All in all, these figures suggest that the high density of small Hungarian-owned businesses in Nitriansky is responsible for the region's outlier position.

The other slightly puzzling case is the Czech Jihomoravsky in the pre-crisis period. Similar to Nitriansky, the region's share of foreign companies (10 per cent) was much higher than its share of total operating revenue (5 per cent). This was caused by a very large proportion of small foreign firms setting up their business in wholesale and retail: the share of enterprises active in this sector (38 per cent) was the highest among all the Czech regions, which put Jihomoravsky even ahead of Prague and its surrounding region, Středočeský (31 per cent in both cases). The average turnover of the foreign-owned wholesale and retail firms established before the crisis in Jihomoravsky amounted to 9.6 million euros, which was well below the same figure for other sectors (16.80 million euros) and even further below the average of the whole country sample (27.73 million euros). The area lies in a favourable geographical

15. In the pre-crisis sample the average operating revenue of the foreign firms with Hungarian ownership in Nitriansky was 3.39 million euros compared with 11.91 million euros for the other foreign-owned companies in the region. In the post-crisis sample the difference was lower: firms owned by Hungarians produced an average of 3.38 million euros operating revenue, while the other foreign companies generated an average turnover of 5.59 million euros.

position because it shares a border with both Austria and Slovakia and is located close to Vienna and Bratislava, which seems to be attractive to many retail businesses. The strong concentration of these companies with relatively low average turnover explains the peculiar situation of Jihomoravsky. Even after the crisis, the region preserved its leading status in Czechia in securing wholesale and retail foreign investors: after Prague, the second highest number of firms active in this segment established their businesses there.

Besides the two cases mentioned above, the other central and eastern European regions demonstrate a consistent pattern in that a high regional concentration of foreign businesses involves a similarly high degree of concentration of operating revenue. This implies that in most of the regions there is a fairly balanced mixture of small and large firms, although there is some variation in this respect, due mainly to the varying sectoral composition of foreign companies. Before discussing the pre- and post-crisis sectoral patterns of FDI, it still needs to be determined whether the same or different regions have benefited the most from foreign investment in the two periods.

It goes without saying that the four capital city regions have been the biggest beneficiaries of foreign capital inflows both before and after the crisis. Actually, the crisis has even further strengthened their dominant positions; compared with the pre-crisis period these regions have registered higher shares both of the newly incorporated foreign companies and of total turnover after the crisis. It is hardly surprising that the capital cities and their immediate surroundings are capable of attracting the bulk of foreign investors. But what characterises the other central and eastern European regions? Is there a similar degree of continuity in their attractiveness or has the crisis shifted the location preferences of foreign investors?

After excluding the capital cities from the analysis, a comparison of the pre- and the post-crisis samples reveals that those regions that had been preferred targets of foreign companies prior to the crisis have been able to preserve their privileged status. The correlation coefficient between the regional share of the pre- and the post-crisis foreign investors is high and significant ($\tau = .726$, $p < .001$, $N = 54$).¹⁶ This suggests that those

16. For a visual representation of the association between the two indicators see Appendix 2.

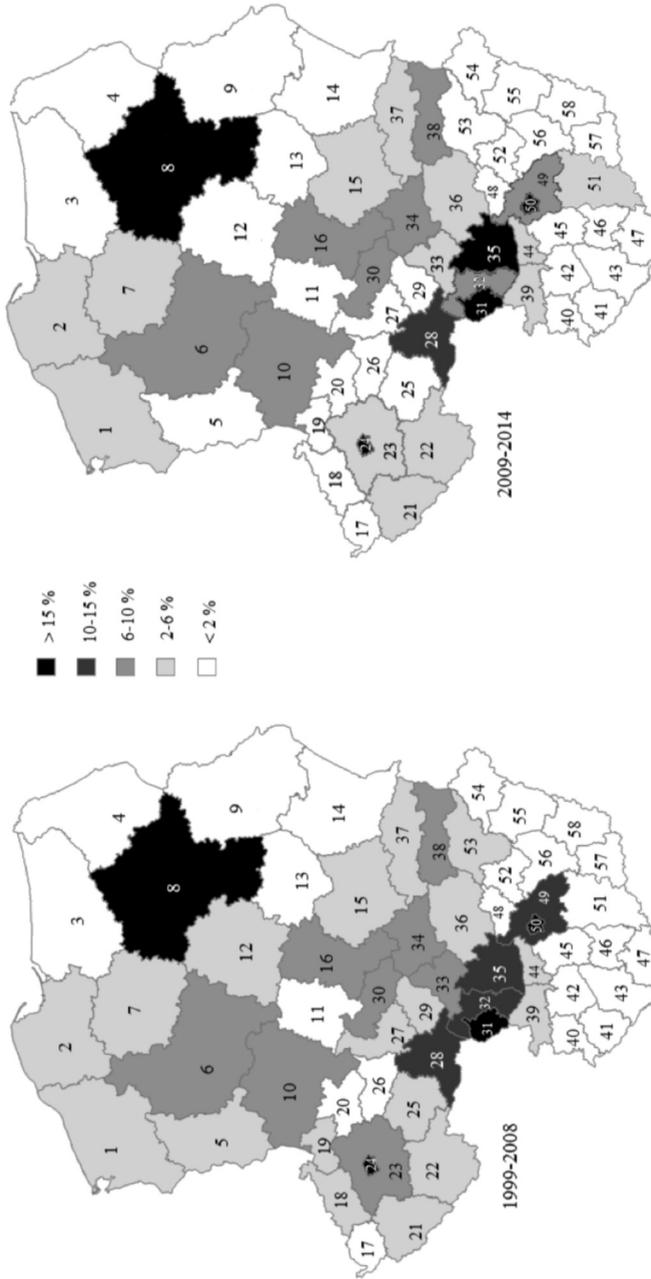
areas that had been successful in attracting external investors have continued to do so after the crisis, whereas those that failed to attract the attention of foreign enterprises were unable to improve their positions.

The maps in Figure 1 offer a visual comparison of the territorial distribution of foreign companies in the two periods. In order to enhance interpretation of the data, five categories were constructed from the regional shares of the total number of foreign firms and each region was classified into one of these categories. The maps reinforce the findings discussed above. On the one hand, they confirm the sustained dominance of the capital cities in attracting the majority of foreign companies. On the other hand, the images also show that the geographical concentration of the foreign-owned firms established after the crisis is higher than in the earlier period and, most importantly, new investments have concentrated in areas already attractive to external investors.

While after the crisis the capital city regions have not only retained but further strengthened their leading role, the majority of the other central and eastern European regions (39) remained in their pre-crisis category. At the same time, more than one-fifth of the territorial units (12) dropped to a category representing lower shares. Only three regions improved their positions compared with the pre-crisis period. Nitriansky experienced the highest jump among them as 20 per cent of the foreign companies in the post-crisis Slovak sample set up their business there, while in the earlier period this figure was 13 per cent. As mentioned above, the great inflow of small Hungarian firms in the retail and transportation sector explains the region's special status. The other winner of the post-crisis era is Małopolskie in Poland, which includes the city of Cracow. The region has been one of the main Polish hubs of foreign investors engaged in info-communication, professional, scientific and technical activities and business support services. After the crisis the role of foreign investors in these sectors has grown and Małopolskie continues to serve as one of the main targets of those businesses. This is why its relative share of the total number of post-crisis foreign companies increased.

The last region that improved its position is Bács-Kiskun in Hungary. Although the low number of enterprises in the post-crisis Hungarian sample does not allow us to draw definite conclusions about the status of this area, Bács-Kiskun has indeed gained the attention of foreign investors recently. The region received a major automotive investment in 2008 when Mercedes decided to build the company's first central and

Figure 1 Territorial distribution of foreign-owned companies in central and eastern Europe before and after the economic crisis (regional shares of total number of foreign firms in each country)



Note: The names of the regions with their corresponding numbers indicated on the map are in Appendix 3.

eastern European factory there. Production in the new plant began in late 2011 and the German company attracted several of its suppliers to the neighbourhood, such as HBPO Manufacturing or Phoenix-Mecano. This is reflected in the region's improving attractiveness to foreign enterprises.

5. Sectoral composition of pre- and post-crisis foreign investment

While the pre- and the post-crisis territorial distributions of foreign investments show great similarities, the Amadeus dataset reveals that this is not the case with regard to sectoral composition. The data presented in Table 3 capture those shifts. The crisis has brought about a massive decline in the share of cost-intensive manufacturing investments and has led to an increase in the proportion of foreign companies in the service sector, especially in wholesale and retail trade and in professional, scientific and business services. These changes also mean that the average size of post-crisis foreign firms is significantly smaller than that of those established before the crisis. This is because the retail and business service companies, which are dominant in the second period, typically have lower average turnover than large manufacturing firms, which appear mostly in the pre-crisis samples. While the share of firms in retail and business services did not increase dramatically in each country after the crisis, their contribution to total turnover did. The rise was twofold in Czechia, almost threefold in Slovakia and nearly double in Poland.¹⁷

These figures suggest that foreign enterprises entering central and eastern Europe after the crisis are active mainly in the service sector and, on average, are smaller than the ones incorporated in the previous period. Manufacturing foreign investments, which have so far fuelled the exported growth of these countries (Bohle and Greskovits 2012) are now in short supply. However, this phenomenon may not pose an obstacle to the economic recovery of central and eastern Europe. On the one hand, past investments remain functional despite the decline in production and revenues and there is little evidence of relocation or plant closures (Pavlínek 2015). On the other hand, planned manufacturing investments may have been postponed but not entirely dropped because of the global economic slowdown. For instance, Apollo Tyres, an Indian tyre manu-

¹⁷. The Hungarian samples do not entirely show the trends that appear clearly in the other three countries. This might be related to the sub-optimal coverage of the Hungarian data.

Table 3 Post-crisis shifts in the sectoral composition of foreign firms

	Pre-crisis sample				Post-crisis sample			
	Average latest reported turnover (million euros)	Share of manufacturing firms	Share of firms in retail and business services ^a	Share of firms in retail and business services in total turnover	Average latest reported turnover (million euros)	Share of manufacturing firms	Share of firms in retail and business services ^a	Share of firms in retail and business services in total turnover
Czechia	27.74	28.21%	49.13%	24.14%	10.40	14.98%	62.92%	47.52%
Hungary	51.68	22.50%	48.82%	26.28%	21.71	20.56%	44.86%	27.24%
Poland	22.56	27.59%	43.06%	37.61%	12.16	20.48%	45.34%	60.88%
Slovakia	21.21	23.62%	51.47%	25.38%	5.66	8.75%	69.29%	66.03%
Central and eastern Europe	25.25	26.56%	47.01%	28.78%	12.52	14.11%	60.56%	55.72%

Note: ^aFirms active in wholesale, retail trade, repair of motor vehicles; professional, scientific and technical activities; and administrative and support service activities.

facturer, initially planned to open a new factory in Hungary in 2008 but because of the crisis the management decided to suspend the investment, only to return to the project in 2014 when the global automotive sector showed clear signs of recovery and the Hungarian government also offered a generous incentive package to the investor.¹⁸

While the crisis has – presumably only temporarily – limited the entry of manufacturing investors, it has provided a boost for service investments especially in the field of professional, scientific and business services. Since the mid-2000s central and eastern Europe has become an increasingly popular location for transnational companies that sought to outsource business service activities to low-cost areas. The crisis has intensified this process and central and eastern Europe has become a primary target of business process outsourcing and offshoring (Gál 2014; Micek in this volume). Although this sector is considered to be knowledge-intensive, foreign investors tend to set up their businesses in the less knowledge-intensive categories of the value chain: most of the

18. State aid: Commission endorses investment aid to Apollo Hungary for production of tyres in Gyöngyöshalász, *European Commission Press Release, IP14/970*, Brussels, 8 September 2014 (Available at: http://europa.eu/rapid/press-release_IP-14-970_en.htm)

activities performed by foreign-owned business service firms in central and eastern Europe involve back office functions, customer contact, HR and IT support services (Capik and Drahekoupil 2011). This is similar to the case of manufacturing foreign investors, which have typically built assembly plants while keeping the higher value added activities such as research and development in their home countries.

In addition, the geographical distribution of foreign-owned business service companies is even more unbalanced than that of foreign firms in other industrial segments. Most of these enterprises are located in the metropolitan regions and in some second-tier cities that offer a relatively large supply of well-trained, but still relatively cheap labour (Gál 2014; Sass 2011). In fact, seven central and eastern European cities are listed in the 2015 Tholons ranking of the top 100 global outsourcing destinations (Cracow, ninth place, Prague fifteenth, Budapest twenty-fifth, Brno twenty-ninth, Warsaw thirtieth, Bratislava forty-ninth and Wrocław sixty-second).¹⁹ This suggests that central and eastern Europe is indeed a top location for companies seeking to locate in large agglomerations.

The Amadeus dataset fully confirms the above observations. Both in the pre- and the post-crisis period the four capital city regions have secured the overwhelming majority of foreign firms in the segments of professional, scientific and technical activities and administrative and support services.²⁰ Only a limited number of other regions have been able to secure a notable share of these investments. In this respect, Jihomoravsky in Czechia, Dolnośląskie and Wielkopolskie in Poland, and the Nitriansky and Trnavsky regions in Slovakia show considerable foreign activity in this sector.

Notwithstanding the shift in the sectoral composition of external investors entering central and eastern Europe after the crisis, location preferences have not changed. In the post-crisis period the same regions have continued to be the preferred targets of foreign companies. This also implies that those regions in which the presence of foreign capital was

19. Source: *2015 Top 100 Outsourcing Destinations*. Tholons Publication, December 2014.

Available at http://www.tholons.com/nl_pdf/Tholons_Whitepaper_December_2014.pdf

20. The share of the capital city regions in the firms active in these services are as follows (first figure stands for the share in the pre-crisis sample, while the second represents the value in the post-crisis sample): Prague: 76 per cent and 79 per cent; Budapest: 88 per cent and 65 per cent; Mazowiecki: 67 per cent and 71 per cent; and Bratislavsky: 68 per cent and 59 per cent.

low have been unable to catch up with the leading areas. But what is the nexus between the degree of internationalisation of central and eastern European regions and their growth performance after the crisis? To put it differently, does a strong foreign presence in the local economy relative to the other areas also involve more rapid economic recovery?

Comparable data on regional GDP are available only until 2011, which limits our ability to examine post-crisis growth patterns. Nevertheless, analysing the data may still reveal interpretable trends. Given that the capital city regions are extreme outliers in terms of their share of foreign investments they are not included in the calculations, to avoid distortion. Bearing these restrictions in mind, Figure 2 shows the association between the pre-crisis regional shares from the foreign enterprises and the post-crisis regional GDP growth relative to the national growth rate.

The figure shows that a larger international presence in a regional economy was to some extent associated with better post-crisis growth performance ($\tau = .343$, $p < .001$, $N = 51$). At the same time, there is high variation in growth among the regions that had a similarly low share of foreign enterprises before the crisis, thus in their case the presence of foreign firms may not be a distinguishing factor for post-crisis growth. This is not surprising, however, because this group of regions demonstrates little variation in the regional share of foreign companies which, evidently, cannot account for the large variation in their relative growth rates.

It is important to remember that correlation is not causation and thus it cannot be argued that a more rapid post-crisis regional recovery was probably caused by the larger local presence of foreign investors. Figure 2 suggests only that those regions that have been able to attract a considerable number of foreign companies are probably also better equipped to adjust to changing external economic circumstances than those in which few foreign firms are active. This is because leading regions are central places with diversified domestic economies and considerable own resources and local demand to draw on when external circumstances turn unfavourable. This is consistent with the results of Capello and Perucca (2015). Because regions with high levels of FDI are also the more developed ones, these findings also imply that regional disparities may not decrease in the near future in central and eastern Europe unless regional growth trends shift radically at the expense of the more prosperous areas. This possibility, however, is unlikely in the

current economic environment in which sustained regional growth is increasingly associated with well-established ties to global markets, which also assumes a strong presence of multinational enterprises in the regional economy.

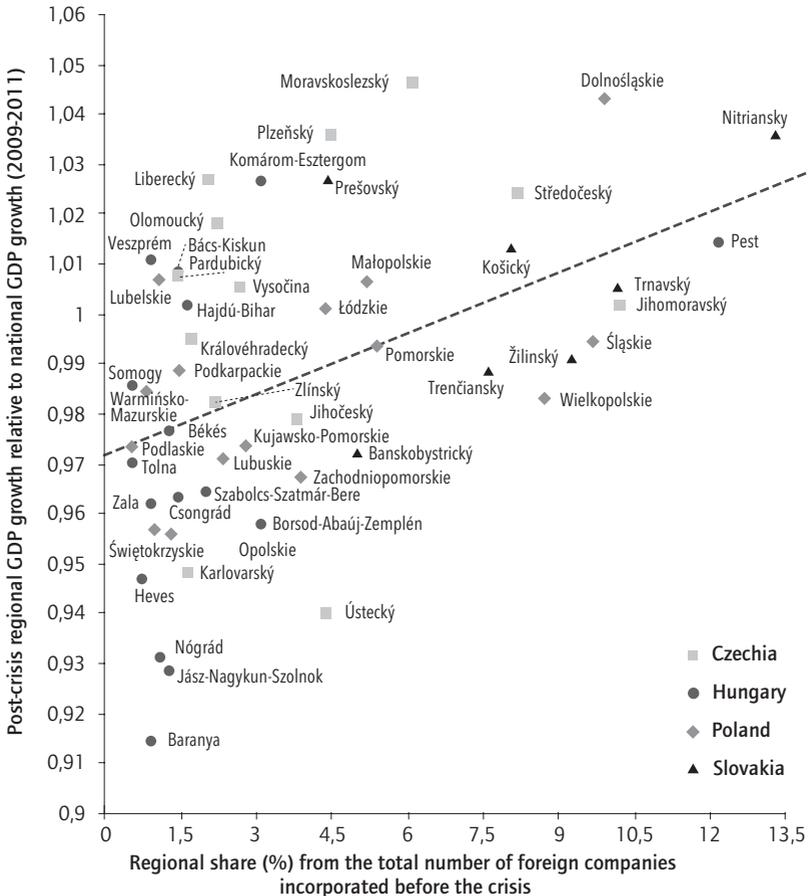
6. Conclusions

The empirical evidence presented in this work suggests that the crisis has not involved a territorial shift in the location preferences of foreign investors entering central and eastern Europe. The same regions have remained the preferred targets of foreign firms, as before the major global economic downturn. However, compared with the previous period, the post-crisis years have experienced a profound change in the sectoral composition of foreign investments. The number of new manufacturing investments declined sharply and the proportion of foreign companies in the service sector – especially in the business services segment – rose considerably. This implies that the most internationalised regional economies have preserved their privileged status, but in recent years they have tended to attract new foreign businesses in other economic sectors.

What do these processes imply for the long-term feasibility of the FDI-driven export-led growth strategies of central and eastern European economies? On the one hand, the crisis has not led to significant disinvestment and exit of capital from these countries: not even the foreign-owned financial sector has experienced a capital run, which otherwise was most susceptible to this (Epstein 2014). On the other hand, neither past manufacturing investments nor new investments in professional and business services represent knowledge-intensive, high value-added activities. In both cases foreign firms take advantage of the availability of a cheap, skilled workforce and refrain from relocating activities at the higher end of the value chain to central and eastern Europe. This implies that in the foreseeable future these countries may not be able to overcome the cheap labour bias that characterises most of the foreign investments there. In fact, low wages, in combination with relatively high skill levels, seem to remain their primary competitive advantage.

The lower foreign investment since the crisis poses a further challenge to domestic economic strategies. Because economic growth depends to a great extent on foreign investors, in order to avoid long-term decline

Figure 2 Post-crisis (2009-2011) relative regional growth performance and pre-crisis regional shares in the total number of foreign investments²¹



21. Excluding the four capital city regions and three deviant Hungarian cases, the counties of Győr-Moson-Sopron, Fejér and Vas. These three regions demonstrate high relative post-crisis growth but low pre-crisis attractiveness to foreign investors. However, the data on their international embeddedness are misleading. In reality, they are among the most developed and most internationalised regional economies in Hungary. The reason why it is not reflected in the data (apart from the fact that the Hungarian data have low coverage) is that most of the foreign investors active in these regions established their businesses well before 1999, which is the cut-off year for the pre-crisis samples. The largest Hungarian exporter, Audi, built its engine plant in Győr-Moson-Sopron in the early 1990s, and Opel opened its car factory in Vas in the same period. Similarly, IBM entered Fejér in the mid-1990s followed by other firms in the electronics and complex manufacturing industries. In short, the three regions are not outliers to the general trend observed in Figure 2 because their high international embeddedness has been associated with high post-crisis growth.

governments need both to retain existing foreign firms and to attract new ones. Given the similar comparative advantages of the four countries, the urge to secure more FDI in times of low foreign capital inflows may result in even tougher investment competition than previously. Such an outcome will have consequences for domestic tax systems, labour law and state budgets. At the same time, ‘fiscal discipline’ has become a key issue in post-crisis Europe: the EU strictly monitors central budgets and constrains government spending, which also limits the generosity of investment incentive schemes. Nevertheless, from the perspective of regional disparities a further widening gap between the internationally embedded, prosperous regions and those that are almost void of foreign investors can be expected.

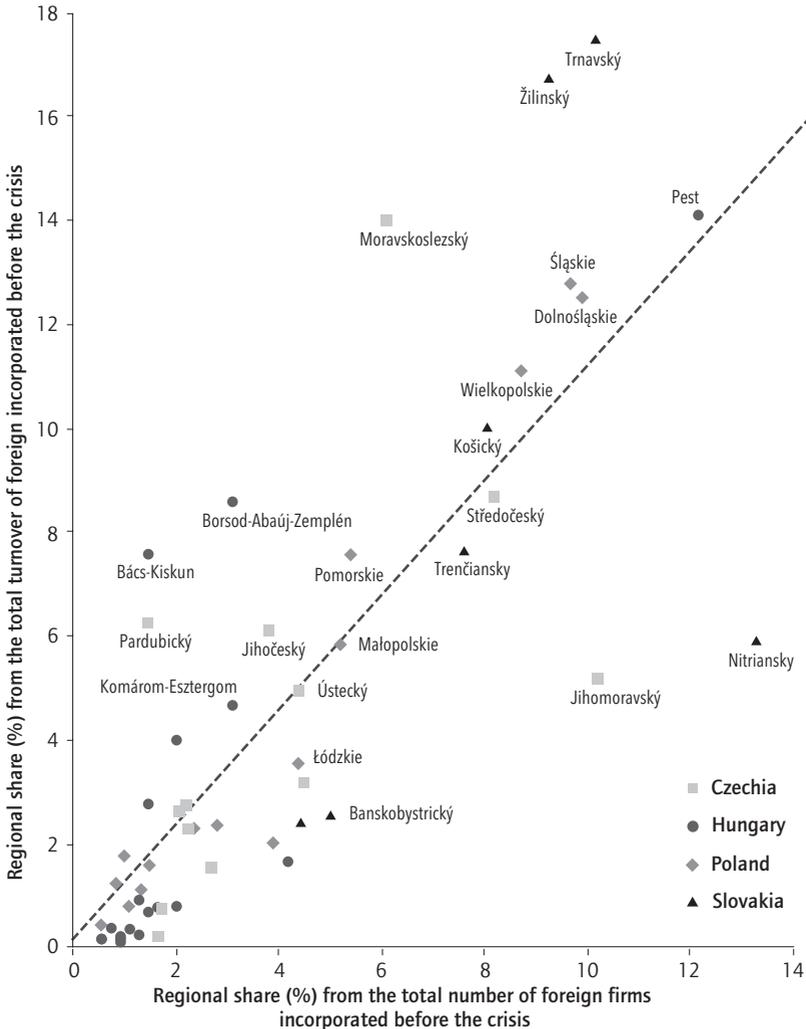
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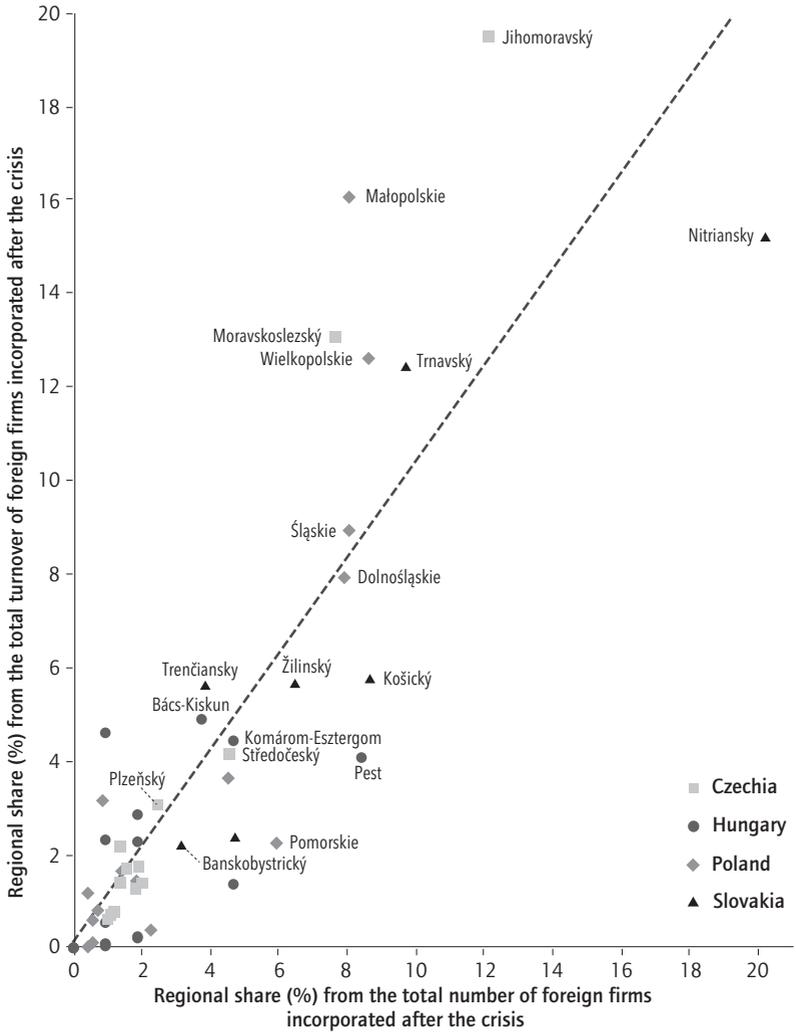
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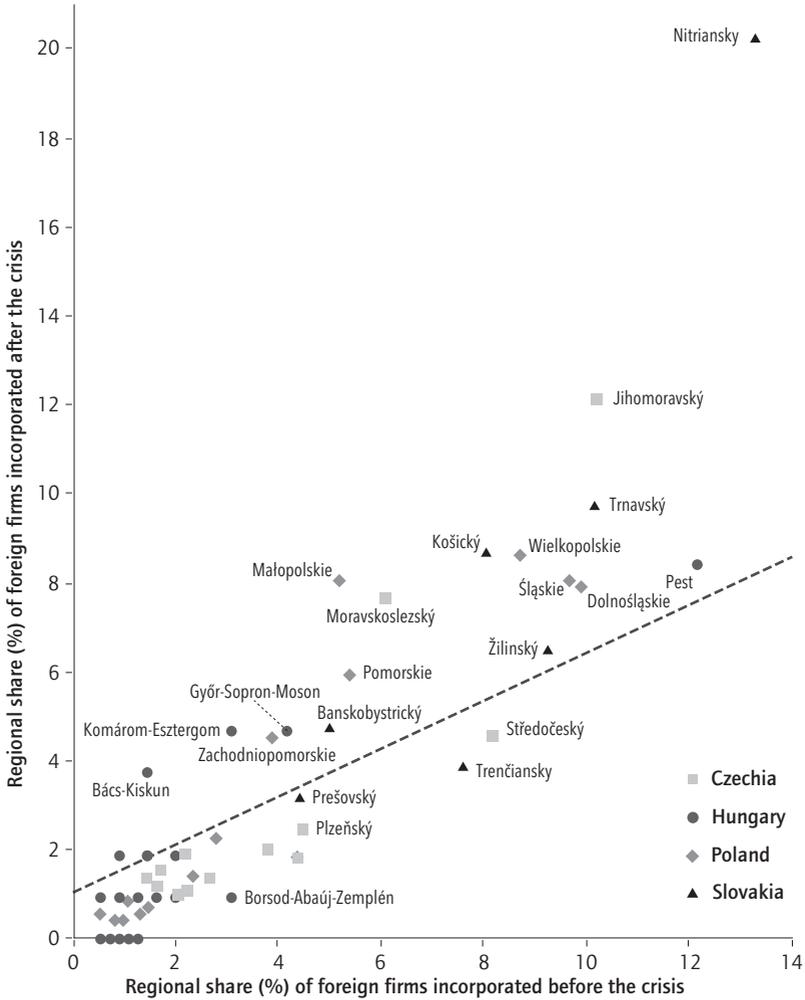
Appendix 1 The regional shares of foreign firms incorporated before and after the crisis and the regional shares of their operating revenue



Appendix 1 (cont.)



Appendix 2 The regional shares of foreign firms established before and after the crisis



Appendix 3

Central and eastern European regions

No.	Region	Country	No.	Region	Country
1	Zachodniopomorskie	Poland	31	Bratislavský	Slovakia
2	Pomorskie	Poland	32	Trnavský	Slovakia
3	Warmińsko-Mazurskie	Poland	33	Trenčiansky	Slovakia
4	Podlaskie	Poland	34	Žilinský	Slovakia
5	Lubuskie	Poland	35	Nitriansky	Slovakia
6	Wielkopolskie	Poland	36	Banskobystrický	Slovakia
7	Kujawsko-Pomorskie	Poland	37	Prešovský	Slovakia
8	Mazowieckie	Poland	38	Košický	Slovakia
9	Lubelskie	Poland	39	Győr-Sopron-Moson	Hungary
10	Dolnośląskie	Poland	40	Vas	Hungary
11	Opolskie	Poland	41	Zala	Hungary
12	Łódzkie	Poland	42	Veszprém	Hungary
13	Świętokrzyskie	Poland	43	Somogy	Hungary
14	Podkarpackie	Poland	44	Komárom-Esztergom	Hungary
15	Małopolskie	Poland	45	Fejér	Hungary
16	Śląskie	Poland	46	Tolna	Hungary
17	Karlovarský	Czechia	47	Baranya	Hungary
18	Ústecký	Czechia	48	Nógrád	Hungary
19	Liberecký	Czechia	49	Pest	Hungary
20	Královéhradecký	Czechia	50	Budapest	Hungary
21	Plzeňský	Czechia	51	Bács-Kiskun	Hungary
22	Jihočeský	Czechia	52	Heves	Hungary
23	Středočeský	Czechia	53	Borsod-Abaúj-Zemplén	Hungary
24	Prague	Czechia	54	Szabolcs-Szatmár-Bereg	Hungary
25	Vysočina	Czechia	55	Hajdú-Bihar	Hungary
26	Pardubický	Czechia	56	Jász-Nagykun-Szolnok	Hungary
27	Olomoucký	Czechia	57	Csongrád	Hungary
28	Jihomoravský	Czechia	58	Békés	Hungary
29	Zlínský	Czechia			
30	Moravskoslezský	Czechia			