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Origin of FDI and domestic productivity spillovers: does European FDI have a 'productivity advantage' in the ENP countries?'

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## **Origin of FDI and domestic productivity spillovers: does European FDI have a 'productivity advantage' in the ENP countries?'**

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### **Abstract**

The process of approximation between the EU and its 'eastern neighbourhood' has created conditions for deepening economic interactions and market integration, giving to the EU –and to EU businesses– an elevated role in the process of economic modernisation and transition in the neighbourhood countries. This raises the question as to whether European business activity in these countries produces indeed measureable economic advantages both in absolute and in relative terms (e.g., compared to business activity from other parts of the world). Similarly, a question arises as to whether European business activity reduces or amplifies spatial imbalances within the partner countries. This paper examines these issues for the case of capital flows (foreign ownership) and the related productivity spillovers, using firm-level data from the Business Environment and Enterprise Performance Survey (BEEPS) covering 28 transition countries over the period 2002-2009. We estimate the direct and intra-industry productivity effects of foreign ownership and examine how these differ across regional blocks (CEE, SEE and ENP), according to the origin of the foreign investor (EU versus non-EU), across geographical scales (pure industry versus regional spillovers) and for different types of locations (capital-city regions versus the rest). Our results suggest that FDI of EU origin plays a distinctive role in the countries concerned helping raise domestic productivity significantly more than investments from outside the EU. However, this process appears to operate in a spatially selective manner, thus enhancing regional disparities and spatial imbalances. This, then, assigns a particular responsibility for EU policy, as it continues to promote economic integration (and FDI flows) to its eastern neighbourhood, to devise interventions that will help redress these problems.

## 1. Introduction

The collapse of communism more than 20 years ago unleashed a historically unprecedented process of economic restructuring and political transformation in the former communist countries. This process of transition involved a number of radical changes both in the political (democratisation, institution-building) and the economic sphere (marketization, liberalisation, restructuring). In this process, the inflow of foreign direct investments has obtained a heightened importance, not only in its role of removing capital shortages, amplifying current account imbalances and strengthening job creation, technology transfers and economic development (Fry et al, 1995; Markusen and Venables, 1999), but also for the effectiveness of, and commitment to, transition itself (Grabbe, 2006).

The process of transition was soon followed by – and in many respects became subordinated to – the process of approximation to the EU. Indeed, as early as in 1993, the EU effectively defined the process and content of transition with the establishment of the Copenhagen Criteria for accession. Whether intentionally or not, these became the guiding principles for successful transition and have been followed, albeit with variable degrees of success or commitment, by virtually all transition countries in the broader European neighbourhood.

The effectiveness, or even relevance, of the EU and its framework of external relations for the countries in its broader neighbourhood has been an issue that has attracted a lot of attention in the literature. The success of this framework in fostering political-economic transformation in Central and Eastern Europe (CEE) in the pre-accession period (Hughes et al, 2004; Schimmelfennig and Sedelmeier, 2005) and especially in facilitating economic integration with the western ‘EU core’, inspired to a large extent the deployment of similar frameworks in countries further afield. In the Balkans (SEE), this took the form of ‘extended conditionality’ through the Stabilisation and Association process, to account for the specificities of the region relating to the conflict resolution initiatives following the wars of the dissolution of Yugoslavia (Phinnemore, 2003; Talani, 2008; Monastiriotes and Petrakos, 2010). In the eastern neighbourhood (as well as in the South Mediterranean), this framework was translated into what became known as the European Neighbourhood Policy (ENP). This policy offers conditional preferential economic and political relations in exchange of the recipient countries’ adherence to the ENP (and Copenhagen) principles; but, as has been long identified in the literature (Emerson, 2004; Schimmelfennig and Scholtz, 2008; Sasse, 2008; Witman and Wolff, 2010), with a significantly weakened ‘carrot’ as the ENP framework explicitly excludes the prospect of accession.

Studies on the economics of the 2004 Enlargement (Brendon et al, 1999; Kaminski, 2001; Clausing and Dorobantu, 2005; Monastiriotes and Agiomirgianakis, 2009) have shown that this prospect of accession has been paramount in mobilising foreign investments, as western firms responded to the opportunities offered by the opening of the new markets by changing the geographical organisation of their production thus instigating a wider process of restructuring for the European industry. As a result, these movements were part of a deeper integration process, reflecting the significant linkages that developed on the ground, which in turn facilitated sizeable technology transfers to the CEECs. In the countries of the wider neighbourhood and in the absence of the prospect of accession, this process was less intense and

partly driven by different motives (Estrin and Uvalic, 2013). Volumes of FDI have been significantly lower; foreign investments have been more of the market-capture type and much less so part of a spatial reorganisation of production systems; and, as a result, the extent of integration with the local economies has been somewhat lower. Still, the ENP provides an institutional framework of association (including preferential trade agreements) which, arguably, gives EU firms a relative advantage at least in the sense of reducing entry costs and uncertainties (information asymmetries, legal barriers, etc).

If, as it is believed to have happened in the CEECs, the framework of association facilitates less speculative and more long-term strategic investments, then EU-originating investments are likely to be more organically linked to the local economies of the host countries thus, possibly, generating larger spillovers for domestic firms. In this paper we examine this hypothesis using firm-level data for the period 2002-2009 covering 28 transition countries. We apply a standard production-function approach to estimate the productivity spillovers accruing to domestic firms by the presence of foreign investments and examine how these spillovers vary (a) for groups of countries belonging to different processes with respect to EU association and (b) separately for investments of EU and non-EU origin. As spillovers are found to be of variable sizes along these dimensions at the national level (within sectors), we further investigate the localisation of these spillovers by examining how their intensity varies at different geographical scales (national – regional) and for different types of locations (capitals versus the rest). The next section introduces in more detail our research questions, also discussing some theoretical considerations and reviewing parts of the literature that are relevant for the motivation of our analysis. Section 3 gives details about our data and method, while section 4 presents our empirical results. The last section concludes with a discussion of the policy implications of our findings.

## 2. Theoretical considerations

There is by now a large body of literature examining the impact of FDI in transition countries, both at the aggregate level and in terms of intra- and inter-industry spillovers. The literature has shown that, generally, vertical spillovers (through backward and forward linkages to the sector of foreign presence) are positive and often sizeable (Damijan et al, 2003; Javorcik, 2004; Gorodnichenko et al, 2007; Nicolini and Resmini, 2010; Damijan et al, 2013). In contrast, estimated horizontal (intra-industry) spillovers are often non-significant or even negative (Konings, 2001; Damijan et al, 2003; Javorcik, 2004; Sabirianova et al, 2005; Gorodnichenko et al, 2007) – similar with established findings in other parts of the world (Aitken and Harrison, 1999; Blomstrom and Sjöholm, 1999). More recent studies, however, have shown that significant positive spillovers do exist, but only conditional on a number of intervening factors<sup>1</sup>, including firm/sector characteristics (such as firm size – Pojar, 2012, Damijan et al, 2013; absorptive capacity and technological distance – Tytell and Yodaeva, 2005, Gorodnichenko et al, 2007, Halpern and Murakozy, 2007, Monastiriotes and Alegria, 2011; sector and geographical location – Sgard, 2001, Gorg and Greenaway, 2004, Monastiriotes and Jordaan, 2010); characteristics of the

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<sup>1</sup> See Gorg and Strobl (2001) for a discussion of this, based on a meta-analysis of studies mainly in the 1990s. See also Merlevede and Schoors (2007) and the review in Damijan et al (2013).

recipient country (level of development, extent of corruption, political regime – Tytell and Yodaeva, 2005); and characteristics related to the foreign investors (extent of ownership – Javorcik, 2004, Monastiriotis and Alegria, 2011; export-orientation – Tytell and Yodaeva, 2005; country/region of origin – Javorcik and Spatareanu, 2011, Monastiriotis and Alegria, 2011). Additionally, Jordaan (2013a and 2013b) has shown that estimates of horizontal spillovers often suffer from problems of selection and endogeneity; whereas Monastiriotis and Alegria (2011) find evidence of a time-varying spillover effect (which they call *hysteresis*), consistent with more micro-level evidence showing that foreign-owned firms increase their domestic linkages with the passage of time (Gorg and Ruane, 2001).

Our attention in this paper deviates from what has come to be the main attention in the contemporary literature on the topic, namely issues such as absorptive capacity and technological distance (Damijan et al, 2013), the nature of backward and forward linkages (Barrios et al, 2011) and the role of domestic institutions (Farole and Winkler, 2012). Instead, our focus is with two issues that have attracted less attention in the transition literature, both relating to questions of geography and space – albeit in different dimensions. The first concerns the role of the *origin* of foreign investments for the size of the observed spillovers; the second concerns the *geography of spillovers* within the recipient countries.

### ***i. Origin of FDI***

Concerning the first issue, there is evidence already in the literature that the origin of investors matters for the size and direction of the spillovers generated (Javorcik and Spatareanu, 2011, Monastiriotis and Alegria, 2011). There are two separate arguments to explain this. In the case of Javorcik and Spatareanu (2011), in an argument that is more akin to the case of vertical spillovers, the mechanism of interest is the presumed higher propensity of foreign investors originating from more distant locations to make more intensive use of local resources and local supply chains (as maintaining traditional home-country suppliers becomes more costly with distance), thus producing more intense interactions with the local production base. This, it is hypothesised (and consistent evidence is presented), leads to stronger vertical spillovers for more distant foreign investors. Instead, the argument presented by Monastiriotis and Alegria (2011) has to do more with cultural and technological proximity. According to this argument, culturally ‘proximate’ foreign investors have a greater advantage in drawing on local knowledge and thus benefit more by engaging more systematically with the local economy. This, in turn, creates a greater scope for spillovers to local firms – which may, additionally, be easier to absorb, to the extent at least that cultural proximity correlates with technological proximity.<sup>2</sup> Although the authors argue that this mechanism applies more clearly to the case of horizontal spillovers, an extension of this argument to the case of vertical spillovers appears straightforward.

Thus, on the issue of ‘origin’, two conflicting arguments – both supported by relevant empirical evidence – have been proposed in the literature. Our empirical analysis in this paper provides some additional evidence for the role of the origin of the investors and in this sense adds to this developing literature. Our conceptualisation of the role of ‘origin’ however

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<sup>2</sup> The example used by Monastiriotis and Alegria (2011) is the case of Greek-owned firms in Bulgaria. The authors find a significant (in terms of the size of spillovers) advantage for Greek compared to both European (rest of EU) and non-European FDI.

is not fully in line with the definitions used in the previous literature. Instead of pure *geographical distance* (Javorcik and Spatareanu, 2011) and relational *cultural proximity* (Monastiriotes and Alegria, 2011), our aim in this paper is to examine the role played by *political-institutional proximity*, especially in relation to the process of EU approximation (be it in the context of accession – CEE; of pre-accession conditionality – SEE; or of neighbourliness – ENP). The hypothesis we put forward is that FDI originating from the EU will have greater productivity spillovers to the local economies of the ENP/association countries, for a number of reasons. First, because EU-originating investors are likely to see their investments as part of the approximation process and, in this sense, as part of a policy that aims at strengthening local capacities and integration with the EU. Thus, local links are encouraged and local synergies pursued. Second, because domestic producers may have similar perceptions about EU-originating investments and thus may be more inclined to cooperate and/or compete with these – resulting in more intensive processes of mimicking, learning and technology transfer. Third, because the very process of association may be creating institutional advantages that can be better internalised by European firms (e.g., transposition of legal frameworks and regulations to come more in line with EU norms and rules – Magen, 2006; Freyburg et al, 2009), which may also be giving a stronger advantage to EU-originating investors (inversely, to local firms) in their interaction with the local economy (with the European investors). Given the differentiation in the process and intensity of association between the EU and each of our three geo-political regions (CEE, SEE and ENP), we also derive group-specific estimates for the impact of EU and non-EI FDI.

## **ii. Scale and regional differentiation of spillovers**

Surprisingly, the literature on FDI has much less to say about the geography of spillovers and the geographical impact of foreign ownership on (local) domestic production. This is despite the voluminous research on the issue of locational spillovers in the agglomeration economics literature (for example, Rosenthal and Strange, 2004; Greenstone et al, 2008; Puga, 2010). Among the few exceptions to this, see the work of Driffield and Hughes (2003), Haskel et al (2007) and Girma and Wakelin (2009) for the UK<sup>3</sup>; Mullen and Williams (2007) for the case of the USA; Sgard (2001) for Hungary; Jordaan (2008 and 2013b) for Mexico; and especially of Monastiriotes and Jordaan (2010), whose work on Greece has shown that productivity spillovers from foreign ownership are not only stronger at the more localised level but also vary widely, and can even move in different directions, across different (types of) locations.<sup>4</sup>

Consistent with the brevity of empirical studies (and evidence) on the issue, also limited is the discussion about the theoretical mechanisms that may – or may not – be causing spatial differentiation in the local impact (spillovers) of FDI.<sup>5</sup> The main mechanism to be found in the literature – which is directly borrowed from the agglomeration economics

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<sup>3</sup> Among these studies, Haskel et al (2007) find consistently negligible regional effects from foreign ownership. This finding is rare, but consistent with earlier findings in the literature for less developed countries (Sjoholm, 1999, Aitken and Harrison, 1999).

<sup>4</sup> See also Gorg and Greenaway (2004) for a meta-analysis of relevant studies, including ones that look at the role of geographical proximity to foreign-owned firms.

<sup>5</sup> This is partly because theoretical considerations in this literature concern more the question of the origin and types of spillovers (e.g., pecuniary versus technological – see Gorg and Strobl, 2004, and Jordaan, 2009).

literature – concerns the effects of concentration on local production through knowledge spillovers, labour pooling and network-sharing (Griliches, 1979; Audretsch and Feldman, 1996; Breschi et al, 2010; Marioti et al, 2010; Overman and Puga, 2010). If advantages from the presence of foreign firms have to do with processes such as the upgrading of workforce skills (either through training or by raising the demand for – and thus the investment in – skills in the local economy), day-to-day interaction (participation in common Chambers, demonstration effects, information-sharing) and pecuniary spillovers (demand-supply linkages, sharing common distribution networks, etc), it is easy to see why (co-)location would matter for the size and intensity of spillovers. If, on the other hand, foreign presence raises domestic productivity through technological spillovers (e.g., introduction of new technologies, processes and management practices, which are subsequently copied by local firms) and competition effects (creative destruction, survival of the fittest), then the resulting spillovers need not be at all localised – as learning and competition can take place at wider scales and/or through trade and are thus not necessarily linearly related to distance. Still, to the extent that knowledge spillovers are localised, it should be expected that the technological externalities of FDI will also be stronger with geographical proximity.

Another, less studied, mechanism accounting for the spatial differentiation of spillovers has to do with the capacities and characteristics of the recipient local economies.<sup>6</sup> More developed regions (often, those of Capital cities) are in general more extrovert and typically host larger agglomerations. In a way this means that they are already open to forces of (international) competition (and learning), more so than their national hinterlands. If so, the scope for benefits derived from the presence of foreign firms, both locally and nationally, may be more limited.<sup>7</sup> On the other hand, these areas will have a greater capacity to internalise any spillovers that may be generated and to withstand the additional competition from the foreign investors (e.g., managing to maintain their market shares). In this sense, the inflow of foreign investments may exacerbate existing spatial disparities in the recipient countries. The literature provides two sets of findings with regard to this. On the one hand, the studies by Driffield and Munday (2001) and Sgard (2001) give evidence of stronger FDI spillovers in areas with larger agglomerations, higher levels of development and greater proximity to markets. On the other hand, Monastiriotis and Jordaan (2010) have shown for the case of Greece that spillovers are maximised in areas with weaker agglomerations and lower levels of development. In our analysis we also examine this dimension, by estimating the productivity spillovers of foreign ownership separately for the capital-city regions and for the regions located elsewhere.

### 3. Data and method

The data used in this paper comes from the Business Environment and Enterprise Performance Survey (BEEPS). This survey is implemented by the EBRD together with the World Bank and it enquires individual firms in Eastern Europe and Central Asia about their business and business environment. The paper uses an unbalanced panel from three waves –

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<sup>6</sup> For exceptions see Sgard (2001), Driffield and Munday (2001), Jordaan (2008) and Monastiriotis and Jordaan (2010).

<sup>7</sup> Inversely, more peripheral regions will have more to gain from the technological knowledge of foreign firms and perhaps may benefit more also from pecuniary spillovers.

2002, 2005 and 2009 – containing approximately 28,000 observations<sup>8</sup> from 28 transition countries, listed in Table A.1 in the Appendix.

The dataset contains information on sales, employment, fixed assets, share of foreign ownership, share of exports, sector (using NACE two-digit classification), country and region where the firm is located and origin of FDI. The availability of some of these variables (share and nationality of foreign presence; region; sector) is limited to certain years so, where available, we projected the values available in previous years or in the cross-sectional editions of BEEPS (e.g., assuming that the region, sector, or share of foreign ownership has not changed between two survey years). Some data-points on employment and capital have also been estimated, using either interpolations (when information was missing for an intermediate year) or projections.<sup>9</sup>

Our main independent variable – horizontal spillovers – has been constructed using each individual firm’s reported share of foreign ownership and information on country, sector and yearly output of each firm. Firm-level output was first multiplied by each firm’s foreign-ownership share and aggregated to country-sector-year clusters. Our ‘horizontal FDI’ measure was then calculated as the ratio of this variable to total output in the cluster. The same approach was followed for the construction of our origin- and region- specific measures. We have favoured this output-based definition against alternative measures (e.g., employment shares of foreign-owned firms) because there are significant differences in labour productivity between foreign-owned and domestic firms in our sample and thus employment-share differences do not adequately reflect the importance of foreign presence in a sector. To separate between foreign-owned and domestic firms (e.g., in our regression specifications), we have used a minimum threshold (>10%) definition.<sup>10</sup> On the basis of this definition, foreign-owned firms in our sample are between 10% and 20% of the total number of firms (across countries) – although for some countries the share of foreign ownership is much lower (e.g., 3% in Turkey).

Table 1 provides some basic information for the main variables, separately for firms with threshold foreign presence and for local firms. In both cases medium-size firms seem to dominate, although firms with foreign presence have on average more employees and higher values for sales and fixed assets. Firms with foreign presence also appear to export more – 28% of their sales in comparison to 10% of local firms’ sales – and the same is true for the imports of materials (50% of material imported versus 10% in local firms). Horizontal linkages also seem to be higher for firms with foreign presence, amounting to 28% compared to 16% in local firms. Finally, the descriptive statistics suggest that in firms with foreign presence, the average percentage of foreign ownership amounts to 75%, with a standard deviation of approximately 30%. Also, it appears that around 60% of the investment in foreign-owned companies comes from countries in the European Union.

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<sup>8</sup> The dataset contains many missing values and some occasional problems with coding. After cleaning the data we are left with 22,009 observations with data on sales (output) and employment and information on ownership and sector. This number is approximately halved when we use the ‘fixed assets’ variable, as there are large gaps in the reporting of this information (questions 6a, 6b, 7a and 7b in the BEEPS). Sample sizes vary notably across countries, with only 82 observations in Montenegro and between 1,000 and 1,600 observations in Bulgaria, Ukraine, Russia, Turkey, Poland, Romania, Kazakhstan and Croatia.

<sup>9</sup> For example, missing data on employment for individual firms were predicted using available values for other years multiplied by the corresponding average rate of employment growth in the firm’s year-region-sector cluster. This affected only 61 observations and in the aggregate-level analysis has no influence on the obtained results.

<sup>10</sup> Alternative definitions (any foreign ownership (>0%); majority ownership (>50%); and full ownership (>99%)) were also tested but are not our focus in this paper.



**Table 1. Descriptive statistics of the main variables**

Variable	<i>no foreign presence</i>			<i>foreign presence</i>		
	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
<i>sales (in millions)</i>	19179	73,000	2,690,000	2830	141,000	2,800,000
<i>Employment</i>	19150	97.96	358.90	2830	232.92	989.96
<i>fixed assets (in millions)</i>	9423	158,000	4,240,000	1608	308,000	4,410,000
<i>% exports/sales</i>	18973	10.11	24.32	2823	27.77	37.20
<i>% imports /material inputs</i>	13376	29.077	36.71	2178	49.47	39.97
<i>horizontal linkages</i>	19179	0.16	0.20	2830	0.28	0.24
<i>share of foreign presence</i>	-	-	-	2566	75.99	27.64
<i>EU foreign ownership</i>	-	-	-	1371	0.58	0.49

Notes: Authors' calculations from the panel edition of BEEPS. See text for details.

In our empirical analysis we use this data and estimate a standard production-function model that incorporates, in addition to the two main factors of production (capital, measured by fixed assets, and labour), the share of foreign presence in the sector where each firm is located. Additionally, the model includes various controls for the different dimensions of the sample, for example fixed-effects for countries and years.<sup>11</sup> Our base estimating model is

$$y_{isct} = b_0 + b_1 l_{isct} + b_2 k_{isct} + b_3 h_{sct} + D_c + D_t + e_{isct}$$

where  $y$  is output;  $k$  is capital (measured by fixed assets);  $l$  is employment;  $h$  is our measure of horizontal FDI;  $D_c$  is a vector of binary dummies for countries;  $D_t$  is a vector of time fixed effects;  $e$  is a normally distributed error; and the  $b$ 's are parameters to be estimated.

Given our controls for the factors of production, the parameter on the horizontal FDI variable gives the effect of foreign presence in the sector (or in the sector-region) on firm's  $i$  total factor productivity.<sup>12</sup> Because this variable is measured at the sectoral level, in our empirical analysis we cluster the standard errors across sectors (and, where appropriate, sector-regions). We estimate this model using alternatively OLS and fixed-effects (within) estimators, the latter in order to

<sup>11</sup> As our nominal variables (sales and fixed assets) are measured in local currencies, the country dummies control also for cross-country differences in currency units. Similarly, country-year dummy interactions control for country-specific price movements.

<sup>12</sup> Some studies correct for a possible endogeneity problem whereby firms, knowing their underlying productivity, invest selectively in capital so that more productive firms have higher levels of capital. This tends to inflate the capital parameter and to underestimate the measured TFP advantage of more productive firms. Unless, however, this selection operates along sectoral lines, it is not clear what its impact is on the parameter of interest (for horizontal FDI).

correct for the non-independence of repeated observations (firms) over time. The fixed effects estimation controls for unobserved firm-specific characteristics (e.g., management quality) but effectively removes from our estimating sample all those firms that only appear in the sample once. Thus, although we discuss the fixed-effects estimates, our main interest in the analysis is with the OLS full-sample results.

#### 4. Empirical results

##### *i. Aggregate effects*

We start our empirical analysis with an exploration of the general effects of foreign-ownership on firm productivity, focusing in particular on the form that these effects take, namely internal versus external and linear versus non-linear (Table 2). As can be seen, the direct (internal) effect of foreign presence is positive and highly significant: firms with higher foreign ownership shares appear to have higher productivity. However, when we control for firm-specific time-invariant characteristics (second column), this effect loses its significance. This suggests that the positive association found in column 1 may in fact be due to a selection mechanism, whereby foreign investors channel their investments to high-productivity firms. Either way, the external effect of foreign ownership (horizontal FDI spillover) is negative and not statistically significant<sup>13</sup>, although it does become statistically significant when we introduce interactive country-year fixed effects (col.3; sample restricted to domestic firms only), which account for time-varying country differences (e.g. in inflation rates). Interestingly, adding sectoral fixed-effects to this specification (col.4) weakens the adverse effect of horizontal FDI, suggesting an inverse selection into sectors (with low-productivity sectors having higher foreign presence, *ceteris paribus*).

**Table 2. Base regressions: impact of foreign ownership on firm productivity**

<i>Dependent: log(sales)</i>	(1)	(2)	(3)	(4)	(5)	(6)
Employment (log)	0.544*** (0.023)	0.333*** (0.056)	0.831*** (0.013)	0.853*** (0.013)	0.566*** (0.023)	0.329*** (0.061)
Fixed assets (log)	0.503*** (0.017)	0.635*** (0.017)	0.189*** (0.019)	0.182*** (0.018)	0.508*** (0.021)	0.625*** (0.019)
Foreign share (own)	0.198*** (0.047)	0.181 (0.284)				
Foreign share (sector)	-0.0085 (0.088)	-0.213 (0.201)	-0.206** (0.074)	-0.126** (0.056)	0.694* (0.385)	2.328*** (0.659)
Foreign share squared (sector)					-0.955* (0.461)	-3.631*** (0.884)
Constant	9.813*** (0.435)	5.248*** (0.307)	21.06*** (0.642)	20.87*** (0.569)	9.171*** (0.416)	4.774*** (0.412)
Fixed effects		Country, Firm,	Country	Country	Country,	Firm,

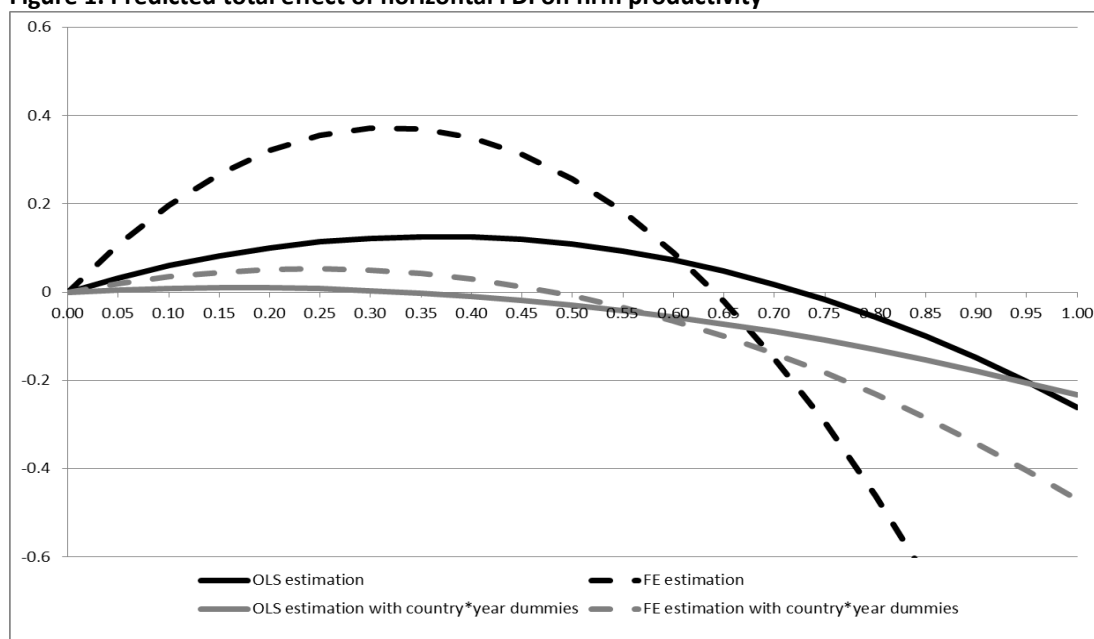
<sup>13</sup> Note that when we drop the country fixed effects this effect becomes positive (although still insignificant), suggesting also a selection mechanism across countries: countries with high productivity tend to attract higher volumes of FDI.

	Year	Year	(x) Year	(x) Year, Sector	Year, Sector	Year, Sector
Observations	10,696	10,696	9,313	9,313	9,313	9,313
R-squared	0.868	0.598	0.922	0.929	0.872	0.634

Notes: Standard errors in parentheses; \*, \*\* and \*\*\* show significance at the 10%, 5% and 1% levels. See text for details on estimation method and types of controls.

Within sectors, the negative effect seems to be driven by high concentrations of foreign presence: introducing a quadratic term for horizontal FDI (col.5) returns a positive coefficient for the linear term but a negative for the quadratic term. Within-sample predictions suggest that the joint effect is maximised at values around 35% (Figure 1) while it only turns negative for sectoral foreign-ownership shares of over 75%. This effect becomes statistically stronger and notably steeper in the fixed-effects specification that controls for time-invariant firm-specific characteristics (last column), thus identifying the horizontal FDI effect only from those firms that remain in the sample when foreign presence changes. The negative effect kicks-in much earlier (above 60%) but its maximum value is almost three times higher than in the OLS specification. Non-linear effects, however, all but disappear when we introduce country-year interactive fixed effects (Figure 1).

Figure 1. Predicted total effect of horizontal FDI on firm productivity



Notes: The figure depicts the predicted total effect on firm productivity (vertical axis) for different values of sectoral shares of foreign presence (horizontal axis) based on the two estimations reported in columns 5 and 6 of Table 2.

All in all, the evidence from Table 2 suggests that, in our sample countries, foreign investments offer little benefits to the sectors in which they locate<sup>14</sup>: there is a direct positive effect for the firms that receive the foreign investment (although, still, this happens selectively) and some evidence of positive spillovers in sectors where foreign presence is (positive but) at rather low levels (although country differences in temporal dynamics may exaggerate this effect); firms in sectors that are dominated by foreign-owned production (well above 50%) show in fact lower productivity. Based on our fixed-effects estimation which, restricting the identification to surviving domestic firms produces a more negative effect for high foreign-presence values, it appears that this is not due to a compositional effect (whereby high foreign presence creams off, through take-overs, or crowds out, through exit, domestic high-productivity firms) but rather due to a pure negative externality.

## *ii. Impact of origin and destination*

As noted earlier, our interest is with how the impact of foreign ownership varies across space – both in its supra-national and in its sub-national dimension. Table 3 reports our results concerning the former, where we examine specifically the role played by EU-originating FDI and the differentiation of its effects across different regional blocks of the ‘European neighbourhood’. We start with the basic linear model used above. On this early evidence and in line with our prior expectations, European FDI appears to have indeed a remarkably different effect compared to that originating from non-EU countries: consistent with the evidence of Table 2, the latter has a negative effect which is statistically significant at 10%; inversely, EU presence appears to be associated with sizeable and statistically significant positive spillovers to domestic firms. Although when we re-introduce the interactive country-year dummies the significance of this effect evaporates, the result for non-EU FDI is, if anything, strengthened – suggesting again that the impact of EU-originating FDI is indeed distinctive and less negative than that of FDI originating from other parts of the world. This difference persists also in the fixed-effects specification (which includes firm-specific controls) and in the quadratic specification (with EU origin having the familiar hump-shaped effect and non-EU origin having a strictly linear negative effect) (results not shown but available upon request).

The remainder of Table 3 shows how these results change for different regional blocks. Columns 3-5 report the results for the total measure of foreign presence (corresponding to the model of col.5 in Table 2), separately for the three regional blocks of interest here, namely the New Member States of the 2004 accession (CEE), the Candidate Countries of the Balkans (SEE), and the countries belonging to the European Neighbourhood Policy and the Eastern Partnership (ENP). As can be seen, the estimated effect from foreign presence in the CEE region tends to be negative but it is not statistically significant. This is consistent with the findings elsewhere in the literature about the non-positive intra-industry impact of FDI in the region. The effect, however, is very strong and strictly non-linear (hump-shaped) in the case of the SEE region. For the countries in this region, the intra-industry (horizontal) effect of FDI is particularly large (almost twice as high as that estimated for the full-sample earlier) and remains non-negative even for within-sector foreign-ownership concentrations of over 90%. Arguably, the specificities of the region (including its slow transition, the legacy of conflicts

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<sup>14</sup> This is not to say that they may not have positive vertical spillovers, or indeed macroeconomic and political effects, as discussed in the relevant literatures (see, inter alia, Fry et al, 1995 and Grabbe, 2006).

and the low capital base and levels of development) may go a long way in explaining this rather unusually large positive effect. In contrast, the estimated horizontal spillover in the ENP region is much smaller and not statistically significant, most probably reflecting this time a capacity issue (i.e., possibly suggesting that domestic firms in this region do not have the capacity to absorb spillovers accruing from the presence of foreign investors).

**Table 3. Impact of foreign ownership by region of origin and destination**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ALL	ALL	CEE	SEE	ENP	CEE	SEE	ENP
Employment	0.566*** (0.009)	0.853*** (0.013)	0.793*** (0.026)	0.397*** (0.045)	0.607*** (0.042)	0.793*** (0.027)	0.384*** (0.044)	0.609*** (0.043)
Fixed assets	0.508*** (0.006)	0.182*** (0.018)	0.253*** (0.027)	0.704*** (0.059)	0.477*** (0.029)	0.254*** (0.028)	0.710*** (0.060)	0.476*** (0.030)
Horizontal (total)			-0.0461 (0.599)	3.130*** (1.000)	-0.135 (0.566)			
Horizontal squared (total)			-0.0309 (0.689)	3.437*** (1.052)	0.0590 (0.682)			
EU horizontal	0.362*** (0.093)	0.0006 (0.047)				-0.0721 (0.131)	1.308** (0.576)	0.567* (0.282)
Non-EU horizontal	-0.267* (0.139)	- (0.094)				-0.335** (0.153)	1.003 (1.490)	-0.0427 (0.331)
Constant	9.179*** (0.155)	20.84*** (0.575)	8.265*** (0.313)	5.171*** (1.272)	8.234*** (0.456)	8.271*** (0.309)	5.266*** (1.277)	8.179*** (0.429)
Fixed effects	Country, Year, Sector	Country (x) Year, Sector	Country, Year, Sector	Country, Year, Sector	Country, Year, Sector	Country, Year, Sector	Country, Year, Sector	Country, Year, Sector
Observations	9,313	9,313	4,233	1,581	3,499	4,233	1,581	3,499
R-squared	0.872	0.929	0.913	0.876	0.867	0.913	0.876	0.867

Notes: Standard errors in parentheses; \*, \*\* and \*\*\* show significance at the 10%, 5% and 1% levels. All regressions include country, year and industry fixed effects and have been estimated with OLS. For the corresponding results from the fixed-effects (within) estimation, which includes controls for firm-specific time-invariant effects, see Table A.2 in Appendix.

In the last part of Table 3 we examine how these effects are differentiated depending on the origin of the foreign investor.<sup>15</sup> Consistent with what we saw before, in all cases EU-originating FDI appears to have a productivity advantage compared to FDI from outside the EU. The effect is significantly positive in the SEE and ENP regions, where the presence of non-EU owners produces effects of no statistical significance. Inversely, the EU effect is negative but non-significant in the CEE region; but this still compares favourably to the effect of non-EU FDI, which is significantly negative.

Overall, these results offer support to our underlying hypothesis that the origin of FDI matters, not only in itself but also in relation to the recipient country. In the CEECs, where levels of development are comparatively (to the other regions) high and where economic openness happened earlier and faster, the benefits from FDI, in an intra-industry sense, seem to have been exhausted – for both EU and non-EU FDI. Instead, in the case of the SEECs, where the EU has been playing a pivotal role for political-economic stabilisation and development, the productivity effects of European FDI are exceptionally strong and much more significant than spillovers from FDI of other origins. Finally, in the ENP region, where

<sup>15</sup> Results from the quadratic specifications are available upon request. The results are in line with those presented in the paper: the EU effect tends to be positive and hump-shaped, while the non-EU effect is either negative or non-significant.

EU's involvement is also preferential but much less significant, or influential, European FDI produces smaller spillovers, albeit still more advantageous ones compared to FDI from other regions.

### *iii. Geographical impact*

Notwithstanding the findings about the distinctive role of European FDI, our overall results suggest that foreign presence has rather limited intra-industry effects. In this sub-section we examine whether this is due to a scale issue, as our attention thus far has been on country-wide sectoral spillovers. We start by examining whether intra-industry spillovers operate more strongly at the local level (within regions). Despite our prior expectations, based at least on the body of knowledge deriving from the knowledge spillovers literature, the concentration of foreign presence within region-sector clusters (i.e., within sectors within regions) is not found to be associated with higher levels of productivity for domestic firms in the cluster. As is shown in col.1 of Table 4, the effect is positive but highly insignificant and, moreover, it remains so across alternative specifications (firm-specific fixed-effects, non-interactive dummies, etc – results not shown but available upon request). Again, however, concentration appears to play an important role in this relationship. In col.2, where we test the quadratic specification, we obtain a highly significant result<sup>16</sup>, with intra-regional horizontal spillovers following the hump-shaped pattern seen above and becoming negative only at shares of foreign-ownership above 75%. Nevertheless, this time the non-linear effect is flatter and its maximum is notably lower than that found earlier for the case of the country-wide intra-industry spillovers. This clearly suggests not only that spillovers are not particularly localised, but also that they are rather heterogeneous across space.

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<sup>16</sup> Again, the results are similar across specifications, returning consistently a statistically significant hump-shaped relationship.

**Table 4. Local and spatial effects of foreign ownership**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	
Employment	0.853*** (0.013)	0.853*** (0.013)	0.853*** (0.013)	0.853*** (0.013)	0.853*** (0.013)	0.853*** (0.013)	0.854*** (0.013)	
Fixed assets	0.182*** (0.018)	0.182*** (0.018)	0.182*** (0.018)	0.182*** (0.018)	0.182*** (0.018)	0.182*** (0.018)	0.182*** (0.018)	
FP (region-sector)	0.0197 (0.067)	0.515*** (0.166)						
FP^2 (region-sector)		- 0.727*** (0.196)						
EU FP (region-sector)			0.0962 (0.075)					
Non-EU FP (region-sector)			-0.157 (0.117)					
<b>Interactions</b>								
Capital regions (x) ...								
FP (sector)			0.0900 (0.121)		0.813*** (0.274)			
FP (sector-region)				0.193* (0.102)		1.002*** (0.187)		
FP^2 (sector)					- 1.154*** (0.317)			
FP^2 (sector-region)						- 1.233*** (0.244)		
EU FP (region-sector)							0.215** (0.091)	
Non-EU FP (region-sector)							-0.097 (0.152)	
Other regions (x) ...								
FP (sector)			- 0.212*** (0.061)		-0.140 (0.209)			
FP (sector-region)				-0.098 (0.073)		0.172 (0.203)		
FP^2 (sector)					-0.051 (0.260)			
FP^2 (sector-region)						-0.369 (0.250)		
EU FP (region-sector)							0.0094 (0.094)	
Non-EU FP (region-sector)							-0.194 (0.136)	
Constant	20.82*** (0.583)	20.77*** (0.586)	20.81*** (0.580)	20.88*** (0.564)	20.86*** (0.575)	20.87*** (0.564)	20.83*** (0.579)	20.84*** (0.579)
Observations	9,313	9,313	9,313	9,313	9,313	9,313	9,313	9,313
R-squared	0.929	0.929	0.929	0.929	0.929	0.929	0.929	0.929



Notes: Standard errors in parentheses; \*, \*\* and \*\*\* show significance at the 10%, 5% and 1% levels. All regressions include country-year interactive dummies and industry fixed effects and have been estimated with OLS.

To examine these two propositions further, we first estimate the size of intra-regional horizontal spillovers by groups of destination countries (our three regional blocks) and types of origin (EU versus non-EU); and then estimate the size of these spillovers for different types of locations within each recipient country (splitting between capital-city regions and the rest of the country). Across regional blocks, both the linear and the quadratic models return spillovers that are always smaller than those obtained for the country-level analysis (Table 3) and often not statistically different from zero (in CEE and ENP – results available upon request). Concerning the EU – non-EU split, again we find some evidence of an EU ‘advantage’ but the effect is less strong and not significant statistically (col.3). All results indicate that intra-industry spillovers in our sample are not localised, reinforcing our earlier conclusion.<sup>17</sup>

Given this, we turn our attention to the question of spatial heterogeneity in the size and direction of spillovers. Column 4 shows the estimated spillover effects of country-wide foreign presence in a sector, separated between firms that are located in capital-city and non-capital-city (‘peripheral’) regions within each sector. The effect appears to be strongly negative in peripheral regions and positive but not significant in the capitals. The result is broadly consistent also in the case of the region-specific measure of foreign presence (col.5), which shows a positive and significant effect in capital-city regions and an adverse effect (albeit not statistically significant this time) in peripheral regions. When we re-specify these models in quadratic form (columns 6 and 7), the results remain consistent. Regions of capital cities benefit more from foreign presence (with a hump-shaped effect), whereas the rest of the regions do not enjoy positive productivity spillovers. From results not shown, these patterns appear to be strongest in the CEE region and weakest in the SEECs. This suggests that the overall effect of FDI in the CEE, which was found earlier to be consistently non-positive, is mainly driven by a negative spillover accruing predominantly to the peripheral regions within the countries of this group. This is consistent with the findings of Sgard (2001) for Hungary.

The last column of Table 4 reports the results from the model that examines the capital – periphery distinction separately for EU and non-EU firm ownership shares. Consistent with all our previous results, EU-originating FDI appears to have an advantage relative to non-EU FDI in both types of regions. The EU effect is positive and statistically significant in capital cities and positive but highly insignificant outside capital-city regions; while the non-EU effect is negative and not statistically significant in both types of regions, but it is also more positive in capital-city regions. All of these results point to the same conclusion: although the presence of foreign-ownership in a sector is often associated with non-positive productivity spillovers, invariably the largest benefits, even in cases where the overall effect is negative, accrue to firms located in capital-city regions. The obvious implication of this is that foreign-firm presence, even in cases where its overall effect is positive (e.g., moderate concentration, European origin, etc), has a detrimental spatial effect as it tends to increase the distance (in terms of firms’ total factor productivity) between capital-city regions – which usually possess

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<sup>17</sup> In contrast, when we include a region-wide measure of the share of foreign-ownership (taking weighted averages across sectors within each region), the estimated spillovers are highly significant and very positive suggesting the presence of positive *vertical* (inter-industry) spillovers or, in the agglomeration economics terminology, urbanisation (as opposed to localisation) effects.

higher levels of development and greater agglomeration and other advantages – and the rest of the country. Comparing the results presented in columns 6 and 7 of Table 4, i.e., between the spillovers estimated using the country-wide versus the region-specific measure of horizontal FDI, this effect does not seem to be driven by the natural tendency of foreign investments to concentrate in, or near, capital cities. But given this tendency, the spillover advantage observed in capital-city regions implies necessarily that foreign-firm presence magnifies regional disparities in the host economies (at least those of our sample).

## 5. Conclusions

The literature on the intra-industry productivity spillovers of foreign firm ownership has made significant advances over the last ten years or so, and has expanded notably, producing a large body of empirical evidence on the nature of these spillovers and the range of factors that condition them (including factors such as technological distance and absorptive capacity, domestic institutions and legal frameworks, firm size and export-orientation, etc). Despite these advances, only a handful of studies exist that examine the issue of the origin and type of the foreign investor as one of the mediating factors determining the size and direction of spillovers. Similarly, and despite the theoretical origins of this literature in the broader literatures of knowledge spillovers and agglomeration economies, studies that examine the geographical scale and spatial distribution of these productivity spillovers accruing from foreign ownership are really scarce.

This paper takes up these observations and examines these two issues (origin of investor and geography of spillovers) for a case of particular interest and policy significance. The European Neighbourhood Policy, launched by the European Union in 2004 at the time of the EU's eastward enlargement, has been an innovation that has transformed the Union's external relations with its near neighbourhood and has linked them inexorably with processes of institutional adaptation (Europeanisation) and economic integration (trade liberalisation and preferential agreements). Because of this, and despite its political and foreign-policy origins, the ENP has become today one of the main economic-policy instruments in the Continent and has accelerated and intensified economic flows and interactions between countries and between businesses across the two regional blocks. These dynamics necessitate an examination of the usefulness and economic benefits of processes of economic integration and the identification of any possible unintended consequences that they may have.

Within this context, this paper examined the size and direction of productivity spillovers accruing to the domestic economies of the countries in the eastern part of the ENP region and, comparatively, the countries belonging to the CEE and SEE regions. We examined the differentiated spillovers generated by European and non-European FDI, at the national-sectoral level, and proceeded to investigate the geographical scale and spatial differentiation of these effects, asking whether positive FDI spillovers, which may be beneficial nationally, may be exacerbating regional disparities and existing spatial asymmetries.

Our results offer a plethora of interesting findings, three of which we want to emphasise here. First, EU-originating FDI appears to have a 'productivity advantage' over investments from other parts of the world, in the sense that it tends to

generate greater productivity spillovers for domestic firms or, at least, less significant negative effects. This result is consistent across specifications and for different definitions of our policy variable. Although theoretically it is possible that this result may emanate purely from technology and other advantages possessed by European firms relative to other investors, in practice it is difficult to argue that European multinationals would be systematically more advanced than multinationals of other origins. If this is true, then it can be argued that at least part of this productivity advantage must be related to the process of EU association, which gives a preferential access to European firms in the economies examined here and harmonises their institutional and legal environment.

Second, FDI spillovers, including European ones, have not reached their maximum value in the ENP region. In the SEE, where the involvement of the EU is magnified, such spillovers are very positive and strong, despite the recipient countries of the region sharing similar problems of institutional quality and absorptive capacity with many of the ENP countries. This in turn suggests that further approximation with the countries of the region and further intensification of economic links and capital flows may prove to be increasingly beneficial for the domestic economies of the countries in the 'eastern neighbourhood'.

Third, the observed productivity spillovers, although not particularly localised, tend to be significantly stronger and more positive for firms located in the capital-city regions of the recipient countries, irrespective of the location of the foreign firms. As FDI tends to concentrate in, or near, capital cities anyway, it follows that it indeed acts to amplify within-country spatial disparities. European FDI appears to have the strongest contribution to this adverse geographical effect, partly owing to the fact that its effect is also stronger at the national level. This finding raises important concerns about the role and consequences of foreign capital inflows in the former transition countries of the eastern and southeastern periphery of Europe. Processes of transition, development and internationalisation (openness) are long known to be related to widening regional disparities, as they benefit, at least in their initial stages, the most dynamic, extrovert and human-capital abundant parts of an economy. If the role of FDI is similarly geographically inequitable and spatially uneven, policy-makers in FDI-receiving countries face an important policy problem, in the form of a trade-off between higher technology transfers and lower regional disparities.

This observation leads us to the main conclusion that we wish to draw from our analysis in this paper. Through its policy of approximation and conditionality, the EU has affected in fundamental ways the market orientation and external political and economic relations of the countries in its neighbourhood. This influence, and the very gravitational pull of the EU economy (even during the time of the Eurozone crisis), makes the countries in the EU periphery unable to choose or control the pace at, and areas in, which processes of integration and market openness take place. In this sense, the EU shares a responsibility, together with the countries concerned, to address any adverse consequences and any imbalances generated by these processes of approximation and openness. From this perspective, the issue of spatial imbalances, and in particular of the impact that the processes of approximation and openness may have on these, is not only important but also an issue of shared EU responsibility. Although the evidence we present in this paper is untested to other datasets and model specifications, and in this sense, can only be received as tentative, our results provide a clear indication that the effects of FDI in the European periphery, and particularly of European FDI there, are favouring geographical

differentiation and regional disparities. If this is true, then the recommendation follows that the 'neighbourhood' policies of the EU should obtain a much more specific geographical focus and attention, and develop actions and interventions that will seek to identify and correct the regional imbalances that are generated by otherwise well-intentioned and probably on-the-aggregate beneficial policies.

## Appendix

**Table A.1. Firm ownership by country and year**

Country	Ownership	2002	2005	2007	2009	Sub-Total	Total
<b>Albania</b>	<i>domestic</i>	96	127	186	28	437	507
	<i>foreign</i>	18	19	29	4	70	
	<i>total</i>	114	146	215	32	507	
	<i>% foreign</i>	16%	13%	13%	13%	14%	
<b>Armenia</b>	<i>domestic</i>	104	279	0	255	638	703
	<i>foreign</i>	13	28	0	24	65	
	<i>total</i>	117	307	0	279	703	
	<i>% foreign</i>	11%	9%	-	9%	9%	
<b>Azerbaijan</b>	<i>domestic</i>	78	0	0	315	393	444
	<i>foreign</i>	11	0	0	40	51	
	<i>total</i>	89	0	0	355	444	
	<i>% foreign</i>	12%	-	-	11%	11%	
<b>Belarus</b>	<i>domestic</i>	180	186	0	192	558	658
	<i>foreign</i>	42	24	0	34	100	
	<i>total</i>	222	210	0	226	658	
	<i>% foreign</i>	19%	11%	-	15%	15%	
<b>Bosnia</b>	<i>domestic</i>	103	100	0	258	461	515
	<i>foreign</i>	17	15	0	22	54	
	<i>total</i>	120	115	0	280	515	
	<i>% foreign</i>	14%	13%	-	8%	10%	
<b>Bulgaria</b>	<i>domestic</i>	164	190	858	211	1,423	1628
	<i>foreign</i>	32	24	122	27	205	
	<i>total</i>	196	214	980	238	1628	
	<i>% foreign</i>	16%	11%	12%	11%	13%	
<b>Croatia</b>	<i>domestic</i>	97	174	541	85	897	1013
	<i>foreign</i>	26	18	60	12	116	
	<i>total</i>	123	192	601	97	1013	
	<i>% foreign</i>	21%	9%	10%	12%	11%	
<b>Czech Republic</b>	<i>Domestic</i>	123	277	0	156	556	640
	<i>Foreign</i>	21	27	0	36	84	

	<i>Total</i>	144	304	0	192	640	
	<i>% foreign</i>	15%	9%	-	19%	13%	
<b>Estonia</b>	<i>Domestic</i>	133	166	0	213	512	628
	<i>Foreign</i>	31	36	0	49	116	
	<i>Total</i>	164	202	0	262	628	
	<i>% foreign</i>	19%	18%	-	19%	18%	

<b>FYROM</b>	<i>domestic</i>	69	92	0	268	429	493
	<i>foreign</i>	7	14	0	43	64	
	<i>total</i>	76	106	0	311	493	
	<i>% foreign</i>	9%	13%	-	14%	13%	
<b>Georgia</b>	<i>domestic</i>	128	124	0	241	493	552
	<i>foreign</i>	21	20	0	18	59	
	<i>total</i>	149	144	0	259	552	
	<i>% foreign</i>	14%	14%	-	7%	11%	
<b>Hungary</b>	<i>domestic</i>	147	406	0	224	777	957
	<i>foreign</i>	47	76	0	57	180	
	<i>total</i>	194	482	0	281	957	
	<i>% foreign</i>	24%	16%	-	20%	19%	
<b>Kazakhstan</b>	<i>domestic</i>	173	380	0	409	962	1053
	<i>foreign</i>	25	44	0	22	91	
	<i>total</i>	198	424	0	431	1053	
	<i>% foreign</i>	13%	10%	-	5%	9%	
<b>Kyrgyz</b>	<i>domestic</i>	90	132	0	156	378	456
	<i>foreign</i>	21	28	0	29	78	
	<i>total</i>	111	160	0	185	456	
	<i>% foreign</i>	19%	18%	-	16%	17%	
<b>Latvia</b>	<i>domestic</i>	136	148	0	197	481	581
	<i>foreign</i>	26	23	0	51	100	
	<i>total</i>	162	171	0	248	581	
	<i>% foreign</i>	16%	13%	-	21%	17%	
<b>Lithuania</b>	<i>domestic</i>	160	157	0	223	540	615
	<i>foreign</i>	28	23	0	24	75	
	<i>total</i>	188	180	0	247	615	
	<i>% foreign</i>	15%	13%	-	10%	12%	
<b>Moldova</b>	<i>domestic</i>	113	213	0	312	638	726
	<i>foreign</i>	19	31	0	38	88	
	<i>total</i>	132	244	0	350	726	
	<i>% foreign</i>	14%	13%	-	11%	12%	
<b>Montenegro</b>	<i>domestic</i>	0	2	0	75	77	82
	<i>foreign</i>	0	0	0	5	5	
	<i>total</i>	0	2	0	80	82	
	<i>% foreign</i>	-	0%	-	6%	6%	
<b>Poland</b>	<i>domestic</i>	283	702	0	264	1,249	1385
	<i>foreign</i>	53	48	0	35	136	
	<i>total</i>	336	750	0	299	1385	
	<i>% foreign</i>	16%	6%	-	12%	10%	
<b>Romania</b>	<i>domestic</i>	177	463	0	300	940	1089

	<i>foreign</i>	29	61	0	59	149	
	<i>total</i>	206	524	0	359	1089	
	<i>% foreign</i>	14%	12%	-	16%	14%	
<hr/>							
<b>Russia</b>	<i>domestic</i>	265	361	0	702	1,328	1443
	<i>foreign</i>	42	29	0	44	115	
	<i>total</i>	307	390	0	746	1443	
	<i>% foreign</i>	14%	7%	-	6%	8%	
<hr/>							
<b>Serbia</b>	<i>domestic</i>	72	146	0	314	532	610
	<i>foreign</i>	12	19	0	47	78	
	<i>total</i>	84	165	0	361	610	
	<i>% foreign</i>	14%	12%	-	13%	13%	
<hr/>							
<b>Slovakia</b>	<i>domestic</i>	109	136	0	173	418	488
	<i>foreign</i>	22	16	0	32	70	
	<i>total</i>	131	152	0	205	488	
	<i>% foreign</i>	17%	11%	-	16%	14%	
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<b>Slovenia</b>	<i>domestic</i>	155	186	0	234	575	654
	<i>foreign</i>	27	16	0	36	79	
	<i>total</i>	182	202	0	270	654	
	<i>% foreign</i>	15%	8%	-	13%	12%	
<hr/>							
<b>Tajikistan</b>	<i>domestic</i>	130	160	0	260	550	601
	<i>foreign</i>	3	23	0	25	51	
	<i>total</i>	133	183	0	285	601	
	<i>% foreign</i>	2%	13%	-	9%	8%	
<hr/>							
<b>Turkey</b>	<i>domestic</i>	0	268	0	897	1,165	1203
	<i>foreign</i>	0	7	0	31	38	
	<i>total</i>	0	275	0	928	1203	
	<i>% foreign</i>	-	3%	-	3%	3%	
<hr/>							
<b>Ukraine</b>	<i>domestic</i>	106	403	0	552	1,061	1440
	<i>foreign</i>	275	50	0	54	379	
	<i>total</i>	381	453	0	606	1440	
	<i>% foreign</i>	72%	11%	-	9%	26%	
<hr/>							
<b>Uzbekistan</b>	<i>domestic</i>	204	195	0	312	711	845
	<i>foreign</i>	41	44	0	49	134	
	<i>total</i>	245	239	0	361	845	
	<i>% foreign</i>	17%	18%	-	14%	16%	
<hr/>							
<b>Total</b>	<i>domestic</i>	<b>3,595</b>	<b>6,173</b>	<b>1,585</b>	<b>7,826</b>	<b>19,179</b>	<b>22009</b>
	<i>foreign</i>	<b>909</b>	<b>763</b>	<b>211</b>	<b>947</b>	<b>2,830</b>	
	<i>total</i>	<b>4504</b>	<b>6936</b>	<b>1796</b>	<b>8773</b>	<b>22009</b>	
	<i>% foreign</i>	<b>20%</b>	<b>11%</b>	<b>12%</b>	<b>11%</b>	<b>13%</b>	

**Table A.2. Fixed-effect results: impact of foreign ownership by origin and destination**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ALL	ALL	CEE	SEE	ENP	CEE	SEE	ENP
Employment	0.331*** (0.061)	0.482*** (0.047)	0.775*** (0.098)	0.237** (0.117)	0.559*** (0.116)	0.777*** (0.097)	0.213* (0.111)	0.565*** (0.116)
Fixed assets	0.631*** (0.019)	0.0638*** (0.022)	0.121*** (0.026)	0.713*** (0.048)	0.446*** (0.038)	0.122*** (0.025)	0.686*** (0.048)	0.452*** (0.037)
Horizontal (total)			0.0071 (0.606)	5.943*** (2.001)	1.280 (0.980)			
Horizontal squared (total)			-0.0367 (0.789)	-8.40*** (2.989)	-2.201 (1.356)			
EU horizontal	0.223 (0.314)	-0.126 (0.224)				-0.139 (0.260)	5.250*** (1.319)	0.250 (0.538)
Non-EU horizontal	-1.031** (0.419)	-0.699** (0.290)				-0.208 (0.384)	-3.792 (2.357)	-0.918* (0.552)
Constant	4.963*** (0.408)	13.46*** (0.383)	10.67*** (0.505)	3.866*** (1.300)	6.795*** (0.707)	10.69*** (0.493)	4.486*** (1.315)	6.843*** (0.708)
Observations	9,313	9,313	4,233	1,581	3,499	4,233	1,581	3,499
R-squared	0.629	0.863	0.333	0.846	0.494	0.334	0.852	0.495

Notes: All regressions include year and industry fixed effects and have been estimated with the fixed-effects (within) estimator. The corresponding OLS results are reported in Table 3 in the text.



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