

# **Bridging the Gap? Institutions, Corruption and Foreign Ownership in Transition Countries**

## **Introduction**

Using firm-level panel data set for the period 1997-2006, this paper examines the impact of institutions on foreign ownership structures in Central and Eastern Europe. Despite tremendous interest among the policy-makers to understand the factors attracting FDI and also some research efforts (e.g., Kaufman et al. 1999, Henisz, 2000, Bevan and Estrin 2004, Globerman and Shapiro, 2003; Merlevede and Schoors, 2009), our knowledge about the effects of institutions on the location choice and ownership structure of foreign firms remains inadequate. This paper attempts to fill in this gap of the literature.

The primary innovation of this paper is to assess the role of knowledge advantage of parent firms in relation to institutional differences in source and host countries. The internationalisation theory suggests that parent firms expand abroad to utilize the knowledge advantage created within the firm; accordingly parent firms with more intangible assets are more likely to be key investors in host countries. In addition, Javorcik and Wei (2009) empirically show that compared to investors with less intangible assets, foreign investors with more sophisticated technology are less likely to share it with some firm in a host country in a form of joint venture, as transaction costs of protecting specific assets are higher for this strategy. Thus in an attempt to assess the total risk of expropriation of firm-specific knowledge by local partners, one needs to take account of intangible assets of the host firm as well. It is not only the home country firm specific assets, but also the host country joint venture knowledge characteristics that may

affect ownership shares held by the host country investor firm in the home country investee company.

Second, we argue that the ownership structure of foreign investment will also depend on institutional quality. This is because poor institutions increase the transaction costs of settling potential disputes with a local shareholder or stakeholder (private/government), including the risk of expropriation. While this approach follows Javorcik and Wei's (2009) insights, we extend their work by using continuous ownership structure (percentage of foreign ownership) instead of dummies denoting ownership modes. Among various institutional characteristics, freedom from corruption could be particularly important in this respect.

More importantly, we argue that to benefit most from the internal knowledge advantage firms are best off to expand in an environment which is *similar* to the environment they are familiar with. In other words, institutional differences between source and host countries could limit cross-border activities; this could particularly be important for high-tech foreign firms who are wary of sharing their knowledge advantage with some host country firm, especially when legal environment is weak. It is thus important to take account of the institutional quality in host country *in relation to* that in the source country resulting in negative effect of institutional difference on foreign investment. However, a counter argument to this, resulting in an opposite sign effect would be that good governance practices are a source of firm specific advantage.

While expecting the former (negative) effect to dominate over the latter (positive) effect, we highlight the importance, not only of the absolute levels of institutional quality in the host country, but also of its relative levels (in comparison with the home country)

for the distribution of foreign ownership share at the firm level. This is a notable extension on the previous literature that essentially ignores the source (home) country context. This remains an open empirical scrutiny that we explore in the paper

The rest of the paper is organized as follows. In Section 2 we discuss our priors on FDI and institutions. Section 3 portrays the data set used in the analysis and presents descriptive statistics. Section 4 discusses of the econometric methodology and section 5 presents the results. Section 6 concludes.

### **FDI and Institutions**

The stylised literature on foreign direct investment (FDI) by multinational enterprises (MNEs) has at its basis the ownership-location-internalisation (OLI) framework (Buckley and Casson, 1976; Dunning, 1979, 1988). The basic proposition of the OLI model continues to be valid, in the sense that MNEs expand into other countries and continents to take advantage of local resources and by leveraging their unique capabilities (Luo and Tung, 2007). This approach resulted in numerous attempts to link institutions, economic development and FDI. Typically they have been based on macro-level cross-country studies. A fundamental argument however is that strong governance structures designed to protect property rights that define the core economic institutions (North, 1990) are likely to prevent unintended knowledge transfer from the foreign firm, and that this is an important consideration for potential investors. However, locations with weak institutions still attract FDI, and the subject of the relationship between FDI and the host country institutional quality remains a matter of high profile political disputes, as exemplified by one of the recent G8 summits<sup>i</sup>. Links between local- or national level governance structures and FDI have been explored in the literature, see for example Bhaumik et al.

(2009) or Frynas et al (2006) and the references therein. Generally, this literature suggests that better governance is associated with development, following la Porta et al (1998a, b), and parallel to that firms are more likely to invest in locations with good governance and institutions.

Much of the general literature on FDI and institutional quality is discussed in Bhaumik et al (2009) who argue that institutions provide location advantages, facilitating transactions and reducing risk. Similar arguments are made by Smarzynska and Wei (2002) and by Daude et al (2004) – who argue that weak institutions increase the transactions costs of the investor, and the level of risk. However, Frynas et al (2006) take a different perspective, pointing out that engaging successfully with corrupt officials and/or operating in an environment where institutions are malleable may be a source of first mover advantage.

Much of the focus of the literature stressing the negative impact of both weak property rights and the empirically associated phenomenon of corruption on FDI focuses on the relationship between investors and government agents. Property rights remain the first element in the governance chain (Dyck, 2001; see also: Mickiewicz, 2009). The next chain relates to the more detailed corporate governance frameworks shaping the relationships between the shareholders. Standard analysis of corporate governance tends to refer to principal – agent and principal – principal theory. This analysis is extended by Doukas and Travalos (1998), Doukas (1995) and Doukas and Lang (2003) who link the (foreign) investment decision to shareholder returns. Doukas and Lang (2003) for example highlight the importance the risks associated with FDI, and the returns to “external” shareholders. As investing firms become visible participants in the market for

overseas investment, typically operating in countries with weaker corporate governance credentials, the relationship between ownership (and hence corporate governance) structures and the decision to invest overseas assumes importance. This is likely therefore to be associated with concentrated, rather than dispersed ownership, where large shareholders are actively involved in the running of the firm (see also seminal work by Shleifer and Vishny, 1997).

While it should be clear from the above analysis, that micro-foundations of the decision making are critical for understanding determinants of FDI, primarily due to data limitations, much of the FDI literature is related to macro level. Following the recent development on the effect of institutions on economic growth (e.g. Mauro 1999, Kaufman and Wei, 1999), a strand of the FDI literature seeks to determine the impact of institutions on FDI using data at the country-level (e.g., see Wei 2000a, 2000b) or sub-national regional level (Du et al. 2007). Bhaumik et al (2010) argue that institutions provide location advantages, facilitating transactions and reducing risk. Similar arguments are made by Javorcik and Wei (2009) who argue that higher levels of corruption increase the transactions costs of the investor, and affect the perceived level of risk, albeit this may affect portfolio investment more than FDI (Daude and Fratzscher, 2008). In contrast, Frynas et al. (2006) take a different perspective, pointing out that engaging successfully with corrupt officials or operating where institutions are malleable may be a source of first mover advantage. It is clear that the analysis of institutions with respect to risk, and, more generally, of transaction costs are directly applicable to the comparative analysis of FDI in corrupt regions, but the extent to which such locations also offer greater rewards, perhaps through first mover advantage, market power, or

familiarity with a specific type of business environment (as proxied by host-home institutional differentials) are seldom discussed.

Thus, the existing literature typically adopts a stance that increased risk deters FDI and risk is typically proxied with measures of host country level corruption, which is also closely related to the strength of property rights and is treated as a proxy for overall institutional quality (Tanzi, 1998). Typically, the existing empirical literature in the main finds an inverse relationship between corruption and the attraction of FDI. This has been extended to related (and highly correlated) institutional measures of rule of law, property rights and political freedom (see, Harms and Ursprung, 2002; Schneider and Frey, 1985; Wheeler and Moody, 1992, Egger and Winner 2003). However, in direct contrast, some studies have shown a positive impact of corruption on FDI, as for example, Egger and Winner (2005). This puzzle may be resolved by distinguishing between absolute and relative effects of institutions and by controlling for the selection bias (decision to entry) when estimating determinants of the foreign share in ownership.

An additional reason for these rather contradictory results is that much of the analysis focuses on investment flows at the macro level, and so says little directly about the motivation of firms to engage in FDI in a given location. A recent example of this literature is Busse and Hefer (2007) who seek to relate FDI flows to a number of institutional variables. Typically however, they are unable to distinguish between many of the institutional effects they consider, not just because of the collinearity of the data, but also because many measures of institutions or institutional quality are in effect measuring the same thing. On the other hand, while there is a vast literature on FDI based on firm level data, the institutional aspects remain relatively unexplored. Firm level or

case study approach has been applied to analyse the mode of entry. This literature explores the choice of entry mode of foreign firms distinguishing between joint venture and sole proprietorship typically building on the work of Agarwal and Ramaswamy (1992). This however typically focuses on the strategic decisions of firms, but as Bhaumik et al (2010) note, typically disregards the role of institutions in this respect.

As institutional quality affects firm level decisions, an appropriate approach is to merge individual firm level data with country (or regional) level determinants. There is however a dearth of studies that take account of both firm characteristics and institutional characteristics together. Hines (1995) was the first paper that reported a negative effect of corruption on foreign investment using a sample of U.S. multinational firms. However the effect of corruption on U.S. multinational firms may not be representative of the effect on the universe of foreign investors, as Hines himself has pointed out. To the best of our knowledge, Javorcik (2004) and Javorcik and Wei (2009) are the only papers, which use multiple-country firm-level data to analyse the role of institutional quality on an outward investor's entry mode in transition countries. The present paper extends Javorcik and Wei (2009) in a number of ways: (a) rather than using a cross-section, we use panel data for the period 1997-2006; (b) while Javorcik and Wei (2009) use a binary variable to distinguish sole ownership from joint venture, we use the percentage of foreign ownership as a continuous variable; (c) we include characteristics of both host and source firms in our analysis; this in particular enables us to assess the effect of R&D in the host firm, but also the distance between the R&D in the host and source firm on foreign ownership. In addition, (d) while we focus on the impact of corruption on foreign ownership, we explore if the results are robust if we control for host country investment profile (from ICRG country risk database) and for infrastructure indicators (from EBRD).

(e) While most existing studies focus on the institutional environment in the host countries, we in addition, explore how the distance between institutional environment in source and host countries could affect foreign ownership in a host country.

In addition, the internationalisation theory of firm suggests that firms expand abroad to utilize the knowledge advantage created within the firm; the latter highlights the role of intangible assets on FDI. Javorcik and Wei (2009) empirically show that compared to investors with less intangible assets, foreign investors with more sophisticated technology are less likely to share it with some firm in a host country in the form of joint venture, as transaction costs of protecting specific assets are higher for this strategy. We update this attempt by taking into account the intangible assets of the parent firm which may also affect the foreign ownership pattern in the host country firm.

A final point to note about much of the literature discussed here is that it focuses on the FDI decision, or the FDI flows, purely from the perspective of the source country (firm). Given that much of the firm level literature is either implicitly or explicitly developed from the earlier entry literature (see for example Geroski, 1995), which focuses on the characteristics of the host industry, this is perhaps surprising. For example, the mode of entry literature discussed above assumes that for two of the standard three categories (joint venture or acquisition) there exists a pool of firms from which to draw targets or partners. The underlying selection process that determines this however is seldom discussed. This is where we intend to fill some existing gap in research.

## **Data and some descriptive statistics**

### *3.1 Firm level data*

The dataset used in this paper is drawn from *ORBIS* which is a comprehensive

and rich firm-level dataset. It is provided by Bureau van Dijk (BvD), which is a leading electronic publisher of annual account information on several million private and public firms around the world. The data also lists the subsidiaries of a given company together with its percentage of ownership. Again, each ownership link contains a unique identification number, the name and nationality of the subsidiary and a direct or total (or both) percentages of ownership in the subsidiary. This information is taken as evidence that a firm is either a multinational (if it has one or more foreign subsidiaries) or a purely domestic firm (if it does not have any foreign subsidiaries). This is unique feature of the data set which allows the identification of domestic multinationals, an issue which is rarely addressed in the literature.

The data on these firms is collected from various sources including national official bodies in charge of collecting company accounts data. They are always the officially filed and audited accounts. The data are then compiled and organised by BvD in a consistent format following strict guidelines. Thus, the main advantage of the data is that they are comparable across countries. In the past, BvD collected data on mainly large firms, but in recent years the coverage has expanded to include many medium and small firms.

A standard company report includes information based on balance sheets, profit and loss accounts, industry codes, ownership and subsidiary information. Some of the variables of interest in this paper are sales, turnover, fixed assets, number of employees, cost of employees, material costs, and also location (see appendix for variable definitions). From these accounting variables we are able to construct suitable productivity estimates. Finally and most importantly, the data includes detailed

ownership and subsidiary information which enables the identification of ownership of assets worldwide. This is based on millions of links between firms and their shareholders and subsidiaries worldwide. A link establishes an ownership relationship between a firm and its shareholder and its subsidiaries. A shareholder might be a corporation, a private individual, a government or a collectively described entity (such as the "public" for listed companies). A subsidiary, however, is always a corporation. It lists the direct and indirect shareholders and subsidiaries of a given company with their percentage ownership.

Each ownership link contains a unique identification number, the name and nationality of the shareholder and ultimate owner. From this information, it is possible to distinguish between foreign-owned and domestically-owned firms. Thus, the nationality of a firm is determined by the ultimate parent's country of ownership. If the ultimate owner is not known, the nationality of the shareholder is taken. If both types of information are missing, a firm is considered domestically-owned.

The data also lists the subsidiaries of a given company together with their percentage of ownership. Again, each ownership link contains a unique identification number, the name and nationality of the subsidiary and a direct or total (or both) percentages of ownership in the subsidiary.

### *3.2. Country level indicators*

As already discussed, we take freedom from corruption as our key institutional indicator. This has two advantages. First, as already argued corruption can be seen as a key single indicator of institutional quality, as it condensates the impact of underlying institutional inputs (including poor protection of property rights and excessive and arbitrary regulation) into one output indicator that describes the quality of the interface between

businesses and public administration (Tanzi, 1998). Moreover, unlike most of other institutional indicators, the corruption indicators are not expert-assessment based but result from survey data based on experience of businesses. While those data capture the perceptions of business environment, the issue of subjectivity is more apparent than real, as the real life business decisions are driven by the same perceptions of the decision makers. The methodology to combine existing surveys into country-level scalars was developed by Transparency International (see Lambsdorff, 2005 for a description of methodology and Knack, 2006, for a discussion of limitations); these are subsequently used by other public and private agencies that report institutional indicators. For this paper we rely on data on freedom from corruption from International Risk Country Guide compiled by Political Risk Services Group, but they are consistent with measures available either directly from Transparency International or from Heritage Foundation / Wall Street Journal.

We illustrate the results on freedom of corruption for our group of countries with Figure 1 below.

{Figure 1 about here}

One may notice that due to Soviet heritage, countries of Eastern and Central Europe still suffer from weak institutional environment, most of them being located below the horizontal line representing expected values based on world sample. However there are notable exceptions, including Estonia. On the other hand, EU integration process is not yet having any decisive impact as documented by relatively low scored of both Romania and Poland.

In addition to freedom from corruption, to control for robustness of our results, we also introduce assessment of host country investment risk profile (also from IRCG), and of the quality of infrastructure regulatory reform (from European Bank for Reconstruction and Development).

### **Data Description**

Table 2 shows the distribution of percentage of foreign ownership in our sample. In general average percentage of foreign ownership is quite high, the lowest being 58% in Ukraine. Significant inter-country variation in foreign ownership is noteworthy too: the average is as high as 89% in Czech Republic closely followed by Poland (87%), Estonia (83%), Slovakia and Romania (82%), Latvia (81%) and Hungary (81%). This is further reflected in the percentage distribution of firms with some foreign ownership: A significantly higher percentage of firms in the sample countries have 50% or more foreign ownership. In fact, a large proportion of firms in our sample have sole foreign ownership.

Table 3 shows the distribution of home countries in the CEE region in our sample. While Baltic countries tend to have major investment from parent firms from Scandinavian countries, German firms are key investors in Czech Republic, Hungary and Poland; Italian firms are major investors in Romania. US firms are visible in all the sample countries, but most notably in Latvia, Ukraine, Slovakia and Bulgaria.

In this context, it is interesting to compare some selected characteristics of firms with foreign investment and purely domestic firms (with zero foreign investment). Table 4 shows comparison of means and the associated t-statistics. This non-parametric

comparison highlights the fact that foreign firms not only have more share of intangible assets, but also have significantly higher profitability and total factor productivity.

## Methodology

In order to examine the link between institutions and foreign ownership structures, we start with a simple model estimating the percentage of foreign ownership  $FO_{ijct}$  of a firm  $i$  in industry  $j$  located in country  $c$  at time  $t$ :

$$FO_{ijct} = \beta_0 + \beta_1 [(home\ R\&D)]_{ijct} + \beta_2 [(host\ R\&D)]_{ijct} + \beta_3 [(host\ institutions)]_{ijct} + \beta_4$$

We include three sets of variables relating to our central hypotheses. First, we consider the share of intangibles in total assets of foreign firms. In particular, we construct a high-tech dummy that takes a value 1 if the parent firm's intangible assets share is above the 90 percentile of the sample distribution. Inclusion of this variable allows us to account for behavioural difference of high-tech firms from others, if any. Note however that we could obtain parent firm's information only for a subset of firms (as shown in Table 7-8). Hence for the full sample estimates (shown in Table 6), we could only include host firms' share of intangibles. Second, we include country-level institutional variables for a given point in time. . We first include our key institutional variable, namely, corruption index (CI) and then add controls for investment climate, and infrastructure development (in alternative specifications). Third, we include absolute difference in corruption between host and home firms.

Other control variables  $X$  include characteristics of host firms, namely, firm size (small, medium, large), age of the firm, lagged value of total factor productivity (TFP), capital intensity and market share. We also control for size of parent firms (medium and

large). Given the multi-level data at our disposal, we allow for industry-specific fixed-effects ( $\gamma_j$ ) as well as year-specific fixed-effects that capture common shocks ( $\gamma_t$ ). Country specific effects are accounted for by the institutional characteristics of home and host countries. The remaining iid errors are included in the independently and identically distributed error term  $\varepsilon$ . Means and standard deviations of regression variables are shown in Table 5.

### **Econometric Considerations**

We experiment with a number of alternative estimators including probit, tobit, standard fixed effects and selectivity corrected Wooldridge estimates. After careful considerations, we choose the selectivity corrected estimates of foreign ownership percentages suggested by Wooldridge (1995). This allows us to focus on those firms that have attracted foreign investors, and seek to explain the share of holdings that foreign investors have taken. Following equation (1) we seek to link percentage of foreign ownership in a host firm in sector  $j$  in country  $c$  at a time  $t$  not only to characteristics of the subsidiary, but also to those of the parent firm and to the institutional differences between the host and home country. The results then highlight an effect that has been talked about in the high profile management literature, but not, as far as we know, tested. Not only is the absolute level of institutional quality important, but relative levels also matter. This links to literature from economics, business, management and finance area, highlighting the importance not just of risk in the FDI decision, but also of the institutional setup in the home country in relation to that in the host country. The quality of host country governance may correlate

with another key investor firm's asset which relates to the ability to manage resources better.

The analysis therefore proceeds in the manner suggested by Wooldridge (1995), which is a panel data extension to Heckman (1979). According to Wooldridge (1995), estimates derived via the Heckman method lead to inconsistent estimates and thus he proposes further modifications for testing and correcting for sample selection bias in panel data models. It is similar to the Heckman selection model in that the Wooldridge estimator starts by estimating the selection equation by standard probit from which it obtains the inverse Mills ratio,  $\hat{\lambda}_{it}$ , for MNE firms. However, it estimates the probit equation for each time period of the panel by pooled OLS with serial correlation and heteroskedasticity-robust standard errors and defines the matrix of inverse Mills ratios as,

$$\Lambda_{it} = \begin{pmatrix} \hat{\lambda}_{i1} & 0 & 0 \\ 0 & \hat{\lambda}_{i2} & 0 \\ 0 & 0 & \hat{\lambda}_{i3} \end{pmatrix}$$

where in this particular example 3 periods are shown. The selection bias corrected estimates are then obtained by estimating augmented with correction terms (i.e. the matrix of inverse Mills ratios). A test for joint significance (i.e. Wald test) can then be performed on the correction terms,  $\Lambda_{it}$ , which provides a test for sample selection bias, made robust to arbitrary serial correlation and heterogeneity. Appropriate standard errors and t-statistics are obtained using bootstrapped methods.

There are two steps in estimating this selection model: (a) first we use a probit model to determine whether a firm has any foreign ownership (see model (1a), Table 6

below i); (b) after selecting the firm with foreign ownership, we determine the percentage share of foreign ownership  $FO_{ijct}$ . Among the alternatives (fixed effects, tobit and Wooldridge) to determine percentage share of foreign ownership we implemented, for space constraint we focus our attention on selection corrected Wooldridge estimates; the choice in favour of Wooldridge estimates has been dictated by the greater value of log-likelihood as well as the likelihood ratio chi-square statistics.

## Results

We start our analysis with full sample estimates of equation (1) determining the percentage of foreign ownership in the CEE host countries as shown in Table 6. This is the simplest specification, and can be thought of as the baseline model, focusing on the firm level characteristics of host country firms that explain the probability of a given firm to attract foreign investment, and subsequently the scale of that investment, allowing for the selection effect discussed above. In other words, we set  $\beta_1 = 0$ ;  $\beta_4 = 0$  for this purpose. Selectivity corrected estimates of percentage of foreign ownership confirm the earlier analysis, that corruption is inversely related to FDI flows. This is a strong result, which shows that host firms in more corrupt countries are less likely to attract foreign investors, compared with similar firms in countries at similar stages of development with less corruption. Other results too are very much as expected. Larger firms are more likely to attract foreign investment, and at a larger scale in terms of percentage ownership compared with both medium and small size companies. Market share of the host firm however is negative. Equally important is that performance in terms of total factor productivity is more important in explaining investment in CEE than are intangible assets. It is clear, and not surprising, that the best performing firms attract foreign

investment; in contrast, the motivation for investing in CEE does not appear to be knowledge acquisition. This is reflected in the insignificant coefficient of intangible assets of the host country firms in probit estimates (shown in column 1) and statistically significant negative coefficient in selectivity corrected estimates shown in column 2 of Table 6.

It is however more interesting to consider the estimates presented in Table 7 where we include variables relating to the parent company in the home country. By construction, this focuses only on those firms that for some point in the period had foreign investment. The results are selectively corrected to allow for the obvious bias that would ensue from treating this sample as a random sample from the wider population. In particular, we show estimates for four specifications (1)-(4) depending on different sets of explanatory variables included. Specification (1) includes only host country characteristics (including host country freedom from corruption index) with control for industry and year specific fixed effects; these estimates are rather comparable to those shown in Table 6. Specification (2) supplements specification (1) by a variable labelled parent firm size (medium and large) and also if the parent firm is a high-tech one. This takes a value 1 if the parent firm has intangible assets greater than or equal to 9<sup>th</sup> decile value of share of intangible assets in our sample; otherwise the variable takes a value 0. Inclusion of this binary variable will examine if high-tech foreign firms behave differently from all other foreign firms in our sample. Specification (3) augments specification (2) by absolute difference in corruption between host and home countries. Specification (4) further augments (3) by two more institutional indicators, namely, EBRD infrastructural indicator and investment profile in the host country to control for

robustness of our key institutional results (at risk of overspecification and multicollinearity). Thus specification (4) is the most complete one.

Results of specification 1 are rather similar to those in Table 6 (the difference arises from the differences in the sample). So we start with the analysis of specification (2) that includes parent firm size (medium and large) and also if the parent firm is high-tech or not; other variables are the same as shown in column (2) of Table 6. As before intangible assets of the host firm remains insignificant, but the high-tech dummy of the parent firms is negative and statistically significant. Thus other factors remaining unchanged, parents firms with very high level of intangible assets tend to have lower foreign ownership in the sample countries. The result remains unchanged even when we supplement estimates (2) by including absolute difference in freedom from corruption in home and host countries (see specification (3)) or we further augment specification (3) by including host country investment profile and infrastructure indicator (see specification (4) estimates).

Other results pertaining to host firm/country characteristics remain rather similar to those in Table 6. In particular, more productive firms attract foreign investment and are associated with larger foreign ownership share while larger firms or firms with greater market share tend to have lower foreign ownership. Also less corrupt host countries tend to have more foreign investment in our sample

More interestingly, estimates from specification (3) and (4) highlight significant effect of the absolute difference in corruption: other things remaining unchanged, higher absolute difference in freedom from corruption between host and source country is associated with lower foreign ownership in our sample (models 4 and 5). A comparison

of estimates from (3) and (4) suggests that the effect of absolute difference in corruption is not sensitive to the introduction of infrastructural index and investment profile in the host country – it continues to be negative and significant. We may also note that both infrastructure reform and the overall high country investment profile are associated with more foreign investment. In addition to negative effects of corruption on foreign ownership, parent firms are also wary of investing in foreign countries if the absolute difference in corruption index is too high relative to the host country.

Given that high-tech dummy is highly significant in specifications (2)-(4) in Table 7, we next examine if there is any systematic difference in the effects of all explanatory variables between high tech and low tech investor firms. Table 8 shows the selectivity corrected Wooldridge estimates and highlights differential behavioural patterns of high-tech and low-tech firms. While the effect of host country freedom from corruption is the same for both high-tech and low-tech firms, that of absolute difference in freedom from corruption is different for these two groups of firms. In particular, the effect of absolute difference in corruption is negative for high-tech firms (specification 5a) while it is positive for low-tech firms (specification 5b). In other words, unlike low-tech firms, high-tech firms are more sensitive to absolute difference in institutions in parent and host countries and therefore respond negatively; the latter could be attributed to their higher risks involved, especially if the corruption is much higher in the host (relative to the home) country. that the risk arises from the fact that a higher degree of corruption is generally associated with the absence of effective protection of property rights in the host country, which is understandably costlier for high-tech parent firms.

## **Conclusion**

While the recent literature on foreign investment and foreign ownership highlights the role of institutions, findings are rather mixed. Both positive and negative effects of weak institutions have been observed. In an attempt to resolve this ambiguity, the present paper highlights the importance of not only host country institutions, but also the absolute difference in quality of institutions in host and home countries. Using Orbis firm-level dataset for the period 1997-2006 in Central and Eastern Europe, we find evidence suggesting that both the presence of a foreign investor and the percentage of shares held in a domestic firm depend on differences in institutional environment between the host and the source countries. Namely, better host country institutional environment implies both presence and larger share of foreign investment. In addition, bigger difference in institutional quality between the host and home country is associated with lower share of foreign investment. We interpret this result as implying that an investor coming from a functional institutional environment has an additional disadvantage in the environment which is further away from theirs. The results on institutional difference hold for the whole sample (with selectivity bias corrected) and for the high tech sector subsample but the sign of the absolute difference effect reverses (with the corresponding coefficient being significant) for the low tech sector subsample. We interpret this as evidence that high tech firms are more sensitive to the institutional variation because of their obvious sensitivity to share their knowledge advantage with host country firms, especially if intellectual property rights laws are not upheld.

## Tables

Table 1 Distribution of firms in the sample (1997-2006)

Country	Frequency	% of total observations
Bulgaria	1,682	2.85
Czech Rep.	4,032	6.84
Estonia	1,857	3.15
Hungary	121	0.21
Lithuania	1,427	2.42
Latvia	827	1.40
Poland	6,986	11.85
Romania	15,648	26.55
Russia	22,113	37.52
Slovakia	105	0.18
Ukraine	4,138	7.02
<b>Total</b>	<b>58,936</b>	<b>100.00</b>

Table 2 Nature of FDI

Host countries	% Foreign holding Mean (std dev)	Foreign holding 25<=%<50	Foreign holding %>=50	Foreign holding %=100
Bulgaria	61.87 (36.39)	19.48	63.78	30.19
Czech Rep.	88.73 (21.88)	8.42	92.40	67.86
Estonia	83.12 (26.95)	13.53	86.02	61.55
Hungary	79.62 (30.40)	11.95	84.06	48.21
Lithuania	75.67 (29.39)	14.50	83.55	45.60
Latvia	80.99 (29.03)	14.49	81.28	57.70
Poland	86.61 (24.84)	7.02	89.37	61.14
Romania	81.50 (27.84)	11.94	86.29	54.36
Russia	74.45 (33.13)	14.91	76.22	45.37
Slovakia	82.40 (25.33)	7.06	94.06	53.13
Ukraine	58.00 (32.38)	22.36	58.54	14.03

Table 3 Distribution of source countries among the CEE host countries

	<b>FDI – country of origin</b>						
<b>Host countries</b>	Netherlands	France	UK	Italy	Germany	US	Others
Bulgaria	3.74	2.90	3.32	12.07	9.80	10.34	57.82
Czech Rep.	13.56	8.07	4.14	2.52	32.60	9.16	29.95
Hungary	7.06	12.27	2.60	5.20	24.91	4.09	43.87
Poland	9.86	8.65	4.08	5.62	29.37	8.87	33.54
Romania	4.39	5.06	3.15	30.20	15.82	3.76	37.62
Russia	5.48	2.75	5.54	3.91	14.00	7.48	60.84
Slovakia	13.24	14.19	3.35	2.87	14.67	15.15	36.52
Ukraine	3.49	1.84	8.85	2.10	7.46	10.46	65.81
<b>Baltic states</b>	Germany	Denmark	Finland	Sweden	Norway	US	Others
Estonia	6.16	4.62	39.50	23.89	4.80	3.68	17.35
Lithuania	9.87	10.52	8.90	14.24	15.37	4.21	36.89
Latvia	9.12	14.23	9.51	15.80	1.65	14.94	34.75

Table 4. Foreign and domestic firms: A Comparison of Means

	<b>FoFs</b>	<b>DoFs</b>	<b>T-test (Mean comparisons)</b>
<b>Output</b>	23371.9 (123964.9)	5290.378 (132463.7)	30.6182
<b>Labour</b>	324.7791 (1346.024)	154.7915 (768.8418)	40.5684
<b>Capital</b>	8196.758 (52828.47)	2702.826 (245051)	5.4615
<b>Materials</b>	14351.47 (88606.65)	4094.851 (170446.8)	13.9860
<b>Intangibles</b>	209.0173 (4168.897)	29.71382 (980.9314)	20.9986
<b>Fixed assets</b>	9657.292 (61458.26)	2980.429 (260186.2)	6.3382
<b>Profitability</b>	1613.438 (15350.31)	367.5414 (14662.96)	19.0440
<b>Wage bill</b>	1764.507 (7784.507)	483.1545 (4955.421)	42.9223
<b>Cash flow</b>	1613.777 (13781.69)	216.9173 (3266.775)	37.0505
<b>Long term debt</b>	1470.97 (11764.75)	292.9729 (5069.722)	36.7830
<b>TFP</b>	22.2467 (219.6368)	12.18214 (46.30539)	20.4855

Note: All monetary values are deflated and in thousands of US dollars.

FoFs – Foreign owned Firms; DoFs – Domestic owned Firms

Differences in coefficients between FoFs and DoFs are statistically significant at the 1 percent level.

Table 5 Summary Statistics of regression variables

Variable (definition)	No of Obs.	Mean	Std. Dev.	Min	Max
<b>Host Firm</b>					
Host firm size: small	92317	50.63425	37.30941	0	129.8639
Host firm size: medium	184647	815.3899	637.8354	129.8701	2534.228
Host firm size: large	92322	27853.59	633145.7	2534.301	1.31e+08
Host total factor productivity	293203	14.07085	103.9635	.0000275	29662.87
Host intangible/tangible assets (IATA)	368417	.0058332	.2291399	0	134.0892
Host firm Market share	362622	.000634	.005898	0	.9090915
Host country freedom from corruption	385542	2.236305	.8062952	1	5
Host EBRD infrastructure indicator	387831	2.775338	.4576038	1.7	3.7
Host country investment profile	385542	8.666008	1.907055	3	12
Abs. diff. in freedom from corr. (home-host)	63473	1.544108	1.106462	0	5
Parent firm size: small	3644	1311.598	1212.93	0	4246.722
Parent firm size: medium	7288	114741.7	135195.5	4247.246	553882.3
Parent firm size: large	3644	1.55e+07	4.48e+07	554106.9	3.99e+08
Absolute difference in IATA	13508	.1100426	.3157898	0	30.59237
Diff. in IATA* corruption	13418	.2364209	1.40966	-152.9619	4.113893
Diff. in IATA* diff in corruption	13416	.1590978	.5160478	-40.78983	3.521779

Source: Authors' calculations using Orbis database. All monetary values are deflated and in thousands of US dollars.

**Table 6 – Full sample estimates**

Estimator	(1) Probit	(2) Selection-corrected (Wooldridge)
Dependent Variable	Whether the firm has any foreign ownership	For firms with foreign ownership, percentage of foreign ownership
Explanatory variables:	<b>(1a)</b>	<b>(2a)</b>
Host firm size: medium	0.286*** (0.063)	4.677*** (0.204)
Host firm size: large	0.819*** (0.076)	6.536*** (0.362)
Total factor productivity	0.223*** (0.048)	0.715*** (0.193)
Host intangible/tangible assets (IATA)	0.003 (0.009)	-0.380** (0.150)
Host firm Market share	-0.013 (0.028)	-0.847*** (0.076)
Host country freedom from corruption	0.298*** (0.066)	7.053*** (0.148)
Industry Dummies	Yes	Yes
Year Dummies	Yes	Yes
Inverse Mills Ratio	No	Yes
Constant	-2.815*** (0.555)	29.852*** (3.026)
Observations	226,802	226,802
R-squared (pseudo)	0.097	0.1123
F-stat (Wald)	29,699.89***	494.23***

Notes: Robust standard errors in parentheses; corrected for clustering for host countries.

\*\*\*, \*\*, \* denote significance at the 1, 5, and 10 per cent level, respectively.

All financial variables are lagged one period.

**Table 7 – Selection corrected estimates of % share of foreign ownership**

	(1)	(2)	(3)	(4)
Host firm size: medium	2.886***	-2.610***	-2.368***	-2.111***
	(0.509)	(0.503)	(0.508)	(0.505)
Host firm size: large	1.228*	-1.478*	-1.696*	-1.63*
	(0.714)	(0.898)	(0.906)	(0.90)
Host total factor productivity	2.203***	2.217***	2.159***	1.510***
	(0.265)	(0.267)	(0.269)	(0.264)
Host intangible/tangible assets (IATA)		0.397	0.425	0.187
		(0.306)	(0.36)	(0.179)
Host firm Market share	-1.656***	-1.659***	-1.58***	-1.457***
	(0.133)	(0.126)	(0.129)	(0.13)
Host country freedom from corruption	8.253***	7.076***	6.47***	0.25
	(0.322)	(0.316)	(0.33)	(0.369)
Host EBRD infrastructure indicator				15.323***
				(0.68)
Host country investment profile				0.225
				(0.15)
Abs. diff. in freedom from corr. (home-host)			-0.666***	-0.45***
			(0.14)	(0.138)
Parent firm High-tech dummy		-8.359***	-8.070***	-6.42***
		(0.515)	(0.52)	(0.51)
Parent firm size: medium		6.479***	6.159**	5.22***
		(0.562)	(0.56)	(0.56)
Parent firm size: large		2.255***	1.86***	0.68
		(0.668)	(0.67)	(0.66)
Industry Dummies	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
Constant	34.26***	51.36***	51.53***	
	(3.943)	(3.605)	(4.21)	
Observations	41948	42668	41666	41666
R-squared	0.049	0.068	0.0668	0.0875
F-stat	46.40***	70.53***	66.24***	79.41***

Notes: Selection-corrected (Wooldridge) estimator

Robust standard errors in parentheses; corrected for clustering for host countries.

\*\*\*, \*\*, \* denote significance at the 1, 5, and 10 per cent level, respectively.

**Table 8 – Selection corrected estimates of % share of foreign ownership: High-tech and low-tech parent firms**

	(5a)	(5b)	(6a)	(6b)
	High-tech group	Low-tech group	High-tech group	Low-tech group
Host firm size: medium	-2.05***	-3.277***	12.24**	2.52
	(0.60)	(0.912)	(6.097)	(1.84)
Host firm size: large	0.129	-6.231***	11.06*	0.126
	(1.099)	(1.58)	(6.654)	(1.975)
Total factor productivity	2.453***	0.86*	3.137**	1.557***
	(0.315)	(0.49)	(1.353)	(0.445)
Market share	-1.767***	-0.927***	-2.398***	-1.275***
	(0.15)	(0.23)	(0.693)	(0.231)
Host IATA	12.381**	0.134		
	(4.995)	(0.138)		
Parent-size: medium	12.177***	5.509***	13.85***	5.549***
	(1.98)	(0.703)	(3.245)	(0.718)
Parent-size: large	-0.716	3.867***	10.39***	3.676***
	(1.695)	(0.917)	(3.893)	(0.938)
Absolute difference in IATA			-7.95	13.29**
			(29.32)	(6.701)
Host country freedom from corruption	7.195***	3.018**	7.036	3.057***
	(0.391)	(0.532)	(5.514)	(0.541)
Absolute difference in freedom from corr.	-1.098***	0.721***	-3.689	0.888***
	(0.166)	(0.216)	(2.7)	(0.241)
Diff. in IATA* corruption			-6.715	-1.481
			(10.13)	(0.996)
Diff. in IATA* diff in corruption			7.238	-4.587**
			(5.004)	(2.183)
Industry Dummies			Yes	Yes
Year Dummies			Yes	Yes
Constant	39.68***	78.53***	57.90***	51.43***
	(5.07)	(5.39)	(19.6)	(6.318)
Observations	32294	9372	1004	9155
R-squared	0.0528	0.0464	0.153	0.046
F-stat	40.07**	11.65***		

Notes: Selection-corrected (Wooldridge) estimator.

Robust standard errors in parentheses and corrected for clustering for host countries.

\*\*\*, \*\*, \* denote significance at the 1, 5, and 10 per cent level, respectively.

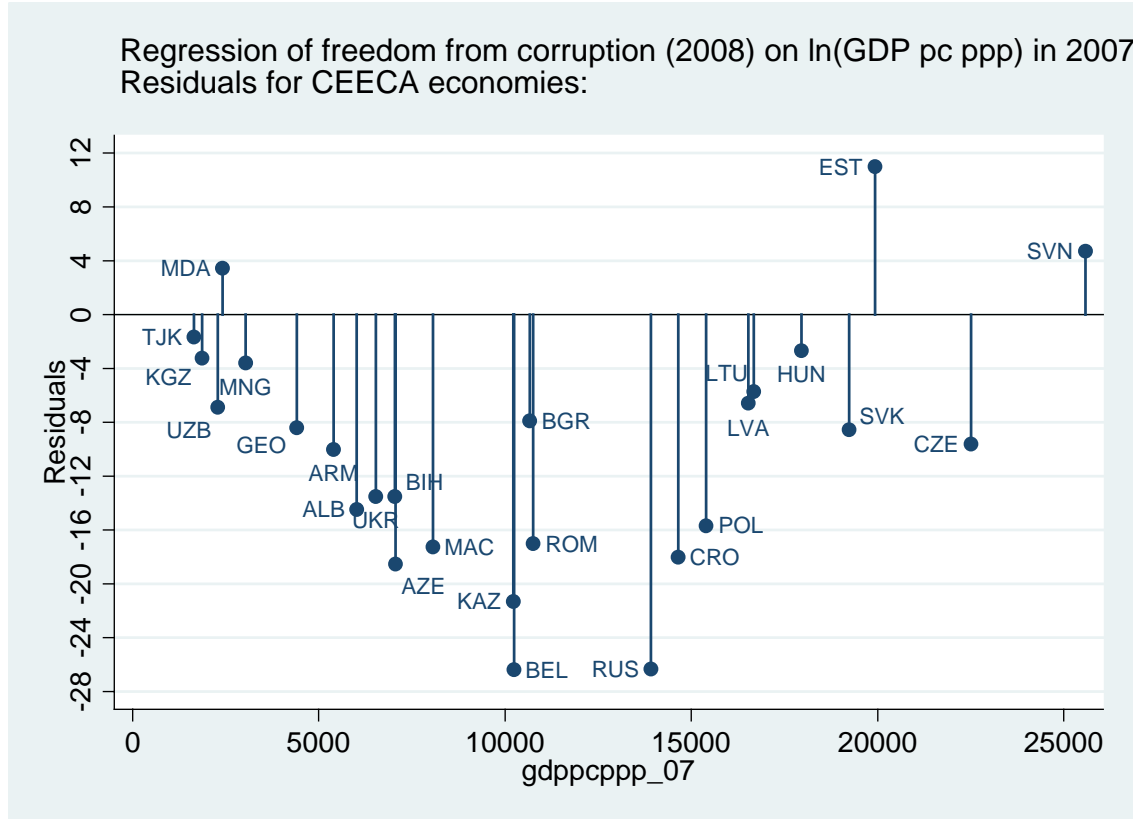
All financial variables are lagged one period.

## References

- Agarwal, S and S. N. Ramaswami (1992). 'Choice of Foreign Market Entry Mode: Impact of Ownership, Location and Internalization Factors'. *Journal of International Business Studies*, 23 (1) , 1-27.
- Bevan, A. and S. Estrin (2004). 'The determinants of foreign direct investment into European transition economies '. *Journal of Comparative Economics*, 32 (4), 775 – 787.
- Bhaumik, S., N. Driffield and S. Pal (2010). 'Does Ownership Structure of Emerging Market Firms Affect their Outward FDI? The Case of Indian Automotive and Pharmaceutical Sectors', *Journal of International Business Studies* (forthcoming).
- Busse, M. and C. Hefker (2007) 'Political Risk, institutions and foreign direct investment'. *European Journal of Political Economy*, 23 (3), 397-415.
- Daude, C. and M. Fratzscher (2008). 'The Pecking Order of Cross-Border Investment', *Journal of International Economics*, 74, 94-119.
- Du, J., Y. Ku and Z. Tao (2007). 'Economic Institutions and FDI Location Choice: Evidence from U.S. Multinationals in China', *Journal of Comparative Economics*, 36 (3), 412-429.
- Dunning, J.H. (1992). *Multinational enterprises and the global economy*. London: Prentice Hall.
- Dyck, A. (2001). 'Privatization and Corporate Governance: Principles, Evidence , and Future Challenges'. *World Bank Research Observer*, 16, 59-84.
- Egger, P. and H. Winner (2003). 'Does Contract Risk Impede Foreign Direct Investment?'. *Swiss Journal of Economics and Statistics*, 139, 155-172.
- Egger, P. and H. Winner (2005). 'Evidence on corruption as an incentive for foreign direct investment'. *European Journal of Political Economy*, 21, 932-952.
- Frynas, J., K. Mellahi, G. Pigman (2006). 'First Mover Advantages in International Business and Firm-Specific Political Resources'. *Strategic Management Journal*, 27, 321-345.
- Geroski, P.A. (1995). 'What do we know about entry?'. *International Journal of Industrial Organization*, 13 (4), 421-440.
- Globerman, S. and D. Shapiro (2003). 'Governance infrastructure and US foreign direct investment'. *Journal of International Business Studies*, 34, 19-39.
- Harms, P. and H. Ursprung (2002). 'Do Civil and Political Repression Really Boost Foreign Direct Investments?'. *Economic Inquiry*, 40, 651-663.
- Heckman, J. (1979). 'Sample Selection Bias as a Specification Error', *Econometrica*, 47(1), 153-161.
- Henisz, W. (2000). 'The Institutional Environment for Multinational Investment', *Journal of Law, Economics and Organisation*, 16, 334-364.
- Hines, J. R. Jr. (1995). 'Forbidden Payment: Foreign Bribery and American Business After 1977', NBER Working Paper 5266.
- Javorcik, B.S. (2004). 'The Composition of Foreign Direct Investment and Protection of

- Intellectual Property Rights: Evidence from Transition Economies'. *European Economic Review*, 48(1), 39– 62.
- Javorcik, B.S. and S.J. Wei. (2009). 'Corruption and Cross-border Investment in Emerging Markets: Firm-Level Evidence', Working Paper, Emerging Markets Group, Cass Business School, City University, UK.
- Knack, S. (2006). 'Measuring Corruption in Eastern Europe and Central Asia: A Critique of the Cross-Country Indicators', Policy Research Working Paper 3968, World Bank.
- Kaufmann, D. and S. Wei (1999). 'Does 'Grease Payment' Speed Up the Wheels of Commerce?' NBER Working Paper 7093. Also released as a World Bank Policy Research Working Paper 2254.
- Lambsdorff, J. (2005). 'Methodology of the 2005 Corruption Perceptions Index', Transparency International and University of Passau, mimeo.
- Mauro, P. (1995). 'Corruption and Growth', *Quarterly Journal of Economics*, 110, 681-712.
- Merlevede, B. and K. Schoors (2009) 'Privatisation and Foreign Direct Investment in 10 Transition Countries', *Post Communist Economies*, 21, 143-156.
- Meyer, K., Estrin, S., Bhaumik, S., and Peng, M. (2009). 'Institutions, resources and entry strategies in emerging economies'. *Strategic Management Journal*, 30(1): 61-80.
- Mickiewicz, T. (2009), 'Property Rights, Corporate Governance and Privatisation in Central-Eastern Europe and Central Asia', CSESCE UCL Working Paper No 90.
- North, D. C. (1990). *Institutions, Institutional Change and Economic Performance*. Cambridge: Cambridge University Press.
- North, D.C. (2005). *Understanding the process of economic change*. Princeton, NJ: Princeton University Press.
- Schneider, F and B. Frey (1985). 'Economic and political determinants of foreign direct investment', *World Development*, 40, 651-663.
- Shleifer, A. and R. Vishny (1997). 'Survey of Corporate Governance'. *The Journal of Finance*, 52, 737-783.
- Tanzi, V. (1998). 'Corruption around the World: Causes, Consequences, Scope and Cures'. *IMF Staff Papers*, 45, 559-694.
- Wei, S. (2000a). 'Local Corruption and Global Capital Flows', *Brookings Papers on Economic Activity*, 31(2), 303-354.
- Wei, S. (2000b). 'How Taxing is Corruption on International Investors?', *Review of Economics and Statistics*, 82(1), 1-11.
- Wheeler, D. and A. Moody (1992), 'International investment location decisions: The case of US firms', *Journal of International Economics*, 33, 57 - 76.
- Wooldridge, J.M. (1995). 'Selection corrections for panel data models under conditional mean independence assumptions'. *Journal of Econometrics*, 68(1), 115-132.

Figure 1.



Note: based on calculations in Mickiewicz (2009); source data are from Heritage/Wall Street Journal (freedom from corruption) and from World Bank, World Development Indicators (GDP pc ppp).

<sup>i</sup> On 7th June 2007 the (then) UK Prime Minister made a speech at the G8 summit, attacking the lack of progress in Russia's institutional development, and suggested that if this was not rectified, Russia would lose out on a lot of inward FDI. This assertion was immediately rejected by Mr Putin, not because he claimed that Russia was strengthening its institutions, but because he saw no link between institutional quality and FDI.