

# **The location determinants of foreign direct investment in transition economies**

**Yuko Kinoshita\***

**Department of Economics, Hunter College, City University of New York,  
University of Michigan William Davidson Institute  
and CEPR  
and**

**Nauro F. Campos**

**Department of Economics, University of Newcastle,  
University of Michigan William Davidson Institute  
and CEPR**

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## **Abstract**

The objective of this paper is to investigate the determinants of foreign direct investment inflows in the transition economies between 1990 and 1998. The paper brings two innovations. One is the attention to the effect of agglomeration, an issue that has been highlighted recently in the works of Economic Geography. The second innovation is that we look at all transition countries instead of focusing on, for instance, EU candidates. We find that the main determinants of FDI in transition are agglomeration, the degree of external liberalization, and the quality of the bureaucracy. We also find an important difference between CEE and CIS countries. The agglomeration effect is greater for CIS countries than in non-CIS countries. For non-CIS countries, the more liberalized the trade regime is, the more FDI they attract. For CIS countries, availability of skilled labor and the rule of law are the main factors influencing FDI flows.

\*Correspondence: [yuko.kinoshita@hunter.cuny.edu](mailto:yuko.kinoshita@hunter.cuny.edu) and [n.f.campos@ncl.ac.uk](mailto:n.f.campos@ncl.ac.uk) Many thanks to Aurelijus Dabušinskas, Anna Ratcheva, Evis Sinani and Dana Zlabkova for excellent research assistance. The authors acknowledge financial support from William Davidson Institute University of Michigan Business School. The usual disclaimer applies.

## 1. Introduction

Foreign direct investment (FDI) is one of the most effective ways by which transition economies become integrated to the global economy as FDI provides not only capital but also technology and management know-how necessary for restructuring firms in the host economies. [Estrin, Hughes, and Todd(1997); Lankes and Venables(1996)] There is also evidence that there is a positive correlation between FDI inflows and economic growth of the host country via the spillover effects of advanced technology. [Borenzstein, De Gregorio, and Lee (1998), Campos and Kinoshita(2002)]

An important question for policy makers is what the host government can do to attract FDI. Trade theory argues that the location choices by investing firms are influenced by the classical factors of comparative advantages specific to the country: market size, low wages, skilled labor force, and infrastructure<sup>1</sup>. Others suggest that the investment location choices be explained by agglomeration economies (e.g. positive externalities by co-locating to others).<sup>2</sup>

In this paper, we examine the location determinants of FDI into 25 transition economies<sup>3</sup> by utilizing the panel data between 1990 and 1998. In the empirical analyses, we take into account both host country characteristics and agglomeration economies as determinants of FDI location. In order to incorporate the past stock of FDI as a proxy for agglomeration economies, we use the standard GMM (Generalized Method of Moments) in explaining a spatial distribution of FDI across these countries.

Many policy makers in the transition countries are aware that FDI plays a key role in encouraging successful transition and many countries in the region offered various incentives to attract FDI in the country.<sup>4</sup> There has been a steady increase in the global share of inward FDI in the region. Yet, the geographical distribution of FDI inflow among these countries remains uneven<sup>5</sup>

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<sup>1</sup> Kravis and Lipsey(1982) find market size and openness as important determinants for the location choices of US multinationals. Lucas(1993) finds FDI inflows into seven Southeast Asian countries are sensitive to relative wage differentials.

<sup>2</sup> See Wheeler and Mody(1992) and Kinoshita and Mody(2001).

<sup>3</sup> 25 transition countries we analyze in the paper are Albania, Armenia, Azerbaijan, Belarus, Bulgaria, Croatia, Czech Republic, Estonia, Macedonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Poland, Romania, Russia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan.

<sup>4</sup> The evidence on the benefits of FDI promotion in the form of subsidies and tax holidays is rather mixed. See Hanson(2000) for further discussions.

<sup>5</sup> A standard neoclassical model of economic growth predicts that capital always flows from rich to poor countries, which is contradicted by empirical evidence. One way to reconcile them is to introduce the role of human capital in an input of production as in Lucas(1990).

with high concentration on three CEE countries (Hungary, Poland, and the Czech Republic) and Russia.<sup>6</sup> The other countries are struggling to encourage the first wave of large investment to arrive.

The concentration of FDI in these three countries may be explained by initial differences prior to the start of economic transition in 1989. Three countries differ from the rest in were different in some respects such as privatization strategies, inflation rate and international debts. However, all three are relatively open to trade compared to other transition economies. This favorable condition drew a large bulk of investment at the time of disintegration of the CMEA in 1991 and the cascading effect of FDI had followed via signaling of good local conditions to other investors, which magnified the differences in FDI flows even further.

Once agglomeration economies set in, there will be a snow balling effect of FDI inflows in successful countries. On the other hand, if classical factors of comparative advantages are more dominant than agglomeration economies as locational determinants, it is still possible for the remaining countries to reverse the trend.

In light of the above framework, a closer look at the role of agglomeration economies in relation to classical factors of comparative advantages is all the more important in understanding the drivers of FDI flows into these countries. Despite its importance, the empirical analyses on FDI in transition economies<sup>7</sup> is limited to a set of CEEC countries due to paucity of data. This study attempts to fill this gap by utilizing data on a full sample of 25 transition economies.

This paper is organized as follows. In the next section, we review the theoretical framework on the location determinants of FDI. In section 3, we discuss the variables to be tested as the determinants of FDI in our empirical setting. In section 4 and 5, estimation methods and data are described, respectively. Section 6 reports regression results and section 7 concludes the paper and outlines the direction of our future research.

## **2. Factors driving FDI inflow**

A firm becomes multinational mainly for three reasons. The so-called OLI paradigm proposed by Dunning summarizes them as **O**wnership advantages, **L**ocation-specific advantages and **I**nternalization. Firms endowed with ownership advantages or intangible assets expand operations

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<sup>6</sup> The ranking of major recipients of FDI is based on cumulative FDI inflows between 1989-1999. [Source: Transition Report 2000, P. 74 (EBRD, 2000)]

<sup>7</sup> Resmini(2000) and Bevan and Estrin(2000) study the determinants of FDI flows into 10 and 11 transition economies, respectively.

abroad to internalize the benefits arising from ownership advantages and to match their strengths with location-specific comparative advantages.

In this study, we focus on the location-specific advantages of the host country as determinants of FDI in order to account for the geographical distribution of FDI inflows across transition economies. Large market size, proximity to home market, low-cost labor and favorable tax treatment in the host country are all considered as location advantages. At the same time, we also address to transition specific issues such as changes in macroeconomic and institutional environments.

Location-specific advantages are further classified by three types of motives of FDI. First, market-seeking investment is undertaken to sustain existing markets or to exploit new markets. For example, due to tariffs and other forms of barriers, the firm has to relocate production to the host country where it had previously served by exporting. Because the reason for this type of investment is to better serve a local market by local production, market size and market growth of the host economy are the main factors that encourage market-seeking FDI. The impediments in serving the market such as tariffs and transport costs also encourage this type of FDI.<sup>8</sup> Japanese FDI in automobiles in the US in late 80's is an example of this type of FDI.

Second, when firms invest abroad to acquire resources not available in the home country, the investment is called resource- or asset-seeking. Resources may be natural resources, raw materials, or low-cost inputs such as labor. An example is investment made by the US and Japan in export assembly in electronics in Asia in search for cheap labor.<sup>9</sup> Unlike market-seeking FDI, this type of FDI is intended to serve not only the local market but also the home and third country markets. Availability of resources, cheap and skilled labor, and physical infrastructure are the main attractors of resource-seeking FDI.

Third, the investment is rationalized or efficiency-seeking when the firm can gain from the common governance of geographically dispersed activities in the presence of economies of scale and scope. In this respect, prospective membership of the European Union conducive to the establishment of regional corporate networks and the presence of high transport and communication costs will encourage more of efficiency-seeking FDI.

There are also other factors that could influence the choice of investment locations in the region. Favorable macroeconomic conditions of the host country such as stable prices, low national

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<sup>8</sup> This is also called 'horizontal FDI' as a firm duplicates the production process in foreign locations. See Markusen and Venables (1998), for example.

<sup>9</sup> This is 'vertical FDI' as a firm relocates part of the vertical chain of production in a low-cost location.

debt, and sustainable budget deficit are attractive to foreign investors. Social and political stability also encourage FDI inflows. The progress of economic reform is particularly important in the transition economy context. Other non-economic factors are the degree of corruption, legal enforcement, and administrative efficiency, all of which facilitate business operating conditions.

The above framework of FDI gives guidance in identifying the set of economic, political and institutional variables to be tested as determinants of investment locations, which is discussed in detail in the next section.

There is much empirical evidence that FDI is spatially clustered. Agglomeration of FDI may be explained by differences in classical comparative advantages such as factor endowment and market size. Also, agglomeration is induced by the investors' tendency to herd. Especially when investors have insufficient information about the host country conditions, the existing stock of foreign investment made by others may work as a signal of favorable investment environments.<sup>10</sup> Alternatively, agglomeration economies emerge when there are positive externalities by co-locating near others due to the presence of knowledge spillovers, specialized labor markets and supplier network<sup>11</sup>. In our analysis, we include the agglomeration effect as a determinant of location choice together with the above economic and policy variables.

### 3. The variables to be tested

#### *Classical sources of comparative advantages*

Investors choose a location of investment according to the expected profitability associated with each location. Profitability of investment is in turn affected by various country specific factors as well as a type of investment motives. For example, market-seeking investors will be attracted to a country with large local market and fast growing market. Resource-seeking investors will look for a country with abundant natural resources. Efficiency-seeking investors will weigh more of geographical proximity to the home country to minimize the transportation cost.

Thus, the location of FDI is closely tied with comparative advantages of the country, which in turns affect the expected profitability of investment. The classical sources of comparative

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<sup>10</sup> See Kinoshita and Mody(2002).

<sup>11</sup> The sources of externalities are identified differently in different models. Lucas(1988) argues that the accumulation of human capital generates positive spillovers while, in the Krugman's(1991) model, transportation costs and fixed costs in production lead to the demand linkages of firms, which increases the incentives to agglomerate. See Fujita, Krugman, and Venables (1999) for recent surveys of theories on agglomeration.

advantages are input prices, market size, growth of the market, and relative abundance of natural resources.

For market-seeking FDI, the determining factor is the size of the host country market. We use GDP per capita as a measure of market size (YPC).<sup>12</sup>

Availability of cheap labor is crucial for vertical FDI. To exploit low cost of labor input, firms can justify relocating a part of production process in foreign countries. We use nominal wage rate WAGEN as a proxy for labor cost. If vertical FDI is dominant, we expect a negative sign on the coefficient. (e.g. the host country with lower labor cost attracts more FDI.)

Investing firms should be concerned not only with the cost of labor but also the quality of labor. More educated labor force can learn and adopt new technology faster and the cost training local workers is less for investing firms. Labor quality is introduced as general secondary school enrollment rate (SS3).

Some CIS countries such as Azerbaijan and Kazakhstan and Russia have been receiving FDI mostly in resource-based industries as they are rich in oil and natural gas. This is considered to be an example of resource-seeking FDI. Natural resource rich countries may attract foreign investment in those industries while they may divert investment from the manufacturing sector.<sup>13</sup> The variable we use is NATRES that indicates if the host country is 'poor' (=0), 'moderate' (=1), and 'rich' (=2) in natural resources.<sup>14</sup>

Proximity to the home country is empirically an important factor for explaining the volume of trade flows between countries. The gravity model predicts that the closer the country is to the home country, the more trade flows between the two countries will be observed. The analogous argument may apply for FDI as FDI flows are closely related to trade flows. The sign of proximity to the home country can go either way depending on the type of FDI undertaken. In the case of market-seeking FDI, the further distance between the home and host country markets implies the higher transportation cost. A fixed cost of transporting goods would encourage production in a foreign market to exploit economies of scale. On the other hand, if goods produced abroad are shipped back to the home or the third country markets, then the closer the production site is to the home or the third country, the more efficient it is for MNCs.

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<sup>12</sup> Another variable to measure market potential is annual GDP growth.

<sup>13</sup> Gyfason and Zoega(2001) find that abundant natural resources may crowd out physical capital and inhibit economic growth. See also Robinson, Torvik, and Verdier(2002).

<sup>14</sup> This variable is constructed by De Melo et al. (1997).

It is best if we could measure the distance between the home and host country for this purpose. However, the data we use only contains the information on the host country of FDI flows and we use a proxy for geographical distance to the major investor in the region, say, Germany. The variable we use is DIST that measures the distance between Dusseldorf and the capital city of each country in kilometers. Also, Germany has historically close ties with transition economies in the region.<sup>15</sup> In particular, efficiency-seeking FDI in light of EU enlargement to the region will be encouraged if the country is closer to the major Western markets as proximity reduces communication and coordination costs.

Availability of good infrastructure is a necessary and sufficient condition for foreign investors to operate business locally regardless of the type of FDI. There are several candidates for the infrastructure variable. One is a percentage of paved roads in the country and the other is a number of main telephone lines. The first figure may be misleading. For instance, if there is one main road in the country and it is paved, then it is reported as 100. This is indeed the case in many countries in the sample. Thus, we use the number of main telephone lines (TELEPHON) as the infrastructure variable.

Other things being equal, we expect that the more FDI be made in the countries with larger market size, lower labor cost, better educated labor force, abundant natural resources, and better infrastructure.

### *Policy variables*

Investment decisions in emerging markets are also influenced by economic and political risks. Successful implementation of economic reform by the host government is a good signal to investors as stable macroeconomic performance implies less investment risk.

A record of price stability is a good indicator for sound macroeconomic management by the host government. For example, a history of low inflation and manageable fiscal deficits signals to investors how committed and credible the government is. For this, we use the average inflation rate (INFAV). At the onset of transition, as the countries liberalized prices and underwent structural changes in economic activities, all countries experienced the increase in the price level. As the countries proceeded with structural reforms and stabilization policies, the price level also subsided. The sustainability of moderate or low inflation tells investors how successful the host

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<sup>15</sup> We experimented with other distance variables such as distance from Brussels. But the results obtained are very similar.

government is and thus the prospect of further growth. Thus, the lower the average inflation rate is in the host country, the more foreign investment will be attracted to the country.

Another indicator of economic reform is external liberalization index. We use the variable CLIE as a removal of trade controls and quotas, moderation of tariff rates and foreign exchange rate restrictions.<sup>16</sup> The more liberalized regime means the more successful reform and the more foreign investment flows.<sup>17</sup> In other cases, the more restrictive external regime may also induce FDI. If FDI is done for tariff-jumping purpose, FDI flows may negatively correlated with the external liberalization index.

### ***Business operating conditions***

Non-economic factors also influence returns to investment. The cost of investment consists of not only the actual costs of inputs but also non-economic costs such as bribery and time lost in dealing with local authorities.

To assess business operation conditions of the host country for investing firms, we use two institutional variables, 'rule of laws' (RULELAW) and 'quality of bureaucracy' (BUROQUAL).<sup>18</sup> The rule of law is a composite of three indicators: (i) sound political institutions and a strong court system<sup>19</sup> (ii) the fairness of the judicial system over property right, and (iii) substance of the law itself<sup>20</sup>. The higher score in the rule of law implies the more sound and the better enforced the legal system is in the host country.

The quality of the bureaucracy is based on two indicators: (i) the extent to which the national bureaucracy enjoys autonomy from political pressure in a stable manner and whether or not it has an effective mechanism for recruiting and training, and (ii) the ease of regulations concerning licensing requirements and labor, environmental, consumer safety, and worker health. If this score is high, then the investors perceive less cost in dealing with the local bureaucracy.

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<sup>16</sup> The index is constructed by De Melo et al. (1997).

<sup>17</sup> See Caves(1996) and Sigh and Jun(1995), for example.

<sup>18</sup> The variables are taken from Campos(2000).

<sup>19</sup> It reflects the degree to which citizens are willing to accept the established institutions for making and implementing laws and adjudicating disputes.

<sup>20</sup> This measures whether a post-communist constitution has been adopted, whether the constitution provides for property and human rights, whether the criminal code has been subject to reform, whether judges rule fairly and impartially, and whether they were appointed during the communist era, whether the courts are free of political control, whether the state provides public defenders, and whether ethnic minority rights are protected.



### *Agglomeration economies*

Agglomeration economies emerge when there are some positive externalities by co-locating near other economic units due to the presence of knowledge spillovers, specialized labor markets and supplier network<sup>21</sup>.

Various empirical studies present evidence on the presence and importance of such a self-reinforcing effect of foreign investment. Interestingly, FDI is found to agglomerate more often than mere financial investment partly because FDI is a long-term capital investment that is irreversible in a short run. For instance, Head, Ries, and Swenson (1995) find industry-level agglomeration benefits play an important role in the location choice of Japanese manufacturing plants in the US. Wheeler and Mody (1992) confirms the importance of agglomeration for investors' location decisions using qualitative data on US firms. More recently, Chen and Kwang(2000) in the study of the determinants of FDI in Chinese regions also report the positive feedback effect of FDI. If there is a positive feedback effect, once the initial flow of FDI sets in, it should perpetuate itself and attract further FDI.

In this study, we use one-year lagged stock of FDI in the country as an independent variable to capture these agglomeration effects. A positive and significant coefficient of lagged stock of FDI means the presence of agglomeration economies. The inclusion of the lagged dependent variable on the right hand side of the OLS regression introduces the endogeneity problem. We address this issue in detail in the next section.

#### **4. Estimation method**

In order to test the presence of agglomeration effects, we have to relate current FDI to past FDI along with other explanatory variables. We follow the model proposed by Cheng and Kwan (2000) in which they formulate the role of past FDI values as the process of partial stock adjustment. They assume that it takes time for FDI to adjust to equilibrium or desired level.

Our empirical specification is based on the assumption of the presence of such an adjustment cost. We postulate a reduced form of the following equation:

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<sup>21</sup> The sources of externalities are identified differently in different models. Lucas(1988) argues that the accumulation of human capital generates positive spillovers while, in the Krugman's(1991) model, transportation costs and fixed costs in production lead to the demand linkages of firms, which increases the incentives to agglomerate. See Fujita, Krugman, and Venables (1999) for recent surveys of theories on agglomeration.

$$Y_{it} = \alpha Y_{it-1} + \beta X_{it} + v_{it}$$

$$v_{it} = \eta_i + u_{it}$$

where  $Y_{it}$  is the stock of FDI in country  $i$  in year  $t$ ,  $X_{it}$  is a vector of other explanatory variables such as market size, labor cost, labor quality, resource abundance, distance from Dusseldorf, infrastructure, policy variables, and business operating conditions, and  $v_{it}$  is an error term that includes the unobservable country-specific attribute,  $\eta_i$ . If there is any agglomeration effect or a positive feedback effect, then  $\alpha$  is expected to be positive. When there is a country-specific effect that is time invariant and unobservable as in the above specification, then the lagged dependent variable will be correlated with the error term and OLS will lead to asymptotically biased estimates. To get consistent estimates, we choose to use the generalized method of moments (GMM) technique proposed by Arellano and Bond (1991). In this approach, we first remove the country-specific effect by first-differencing equation (1) and estimate the following equation by using instrumental variables:

$$\Delta Y_{it} = \alpha \Delta Y_{it-1} + \beta \Delta X_{it} + \Delta u_{it}$$

where  $\Delta Y_{it} = Y_{it} - Y_{it-1}$ . In the above equation,  $\Delta Y_{it-1}$  is correlated with  $\Delta u_{it}$ . Valid instruments in this case are lagged levels of dependent variables,  $Y_{it-s}$  where  $s \geq 2$  and  $t = 3, 4, \dots, T$ . As the length of panel progresses, the number of valid instruments increases. If  $X_{it}$  is predetermined [check as opposed to 'strictly exogenous'], then  $\Delta X_{it-s}$  (for all  $s$ ) can be used as additional instruments to increase the efficiency of the estimates. The validity of instruments is checked by the Sargan test. The second-order correlation of the error term in the first-differenced equation is checked by Arellano-Bond statistics for autocorrelation, which is distributed as  $N(0,1)$  asymptotically.

For a small number of samples relative to a number of parameter estimates, however, we are concerned with a possible bias introduced in the GMM estimation. Because the data set we employ may suffer from such a bias, we also estimate in fixed-effects model and compare with those obtained from GMM where appropriate.

The dependent variable  $Y_{it}$  is per capita FDI stock in constant million USD in year  $t$ . We constructed the series by using figures on FDI inflows taken from World Development Indicators (WDI).

## 5. Data

There are typically two approaches to analyze the location determinants of FDI. The first class of studies<sup>22</sup> is to explain the location choice made by investing firms by investors' perceptions or ratings of location-specific factors such as labor cost, corporate tax rates, and market size. Namely, they regress the probability of locating in a certain location on various location-specific factors. In other studies<sup>23</sup>, the dependent variable is the actual amount of FDI flow or stock. The choice of two approaches depends on what type of data is available for the analysis. If firm-level data is available, then the first approach will be employed. If investment data is available only at the aggregate level, then the second approach is viable.

The data we use in this study covers the period of 1990-1998 for 25 transition countries. The number of observations in the panel is 225 (=25x9). The definitions and summary statistics of the variables are found in appendices.

The panel data is meaningful for our study for several reasons. First, the agglomeration or self-reinforcing effects of FDI in the aggregate level can be addressed only if there is a time-series of FDI. Due to positive externalities by localization of industry, FDI in the past will lead to more FDI today. Second, during the time period covered in our data, transition economies had undertaken and completed economic reforms. Cross-sectional data would not allow us to assess changes of the reform variables.

Transition from planned to market economy started in early 1990s in many of these countries but foreign investors were cautious in the beginning with a few exceptions of Hungary and Poland. Due to difficulty of obtaining FDI data sufficiently long enough, the past studies on FDI in transition economies are confined to the set of CEEC countries that are the major recipients of substantial FDI in the region. A recent study by Resimini(2000) examines the location determinants of FDI into 10 CEEC countries. Bevan and Estrin(2000) use the data on FDI flows from 18 investing countries to 11 transition economies in explaining the determinants of FDI from both home and host country viewpoints.

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<sup>22</sup> Coughlin, Terza, and Arromdee(1991), Wheeler and Mody(1992), and Head, Ries, and Swenson(1995).

<sup>23</sup> Lucas(1993), Singh and Jun(1996), Cheng and Kwan(2000), Resmini(2000), and Bevan and Estrin(2001).

In this study, we expand to the set of 25 transition economies. With additional countries in the data, we are hoping to introduce more heterogeneity as well as to incorporate different motives of investment in order to provide a more complete and detailed picture of the reasons for locating FDI in transition countries. The countries excluded in the past studies are CIS countries. These are the countries that receive FDI mainly in non-manufacturing such as service sectors and oil industries. A picture for the complete set of countries may differ from the ones obtained for the subset of the countries in the past studies because of differences in the areas in which they receive FDI.

## 6. Results

### *Host country characteristics as FDI determinants*

Table 1 reports OLS regressions with fixed effects.<sup>24</sup> First, we look at the roles of host country characteristics without agglomeration effects. How much of variations of FDI inflows across transition economies are explained by classical factors? Column 1 in table 1 answers this question. With no policy and risk variables and agglomeration economies being taken into account, most classical sources of comparative advantage bear statistical significance. Column I indicates that FDI into transition economies are mainly driven by the host country's market size, availability of skilled workers (or the level of human capital), and sufficient infrastructure. All regressions include time dummies.

Since natural resources and distance from Dusseldorf are both invariant over time in the data set, after taking first-differences, they both drop out. In order to recover the estimates of these variables, we transform them by multiplying by a time trend.

The positive and significant coefficient of DIST indicates that the further away the country is from Germany the more FDI it attracts. In other words, FDI is not gravitated towards Germany. There are a few possible explanations for this result. Horizontal FDI or intra-industry FDI is induced by the presence of transportation cost. If the motive for FDI is to serve the export (local) market, then the greater distance from the home country justifies more FDI flows. The other possibility is a bias in a coefficient due to omitted variables such as the agglomeration effect.

Labor cost is found to have a negative but insignificant effect on FDI inflows. Note that, without adjusting for labor productivity, low wage rate alone is not a good indicator for labor cost

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<sup>24</sup> The Hausman test rejects random effects model.

advantage. In fact, investors are attracted to the site with more educated workers than low cost labor as SS3 shows.

Abundance of natural resources is another rejected variable as a determinant of FDI. Richness in natural resources is not a main reason for FDI flows. Total cumulative FDI stock in CIS countries is greatest in resource-based industries. (e.g. Russia is in the third place in total FDI stock in the region.) However, once we take into account a scale effect by using per capita FDI stock, natural resources become no longer important.

In sum, column I indicates that FDI in these transition economies is seeking to sell in the local market rather than exploiting cheap inputs and factor endowments. Availability of skilled workers and sufficient infrastructure are a plus while abundance of natural resources and cheap labor do not help attract more FDI. In particular, the increasing importance of human capital as an attractor of FDI is also confirmed in a broader set of developing countries in Noorbakhsh and Youssef(2001) as more FDI is tilted towards manufacturing sector than in the primary sector.

In column II, we add two policy variables. One is the average inflation rate to control for the success of macroeconomic reform. The other is external liberalization index to measure how open the country is. The results are quantitatively very similar to column I. Explanatory power of the model is strengthened somewhat by the inclusion of external liberalization index (CLIE). A positive and large coefficient of CLIE says that the progress of external liberalization is valued much by foreign investors. Inflation rate is negatively related to FDI flows but not statistically significant. This should not undermine the importance of price stabilization in the transition period. Rather, as the price stabilization is typically introduced in the initial stage of transition and external liberalization in the latter stage, investors may distinguish the winner of economic reform by looking at the outcome of external liberalization.

Similar results are found in column III after adding the institutional factors that facilitate business operations. Both the rule of law and quality of bureaucracy are positive and significant: the better perceived the judicial system is and the less corrupted is the local bureaucracy, the more FDI the country can attract. In Russia and CIS countries, corruptions and redtapes are often quoted as impediments to new foreign investment. The result here is consistent with this anecdotal evidence.

The results in columns I-III without the agglomeration effect consistently show that FDI in the region is driven by access to local market rather than by cheap labor. This observation is more relevant for the earlier comers of investment in the region when there is no prior investment made.

Once a volume of investment reaches a critical mass, potential investors may simply follow the herd of other investors: more FDI today leads to more FDI tomorrow. Investors pondering to invest will flock to the countries that already received much FDI because they believe that past FDI stock reflects favorable local conditions that are perceived by existing investors but not yet known to them.<sup>25</sup> Such agglomeration effects are proxied as a one-year lagged FDI stock per capita in this study.

Once we include the agglomeration effect (Column IV), there is a large increase in R square. Interestingly, the importance of the lagged dependent variable replaces the significance of other variables. One exception is the quality of bureaucracy. This implies that there is a strong tendency for foreign investors to agglomerate in certain locations. Attributes of other location-specific factors such as market size, labor cost, and even policy variables become relatively less important for the choice of investment locations once the agglomeration effect sets in. The quality of bureaucracy yet remains.

However, it is well known that OLS often yields biased estimates in the presence of a lagged dependent variable on the right-hand side of the regression since the lagged dependent variable is endogenous by construction. This endogeneity problem has to be dealt with in the next subsection.

### *Agglomeration of foreign investors*

Lagged dependent variable is not only non-random but also endogenous in the presence of an unobservable fixed effect and OLS estimates will be biased and inconsistent. Following Anderson and Hsiao(1981), we use the Generalized Method of Moments (GMM) Instrumental Variable estimator for dynamic panels that yields consistent estimates.<sup>26</sup>

Table 2 compares the result from OLS and that of GMM. All regressions include year dummies to control for time variation due to changes in external economic environment common across countries. The sizes of coefficients are similar in both regressions. The agglomeration effect and quality of bureaucracy remain significant in GMM. The main difference is observed in the external liberalization index. It becomes significant in GMM.

The p-value of the Sargan test is very small. Thus, we reject the null hypothesis at 1% level that there is no misspecification with a set of instruments we use in GMM. Second-order serial

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<sup>25</sup> See Kinoshita and Mody(2001) for further discussion.

<sup>26</sup>The efficiency of estimates can be improved by adding more moment conditions. For the system GMM estimation, see Arellano and Bond(1991), Ahn and Schmidt(1995, 1997), Arellano and Bover(1995), and Blundell and Bond(1998)

correlation is not detected according to the SOC test. However, as the Sargan test shows, the validity of instruments is questionable. Overall, a comparison between OLS and GMM results shows a bias in estimates in most variables is not great as seen in similar sizes of coefficients in both specifications. But the reform policy variable CLIE may have been biased in OLS.

Both results confirm the presence of agglomeration of FDI that overrides other location-specific factors such as market size and labor cost. The fact that both infrastructure and human capital variables are affected by an inclusion of agglomeration suggests that the agglomeration effect tend to be triggered by ‘created’ comparative advantages (e.g. skilled labor force, availability of telephone lines) rather than indigenous ones (e.g. oil, gas, and cheap labor).

After correcting for possible bias in OLS, we still see that the agglomeration effect plays an dominant role in guiding investors in choosing the investment location.

### *Is FDI into CIS countries driven by different factors?*

We argue that different types of FDI are motivated by different factors. Market-seeking FDI goes to countries with large local market while resource-seeking FDI goes to countries with abundant natural resources. As Resmini(2000) reports, the locational determinants of FDI in transition economies vary greatly across different sectors. However, a sectoral breakdown of FDI is not available in the data we compiled. Generally, the sectors in which CIS countries<sup>27</sup> receive FDI are mainly in light manufacturing industries (e.g. food, tobacco) and recourse-based industries by way of privatization whereas the sectoral distribution of FDI in other transition economies is more evenly spread with a slight skewness towards heavy manufacturing industries (e.g. automobile and machinery in the CEECs) and finance.

To introduce sectoral differences with the paucity of sectoral data, we divide the sample into non-CIS and CIS countries. As discussed before, sectoral differences in FDI inflows in non-CIS and CIS countries are large and we expect to see different factors driving FDI in these two groups.

Table 3 shows the estimates from GMM for these two groups. Some differences are observed in the results. First, the agglomeration effect is present in both but more pronounced in CIS countries. Second, another important determinant of FDI flows is availability of skilled labor for CIS countries and the external liberalization index for non-CIS countries.

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<sup>27</sup> Commonwealth of Independent States (CIS) are Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgystan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan.

Somewhat puzzling is the positive coefficient on distance from Germany. CIS countries are located far from the West than non-CIS countries. The main market they serve is Russia instead of the Western Europe for historical and geographical reasons. In fact, when we replace DIST with distance from Moscow instead of Dusseldorf, the sign of the distance variable becomes negative and significant for CIS countries. This evidence shows that CIS countries are gravitated towards Russia than the West.

For non-CIS countries, however, Sargan test indicates the invalidity of the instruments. Due to small samples, GMM estimates may be asymptotically biased. In table 4, we run fixed-effects model instead to compare with the results from table 3.

In column I in table 4, non-CIS countries yield the results similar to those obtained from GMM in table 3. This implies that a bias in GMM for non-CIS countries is not so severe. For non-CIS countries, the agglomeration effect and human capital remain main drivers of FDI inflows. Note that DIST is no longer significant in OLS and that the rule of law becomes more crucial in explaining FDI inflows. In these variables, GMM in table 3 might have introduced bias in table 3.

Summarizing the results from tables 3 and 4, we find that the agglomeration effect seems to be the most important variable in explaining FDI inflows. This is particularly so for CIS countries because there is less direct information about business operating conditions than in non-CIS countries. For investors, the signaling effect of other investors weigh more than classical economic factors of comparative advantages.

For non-CIS countries, the degree of external liberalization is a key factor for promoting FDI. For CIS countries, favorable business operating conditions such as well-enforced rules and reasonable judicial systems encourage more FDI inflows. Availability of skilled labor force is another important determinant.

These differences stem from the fact that two groups are in a different stage of economic development and that they attract FDI in different sectors. Non-CIS countries had a head-start in industrialization as they swiftly privatized nationally-owned enterprises and they are more successful in accessing to global knowledge base via relatively open trade regime. CIS countries are still lagging behind non-CIS countries in the level of industrial production and they are still shy of attracting substantial FDI flows. Our results suggest that main impediments to FDI flows in CIS countries are a lack of skilled labor force and a sound legal infrastructure.

## **5. Conclusions**



In this paper, we study the factors explaining the geographical distribution of FDI inflow across 25 transition economies by utilizing panel data between 1990 and 1998. The location determinants we test consist of three categories: the first are country-specific advantages such as low-cost labor, large local market, skilled labor force, sufficient infrastructure, and proximity to the West. The second group of variables to be tested is macroeconomic policy and policy that facilitates business-operating conditions. The third is the agglomeration effect of foreign investment. We explain FDI stock per capita in each country as a function of the above variables in the GMM estimation.

In regression results, we find the role of agglomeration economies the most significant determinant of foreign investment inflows in the transition economies. This result is robust throughout alternative specifications. The model without the agglomeration effect seems to show that FDI in the region is sought for by market-seeking investors rather than resource-seeking investors. Once we introduce the agglomeration effect, however, market size becomes no longer an important location determinant.

Nevertheless, poor quality of the bureaucracy in the host country is found to be a deterrent to foreign investment decisions even after controlling for the agglomeration effect. This suggests an interesting policy implication. Improving institutional governance such as bureaucratic quality is a strong signal of favorable investment environment for many foreign investors. Economic and political stability is a necessary condition in order for a host country to attract foreign investment. Once it secures macroeconomic stability in the earlier stage of transition from centrally-planned to a market economy, institutional dimension of the transition process becomes more important particularly when a country tries to promote FDI.

The other determinant of FDI inflow is ‘openness’ to trade measured as external liberalization index. Our results show that the more liberalized the country is towards external trade, the more FDI it will attract. This confirms the findings in earlier studies that trade and FDI are complementary to each other.

CIS and non-CIS countries (e.g. CEECs and the Baltic states) differ in the sector in which they attract FDI. The location determinants reflect such differences when we divide the samples into two groups. For CIS countries, there is a greater effect of agglomeration at work perhaps due to insufficient information about local conditions as a destination of investment. For these countries, securing the first wave of foreign investment flows is all the more important because this will lead to a cascading effect of investment in subsequent periods. Other factors that contribute to FDI

inflows in CIS countries are availability of human capital and good rule of law, or a sound judicial system. For non-CIS countries, the agglomeration effect is present but to a lesser extent than in CIS countries. One determining factor in attracting FDI in these countries is the more liberalized trade regime.

Using a broader set of transition countries and a longer time span than in existing studies, we hope to introduce heterogeneity both in time and country in analyzing the location determinants of FDI. We confirm the presence of agglomeration economies as a dominant factor in explaining the pattern of geographical FDI distribution across these countries. Also important are the extent of trade liberalization and the quality of bureaucracy. Educated workforce is particularly important for CIS countries as it might reflect a change of direction in the areas of FDI they receive.

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**Table 1. Determinants of FDI: Fixed effects**  
**Dependent variable=per capita FDI stock(t)**

	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>
<b>FDI stock (t-1)</b>	—	—	—	0.93*** (0.04)
<b>ypc</b>	0.08*** (0.02)	0.05** (0.02)	0.04 (0.02)	0.01 (0.01)
<b>wagen</b>	-0.05 (0.15)	-0.08 (0.14)	-0.03 (0.14)	-0.05 (0.06)
<b>ss3</b>	20.33*** (4.43)	15.02*** (4.43)	18.33*** (4.52)	2.84 (2.16)
<b>natres</b>	-8.30 (7.13)	-2.78 (6.88)	-2.55 (6.71)	-0.44 (3.25)
<b>dist</b>	0.02*** (0.006)	0.02*** (0.006)	0.02*** (0.006)	0.002 (0.003)
<b>telephon</b>	5.25*** (0.59)	5.09*** (0.56)	5.57*** (0.59)	0.36 (0.37)
<b>infav</b>	—	-0.006 (0.007)	-0.003 (0.007)	0.001 (0.003)
<b>clie</b>	—	123.34*** (31.71)	102.44*** (31.88)	21.77 (15.73)
<b>rulelaw</b>	—	—	26.27* (13.91)	1.74 (6.56)
<b>buroqual</b>	—	—	49.47* (25.42)	28.29** (13.33)
<b>n</b>	148	148	148	140
<b>R square</b>	0.82	0.84	0.85	0.96

**Note:**

(1) Parentheses are standard errors. \*\*\*, \*\* and \* indicate 1, 5, and 10% significance level, respectively.

(2) Time dummies included in all regressions.

**Table 2. Determinants of FDI**  
**Dependent variable=per capita FDI stock(t)**

	<b>OLS</b>	<b>GMM</b>
<b>FDI stock (t-1)</b>	0.93*** (0.04)	0.89*** (0.06)
<b>ypc</b>	0.01 (0.01)	0.009 (0.01)
<b>wagen</b>	-0.05 (0.06)	-0.08 (0.06)
<b>ss3</b>	2.84 (2.16)	0.81 (2.61)
<b>natres</b>	-0.44 (3.25)	-0.20 (3.75)
<b>dist</b>	0.002 (0.003)	0.003 (0.003)
<b>telephon</b>	0.36 (0.37)	0.32 (0.42)
<b>infav</b>	0.001 (0.003)	0.002 (0.003)
<b>clie</b>	21.77 (15.73)	38.18** (18.91)
<b>rulelaw</b>	1.74 (6.56)	-9.77 (8.62)
<b>buroqual</b>	28.29** (13.33)	33.96** (15.71)
<b>n</b>	140	116
<b>Sargan test</b>		0.000
<b>SOC test</b>		0.58

**Note:**

- (1) Parentheses are standard errors. \*\*\*, \*\* and \* indicate 1, 5, and 10% significance level, respectively.
- (2) Time dummies included in all regressions.
- (3) Sargan and SOC tests show the p-value for overidentifying restrictions and second-order serial correlation, respectively.



**Table 3. Determinants of FDI :GMM**  
**Dependent variable=per capita FDI stock(t)**

	<b>Non CIS countries</b>	<b>CIS countries</b>
<b>FDI stock (t-1)</b>	0.74*** (0.10)	0.89*** (0.13)
<b>ypc</b>	0.008 (0.028)	0.005 (0.016)
<b>wagen</b>	-0.12 (0.08)	0.23 (0.29)
<b>ss3</b>	-2.24 (5.98)	2.27** (1.07)
<b>natres</b>	2.87 (10.14)	1.99 (2.50)
<b>dist</b>	0.03 (0.02)	0.003** (0.001)
<b>telephon</b>	0.93 (0.93)	0.30 (0.24)
<b>infav</b>	0.06 (0.05)	0.0004 (0.001)
<b>clie</b>	309.33*** (101.01)	2.27 (8.18)
<b>rulelaw</b>	-19.75 (14.61)	6.01 (5.28)
<b>buroqual</b>	29.91 (23.57)	19.55 (14.38)
<b>n</b>	67	49
<b>Sargan test</b>	0.06	0.98
<b>SOC test</b>	0.93	0.22

**Note:**

- (1) Parentheses are standard errors. \*\*\*, \*\* and \* indicate 1, 5 and 10%, respectively.
- (2) Time dummies included in all regressions.
- (3) Sargan and SOC tests show the p-value for overidentifying restrictions and second-order serial correlation, respectively.

**Table 4. Determinants of FDI : FE model**  
**Dependent variable=per capita FDI stock(t)**

	<b>Non CIS countries</b>	<b>CIS countries</b>
<b>FDI stock (t-1)</b>	0.82*** (0.08)	1.08*** (0.12)
<b>ypc</b>	0.006 (0.026)	0.00004 (0.01)
<b>wagen</b>	-0.08 (0.08)	0.19 (0.31)
<b>ss3</b>	-0.31 (4.87)	2.61** (1.18)
<b>natres</b>	2.96 (8.97)	0.64 (2.55)
<b>dist</b>	0.02 (0.01)	0.001 (0.001)
<b>telephon</b>	0.72 (0.86)	0.29 (0.25)
<b>infav</b>	0.06 (0.05)	0.001 (0.001)
<b>clie</b>	231.41*** (82.17)	-7.03 (8.14)
<b>rulelaw</b>	-7.46 (12.60)	13.68*** (4.63)
<b>buroqual</b>	31.54 (20.76)	14.66 (12.47)
<b>n</b>	79	61
<b>R-squared</b>	0.97	0.95

**Note:**

- (1) Parentheses are standard errors. \*\*\*, \*\* and \* indicate 1, 5 and 10%, respectively.
- (2) Time dummies included in all regressions.
- (3) Sargan and SOC tests show the p-value for overidentifying restrictions and second-order serial correlation, respectively.

## Appendix 1. Definitions of variables

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<b>per capita FDI stock</b>	Per capita cumulative FDI stock (constant million USD) [source: World Development Indicator]
<b>lagged FDI stock</b>	One-year lagged per capita FDI stock
<b>ypc</b>	GDP per capita (USD)
<b>wagen</b>	Gross nominal wage (USD) [source: UNECE 'Economic Survey of Europe']
<b>ss3</b>	General secondary school enrollment (%)
<b>natres</b>	Natural resource endowment: =0 if poor, =1 if moderate, and =2 if rich.[source: DDGT]
<b>dist</b>	Distance from Dusseldorf (km)
<b>telephon</b>	# of telephone mainlines per 1000 people
<b>infav</b>	Average inflation rate (%)
<b>clie</b>	Cumulative external liberalization index, i.e. trade liberalization
<b>rulelaw</b>	Extent of law enforcement [source: Campos(2000)]
<b>buroqual</b>	Quality of bureaucracy [source: Campos(2000)]

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## Appendix 2. Summary Statistics

	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
<b>FDI stock</b>	188	164	295	0	1771
<b>Lagged FDI stock</b>	163	131	250	0	1572
<b>ypc</b>	220	2134	1784	219	9850
<b>wagen</b>	151	167	217	0.02	1247
<b>ss3</b>	221	26	7.7	8.8	45.6
<b>natres</b>	225	0.52	0.75	0	2
<b>dist</b>	225	2237	1476	559	5180
<b>telephon</b>	219	162	88	0	374
<b>infav</b>	225	434	1304	-0.8	15606
<b>clie</b>	225	2.74	2.45	0	9.5
<b>rulelaw</b>	225	6	2.46	2	10
<b>buroqual</b>	225	2.45	1.63	0.83	8.33