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***WHY DOES FDI GO WHERE IT GOES?
NEW EVIDENCE FROM THE TRANSITION ECONOMIES***

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**WHY DOES FDI GO WHERE IT GOES?
NEW EVIDENCE FROM THE TRANSITION ECONOMIES***

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Abstract: This paper examines the importance of agglomeration economies and institutions vis-à-vis initial conditions and factor endowments in explaining the locational choice of foreign investors. Using a unique panel data set for 25 transition economies between 1990 and 1998, we find that the main determinants are institutions, agglomeration and trade openness. We find important differences between the Eastern European and Baltic countries, on the one hand, and the former Soviet Union countries on the other: in the latter group, natural resources and infrastructure matter, while agglomeration matters only for the former group.

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1. Introduction

One of the key components of the movement towards economic globalization are international capital flows in which figure prominently portfolio investment, foreign and foreign direct investment (FDI). FDI has received the attention of a vast literature that focuses on its determinants as well as on its consequences. Two important theories throw light on the locational determinants of FDI. Factor endowments-based trade theory argues that FDI is drawn to countries with lower wages and more abundant natural resources, while the new trade theory suggests that economies of scale are a driving force of FDI and that agglomeration effects often play a crucial role.¹

The objective of this paper is to investigate the importance of institutions and agglomeration vis-à-vis initial conditions and factor endowments as determinants of the choice of location by foreign investors in an almost natural experiment setting, namely, during the transition from centrally planned to market economy in Central Europe and in the former Soviet Union. The former communist countries present an extremely valuable and so far little utilized object of research. The transition has been initiated more-or-less simultaneously in nearly thirty countries that differ substantially in terms of inherited institutions, initial conditions, income levels and reform paths. This richness of variation allows comparative analysis in a unique situation akin to a natural experiment: a number of centrally planned economies set out to implement economic and political reforms, applying different strategies and experiencing dramatically different outcomes (in a large number of different dimensions, among them FDI). The collapse of the socialist system in the late 1980s created a myriad of investment opportunities in the Central and Eastern European and former Soviet Union countries. These economies were industrialized and could count on a relatively cheap yet highly educated workforce. FDI is also perceived as a catalyst as it could bring not only less volatile capital flows but also the technology and managerial know-how necessary for restructuring firms.²

Despite early optimism for much FDI inflows into the region, these high expectations did not materialize, so far. The share of FDI inflows into transition economies

¹ See Wheeler and Mody(1992), Head, Ries, and Swenson(1995), and Kinoshita and Mody(2001).

² See Estrin, Hughes, and Todd (1997), Lankes and Venables (1996) and Prasad et al. (2003).

has been consistently smaller than those of other developing regions such as Asia and Latin America. Between 1990 and 1994, transition economies received 2.1 percent of the global FDI inflows, while Latin America received about 10 percent and Asia about 20 percent (UNCTAD, 2002). Between 1995 and 1999, transition economies received 3.2 percent of global FDI inflows, while Latin America received about 12 percent and Asia about 16 percent (UNCTAD, 2002). Although these flows accelerated in the second half of the 1990s, they were still disproportionately concentrated in a handful of Central Eastern European and Baltic countries (CEEB).³ For instance, between 1990 and 1994, the CEEB received 95% of the total per capita FDI to transition countries while between 1995 and 1998 the CEEB share declined to still substantial 84%.

This paper tries to contribute to two different branches of literature. The first is the one on the locational determinants of FDI. One of the most recent developments is the incorporation of institutional quality in modeling the location decision of foreign firms. Institutions underpin local business operating conditions but are different from “physical” supporting factors such as transport and communication infrastructures. The basic notion is that a lower level of corruption, a fair, predictable and expedient judiciary and efficient bureaucracy help to attract FDI. Albeit intuitive, data constraints have impeded extensive testing of these ideas and constrained existing studies to focus on one sole aspect of the issue, normally corruption. In this paper, we examine a array of institutional features and try to assess their relative importance.

This paper also tries to contribute to a second strand of literature, that on FDI in transition economies. Past studies have focused on the more advanced countries in transition, and more specifically, have favored the Central European countries in detriment of those from the former Soviet Union. For instance, Bevan and Estrin (2000) study the determinants of FDI inflows into 11 transition economies,⁴ while Resmini (2000) uses a similar set of 10 countries. In this study, we use a set of 25 countries covering both the more and less advanced countries in transition. Hence, our objective is to provide a fuller

³ In per capita terms, these are Hungary, Estonia, Czech Republic and Poland. In total FDI inflows, Russia, Kazakhstan, and Azerbaijan are added to this list [Source: EBRD Transition Report 2000, p.74].

⁴ The 11 transition countries analyzed in Bevan and Estrin (2000) are Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia, and Ukraine.

and more complete identification of the factors that affect the success and failure of (all) transition countries in attracting FDI. One exception is the study by Garibaldi et al. (2001) that covers a large number of transition countries. Yet using different variables and different estimation methods conclude that FDI can be well explained by macroeconomic fundamentals. In this paper, we use panel estimation to suggest instead that institutions, natural resources and agglomeration economies are the more important determinants.

In this paper we use a unique panel data set covering 25 transition economies between 1990 and 1998,⁵ and report that the main determinants of FDI inflows to these countries are institutions, natural resources, agglomeration economies and labor costs. We also investigate whether the set of determinants varies across the region. We find that for the Eastern European and Baltic countries, institutions, agglomeration economies and the extent of economic reforms are the main determinants while, for the CIS countries,⁶ abundant natural resources and economic reforms are main drivers of FDI inflows.

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, the estimation method and the data we use. Section 4 reports econometric results and section 5 concludes the paper and outlines directions for future research.

2. Literature review

What are the host country characteristics that attract FDI? The emerging consensus is that the answer crucially depends on the motives of foreign investors in undertaking those investment projects. Accordingly, there are three types of FDI.⁷ The first is market-seeking FDI whose purpose is to serve local and regional markets. This type of FDI is also called horizontal FDI as it involves replication of production facilities in the host country.⁸ Tariff-jumping or export-substituting FDI is a variant of market-seeking FDI. Because the reason

⁵ The data set constructed for this paper is available upon request from the authors.

⁶ The CIS stands for the Commonwealth of Independent States, which consists of all former Soviet Union countries (excluding the Baltic States) and they are Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan.

⁷ See Dunning (1983).

⁸ The mode of horizontal FDI is typically Greenfield investment.

for horizontal FDI is to better serve a local market by local production, market size and market growth of the host economy are the main drivers. The impediments to access local markets such as tariffs and transport costs also encourage this type of FDI.

Second, when firms invest abroad to acquire resources not available in the home country, FDI is said to be resource- or asset-seeking. Resources may be natural resources, raw materials, or low-cost inputs such as labor. Especially in the manufacturing sector, when multinationals directly invest in order to export, factor cost considerations become important. In contrast to horizontal FDI, vertical or export-oriented FDI involves a relocation of parts of the production chain to the host country. Availability of low-cost labor is one prime driver for export-oriented FDI. Furthermore, FDI in resource sector such as oil and natural gas is attracted to the countries with abundant natural endowments.⁹

Third, the foreign investment is said to be efficiency-seeking when the firm can gain from the common governance of geographically dispersed activities in the presence of economies of scale and scope. Bevan and Estrin (2000) found the evidence that this is the case for the first wave of EU accession countries¹⁰. Prospective membership of the European Union conducive to the establishment of regional corporate networks seems to have attracted more of efficiency-seeking FDI after the initial announcement of the progress of EU accession¹¹.

All these suggest that the countries that possess a large market, low-cost labor, abundant natural resources, and are close to the major Western markets would attract large amounts of FDI inflows. FDI would thus go to countries with favorable initial conditions.

Based on a survey of Western manufacturing companies, Lankes and Venables(1996) find that the main purpose of FDI in transition economies before 1995 varied substantially across countries. They find that there had been a noticeable shift from the region's projects to serve local markets to those to serve export markets. Export-

⁹ As reported in Esanov et al (2001), most FDI in resource-rich countries of the CIS is of this type.

¹⁰ The first wave countries they consider are the Czech Republic, Estonia, Hungary, Poland, and Slovenia.

¹¹ World Investment Report (UNCTAD, 2002) suggests that, with the accession of various CEEB countries envisaged in 2004, the integration of operations by EU transnational corporations will be accelerated and that more efficiency-seeking FDI will be directed to the accession countries.

oriented FDI was then expected to increase as the market integration with the EU progresses. If so, we would expect cost factors to become more important.

Another important variable for explaining the geographical distribution of FDI is agglomeration economies. When agglomeration economies are present, new investors mimic past investment decisions made by other investors in choosing the location. By co-locating next to other firms, they benefit from positive spillovers from other investors already in place. The usual sources for these positive externalities are knowledge spillovers, specialized labor, and intermediate inputs¹².

The empirical evidence on agglomeration economies is ample. The existing literature is concentrated on FDI in the US or US FDI abroad. A seminal work by Wheeler and Mody (1992) makes a strong case for agglomeration (and market size) in US investors' location decisions. Barrell and Pain (1999) find similar results on US investment in Europe. Head, Ries, and Swenson (1995) find industry-level agglomeration economies play an important role in the location choice of Japanese manufacturing FDI in the US. A recent work by Chen and Kwang (2000) report a similar effect of agglomeration observed in China.

Factor-endowment based theory suggests that inherent differences in endowments and favorable initial conditions among countries explain the geographical pattern of inward FDI. The only way the host country can affect this pattern is to change economic fundamentals. On the other hand, a story of agglomeration economies suggests that once countries attract the first mass of investors, the process will be self-reinforcing without resorting to changes in policies. In this light, if there is any agglomeration effect, we expect that the past stock of FDI will be a good predictor of current FDI even after controlling for the classical factors of comparative advantages.

A growing body of literature that relates institutions and economic outcomes argues that good economic institutions are instrumental to economic growth via higher investment, higher educational attainment, and lower mortality (Mauro, 1995: and La Porta

¹² Marshall (1920) argues that industrial districts arise because of technology spillovers, the advantages of thick markets for specialized skills, and the backward and forward linkages. A new economic geography emphasizes the linkages effect: users and suppliers of intermediate inputs cluster near each other because the large market provides greater demand for a good and supply of inputs. See Krugman (1991), for example.

et al. ,1998,1999).¹³ We believe that good institutions can also play a crucial mediating role in attracting FDI. Thus, the key question we ask in this paper is how important institutions and the agglomeration effect are relative to other factors in the host countries.¹⁴

In transition economies, it is well known that the recovery after the initial drop in output level of these countries varied greatly across countries (Campos and Coricelli, 2002). The economies that recovered fastest tend to be the CEEB despite different inflation rates, fiscal deficits, external debts and privatization strategies. Also, these countries had been relatively more open to trade even before the process of transition began. The favorable initial conditions drew a large bulk of investment at the time of disintegration of the CMEA in 1991 and it might have been further magnified by the agglomeration effect.

In summary, in order to understand the determinants of FDI in transition economies it is crucial to specify an empirical model that allows for a combination of traditional (e.g., market size and labor costs), newer (e.g., institutions) as well as transition specific determining factors (e.g., initial conditions).

3. Data and estimation

The data used in this study is a panel of 25 transition countries (the CEE, the Baltics, and the CIS) between 1990 and 1998. The number of observations in the complete panel is 225 (=25x9).¹⁵ The definitions of the variables are found in Table 1. Our dependent variable is per capita FDI stock in constant million USD and is constructed from a series of FDI inflows reported in the World Bank's *World Development Indicators* (WDI).¹⁶ Independent variables are drawn from various sources reported in Table 1.

The time-series aspect is important for our study for at least two reasons. First, the agglomeration or self-reinforcing effects of FDI can be addressed only if there is a time series of FDI. In the presence of agglomeration, newly made investment would be an increasing function of the past investment already in place. Second, during the time period

¹³ More recently, Johnson et al. (2000) show that differences in institutional quality of law and corporate governance can also explain the depth and severity of the Asian financial crisis.

¹⁴ For instance, Wei (2000a, 2000b) finds that corruption in a host country deters inward FDI substantially.

¹⁵ The data used for estimation is unbalanced due to missing observations in the key variables.

¹⁶ We use the GDP deflator as this was the only relevant series available.

covered in our data, transition economies went through comprehensive reforms. Cross-sectional data would not allow us to take into account changes of the reform variables.

The cross-sectional aspect of our study is also important. Transition from planned to market economy started in the early 1990s in these countries but foreign investors were cautious in the beginning. Due to difficulty of obtaining sufficiently long FDI data, the past studies on FDI in transition were often limited to the more advanced countries in transition (e.g. the CEEB countries) that are also the major recipients of FDI in the region. In this study, we use the set of 25 transition economies. Adding CIS countries to the data, we are hoping to introduce more heterogeneity as well as to incorporate different motives of investment which may vary across sectors.¹⁷

3.1. Regression variables

Classical sources of comparative advantage

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 transportation costs. Thus, the location of FDI is closely related to comparative advantages of the country, which in turns affects the expected profitability of investment. The classical sources of comparative advantages are input prices, market size, growth of the market, and the abundance of natural resources.

The primary purpose of market-seeking FDI is to serve the host country market. Market size is a measure of market demand in the country. We expect per capita FDI stock to be greater countries with larger domestic market. To proxy for market size, we follow

¹⁷ The main sector for inward FDI in the CEEB countries is manufacturing, while it is the resource sector in the CIS countries (UNCTAD World Investment Report).

the literature and use real per capita GDP using the chain method (RGDPCH)¹⁸. The figures are drawn from *Penn World Table 6*.

If foreign investors are seeking low labor cost sites, availability of cheap labor is an important reason for FDI. To take advantage of low cost of the labor input, firms can justify relocating a part of their production process to foreign countries. We use the nominal wage rate (WAGEN) as a proxy for labor cost. We drew the data from UNECE's *Economic Survey of Europe*. If vertical FDI is dominant, we expect a negative sign on the coefficient (e.g. countries with lower labor costs would attract more FDI.)

Potential foreign investors should be concerned not only with the cost of labor but also with the quality of labor. A more educated labor force can learn and adopt new technology faster and the cost of training local workers would less for investing firms. Our labor quality index is general secondary education enrollment rate (EDU) collected by UNICEF.

The CIS countries (e.g., Azerbaijan, Kazakhstan and Russia) receive much FDI in resource-based industries as they are rich in oil and natural gas. In the typology developed above, this is considered resource-seeking FDI. Natural resources rich countries may attract foreign investment in those industries while they may also divert investment from the manufacturing sector.¹⁹ The variable we use is NATRES that indicates if the host country is 'poor'(=0), 'moderate'(=1), and 'rich'(=2) in natural resources.²⁰

Proximity to the home country is an important factor in explaining the volume of trade flows between countries in a gravity model.²¹ It is a stylized fact in the empirical literature that trade volumes between two countries are a function of both income levels of the two countries (GDP) and the distance between them. In a gravity model, the smaller the distance between two countries, the more they are expected to trade. Distance is a proxy for transportation costs, or (economic) barriers to trade. In horizontal FDI, in particular,

¹⁸ The base year is 1996.

¹⁹ 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).

²⁰ This variable is constructed by De Melo et al. (1997). We also used more direct measures (e.g. proven oil and gas reserves) but the results were not significantly different.

²¹ Mody, Razin, and Sadka(2002) and Portes, Rey, and Oh(2001) interpret the distance as a proxy for informational frictions.

transportation costs are treated as a fixed cost by investors.²² The greater is the distance, the more incentives there are for firms to relocate production facilities to the host country. The proximity may be also relevant for cost-motivated investments such as vertical FDI. Note, however, that the proximity in a gravity equation is measured as distance between source and host countries (i.e. distance between the headquarters and foreign production sites). Yet the current data cannot identify the source country of FDI. Given this constraint, we measure the physical distance in kilometers from Brussels to the capital city of the host country (DISB). Distance from Brussels is a proxy for ease of access to the major Western markets due to low communication, transportation and coordination costs.

A good infrastructure is a necessary condition for foreign investors to operate business locally regardless of the type of FDI. We use the number of main telephone lines (TELEPHON) from *World Development Indicators* as our infrastructure variable. Availability of main telephone lines is necessary to facilitate communication between the home and host countries.²³

Macroeconomic policy and reform 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 low investment risk.

A record of price stability is a good indicator for macroeconomic stability and the progress in market reforms. For example, a history of low inflation and prudent fiscal balance signals to investors how committed and credible the government is. For this, we use the annual average inflation rate (INFAV). Most transition countries suffered from a monetary overhang and thus high inflation after freeing prices at the onset of transition. Those countries that embarked on stabilization programs early also succeeded in bringing inflation under control rapidly. The lower the average inflation rate is in the host country, the more successful the stabilization program was, and higher GDP growth can be

²² See Krugman(1991).

²³ One alternative for the infrastructure variable is the percentage of paved roads in the country. This variable can be misleading: for instance, if there is one main road in the country and it is paved, then the value for this will be 100. Thus large values may not necessarily indicate better infrastructure.

expected in the short run. Thus, we expect that the more foreign investment, *ceteris paribus*, will be attracted to countries with lower inflation rates.

Another indicator of economic reform is the extent of external liberalization. We use the variable CLIE that reflects a removal of trade controls and quotas, moderation of tariff rates and foreign exchange rate restrictions.²⁴ Trade liberalization and a removal or reduction in capital controls indicate the speed and level of reforms most relevant to foreign investment among all the available indices of structural reforms.²⁵ Since trade flows are often a complement to FDI flows,²⁶ more FDI would be attracted to the countries with more liberalized trade regimes. On the other hand, if FDI is basically intended for tariff-jumping purposes, the more restrictive trade regime may induce more FDI.

Another important policy variable we use is the index of FDI restrictions (RES). Larger values indicate greater restrictions on FDI flows, which implies less FDI inflows. The index is constructed by Garibaldi et al (2001) based on *IMF Annual Report on Exchange Arrangements and Restrictions*.²⁷

Institutions

Host country institutions also influence investment decisions because they directly affect business operating conditions. The cost of investment consists of not only the economic costs of investment 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 investors, we use two institutional variables, 'rule of law' (RULELAW) and 'quality of bureaucracy' (BUROQUAL). The indicator for rule of law reflects the strength and impartiality of the legal system and popular observance of the law.²⁸ The higher score in

²⁴ The index is constructed by De Melo et al. (1997).

²⁵ Cumulative internal liberalization index (CLII) and cumulative private sector condition index (CLIP) were also tested. Due to high multicollinearity, CLII and CLIP are dropped.

²⁶ Empirical studies find that manufacturing FDI flows complement trade flows. See Caves(1996) and Sigh and Jun(1995).

²⁷ The index covers the categories on approval requirements, the extent to which profits can be remitted abroad, ease in liquidating assets, and preferential treatment of direct investment. See Appendix in Garibaldi et al. (2001).

²⁸ It reflects the degree to which citizens are willing to accept the established institutions for making and implementing laws and adjudicating disputes.

the rule of law implies better legal institutions. We expect that countries with better legal infrastructure will be able to attract more FDI.

The variable on the quality of the bureaucracy²⁹ is constructed from 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. High values for this variable implies lower cost for foreign investors because uncorrupt government with modest regulations is less likely to ask for bribery and side payments.

Agglomeration economies

Agglomeration economies emerge when there are benefits from co-locating near other economic units due to positive externalities. In the present study, foreign investors may be attracted to countries with existing concentrations of other foreign investors. Being less knowledgeable of local environments of the country, investors may consider the investment decisions by others as a good signal of favorable conditions and emulate the decision to reduce uncertainty.

The theoretical literature refers to three sources of positive externalities that lead to the spatial clustering of investors. First, technology spillovers can be shared among foreign investors among various industries. General and/or technical information about how to operate efficiently in the host country is usually obtained by direct experiences of investors. This knowledge can be passed onto other foreign firms by informal communication. To benefit from such knowledge spillovers, firms have to locate close to others. Second, industry-specific localization is observed when firms in the same industry draw on a shared pool of skilled labor and specialized input suppliers. Third, the theory of new economic geography emphasizes backward and forward linkages as a source of agglomeration³⁰. Users and suppliers of intermediate inputs cluster near each other because the large market provides greater demand for a good and supply of inputs.

²⁹ BUROQUAL is close to one of the three corruption measures used by Wei (2000a, 2000b).

³⁰ See Krugman (1991).

In order to be able to distinguish precisely between different types of agglomeration economies, we would need more disaggregated data (say at the industry level) as well as more on the identify of the investors. With the aggregate data we have available, we can lump them all together by using a single variable, the one-year lagged FDI stock,³¹ which is the approach used in most of the literature (Cheng and Kwan, 2000). Note that the inclusion of the lagged dependent variable on the right hand side makes the OLS estimator inconsistent (we address this issue below).

Initial Conditions

Prior to the start of transition, the countries in our sample varied greatly in the initial level of development, macroeconomic distortions, and integration into the trading system of the socialist countries. De Melo et al (1997) argue that such initial conditions play an important role in determining economic performance among transition economies.³²

Initial conditions reflect determinants that are unrelated to policies and invariant during the sample period. For example, these include initial income level, the degree of industrial distortions, urbanization, natural resource endowment, and trade dependence (trade dependence is trade shares in GDP measured in 1989). Among these variables, we report results for natural resource endowment (NATRES) and trade dependence (TRADDEP) in our regressions.³³

3.2. Estimation method

To test for agglomeration effects, we relate current FDI stock to past FDI stock 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 a process of partial stock adjustment. We assume that it takes time for FDI to adjust to equilibrium or desired level. The adjustment process is postulated as follows:

³¹ We tried to distinguish different types of agglomeration by including the interaction terms of agglomeration with the share of the industry and urbanization at the initial year. But none of them were significant.

³² Campos and Kinoshita(2002) find that both initial income level and FDI are important determinants of growth for 25 transition economies.

³³ Other initial conditions were tested but none of them were statistically significant.

$$\Delta Y_{it} = \alpha(Y_{it}^* - Y_{it-1}) \quad (1)$$

where $\Delta Y_{it} = Y_{it} - Y_{it-1}$ and Y_{it}^* is an equilibrium level or a steady-state level of the FDI stock. By rearranging the above, we get:

$$Y_{it} = (1 - \alpha)Y_{it-1} + \alpha Y_{it}^* \quad (2)$$

where α must be less than 1 for stability. The steady-state level of the FDI stock is determined by X_{it} , a vector of economic, policy, and institutional variables discussed in the previous subsections. That is:

$$Y_{it}^* = \beta X_{it} + v_{it} \quad (3)$$

where v_{it} is an error term that includes the country-specific as well as a time-specific effects. The regression model we will estimate thus is:

$$\begin{aligned} Y_{it} &= \delta Y_{it-1} + \lambda X_{it} + \varepsilon_{it} \\ \varepsilon_{it} &= \eta_i + \gamma_t + u_{it} \end{aligned} \quad (4)$$

where $\delta = 1 - \alpha$, $\lambda = \alpha\beta$, and $\varepsilon_{it} = \alpha v_{it}$. Also, η_i is the country specific attributes and γ_t is a time-specific attribute (e.g. time dummies). If there is an agglomeration effect or a positive feedback effect, then δ is expected to be positive.

Because the lagged Y_{it-1} and the time-invariant country-specific attribute η_i are correlated, the OLS estimate is inconsistent. In order to solve this problem, we take a first difference:

$$\Delta Y_{it} = \delta \Delta Y_{it-1} + \lambda \Delta X_{it} + \Delta \varepsilon_{it} \quad (5)$$

However, ΔY_{it-1} and $\Delta \varepsilon_{it}$ are still correlated. To get consistent estimates, we employ the IV estimates, or the generalized method of moments (GMM) proposed by Arellano and Bond (1991). GMM has advantages over the standard IV estimates because as the length of the panel increases, so does the number of valid instruments. For equation (5), valid instruments are lagged levels of dependent variables, Y_{it-s} where $s \geq 2$ and $t = 3, 4, \dots, T$. If X_{it} is strictly exogenous, then ΔX_{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 asymptotically distributed as $N(0,1)$.

For a number of observations that is small relative to that of parameter estimates, however, we should be concerned with small sample bias being introduced in the GMM estimation. Because the data set we employ may suffer from such a bias, we report fixed-effects model and compare with those obtained from GMM where appropriate.

4. Results

In this section we discuss our econometric results. As mentioned, our objective is to provide a more comprehensive description of the rationale of foreign firms to invest in transition economies. To do so, we try to go beyond the traditional factors identified in the literature (e.g., labor and transportation costs) and incorporate in the analysis both agglomeration effects and the role of institutions. We argue that the omission of such factors can bias existing results. Our dependent variable Y_{it} is per capita FDI stock³⁴ in constant million USD in year t .

Host country characteristics as FDI determinants

Table 2 reports the regression results for all countries in our sample. The first column presents the fixed effects model³⁵ and the second and third columns show the GMM estimations. All regressions include year dummies to control for time variation due to

³⁴One alternative is to use the ratio of FDI to GDP. In transition economies, GDP is quite volatile during the initial years of transition. Thus, we prefer to choose per capita FDI to FDI/GDP.

changes in external economic environment common across countries.

In the past, models often exclude agglomeration effects as a determinant. In reality, it generally takes time for the stock of FDI to reach the optimal level. The introduction of agglomeration and partial adjustment mechanism lends itself to straightforward econometric implementation by the inclusion of a lagged dependent variable. (Cheng and Kwan, 2000)

In the presence of a lagged dependent variable on the right hand side, OLS yields inconsistent estimates as the lagged dependent variable is endogenous. To address this issue, we also report the GMM results in Table 2³⁶. In small samples such as ours, the GMM estimators may not be very efficient. Alongside the results from GMM, we also report the fixed-effects model for comparisons.

Table 2 reports the results for the pooled sample. In column I, we have the fixed effects model, the coefficient of the lagged FDI δ is 0.81. The coefficient of partial adjustment α is thus 0.19. This means that net investment in one year is 19% of the difference between Y^* and Y . If the steady-state level of the FDI stock does not change, it will take about five years for the gap between the equilibrium and the current FDI stock to close. The partial adjustment coefficient is somewhat reduced in size in columns II and III in the GMM and ranges from 0.21 to 0.25. Since the lower α implies the slower speed of adjustment, we see large persistence in the pattern of FDI in these transition economies.

Two specification tests in the GMM show a mixed result in column II. The p-value of the Sargan test is 0.001 and we reject the null that the over-identifying restrictions are valid. However, second-order serial correlation is not detected according to the SOC test, which implies the model is correctly specified in this respect.

One possibility is that some of our independent variables are not strictly exogenous. For example, the error term in the current period might affect future changes in real GDP and wage³⁷. We experimented with different sets of the variables and cannot reject that

³⁵ The Hausman test rejects the random effects model.

³⁶ On GMM estimation, see Arellano and Bond(1991), Ahn and Schmidt(1995, 1997).

³⁷ Cheng and Kwan(2000) test for strict exogeneity of the four variables, income, wage, education, and infrastructure and they find that the first two are endogenous, or weakly exogenous in explaining FDI in Chinese regions.

market size and labor cost are predetermined. Column III reports the results for the GMM estimates when market size and labor cost are treated as weakly exogenous. The Sargan test shows that we can no longer reject that instruments are valid in column III.

Comparing columns II and III, most coefficients are reasonably constant. One should note that, by using more instrumental variables, we recover what we initially found in the fixed-effects model in column III, particularly the significance of external liberalization and rule of law.

The results also indicate that FDI into the region consists of the various types of FDI discussed before. For example, the coefficient of market size is 0.01 throughout different specifications: an increase in real GDP by 1% leads to 0.1 % increase in per capita FDI. That is, foreign investors are indeed attracted to a large size of domestic market (market-seeking FDI). Market size becomes insignificant, however, in the GMM, which implies that market-seeking motives may not be a robust finding in these countries.

The lower cost sites also attract FDI as seen in a negative sign on labor cost. Lankes and Venables(1996) find for the first half of the 1990s that FDI in the region was mostly market-seeking. They argue that, as the region integrates into European production networks, we would observe more export-oriented FDI. Our finding is consistent with their prediction for the second half of the 1990s.

Another important explanatory variable among traditional variables is the abundance of natural resources. Since it is a qualitative variable, we cannot interpret its elasticity on FDI. But the finding on natural resources³⁸, or resource-seeking FDI is robust. Resource rich countries are mostly among the CIS such as Azerbaijan, Kazakhstan, Turkmenistan, Uzbekistan, and Russia. For these countries, the abundance of natural resources may be one of the most important drivers of FDI. We will discuss further in the next subsection.

The results on reform, policy and institutional variables are striking. Most of these

³⁸ All time-invariant variables (natural resources, distance from Brussels, trade dependence and restrictions on FDI) drop out after first-differencing, so we first transform them by multiplying by a time trend. The similar coefficients are obtained when we reestimate them by using the individual means of Y and X over time. See Hsiao(1986) for further discussion.

variables turn out to be positive and significant.

There are two trade related variables used in our regressions. One is the reform variable, cumulative external liberalization index. The other is trade dependence that measures trade openness. Not surprisingly, external liberalization contributes not only to an increase in trade volume but also greater inflows of FDI.

Greater trade openness also contributes to more FDI inflows. In emerging economies that are newly opening up, insufficient information on local conditions increases uncertainty and risks of the investment. Via goods trade, potential foreign investors may become better informed of local conditions and more encouraged to invest in the country they know better. Our result is consistent with the notion that FDI flows often complements trade flows.

Turning to institutional variables, there is a strong indication that the countries with good institutions managed to attract more inflows of FDI. Good legal system and its enforcement reflected in high scores of rule of law assures that investors' rights will be more likely to be protected and thus they are able to collect profits from their investment projects.

The other institution variable the quality of bureaucracy reflects the level of corruption and the ease of regulations. The positive and significant coefficient presents another evidence that poor public sector institutions, or poor quality of bureaucracy is a detriment to economic growth as it leads to lower investment of a foreign source.

We also find that restrictions on FDI are negative and significant, which implies that capital controls for direct foreign investment such as approval requirements and restrictions on profit remittance abroad are a deterrence for inward FDI. In this sense, FDI policy that limits foreign capital inflow is quite effective.

On the other hand, variables such as the level of education and infrastructure are found to be insignificant, though they have the expected sign. A insignificant coefficient on education is different from Noorbakhsh et al (2001) finding that high labor quality is an important determinant of FDI. Their argument is based on the fact that an increasing number of FDI projects are undertaken in more technologically sophisticated industries in developing countries, which requires higher levels of human capital. This might be true for

a broader set of developing countries such as Asia in which FDI is received dominantly in the manufacturing sector. This tendency is not observed in the CEEB and CIS countries. Another possibility is lack of cross-country variance, as most of these economies show rather high levels of human capital.

A positive sign of the inflation rate is obviously surprising. It is widely accepted that disinflation in the initial stage is key factor to rapid transition and sustained growth. Countries that have relatively low average inflation rates are expected to attract more capital flows as macroeconomic risks are lower in these countries. This result may be due to potential endogeneity as it may be closely related to other policy factor: successful and swift disinflation generally occurs before the countries liberalize the external sector.

Overall, we find that FDI into transition countries is driven mainly by agglomeration, large market size, low labor cost, and abundant natural resources. Moreover, countries with good institutions, great trade openness, and lower restrictions on FDI flows are likely to receive more FDI.

Is FDI into the CIS countries driven by different factors?

The motives of FDI vary greatly across sectors in which the firm operates. For example, for natural resource based industries, the primary reason for foreign investors to choose the location is abundance of natural resources. For footloose industries that are more export-oriented (e.g. footwear, garments, and car parts assembling), low labor cost is one of the most important determinants.

Despite the obvious importance of studies of FDI determinants at the more disaggregate level, the evidence on sectoral differences is rather scarce in the existing literature. One of the few exceptions is the study by Shiells(2003) which reports for each of fifteen CIS countries sectoral and source country composition of FDI inflows. Not surprisingly, FDI in the CIS countries were mostly in resource extraction or energy transportation infrastructure. FDI in the CEEB, on the other hand, is predominantly in the manufacturing sector (Resmini, 2000).

In our data set, comparable statistics on sectoral breakdown are not available for many countries. Yet we expect to find different determinants for different sectors in FDI. To introduce sectoral differences with this limitation of the existing data, we divide the

sample into two groups, CEEB (that is, non-CIS) and CIS. If sectoral differences in the location determinants are sizeable, then we would also find different factors at work in driving FDI into the two groups of countries.

Table 3 shows GMM group-wise regressions. The Sargan and SOC tests show that the model is correctly specified.³⁹ The GMM estimators are asymptotically biased in a small sample. Alternatively, we present results with those from fixed-effects model in Table 4.

Comparing the non-CIS and CIS countries, we find that there are indeed differences between the two groups. First, the agglomeration effect is present for the non-CIS but no longer so for the CIS. Second, abundance of natural resources is one of the most important determinants for the CIS while it is not for the non-CIS. Third, telephone lines are significant only for the CIS. Finally, trade dependence is more important for the CIS countries. On the other hand, the common factors between the two groups are external liberalization, rule of law, quality of bureaucracy, and restrictions on FDI.

What is also noteworthy is that economic fundamentals such as market size and labor cost lose their statistical significance in the presence of reform, policy and institution variables⁴⁰. Particularly for the non-CIS, inward FDI is explained mainly by the agglomeration effect, the progress of external liberalization, good institutions, and less restrictions on foreign capital. For the CIS, in addition to these factors, resource abundance and the availability of telephone lines are important. A positive sign on distance from Brussels indicates that the geographical proximity to the Western market also plays a role in attracting FDI.

The different determinants between the two groups may reflect sectoral differences as well as differences in the initial conditions of these countries. The greater importance of agglomeration in the non-CIS is consistent with greater externalities associated with the manufacturing sector because possible positive externalities arising from specialized labor,

³⁹ We also estimated the GMM when market size and labor cost are weakly exogenous. But the estimators are similar. Since a small sample bias may be severe when the instrument matrix gets larger, we report here the results from strictly exogenous instrumental variables.

⁴⁰ The insignificance of market size and labor cost may be associated with endogeneity of these variables. We also estimated the model by treating both variables as weakly endogenous but their statistical insignificance remained.

and user and supplier linkages are more relevant for the manufacturing than for the resource sector. In the resource-based sector, investors might have less incentives to agglomerate as the more investors in position, the less resources to extract.

Turning to the fixed-effects model in Table 4, the same results in both groups hold up as in Table 3. The sizes of coefficients are almost identical in the CIS in Tables 3 and 4, which implies that the gains from employing the GMM might be marginal in a small sample of the CIS.

The study conducted by the EBRD finds that energy resources in some of the CIS countries (Azerbaijan, Kazakhstan, Turkmenistan, Uzbekistan, and Russia) have tended to generate larger resource rents, which reduces the likelihood of reform as incumbent elites appropriate more rents and impedes efficient resource allocation.⁴¹ In contrast, here we find that resource wealth can also be a ‘blessing’ as resource abundance is found to attract FDI inflows, which not only bring capital and employment but also increase productivity and efficiency of domestic industries via technology transfer⁴².(Campos and Kinoshita, 2002).

Whether or not FDI inflows can provide necessary impetus for further reforms is another matter. Natural resources may be a pull factor strong enough to attract FDI initially. But, without sound institutions and trade openness, FDI inflows may not continue as energy reserves dwindle in a country. To extend the benefits of FDI, the CIS needs to channel more FDI into other sectors such as manufacturing that is more persistent over time in its pattern.

We consistently find that international trade plays an important role in attracting FDI. The significance of trade dependence shows that the more open the country is, the more FDI it receives. For those countries that are not very open, they can do so by engaging in the trade reform, e.g. removal of trade controls and quotas, moderation of tariff rates and foreign exchange restrictions. For example, import quotas give bureaucrats more discretion as to the allocation of licenses, which may encourage more bribery and thus

⁴¹ See Esanov, Raiser, and Buiters(2001).

⁴² However, the benefits of technology transfer are more relevant to FDI made in the manufacturing sector than in the primary sector.

corruption. Structural reforms in trade should be encouraged not only for greater FDI but also for limiting the scope of corruption.

Improved governance reflected in the high score of quality of bureaucracy also helps increase FDI flows. Some might argue that energy oil companies are used to dealing with corrupt governments and that they may weigh quality of bureaucracy less. But even for the CIS, our results show that good governance encourages more FDI inflow. In the same token, weak legal system including property rights violations is an impediment to foreign investment. This may be due to the fact that poor legal system implies greater extent of state involvement in the economy.

In sum, the geographical distribution of FDI across transition economies are accounted for by agglomeration, the progress of external liberalization, trade openness, good governance, and sound legal system. In addition, for the CIS, the main driver of FDI is abundance of natural resources and availability of basic infrastructure such as the main telephone lines.

Although market size and labor cost are not statistically significant in group-wise regressions, one should not dismiss the importance of these economic fundamentals. In the current setup, we try to explain the spatial distribution of FDI among 25 transition economies, which is a subset of the global market. Within our samples, average labor cost is substantially lower than that in the Western market. Thus, we predict that lower labor cost is one of the reasons why firms invest in transition countries. Within 25 countries, the variance in labor cost is relatively small and this may be why labor cost loses its statistical significance. A large domestic market size might be important if FDI is aimed to serve a domestic consumer market. But in our sample its effect on overall FDI flows is rather limited.

5. Conclusions

In this paper, we study the factors accounting for the geographical patterns of FDI inflows among 25 transition economies by utilizing panel data between 1990 and 1998. The location determinants are classified into three categories: the first is country-specific advantages such as low-cost labor, large domestic market, skilled labor force, adequate

infrastructure, and proximity to the Western European markets. The second are institutions, macroeconomic policy and other policies that facilitate business-operating conditions. The third is the persistent pattern of FDI driven by agglomeration economies. Using the fixed effects and GMM models, we relate per capita FDI stock as a function of these three broad categories of variables.

The main finding is that the most important determinants of FDI location are institutions and agglomeration economies that override the importance of other economic variables. We also find that the region's FDI is motivated by abundance of natural resources and labor cost. Poor quality of the bureaucracy is found to be a deterrent to foreign investors as they conceive it as a high transaction cost which directly affects profitability of their investment projects. A similar argument is made with respect to the rule of law, which was also found to be an important determinant of FDI in transition economies. Furthermore, foreign investors prefer transition countries that are more open to trade and with fewer restrictions on FDI as the destinations of their investment. We also find that progress on economic reform (external liberalization) plays a large role.

Finally, FDI motives vary greatly between non-CIS and CIS countries. In the non-CIS countries that receive FDI mostly in the manufacturing sector, institutions and agglomeration are chief considerations for investors. In the CIS countries that receive FDI mostly in the resource sector, abundance of natural resources and infrastructure are crucial factors.

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TABLE 1: Definitions of variables

FDI stock per capita	Cumulative FDI stock per capita (constant million USD) [Source: The World Bank <i>World Development Indicator</i>]
Lagged FDI	One-year lagged cumulative FDI stock per capita
Market size	Real per capita GDP using chain method [Source: <i>Penn World Table 6</i>]
Labor cost	Gross nominal wage [Source: UNECE <i>Economic Survey of Europe</i>]
Education	General secondary school enrolment (%) [Source: UNICEF]
Natural resources	Natural resource endowment: =0 if poor, =1 if moderate, and =2 if rich [Source: De Melo et al. (1997)]
Distance Brussels	Distance from Brussels to the capital city (km)
Telephone lines	Number of telephone mainlines per 1000 people
Inflation	Annual average of current inflation rate (%)
External liberalization	Cumulative external liberalization index
Rule of law	The variable “law and order” that assesses the strength and impartiality of the legal system and popular observance of the law [Source: <i>International Country Risk Guide</i>]
Bureaucracy	Quality of bureaucracy [Source: Campos (2000)]
Trade dependence	Trade dependence as a share of GDP in 1989 [Source: De Melo et al. (1997)]
Restrictions on FDI	The index of FDI restrictions [Source: Garibaldi et al. (2001)]

TABLE 2:

Determinants of FDI : Fixed effects model and GMM

[Dependent variable = per capita FDI stock (t)]

	FE	GMM	GMM
Lagged FDI stock	0.81 (0.05)***	0.75 (0.07)***	0.79 (0.06)***
Market size	0.01 (0.008)**	0.01 (0.01)	0.01 (0.008)
Labor cost	-0.13 (0.06)**	-0.17 (0.07)**	-0.13 (0.06)**
Education	1.75 (1.98)	3.04 (2.59)	1.85 (2.01)
Natural resources	13.49 (4.25)***	18.22 (5.59)***	14.61 (4.96)***
Distance Brussels	-0.001 (0.005)	-0.002 (0.006)	-0.002 (0.005)
Telephone lines	0.51 (0.39)	0.91 (0.53)*	0.57 (0.41)
Inflation	0.007 (0.007)	0.004 (0.009)	0.007 (0.007)
External liberalization	40.48 (20.37)*	41.57 (27.70)	41.71 (20.86)**
Rule of law	6.35 (3.74)*	5.34 (5.02)	7.27 (4.28)*
Quality of bureaucracy	28.62 (13.04)**	38.95 (16.50)**	27.64 (13.32)**
Trade dependence	1.12 (0.26)***	1.35 (0.34)***	1.18 (0.30)***
Restrictions on FDI	-8.45 (3.23)**	-12.13 (3.94)***	-8.86 (3.40)***
N	132	99	99
R square	0.93	_____	_____
Sargan test	_____	0.001	0.906
SOC	_____	0.83	0.93

NOTES:

*** , ** , and * indicate 1 per cent, 5 per cent, and 10 per cent significance level, respectively. Figures in parentheses are standard errors. Time dummies are included in regressions.

Market size and labor cost are treated as predetermined variables in column 3.

TABLE 3:

Determinants of FDI: GMM

Dependent variable = per capita FDI stock (t)

	Non-CIS countries	CIS countries
Lagged FDI stock	0.54 (0.12)***	0.30 (0.21)
Market size	0.01 (0.01)	0.007 (0.01)
Labor cost	-0.11 (0.09)	0.26 (0.23)
Education	0.88 (3.55)	-5.01 (2.72)*
Natural resources	0.35 (16.50)	51.20 (10.46)***
Distance from Brussels	0.05 (0.02)**	-0.018 (0.008)**
Telephone lines	0.35 (0.96)	3.22 (1.06)***
Inflation	0.06 (0.05)	0.003 (0.003)
External liberalization	313.73 (131.64)**	142.35 (34.17)***
Rule of law	31.27 (14.06)**	26.82 (7.70)***
Quality of bureaucracy	56.38 (22.19)**	44.51 (20.14)**
Trade dependence	0.63 (0.61)	4.99 (1.19)***
Restrictions on FDI	-20.38 (7.49)***	-23.00 (7.74)***
N	67	32
Sargan test	0.1301	0.9994
SOC	0.56	0.75

NOTES:

***, **, and * indicate 1 per cent, 5 per cent, and 10 per cent significance level, respectively. Figures in parentheses are standard errors. Time dummies are included in regressions.

TABLE 4:

Determinants of FDI : Fixed effects model

[Dependent variable = per capita FDI stock (t)]

	Non-CIS countries	CIS countries
Lagged FDI stock	0.64 (0.09)***	0.30 (0.18)
Market size	0.02 (0.01)	0.007 (0.009)
Labor cost	-0.08 (0.08)	0.26 (0.20)
Education	-0.02 (2.87)	-5.01 (2.40)*
Natural resources	-3.35 (14.22)	51.20 (9.20)***
Distance from Brussels	0.05 (0.02)**	-0.01 (0.007)**
Telephone lines	0.09 (0.82)	3.22 (0.93)***
Inflation	0.08 (0.05)	0.003 (0.003)
External liberalization	264.15 (121.16)**	142.35 (30.05)***
Rule of law	28.13 (12.24)**	26.82 (6.77)***
Quality of bureaucracy	48.19 (18.42)**	44.51 (17.72)**
Trade dependence	0.51 (0.52)	4.99 (1.05)***
Restrictions on FDI	-15.82 (6.49)**	-23.00 (6.81) ***
N	80	39
R square	0.74	0.68

NOTES:

*** , ** , and * indicate 1 per cent, 5 per cent, and 10 per cent significance level, respectively. Figures in parentheses are standard errors. Time dummies are included in regressions.

Appendix 1

Summary statistics

	Obs	Mean	Std. Dev.	Min	Max
FDI stock per capita	188	164	295	0	1771
Lagged FDI stock	163	131	250	0	1572
Market size	165	6955	3249	1012	15170
Labor cost	151	167	217	0.02	1247
Education	225	19	8	4.4	51
Natural resources	225	0.52	0.75	0	2
Distance Brussels	225	2222	1387	719	522
Telephone lines	219	162	88	0	374
Inflation	225	434	1304	-0.8	15606
External liberalization	225	2.74	2.45	0	9.5
Rule of law	171	4.47	0.75	3	6
Quality of bureaucracy	225	2.45	1.63	0.83	8.33
Trade dependence	211	19	12	0	41
Restrictions to FDI	223	1.66	0.94	-0.03	3.37

Appendix 2
Correlation matrix

	FDI	Lag FDI	Size of market	Wages	HK	Nat Res	Dist	Tele	Infl	Fiscal bal	CLIE	R of Law	Buro Qual	Trad dep
Lagged FDI	0.984													
Size of the market	0.556	0.529												
Wages	0.429	0.397	0.61											
Education	0.248	0.234	0.44	0.34										
Natural resources	-0.275	-0.261	-0.234	-0.231	-0.197									
Distance Brussels	-0.371	-0.34	-0.669	-0.436	-0.416	0.256								
Telephone lines	0.4313	0.4178	0.6293	0.4991	0.7676	-0.389	-0.516							
Inflation	-0.213	-0.187	-0.206	-0.225	-0.11	0.1264	0.209	-0.12						
Fiscal balance	0.2384	0.2034	0.3235	0.3228	0.2635	-0.046	-0.268	0.274	-0.51					
External liberalization	0.6526	0.6404	0.4114	0.6113	0.4828	-0.349	-0.399	0.536	-0.37	0.3084				
Rule of law	0.4614	0.4241	0.2808	0.3890	-0.157	-0.264	-0.187	0.1407	-0.058	0.1494	0.3002			
Quality bureaucracy	0.5994	0.5724	0.5287	0.1723	0.1215	-0.364	-0.522	0.189	-0.25	0.2117	0.4558	0.564		
Trade dependence	-0.201	-0.204	-0.431	-0.438	0.102	-0.085	0.398	0.057	0.186	-0.024	-0.321	-0.335	-0.42	
Restrictions to FDI	-0.408	-0.373	-0.326	-0.194	-0.062	0.3691	0.113	-0.25	0.028	0.025	-0.215	-0.298	-0.36	0.201

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