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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

The views expressed in this Working Paper are those of the author(s) and do not necessarily represent those of the IMF or IMF policy. Working Papers describe research in progress by the author(s) and are published to elicit comments and to further debate.

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 CIS countries on the other: in the latter group, natural resources and infrastructure matter, while agglomeration matters only for the former group.

<div align="center">Contents   Page</div>

I. INTRODUCTION

Foreign direct investment (FDI) has received the attention of a vast literature that focuses on both determinants and 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. The new trade theory suggests that economies of scale are a driving force of FDI, and agglomeration effects often play a crucial role.[2]

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 FDI, for the transition economies in Central Europe and in the former Soviet Union. The transition started 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 many dimensions, including FDI. The collapse of the socialist system in the late 1980s created myriad 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 was 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.[3]

Despite early hope for large FDI inflows into the region, these high expectations have not thus far materialized. The share of FDI inflows into transition economies has been consistently less than for other developing regions such as Asia and Latin America. Between 1990 and 1994, transition economies received 2.1 percent of global FDI inflows, while Latin America received about 10 percent, and Asia received 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 received about 16 percent (UNCTAD, 2002). Although FDI flows to transition countries increased in the second half of the 1990s, they were still disproportionately concentrated in a handful of Central and Eastern European and Baltic (CEEB) countries.[4] For instance, between 1990

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[2] See Wheeler and Mody (1992), Head, Ries, and Swenson (1995), and Kinoshita and Mody (2001).

[3] See Estrin, Hughes, and Todd (1997), Lankes and Venables (1996), and Prasad and others (2003).

[4] In per capita terms, the larger recipients were Hungary, Estonia, Czech Republic and Poland. Russia, Kazakhstan, and Azerbaijan also received a large share of total inflows. See EBRD (2000), p.74.

and 1994, the CEEB received 95 percent of the total per capita FDI to transition countries. Between 1995 and 1998 the CEEB share declined, but was still 84 percent.

This paper addresses two branches of the literature on FDI. The first involves locational determinants of FDI. One of the recent developments is the incorporation of institutional quality in modeling the location decision of foreign firms. Institutions underpin local business operating conditions, but they differ from "physical" supporting factors such as transport and communication infrastructures. The basic notion is that less corruption, a fair, predictable, and expedient judiciary, and an efficient bureaucracy help attract FDI. Data limitations have impeded extensive testing of these ideas, constraining existing studies to focus on just one aspect of the issue, normally corruption. In this paper, we examine an 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. Most past studies have focused on the more advanced countries in transition, the CEEB countries, to the detriment of the CIS countries. For instance, Bevan and Estrin (2000) study the determinants of FDI inflows into 11 transition economies,[5] 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 and more complete identification of the factors that affect the success and failure of transition countries in attracting FDI. One exception is the study by Garibaldi and others (2001) that covers a large number of transition countries. Yet using different variables and different estimation methods they conclude that FDI can be well explained by macroeconomic fundamentals.[6]

We use a unique panel data set covering 25 transition economies between 1990 and 1998.[7] The results show 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

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

[6] What distinguishes our work from Garibaldi and others (2001) is the addition of institutional variables and the employment of a generalized-method-of-moments (GMM) estimator.

[7] The economies covered in the data are Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, Slovenia, Ukraine, Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, the Russian Federation, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan.

extent of economic reforms are the main determinants, while for the CIS countries,[8] abundant natural resources and economic reforms are the main drivers of FDI inflows.

The paper is organized as follows. In the next section, we review the theoretical framework on the location determinants of FDI. In Section III, we discuss the estimation method and the variables used to examine the determinants of FDI. Section IV reports the econometric results. Section V concludes the paper and outlines directions for future research.

II. LITERATURE REVIEW

What are the host-country characteristics that attract FDI? The emerging consensus is that it depends on the motives of foreign investors and, thus, which of three types of FDI they are undertaking.[9] One type of FDI is called *market-seeking* FDI, whose purpose is to serve local and regional markets. It is also called horizontal FDI, as it involves replication of production facilities in the host country.[10] Tariff-jumping or export-substituting FDI is a variant of this type of FDI. Because the reason 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. Impediments to accessing local markets, such as tariffs and transport costs, also encourage this type of FDI.

A second type of FDI is called *resource-* or *asset-seeking*: when firms invest abroad to acquire resources not available in the home country, such as natural resources, raw materials, or low-cost 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 relocating parts of the production chain to the host country. Availability of low-cost labor is a prime driver for export-oriented FDI. Moreover, FDI in the resource sector, such as oil and natural gas, is attracted to countries with abundant natural endowments.[11]

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[8] The CIS stands for the Commonwealth of Independent States, which consists of all former Soviet Union countries (excluding the Baltic States): Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, the Russian Federation, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan.

[9] See Dunning (1993).

[10] The mode of horizontal FDI is typically "greenfield investment."

[11] As reported in Esanov and others (2001), most FDI in resource-rich countries of the CIS is of this type.

The third type of FDI, called *efficiency-seeking,* occurs 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 this to be true for the first wave of EU accession countries in their sample: Czech Republic, Estonia, Hungary, Poland, and Slovenia. Prospective membership in the EU, which is conductive to the establishment of regional corporate networks, seems to have attracted more efficiency-seeking FDI to these countries after the initial announcement of the progress of EU accession.[12]

Together, the factors attracting each type of FDI suggest that the countries with a large market, low-cost labor, abundant natural resources, and close proximity to the major Western markets would attract large amounts of FDI inflows. FDI would thus go to countries with favorable initial conditions. However, research suggests that other factors also matter.

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 observed a noticeable shift from projects to serve local markets to those serving export markets. Export-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 by other investors in choosing where to invest. By locating next to other firms, they benefit from positive spillovers from investors already in place. The common sources for these positive externalities are knowledge spillovers, specialized labor, and intermediate inputs.[13]

There is much evidence on the value of agglomeration economies, although the existing studies focus on FDI in the United States or U.S. FDI abroad. A seminal work by Wheeler and Mody (1992) makes a strong case for agglomeration (and market size) in U.S.

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[12] *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.

[13] 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 goods and supply of inputs. See Krugman (1991), for example.

investors' location decisions. Barrell and Pain (1999) find similar results on U.S. 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 United States. A recent work by Cheng and Kwang (2000) reports a similar effect of agglomeration in China.

Factor-endowment 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, the theory of agglomeration economies would suggest that once countries attract the first mass of investors, the process will be self-reinforcing, without needing a change in policies. From this perspective, 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 advantage.

A growing body of literature relating institutions to economic outcomes argues that good economic institutions raise economic growth by promoting higher investment, higher educational attainment, and lower mortality (Mauro, 1995; and La Porta and others, 1998, 1999).[14] 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 are institutions and the agglomeration effect relative to other factors in the host countries.[15]

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). Yet the CEEB countries tended to recover fastest despite different inflation rates, fiscal deficits, external debts, and privatization strategies. Moreover, these countries had been relatively more open to trade even before the process of transition began. Favorable initial conditions caused these countries to receive most of the FDI to the region at the time of disintegration of the Council for Mutual Economic Assistance (CMEA) in 1991. The agglomeration effect may have magnified these trends.

In summary, 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), and transition-specific determining factors (e.g., initial conditions).

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

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

III. DATA AND ESTIMATION

The data used in this study comprise a panel of 25 transition countries (the CEEB and the CIS) between 1990 and 1998. The number of observations in the complete panel is 225 (= 25x9).[16] The definitions of the variables are found in Table 1. Our dependent variable is per capita FDI stock in real millions of U.S. dollars (deflated by the GDP deflator) and is constructed from a series of FDI inflows reported in the World Bank's *World Development Indicators* (*WDI*). 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 only be observed using time series data for FDI. In the presence of agglomeration, newly made investment would be an increasing function of past investment. Second, during the time period covered in our data, transition economies implemented 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 the difficulty of obtaining sufficiently long series of FDI data, the past studies on FDI in transition were often limited to the more advanced countries in transition (e.g., the CEEB countries), which are also the major recipients of FDI in the region. In this study, we use the full set of 25 transition economies. Including CIS countries in the data, we are hoping to introduce more heterogeneity and incorporate different motives of investment which may vary across sectors.[17]

A. 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 and by the type of investment motives. For example, market-seeking investors will be attracted to a country with a large and fast-growing local market. Resource-seeking investors will look for a country with abundant natural resources. Efficiency-seeking investors will weigh more heavily geographical proximity to the home country, to minimize transportation costs. Thus, the location of FDI is closely related to a

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[16] The data used for estimation are unbalanced, because certain observations for the key variables are missing.

[17] The main sector for inward FDI in the CEEB countries is manufacturing, while it is the resource sector in the CIS countries (UNCTAD, 2002).

country's comparative advantage, which in turn affects the expected profitability of investment. The classical sources of comparative advantage are input prices, market size, growth of the market, and the abundance of natural resources.

As noted earlier, market-seeking FDI is to serve the host country market. Market size is a measure of market demand in the country. We expect the cumulative stocks of per capita FDI to be greater in countries with a larger domestic market. To proxy for market size, we follow the literature and use real GDP per capita using the chain method (RGDPCH).[18] The figures are drawn from *Penn World Table 6*.

If foreign investors are seeking low labor costs, the availability of cheap labor will be an important factor affecting FDI. We use the nominal wage rate (WAGEN) as a proxy for labor cost.[19] We drew unpublished data from UNECE's *Economic Survey of Europe*. We would expect a negative sign on the coefficient (e.g., countries with lower labor costs would attract more FDI), particularly if vertical FDI predominates.

Potential foreign investors should be concerned not only with the cost of labor, but also with its quality. A more educated labor force can learn and adopt new technology faster, and the cost of training local workers would be less for investing firms. Thus, we also test for the impact of labor quality, using the 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. Countries rich in natural resources may attract foreign investment in those industries, possibly diverting investment from the manufacturing sector.[20] To test the effect of natural resources we use a dummy variable called NATRES, which indicates that the host country is poor(=0), moderate(=1), or rich(= 2) in natural resources.[21]

Proximity to the home country is an important factor in explaining the volume of trade flows between countries in a gravity model.[22] It is a stylized fact in the empirical

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[18] The base year is 1996.

[19] Unit labor cost is an alternative measure for wage cost. However, due to the paucity of the data on unit labor cost, we only report the results from nominal wage rate.

[20] 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).

[21] This variable is constructed by De Melo and others (1997). We also used more direct measures (e.g., proven oil and gas reserves), but the results were not significantly different.

[22] Mody, Razin, and Sadka (2002) and Portes, Rey, and Oh (2001) interpret the distance as

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. On the other hand, in horizontal FDI, transportation costs are treated as a fixed cost by investors.[23] The greater is the distance, the more likely for firms to relocate production facilities to the host country. The proximity may be also relevant for cost-motivated investments, such as vertical FDI. However, proximity in a gravity equation is generally measured as the distance between source and host countries (i.e., distance between the headquarters and foreign production sites). We cannot identify in what country FDI flows originate in the data. As an alternative, we measure the physical distance in kilometers from Brussels (the headquarters of the EU) to the capital city of the host country (DISB). This variable is a proxy for the ease of access to the major Western markets.

Good infrastructure is a necessary condition for foreign investors to operate successfully, regardless of the type of FDI. We use the number of main telephone lines (TELEPHON) from *WDI* as our infrastructure variable. Availability of main telephone lines is necessary to facilitate communication between the home and host countries.[24]

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 a stable macroeconomic environment implies less investment risk.

One indicator of a stable macroeconomic environment is a record of price stability. A history of low inflation and prudent fiscal activity signals to investors how committed and credible the government is. To measure stability, we use the annual average inflation rate (INFAV). Most transition countries experienced high inflation after liberalizing prices at the onset of transition. Those countries that embarked on stabilization programs early succeeded in bringing inflation under control rapidly. On average, the lower the average inflation rate is in the host country, the more successful was the stabilization program and

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a proxy for informational frictions.

[23] See Krugman (1991).

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

the faster GDP growth returned to positive levels. 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 sector liberalization. To measure this we use the variable CLIE, which reflects a removal of trade controls and quotas, moderation of tariff rates, and foreign exchange rate restrictions.[25] Trade liberalization and a removal or reduction of capital controls imply the speed and level of structural reforms most relevant to foreign investment.[26] Since trade flows are often a complement to FDI flows,[27] more FDI should be attracted to the countries with more liberalized trade regimes. On the other hand, if FDI is basically intended for tariff-jumping purposes, more restrictive trade regimes may attract more FDI.

Another important policy variable we use is the index of FDI restrictions (RES). Larger values indicate greater restrictions on FDI flows, which would imply lower FDI inflows. The index is constructed by Garibaldi and others (2001), based on the *IMF Annual Report on Exchange Arrangements and Restrictions*.[28]

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 the noneconomic 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 rule of law variable reflects the strength and impartiality of the legal system and popular observance of the law.[29] A higher score in the rule of law implies better legal institutions. We expect that countries with better legal infrastructure will be able to attract more FDI.

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[25] The index is constructed by De Melo and others (1997).

[26] The cumulative internal liberalization index (CLII) and cumulative private sector condition index (CLIP) were also tested. Due to high multicollinearity, CLII and CLIP were dropped.

[27] Empirical studies find that manufacturing FDI flows complement trade flows. See Caves (1996) and Singh and Jun (1996).

[28] 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 and others (2001).

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

The variable for the quality of the bureaucracy[30] 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 an honest government with modest regulations is less likely to ask for bribery and side payments.

Agglomeration Economies

Agglomeration economies emerge when there are benefits from locating near other economic units, because of positive externalities. In the present study, foreign investors may be attracted to countries with more existing foreign investment. Being less knowledgeable of a country's environment, foreign investors may view the investment decisions by others as a good signal of favorable conditions and invest there too, to reduce uncertainty.

The theoretical literature identifies 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 comes from the direct experiences of investors. This knowledge can be passed onto other foreign firms by informal communication. To benefit from such spillovers, foreign firms have to locate close to each other. Second, industry-specific localization arises 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 agglomeration.[31] Users and suppliers of intermediate inputs cluster near each other because a larger market provides more demand for a good and a larger supply of inputs.

To distinguish precisely between different types of agglomeration economies, we would need more disaggregated data (for example at the industry level) and more information on investors. With the aggregate data available to us, we must combine them into a single variable, the one-year lagged FDI stock,[32] which is the approach used in most

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

[31] See Krugman (1991).

[32] We tried to distinguish different types of agglomeration by including the interaction terms of agglomeration with the share of the industry and with urbanization in the initial year. Neither term was significant, however.

of the literature (Cheng and Kwan, 2000). Note that the inclusion of the lagged dependent variable on the right hand side makes the OLS estimates inconsistent (we address this issue below).

Initial Conditions

Before the start of transition, the countries in our sample varied greatly in their initial level of development, macroeconomic distortions, and integration into the trading system of the socialist countries. De Melo and others (1997) argue that such initial conditions play an important role in determining economic performance among transition economies.[33]

Initial conditions reflect determinants that are unrelated to policies and invariant during the sample period. For example, these include the 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.[34]

B. Estimation Method

To test for agglomeration effects, we relate current FDI stock to past FDI stock and 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:

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

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:

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

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

[34] Other initial conditions were tested but none of them were statistically significant.

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. Thus:

$$Y^*_{it} = \beta X_{it} + v_{it} \tag{3}$$

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

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

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

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

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

However, ΔY_{it-1} and $\Delta \varepsilon_{it}$ are still correlated. To get consistent estimates, we employ the instrumental variables (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 $t = 3,4,...,T$. If X_{it} is strictly exogenous, then ΔX_{it-s} (for all s) can be used as an additional instrument 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 assessed using Arellano-Bond statistics for autocorrelation, which is asymptotically distributed as N(0,1).

When the number of observations 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 a fixed-effects model and compare it with those obtained from GMM where appropriate.

IV. 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 stock[35] in year t, measured in constant millions of U.S. dollars.

A. 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 model and the second and third columns show the GMM estimations.[36] All regressions include year dummies to control for time variation from 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 effects and the partial adjustment mechanism is easily handled by including a lagged dependent variable (Cheng and Kwan, 2000).

As noted earlier, including a lagged dependent variable on the right-hand side of the equation causes OLS to yield inconsistent estimates, as the lagged dependent variable is endogenous. To address this problem, we also report the GMM results in Table 2.[37] In small samples such as ours, the GMM estimators may not be very efficient. Thus, alongside the results from GMM, we report the fixed-effects model for comparison.

Table 2 reports the results for the pooled sample. Column I shows the fixed effects model. The coefficient of the lagged FDI δ is 0.81, implying a coefficient of partial adjustment α of 0.19. This means that net investment in one year is 19 percent 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, which report the GMM model, and ranges from 0.21 to 0.25. Since the lower α implies

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[35] One 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.

[36] The Hausman test rejects the random effects model.

[37] On GMM estimation, see Arellano and Bond (1991).

the slower speed of adjustment, this implies 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, so we can reject the null hypothesis that the over-identifying restrictions are valid. However, the SOC test does not show second-order serial correlation. This would imply that the model is correctly specified, from this perspective.

The above results suggest that some of our independent variables may not be strictly exogenous. For example, the error term in the current period might affect future changes in real GDP and wages.[38] We experimented with different sets of the variables and could not reject that 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 the possibility that the instruments are valid in column III.

If we compare 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 all the various types of FDI discussed earlier. For example, the coefficient of market size is 0.01 throughout different specifications: an increase in real GDP by 1 percent leads to 0.1 percent increase in per capita FDI. This implies that foreign investors are indeed attracted to a large 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.

Lower cost sites also attract FDI, as seen from the 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 the traditional ones is the abundance of natural resources. Since it is a qualitative variable, we cannot interpret its elasticity with respect to FDI. But the finding for natural resources, or resource-seeking FDI, is robust. Most resource rich countries are in the CIS, including Azerbaijan,

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

Kazakhstan, Turkmenistan, Uzbekistan, and Russia. For these countries, the abundance of natural resources may be one of the most important drivers of FDI.[39] We will discuss this point further in the next subsection.

The results on reform, policy, and institutional variables are striking. Most of these variables turn out to be positive and significant.

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

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

As for institutional variables, there is a strong indication that the countries with good institutions managed to attract more inflows of FDI. A good system of law and law enforcement is reflected in high scores of rule of law, signals that investors' rights will be more likely to be protected. Thus they are more likely to collect profits from their investment projects.

The other institutional variable, the quality of bureaucracy, reflects the level of corruption and the burden of regulation. The positive and significant coefficient presents further evidence that poor public sector institutions or poor quality of bureaucracy deter to economic growth, as they reduce FDI.

We also find that restrictions on FDI are negative and significant. This implies that capital controls for direct foreign investment, such as approval requirements and restrictions on profit remittance abroad, deter inward FDI. In this sense, policies limiting foreign capital inflows are quite effective at inhibiting FDI.

On the other hand, variables such as the level of education and infrastructure are found to be insignificant, though they have the expected sign. An insignificant coefficient

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[39] 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. Similar coefficients are obtained when we re-estimate the models using the individual means of Y and X over time. See Hsiao (1986) for further discussion.

on education is different from the finding by Noorbakhsh and others (2001) that high labor quality is an important determinant of FDI. Their argument reflects the observation that an increasing number of FDI projects in developing countries are undertaken in more technologically sophisticated industries, which require higher levels of human capital. This might be true for a broader set of developing countries such as Asia, in which FDI occurs mainly in the manufacturing sector. This tendency is not observed in the CEEB and CIS countries. Another possibility is the lack of cross-country variance, as most of these economies show rather high levels of human capital.

Finally, 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 with relatively low average inflation rates are expected to attract more capital flows, as macroeconomic risks are lower in these countries. Our 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, greater trade openness, and fewer restrictions on FDI flows are likely to receive more FDI.

B. 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, foreign investors will base their location choice on the abundance of natural resources. For export-oriented industries (e.g., footwear, garments, and car-parts assembling), low labor costs will be more important.

Despite the obvious importance of studies of FDI determinants at the more disaggregated level, the evidence on sectoral differences is rather scarce in the existing literature. One of the few relevant studies here is by Shiells (2003), which reports for each of fifteen CIS countries the sectoral and source-country composition of FDI inflows. Not surprisingly, FDI in the CIS countries appears mainly in resource extraction or energy transportation infrastructure. FDI in the CEEB, on the other hand, was 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 important, 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 for the CIS and the non-CIS countries. The Sargan and SOC tests show that the model is correctly specified.[40] The GMM estimators are asymptotically biased in a small sample. As an alternative, we present results with those from a fixed-effects model in Table 4.

Tables 3 and 4 show clear differences between the non-CIS and the CIS countries. First, the agglomeration effect is present for the non-CIS countries, but no longer for the CIS countries. Second, the abundance of natural resources is one of the most important determinants for the CIS countries, while it has an insignificant effect for the non-CIS countries. Third, telephone lines are significant only for the CIS countries. Finally, trade dependence is more important for the CIS countries. On the other hand, external liberalization, rule of law, quality of bureaucracy, and restrictions on FDI matter for both groups of countries.

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 institutional variables.[41] Particularly for the non-CIS countries, inward FDI is explained mainly by the agglomeration effect, the progress of external liberalization, good institutions, and fewer restrictions on foreign capital. For the CIS countries, 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 for the two groups of countries may reflect sectoral differences as well as differences in initial conditions. The greater importance of agglomeration in the non-CIS countries is consistent with greater externalities in the manufacturing sector. Positive externalities arising from specialized labor, and user and supplier linkages, were more relevant for the manufacturing than for the resource sector. In the natural resource sector, investors may have less incentives to agglomerate, as more investors mean fewer resources for each to extract.

Turning to the fixed-effects model in Table 4, we find the same results in both groups as in Table 3. The sizes of coefficients are almost identical in the CIS countries in

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[40] 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.

[41] 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.

Tables 3 and 4, which implies that the gains from employing the GMM might be marginal in a small sample size such as the CIS countries.

Research 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. This reduces the likelihood of reform, as incumbent elites appropriate more rents, and it impedes efficient resource allocation.[42] In contrast, here we find that resource wealth can also be a 'blessing.' Resource abundance attracts FDI inflows, which not only bring capital and employment, but also increase productivity and efficiency of domestic industries via technology transfer (Campos and Kinoshita, 2002).[43]

Whether or not FDI inflows can provide the necessary impetus for further reforms is another matter. Natural resources may create a strong initial incentive for FDI. 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 countries need to channel more FDI into other sectors such as manufacturing, with a longer expected life.

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 trade reform, e.g., removing trade controls and quotas and moderating 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 corruption. Structural reforms in trade should be encouraged not only for greater FDI, but also to limit the scope for corruption.

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

In sum, the geographical distribution of FDI across transition economies is accounted for by agglomeration, the progress of external liberalization, trade openness, good governance, and a sound legal system. In addition, for the CIS countries, the main

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[42] See Esanov, Raiser, and Buiter (2001).

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

drivers of FDI are abundance of natural resources and the availability of basic infrastructures 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 specification, 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 costs are one reason why firms invest in transition countries. Within the set of 25 countries, the variance in labor cost is relatively small. This may explain why labor cost loses its statistical significance. A large domestic market size might be important if FDI aims to serve a domestic consumer market. But in our sample its effect on overall FDI flows is rather limited.

V. CONCLUSIONS

In this paper, we study the factors accounting for the geographical patterns of FDI inflows among 25 transition economies using panel data for the period 1990–98. The location determinants are classified into three categories. The first comprises 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 is institutions, macroeconomic policy and other policies that facilitate business-operating conditions. The third reflects the persistent pattern of FDI driven by agglomeration economies.

The main finding is that the most important determinants of FDI location are institutions and agglomeration economies. These outweigh the importance of other economic variables. We also find that the region's FDI is attracted by an abundance of natural resources and low labor costs. Poor quality of the bureaucracy is found to be a deterrent to foreign investors as the increased transaction costs adversely affect profitability of 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. We also find that progress on external liberalization plays a large role.

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

Table 1. Definitions of Variables

FDI stock per capita	Cumulative FDI stock per capita (constant million US$) [Source: The World Bank, *World Development Indicators*]
Lagged FDI	One-year lagged cumulative FDI stock per capita
Market size	Real per capita GDP using chain method [Source: *Penn World Table 6*]
Labor cost	Gross nominal wage [Source: UNECE, *Economic Survey of Europe*]
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 and others (1997)]
Distance Brussels	Distance from Brussels to the capital city (km)
Telephone lines	Number of telephone mainlines per 1,000 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: *International Country Risk Guide*]
Bureaucracy	Quality of bureaucracy [Source: Campos (2000)]
Trade dependence	Trade dependence as a share of GDP in 1989 [Source: De Melo and others (1997)]
Restrictions on FDI	The index of FDI restrictions [Source: Garibaldi and others (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	119	99	99
R^2	0.93	_____	_____
Sargan test	_____	0.001	0.906
SOC	____	0.83	0.93

Notes:
*** , **, and * indicate 1 percent, 5 percent, and 10 percent 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 percent, 5 percent, and 10 percent 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^2	0.74	0.68

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

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

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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