

Determinants of FDI in Transition Economies: The Case of CIS Countries

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Abstract. While there has been voluminous research on the determinants of FDI for developed and developing countries, little has been done on this issue for transition economies, especially, for the Commonwealth of Independent States (CIS) countries. The present paper examines the determinants of inward Foreign Direct Investment (FDI) flows in the CIS during 1995-2010. The results of empirical analysis using panel data models, conducted with the purpose of identifying the factors that determine the motivation and decision of multinational companies (MNC) to invest in CIS economies, show that regardless of the presence of high investment risk in transition economies, the choice of FDI location always depends on a preliminary analysis of countries' advantages (FDI stock, market size, abundance in natural resources) and disadvantages at macro level (fiscal imbalance and inflation). These pre-existing conditions can always roughly predict the type of FDI (resource-seeking, market-seeking, efficiency-seeking).

Keywords: determinants of FDI, CIS, MNC, panel data models

JEL classification: F21, G11, P3.

1. Introduction

FDI growth in economies in transition is often considered as being motivated by the process of economic liberalization, and the elimination of entry barriers to FDI. Transition economies now absorb more than half of global FDI, 29% of which comes from exchange between these countries. Outward FDI from these countries also have reached high records with most of their investment directed to other economies in transition. On the other hand, FDI inflows to developed countries continued to decline. Thus, the role of transition economies not only as a recipient but also as a source of FDI is growing (UNCTAD; 2006, 2011).

The collapse of the socialist system in the late 1980s created myriad investment opportunities in the Central and Eastern European (CEE) and Former Soviet Union countries, which had vast and open market and production potential for multinational businesses. These economies were industrialized, though at different levels, and had a relatively cheap yet highly educated workforce. The period of transition in these countries started more-or-less simultaneously with different inherited institutions, initial conditions, income levels, and reform paths. And Foreign Direct Investment (FDI) was expected to be an important source of modern technology and managerial knowledge perceived necessary for restructuring the local industries and firms during the transition.

However, these high expectations for large FDI inflows into these economies in transition have not come true, and they have been consistently less than for other developing regions such as Asia and Latin America. For example, these economies received 2.1% of global FDI inflows in 1990 - 94 and 3.2% in 1995 - 99, and while Latin America received about 10% and 12%,

and Asia received about 20% and 16%, respectively. Although FDI flows to transition countries has been increasing since then with the peak of almost 7% in 2008, they are still disproportionately concentrated in a handful of Central and Eastern European and Baltic (CEEB) countries. For instance, the CEEB received 95% in 1990 and 84% in 1995-99 of all FDI inflows to economies in transition (UNCTAD, 2002).

Yet, among these nearly thirty economies in transition, the region of the Commonwealth of Independent States (CIS) experienced a boom in (FDI) in recent years only. The magnitude of capital inflows resembles the FDI that poured into CEE countries in the late 1990s, which contributed to a major growth in the productivity of local industries and services there.

Hence, the purpose of this thesis work are to provide a brief overview of different theoretical and empirical studies to explain the relations between the theory of FDI and the approaches applied to economies in transition, along with theoretical origins of transition-specific variables (2); and to elaborate an econometric model of FDI determinants to identify factors that affect the success and failure in attracting FDI for the transition economies of CIS.

The work is organized as follows. In the next chapter, we review the theoretical framework on the determinants of FDI. Chapter III describes key facts about FDI inflows to these economies, and we discuss the estimation method and the variables used to examine the determinants of FDI in chapter IV, along with the econometric results. The last chapter concludes and outlines directions for future research.

2. Literature Review

According to the research results, conducted on FDI, there is not one single theory of FDI, but a range of different theoretical assumptions, approaches, and models; moreover, sub-theories of FDI are not mutually exclusive, and each of them requires components of the others, and is incomplete if taken separately (Blonigen, 2006; Faeth, 2009).

To investigate FDI in the context of transition economies, first we need to answer several questions; including: What is an economy in transition? Why do FDI to these economies need a particular consideration? Does traditional FDI theory apply the case of transition as well?

The notion of 'economy in transition' covers a wide variety of different transition states experiencing rapidly changing conditions. These countries can be divided into three groups (however, they are not homogeneous within each group, and had different conditions at the beginning of transition): Central and Eastern European (former communist bloc) countries (1), rent-seeking countries of Africa and the Middle East (2), emerging countries (China, India, and some countries of Latin America) (3). The common characteristics of these countries are the collapse of a whole economic system, abandonment of centralized planning and a common trade space, the recognition of private property, opening up to Western economies. However, insufficient level of political and economic transformation towards democracy and the free market, and stronger regional ties within some groups of transition countries make them remain separated from the rest of the world.

Extension of the traditional FDI theory to economies in transition became both necessary and possible due to new, unforeseen market conditions there, and the openness of the FDI theory. And as far as inward FDI is concerned, the main difference between transition economies and economically advanced countries consists in levels of economic liberalization, less-developed market institutions, unstable economic and political situations and hence a high level of uncertainty, demonstrating a potential risk for business, which plays an important role in risk management for MNCs doing business in transitional economies. On the other hand, the openness of FDI theory gives flexibility to the FDI model, and thus, can be extended by additional regressors. Hence, when modeling FDI determinants for transition economies, we divide our proxies into two groups, namely, the 'traditional' FDI variables drawn from theory, and transition-specific determinants.

Below we provide a brief overview of different theoretical and empirical studies to explain the relations between the theory of FDI and the approaches applied to economies in transition, along with theoretical origins of transition-specific variables.

Neoclassical Theories. Neoclassical international trade and capital market theories assume perfectly competitive markets, as a result of which international specialization leads to gains from international trade. According to this approach, the scarcity and relatively high cost of labor in developed countries make them transfer production facilities to less developed, labor-intensive countries (Caves, 1996; Cantwell, 2000). Consequently, there is only one direction of capital flows: from advanced countries to capital-scarce countries. However, in the context of transition, it was highly criticized due to absence of perfect competitive market and basic market institutions and tools. On the other hand, the assumption of capital movement from economically developed countries to the capital-scarce countries was very important for understanding incentives of FDI in transition economies (McDougall, 1960; Kemp, 1964).

Monopolistic Advantage Theory. Coase (1937), who introduced the concept of transaction costs to explain the nature and limits of the organization of the firm, initiated the discussion of the efficient allocation of assets to dispersed locations, and explained international activities of companies as their attempt to reduce transaction costs.

Consistent with Coase, Hymer (1960) offered an alternative, a microeconomic analysis of MNCs based on industrial organization theory, which relates MNCs' motives for FDI as to extend their activity abroad and transfer intermediate products such as knowledge and technology over the world. Actually, he was the first to identify the MNC as a business entity for international production rather than international trade in an imperfect market. Also, his theory highlights such important factors for transition economies as product differentiation, managerial expertise, new technology or patents, government intervention, information asymmetry, culture differences and business ethics (Caves, 1971).

Based on the hypothesis of comparative advantage of factor endowments, which suggests that differences in endowments and initial conditions between countries explain the geographical pattern of inward FDI, Vernon (1966) introduced the theory of international product life cycle. However, his model simplifies FDI as a substitute for trade, and cannot explain the investment activities of transition countries in advanced economies.

Aggregate Variables as Determinants of FDI. This theory is based on empirical findings, rather than on any existing theory of FDI. While testing MNCs' incentives to invest abroad, Scaperlanda and Mauer (1969) found evidence of an impact of GNP size on FDI in Europe. Other researches also disclosed the significant role of market size, market growth, distance

between the investor and host countries, cultural and language similarities, and diverse trade barriers as main determinants of FDI (Goldberg, 1972; Davidson, 1980; Lunn, 1980). Many investigations of FDI in transition economies are based on this approach. In the context of CEE countries, Altomonte (1998) showed that the bigger the size of the market and its potential demand, the higher the probability of attracting foreign investment; the distance between the home and the host country also influences MNCs' FDI decisions. Using an empirical model of bilateral FDI flows between the EU and CEE countries, Brenton, Di Mauro and Liicke (1998) found that income growth and business-friendly government policies were the key determinants of FDI to the region. The results of Lyroudi, Papanastasiou and Vamvakidis (2003) for transition countries for 1995-98 indicate that FDI does not exhibit any significant relationship with economic growth, which can be explained by the fact that all the transition countries had a similar crisis situation characterized by low economic growth then. Cukrowski and Kavelashvili (2001), and Mogilevsky (2001) claim that the poor transition economies attract fewer investors.

Substitute Theory of FDI. Mundell (1968) argued that relations between commodity and factor movements are substituted when high trade barriers discourage commodity movements. This implies that FDI growth will diminish exports from the home country to the host country, and capital movements driven by FDI become the perfect substitute for exports. Goldberg and Kelin (1999) also argued that FDI can serve as a complement or substitute for trade on the effects identified by the Rybczynski curve. Their results indicated that the relations between FDI and trade present a mixed pattern of linkages, while some FDI flows tend to expand manufacturing trade, the other FDI reduce trade volumes. In the context of transition economies, Johnson (2005, 2006) proved that investment in a host country leads to an increase in the trade of intermediate goods used in production, which also implies that MNCs invest in the transition host country in order to export the output to third countries (neighboring markets).

Complement Theory of FDI. An alternative to Substitute theory, complement theory, developed by Kojima (1979), states that FDI originates from the comparatively disadvantaged industries of the home country, which are potentially comparatively advantaged industries for the host country, depending on the different stages of economic development in home and host countries. In other words, export-oriented FDI occurs when the source country invests in those industries in which the host country has a comparative advantage; and thus, it is welfare improving and trade creating since it can promote both host countries' and source countries' exports. Such evidence found by him for Japanese business may also be extended to other transition countries.

The Theory of Internalization of FDI (OLI Paradigm). According to this theory of Dunning (1988), transactions are made within an institution if the transaction costs on the free market are higher than the internal costs. Later, this theory was developed into the eclectic OLI paradigm, which argues that production of a firm in a foreign country depends on these three conditions: firm should have tangible and intangible assets and skills so that they can compete with the domestic firms of the host country who have national knowledge and experience (production technique, entrepreneurial skills, returns to scale, trademark - ***Ownership***); for a firm, through an advantage taken from the host country, it should be more profitable to produce in the host country than to produce in the home country and export it (such as existence of raw materials, low wages, special taxes or tariffs - ***Location***), and realizing FDI project should be more profitable than selling, leasing or licensing the skills (advantages by producing through a partnership arrangement such as licensing or a joint venture - ***Internalization***). In the context of transition countries, Dunning was the first to consider structure of resources, market size

and government policies as the determinants of the location of FDI. He also argues that the patterns of FDI are not constant, but differ according to these determinants.

The Theory of Traditional Multinational Activity. Three approaches were proposed within this theory: the vertical FDI model, that FDI geographically fragments the production process into stages, and thus, possibly reverses trade in terms of asymmetries of factor endowments between host country and home country, and the asymmetries between countries also make it possible for trade and FDI to coexist (Markusen, 1984); the horizontal FDI model, that FDI produces the same goods and services in different locations, the interacting countries are assumed to be identical in technologies, preferences, and factor endowments, and hence MNC can be motivated by international trade (or by high productivity, lower labor costs, resource endowments, and favorable business environments) (Helpman, 1984), and the knowledge-capital model, which integrates vertical and horizontal approaches (Markusen et al., 1996). Both horizontal and vertical models highlight variables such as research and development across plants, plant-level scale economies, market size, factor endowments and transport costs, including geographical and cultural distance costs as well as the other kinds of barriers involved in the trade between home country and host country. Brenton, Di Mauro and Liicke (1998) demonstrated that FDI has a direct impact on the economy of the source country in terms of being a substitute for trade, supporting the hypothesis of complementary relationship between FDI and trade. Lankes and Venables (1996) note that the mode of MNCs' entry into transition economies forms are different and reflects changes in both internal and external conditions. Bevan and Estrin (2000) and Hunya (2000) in case of CEE countries, Kumar and Zajc (2003) in the context of Slovenia, and Sova, Albu, Stancu and Sova (2009) for the new EU countries have studied many aspects of this issue. Their general finding is that MNCs prefer to construct horizontal FDI in transitional economies patterns due to the high uncertainty of host markets.

The Resource-Based Theory of FDI. According to this theory, MNCs aim to possess resources that are rare, unique, and limited in order to beat their competitors in various performance indicators (Wernerfelt, 1984; Barney, 1991; Grant, 1991; Davidow, 1986). Tondel (2001) supports a hypothesis of market-seeking and resource-seeking investments prevailing in CEE and former Soviet republics. In line with Kudina and Jakubiak (2008), market-seeking orientation has the most positive effect on investment performance, followed by skilled labor and cheap input orientations in smaller transition countries. Based on statistically significant positive relation between FDI and market size, wage differential, the stage of the transition process and the degree of openness of the economy, Resmini (2000) also argues the same. However, in transition economies where the government is main stakeholder, the natural-resource-seeking activity of foreign investors is limited, which is particular characteristic of rent-seeking countries, such as Russia (Filippov, 2008). Consequently, foreign investors should seek labor and efficiency and form horizontal FDI patterns.

The Theory of New Economic Geography. According to Krugman (1999), if trade is largely shaped by economies of scale, then those economic regions with most production will be more profitable and therefore will attract even more production and FDI, and production will tend to concentrate in a few regions (or big cities) with high levels of business infrastructure and large market size. Analyzing FDI distribution in Russian regions, Ledyeva and Mishura (2006) conclude that only a factor of aggregate profit is robustly related to regional distribution of investment in Russia, which can be explained by the fact that only high profits can compensate for the risks and attract investors, due to unfavorable investment climate in Russia.

Diversified FDI and Risk Diversification Model. While the transaction-cost approach and the knowledge-capital model can explain horizontal and vertical patterns of FDI, they cannot explain diversified FDI (both in product and in location), as it occurs because of MNCs' desire to spread investment risk (Faeth, 2009). And there is strong evidence of this phenomenon among MNCs emerging in transition countries according to recent studies. Apart from advantage-seeking, a crucial motive for capital outflow is to avoid or diminish the unfavorable environment impact for domestic business. The attitude towards risk in the home country is strongly related to the size of FDI outflows that can be observed in transition countries (Kimino, Saal, and Driffield, 2007; Kayam, 2009).

Policy Determinants of FDI. The host government's promotion of an attractive business environment for foreign investors can influence MNCs' FDI decisions. In the context of transition, the role of government is strengthened even more by a high level of uncertainty, and thus, the risk. Tests of different proxies of transition uncertainty (such as the level of privatization and risk of expropriation, corruption, use of mass media by competitors, imperfect, non-transparent, and frequently revised legislative systems, political and economic instability, and the dual role of government in declaring policies to attract investment while in fact promoting domestic MNCs in which it is a stake-holder) produce evidence of such an impact. These factors also might cause capital flight from transition countries, and then capital return again via offshore jurisdictions (such as Cyprus, one of few countries with which many CIS countries have agreement to avoid the double taxation).

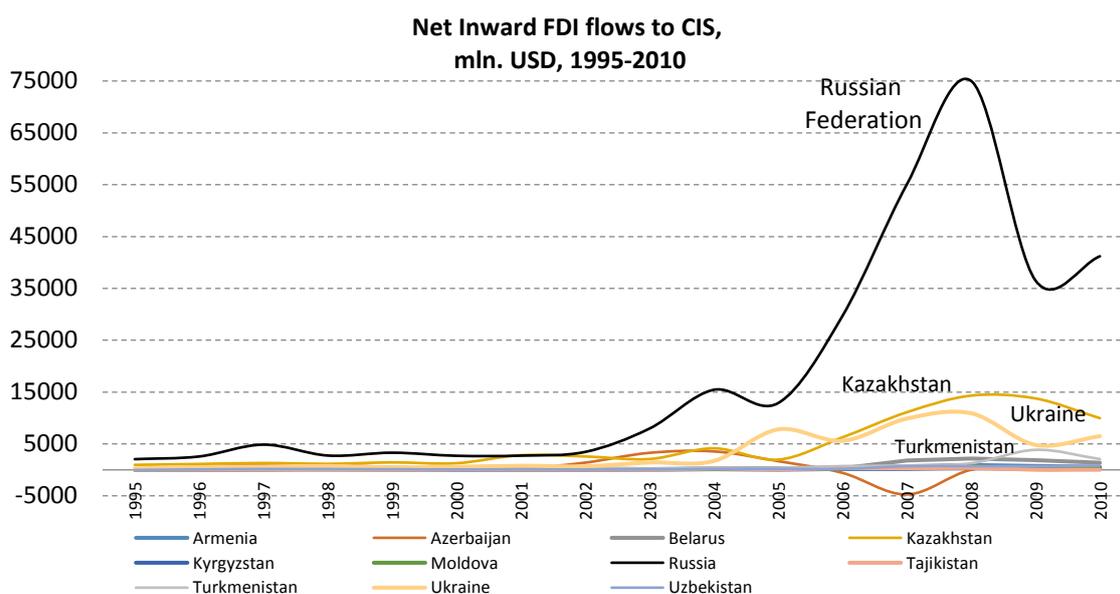
Summarizing the literature review, we can conclude that the studies of FDI patterns and their determinants in transition countries are closely connected to all main components of the classical FDI theories, though not all of the FDI theories are applicable. Thus, transition issues contribute to theories mentioned above and modify their theoretical assumptions. Nevertheless, while classical determinants of FDI almost have the same impact on FDI inflows to transition economies as in economically advanced countries, transition-specific factors differ and determinants of FDI in transition change. Regardless of the presence of high investment risk in transition economies, the choice of FDI location always depends on a preliminary analysis of countries' advantages and disadvantages. These pre-existing conditions can always roughly predict the type of FDI (resource-seeking, market-seeking, efficiency-seeking). And only then, independently of the overall incentives offered, MNC's activity is encouraged (or limited) by the host country's actual development stage reached during transition period.

Thus,

combination of classical theories and transition-specific approaches can explain FDI in transition economies.

3. FDI inflows to economies in transition

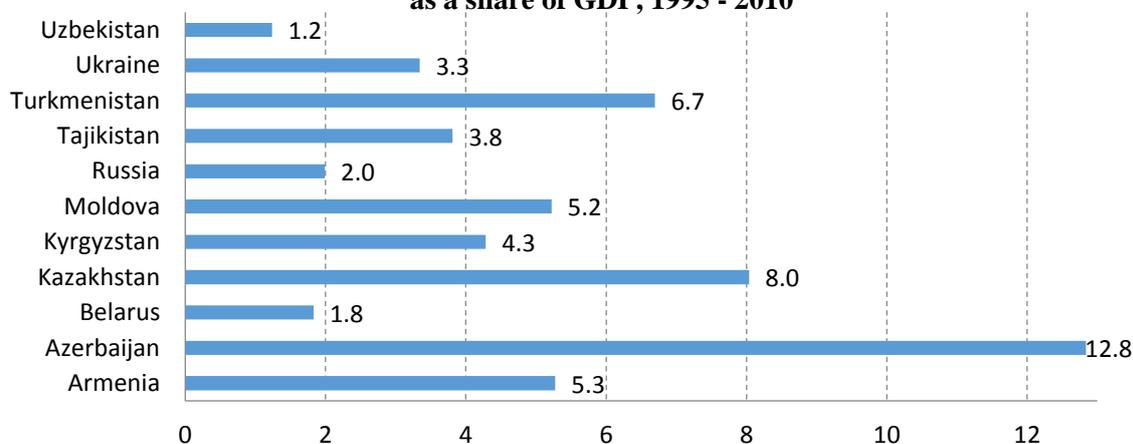
mentioned in the first chapter, FDI inflows have remained low in CIS countries during 1992 – 2002. Following the Asian financial crisis of 1997, which had negative contagion effects on Russian economy in 1998, the already low level of FDI fell down even further in the later years. Economic activity started to recover in 2002 and continued to increase till Global Economic and Financial Crisis of late 2008 (see figure 1). However, despite the crisis and stricter regulations and conditions governing natural resources projects in the Russian Federation and other transition economies, developing country TNCs have continued to access the natural resources of these economies. In addition, the fast growing consumer market of transition economies and the rise of commodity prices are inducing TNCs investment by to these countries (UNCTAD, 2011).



Source: UNCTAD, 2011

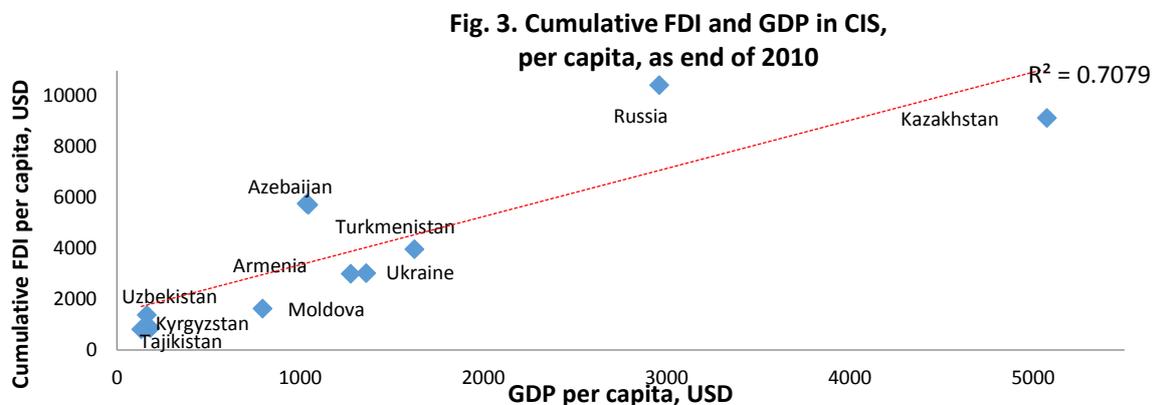
CIS countries, which are well-endowed with natural resources (Russia, Azerbaijan, Kazakhstan and Turkmenistan - oil and gas; and Kyrgyzstan - gold) have attracted relatively large amounts of FDI into the extractive industries. However, generally unfavorable investment climates (including, for example, slow rates of economic reform, high levels of corruption, poor records of enforcing existing laws and agreements, etc.), great distances from world markets and landlocked locations appear to have generally deterred investment in other sectors. In Moldova and Armenia, oil pipeline construction projects and energy sector privatization accounted for the major inflow of FDI. In Ukraine FDI inflow has been more diversified reflecting its industrial structure. In Tajikistan and Kyrgyz Republic FDI has been confined mainly to single large gold mine project in each country with small amounts of inflows to other sectors of the economy. FDI inflow to Uzbekistan and Belarus has been extremely limited, except the invested capital in the construction of the Yamal pipeline in Belarus and oil and gas sector in Uzbekistan in recent years. Net FDI inflow in Uzbekistan has been least among CIS countries (see figure 2).

**Fig.2. Annual averages of FDI inflows in CIS,
as a share of GDP, 1995 - 2010**



Source: UNCTAD, 2011

As seen from the figures above, throughout the transition period the main receivers of the foreign direct investment were Russia, Kazakhstan, Turkmenistan and Azerbaijan, which were mainly driven by their natural resource endowments. And despite these huge variations in allocation of FDI in these countries, FDI has had a positive effect on GDP during these years (see figure 3):



Source: UNCTAD, 2011

Overall, those transition economies with friendly investment environment and certain natural advantages have attracted substantial amounts of FDI than other CIS other countries. A growing number of bilateral agreements such as bilateral investment treaties (BITs) and double taxation treaties (DTTs), concluded between transition economies and other economies are expected to have positive effect on further inward FDI flows.

4. Data and estimation

The purpose of this work is to contribute to existing literature on the determinants of FDI in CIS by providing an econometric analysis of the factors affecting the pattern of FDI inflows to these 11 economies in transition during 1995-2010. Here, we develop a model by extending the findings of previous work on this issue to combine traditional FDI determinants and transition-specific factors that have significant importance in the investment decision of MNCs, which have already invested and are operating in these countries. The model relies on the panel data set recording the FDI inflows from to a host transition country i at year t . The database has been built using a number of different sources (Annual Transition Reports of EBRD, World Investment Reports of UNCTAD, and World Development Indicators of World Bank).

The common agreement on what determines the flow of FDI to a country are good economic fundamentals (high degree of macroeconomic and political stability, favorable growth prospects, a good infrastructure and legal system (including enforcement of laws), a skilled labor force, and liberalized (to some extent, such as membership in free trade areas) trade regime. Besides, location, country (market) size and natural endowments are generally important as well. In the context of the former centrally planned economies, the degree of progress made in moving from centrally planned economy towards market economy has been a key explanation of FDI. In general, those transition economies that have policies that have created friendly investment environment have attracted substantial amounts of FDI than other countries, and they often possess certain natural advantages.

On the other hand, investors choose a location of investment according to the expected profitability from there. 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 and country's comparative advantage are closely related, and the classical sources of comparative advantage are input prices, market size, growth of the market, and the abundance of natural resources.

In line with the previous work, our dependent variable is share of FDI inflow in GDP of each country. As for dependent variables, we have chosen the following traditional factors:

One of significant factors to attract FDI is *agglomeration effects*, which arises from the presence of other firms, other industries, as well as from the availability of skilled labor force in a host country. Such kind of effects emerges due to positive externalities¹ when there are benefits from locating near other economic units. To reduce uncertainty, foreign investors are generally attracted to countries with more existing foreign investment, as they view the investment decisions by others as a good sign of favorable investment.

In order to take into consideration of the existence of such effects, we use *fraction of cumulative FDI stock to GDP, with a year lag*. Moreover, this variable also represents the absorbing capability of a host country; hence, we expect a positive influence of this variable.

As mentioned in previous chapter, market-seeking FDI is to serve the host country market; and measure of market demand in the country is a market, and *real GDP per capita* can be proxy for it.

Many economists and policymakers view macroeconomic stability indicators, such as *inflation*, as a favorable condition for attracting FDI. Most investors would prefer macroeconomic stability over instability in order to secure their revenues and profitability. Moreover, very high inflation rates are sign of breakdown in normal economic relationships, and hence, lower economic growth.

The fiscal balance is also one of the indicators of the macroeconomic stability (Fischer, Sahay and Vegh, 1997), and it should have a positive effect on the FDI, the reason is surpluses are better than deficits in the eyes of investors, as in case of high fiscal deficit in a certain country, the government can impose more taxes. However, due to unavailability of such data for some countries under study, we proxy it by *external balance on goods and services (as a fraction of GDP)*.

Besides these traditional determinants of FDI, we also use following transition-specific variables as our contribution to the previous studies on this issue:

In order to operate successfully, a good infrastructure is important condition for foreign investors regardless of the type of FDI. To test the effect of infrastructure, we employ *EBRD index for overall infrastructure reform*.

¹ Technology spillovers among foreign investors, industry-specific localization (drawing on a shared pool of skilled labor and specialized input suppliers), and clustering of users and suppliers of intermediate inputs near each other (as a larger market provides more demand for a good and a larger supply of inputs).

The EBRD index for *Trade and Foreign Exchange System* is also used as an explanatory variable, which covers exchange rate market restrictions and foreign trade restrictions. Multiple exchange rates and convertibility restrictions worsen inflows of FDI, since the investors will face difficulties with repatriation of profits and also when importing intermediate goods. However, trade liberalization may have an ambiguous effect on the FDI. Trade barriers may increase inflows from market-seeking type of investors, since they want to serve local market and to overcome the trade barriers and in the case of trade being open they would simply export their products. At the same time trade restrictions will deter vertical type of investors and export-oriented investors, since the former will have obstacles with buying intermediate goods and the latter will face difficulty with selling the product in other markets.

We also employ EBRD index of *Competition Policy* as enforcement actions of a host country to reduce abuse of market power, and to promote a competitive environment. Hence, it should affect positively to FDI inflows.

The CIS countries are blessed with having some of the largest deposits of oil, gas, coal and uranium in the world. They receive much FDI in resource-based industries. That's why natural resource endowments are also expected to have a positive effect on the FDI. In order to test the effect of natural resources, we use a dummy for the richness of the countries in natural resources (0, 1, 2 for poor, intermediate and rich, countries, respectively).

4.2. Estimation method and results

Considering literature review in the previous section, we propose following model to assess the impact of variables described in attracting FDI to CIS countries during 1995-2010:

$$\begin{aligned} (FDI/GDP)_{it} = & \mu_i + \beta_1(lag_Cum_FDI_ST/GDP)_{i,t} + \beta_2 \log_RGDP_PC_{it} + \beta_3 Inf_CPI_{it} \\ & + \beta_4 Ext_Bal_{it} + \beta_5 Infrst_{it} + \beta_6 TR_EX_{it} + \beta_7 Comp_Pol_{it} + \beta_8 Bank_{it} \\ & + \beta_9 DUM_NR_{it} + \varepsilon_{it} \end{aligned}$$

Where

$(FDI/GDP)_{it}$	<i>fraction of FDI in GDP, in percentage;</i>
$(lag_Cum_FDI_ST/GDP)_{i,t}$	<i>fraction of cumulative FDI stock in GDP in a country i for year t, with a year lag;</i>
$\log_RGDP_PC_{it}$	<i>log of real GDP per capita at constant US dollars of 2000;</i>
Inf_CPI_{it}	<i>inflation rate of country i for year t, measured by CPI, annual average percentage;</i>
Ext_Bal_{it}	<i>external balance on goods and services of country i for year t, as a percentage GDP;</i>
$Infrst_{it}$	<i>EBRD infrastructure reform index of country i for year t;</i>
TR_EX_{it}	<i>EBRD trade restrictions and exchange rate market restrictions removal index of country i for year t;</i>
$Comp_Pol_{it}$	<i>EBRD competition policy index of country i for year t;</i>
$Bank_{it}$	<i>EBRD banking reform and interest rate liberalization index of country i for year t;</i>
DUM_NR_{it}	<i>dummy variable of country i for year t for the abundance in natural resources (1, if abundant; and 0, otherwise).</i>

This model is based on panel data set, thus the estimation model assumes that regression disturbances are homoscedastic with the same variance across time and countries. This may be restrictive assumption for panels, where the cross-sectional units may be varying size and

as a result may exhibit different variation (Baltagi, 2008). Likewise, ignoring the serial correlation results in consistent but inefficient estimates of the regression coefficient, and biased standard errors (Baltagi et.al., 2008). If this is the case, then it is corrected through autoregressive process of order one, AR(1).

In case of random effects (RE) model, a joint Lagrange Multiplier (LM) test for the error component model is done to detect heteroskedasticity and serial correlation. If detected, then Generalized Least Square (GLS) approach is followed to get estimators robust to heteroskedasticity and serial correlation.

And in case of fixed effects (FE) model, a modified Wald test is done for groupwise heteroskedasticity and serial correlation Wooldridge test is done. Based on the detection of either heteroskedasticity or serial correlation or both, the robust standard error is calculated to get the efficient estimator for FE model². The regression results are presented in Table 1:

Table 1

<i>Panel data Models</i>			
<i>Dependent variable: fraction of FDI inflows in GDP, %</i>			
<i>Independent variables</i>	Pooled OLS	Fixed Effect	Random Effect
$(lag_Cum_FDI_ST/GDP)_{i,t}$.150466*** (.019882)	..0793325*** (.0292532)	.1508961*** (.0198829)
$log_RGDP_PC_{it}$	2.147254** (.8315563)	2.64824 (1.960843)	2.173378*** (.8319678)
Inf_CPI_{it}	.0004381 (.0030498)	-.0008178 (.0031415)	.0011823 (.0029269)
Ext_Bal_{it}	-.1909549*** (.0313012)	-.2381321 (.0364677)	-.191411*** (.0312764)
$Infrst_{it}$	-1.964691 (1.346371)	-.3231885 (1.951634)	-1.954559 (1.343595)
TR_EX_{it}	-.8023996 (.6920933)	-.7370252 (1.183882)	-.7725773 (.6897771)
$Comp_Pol_{it}$.9738307 (1.29728)	1.173775 (1.914552)	.9790587 (1.296777)
$Bank_{it}$.3278615 (1.46165)	-1.465689 (1.812171)	.3144209 (1.457987)
DUM_NR_{it}	3.706459*** (1.147141)	----	3.720308*** (1.146593)
<i>Constant</i>	-13.85249** (6.000681)	-12.5093 (10.07042)	-14.17794 (6.005114)**
Model summary			
R^2	0.41	0.27	0.42
<i>Hausman test</i>	$chi2(8) = 19.93 Prob > chi2(8) = 0.1106$		
<i>Countries included</i>	11	11	11
<i>Total panel observations</i>	176	176	176
<i>Joint LM test</i>	LM(Var(u)=0,lambda=0) = 49.65 Pr>chi2(2) = 0.0000		

Notes:

1. Figures in parenthesis are standard errors.
2. ***, **, and * denote significance at 1, 5 and 10 % level of significance, respectively.
3. [----] denotes results are not computed.

² Before running the regression, we performed unit root tests for stationarity using Hadri test, and found that all the variables were stationary in the levels (see also Appendix 4).

The table above shows the results of OLS with dependent variable as fraction of FDI inflow in GDP on different independent variables defined in previous subchapter. The RE model provides more efficient estimators than those of the other models under Hausman test, with overall R-square of 41.7%. The joint LM test suggests that RE model suffers from heteroskedasticity and serial correlation. Therefore, we calculate the estimators using GLS approach, which is robust to heteroskedasticity and serial correlation issue.

Table 2

<i>Dependent variable: share of FDI inflows in GDP, %</i>	
<i>Independent Variables</i> (<i>lag_Cum_FDI_ST/GDP</i>) _{i,t}	Robust RE
	.1508961*** (.0193098)
<i>log_RGDP_PC</i> _{it}	2.173378*** (.8079868)
<i>Inf_CPI</i> _{it}	.0011823 (.0028425)
<i>Ext_Bal</i> _{it}	-.1914111*** (.0303748)
<i>Infrst</i> _{it}	-1.954559 (1.304867)
<i>TR_EX</i> _{it}	-.7725773 (.6698946)
<i>Comp_Pol</i> _{it}	.9790587 (1.259398)
<i>Bank</i> _{it}	.3144209 (1.415961)
<i>DUM_NR</i> _{it}	3.720308*** (1.113543)
Constant	-14.17794 (5.832019)**

Notes:

1. Figures in parenthesis are standard errors
2. ***, **, and * denote significance at 1, 5 and 10 % level of significance, respectively.

The GLS regression results present the following:

The impact of *agglomeration effects*, proxied by fraction of Cumulative FDI with a year lag, and its consequent implications on the attractiveness of a country's investment climate is relatively large (0.15) and highly significant, which shows that foreign investors are generally attracted to countries with more existing foreign investment, as they view the investment decisions by previous investors as a good sign of favorable investment.

GDP per capita, a proxy for market size, is highly significant and second largest positive determinant of FDI, and it is result of the inward FDI aimed to serve a domestic consumer market in recent years;

A positive, yet trivial value of the *inflation rate* is quite surprising (though not significant): as widely accepted, countries with high inflation rates are expected to distract capital flows, because macroeconomic risks become higher in these countries. On the other hand, other policy factors, including further liberalizing the external sector might lead to disinflation, which investors hope to occur in CIS countries. We also can explain by the fact that high inflation for long periods may make people accustomed to it, and hence lead them to develop various mechanisms for coping with inflation. And this, as we believe, makes FDI inflow unrelated to high inflation rates.

External balance on goods and services has an expected negative and significant effect on FDI inflows: foreign investors perceive fiscal deficit as a risk and further impediment to repatriate their profits (such as higher requirements for mandatory sales of foreign currency at a low exchange rates).

In our estimations, all the policy variables for transition period turned out to be insignificant and in some cases even contrary to what we expected, including:

EBRD index of **infrastructure reform** is the biggest contributor to distract FDI: though we expected a positive impact of it in attracting FDI (through better roads, transportation links and logistics), the fact that public infrastructure is usually not open to foreign investment might be reason to get negative result.

We also used a trade related variable, **EBRD reform index for reforms in exchange rate and external trade liberalization**, in our regressions. Not surprisingly, reforms in these sectors towards liberalization contribute not only to an increase in trade volume, but also to greater inflows of FDI. However, our result is not consistent with the notion that FDI flows often complement foreign trade liberalization reforms;

Competitive environment in terms of reducing abuse of market power by competition legislation and institutions, absence of entry restrictions to most local markets, in a host country also should attract more FDI. Our estimation results also confirm that EBRD index for **Competition Policy** affects positively on FDI inflows.

The EBRD index reform in **banking**, which covers the reforms in banking and interest rate liberalization, has a positive impact on FDI investment decisions to these countries. The differences in magnitude and intensity in accomplishing those reforms among CIS countries might be the reason of such results;

Another important explanatory variable is the abundance of natural resources. However, we cannot interpret its elasticity with respect to FDI as it is a qualitative variable. But the finding for **dummy for natural resources**, or resource-seeking FDI, is robust and has significant, and has the largest positive effect on inward FDI.

5. Conclusion

The analysis presented in this thesis work has enabled us identify some key determinants of FDI inflows to the transition economies of Commonwealth of Independent States (CIS) countries, using panel data for the period of 1995-2010. The results of empirical analysis show that only combination of traditional and transition specific variables can explain better the pattern of inward FDI in transition economies.

Based on a cross-section panel data analysis, we found that FDI flows are relatively highly influenced by agglomeration effect due to positive externalities that arise by locating close to each other. Moreover, high level of uncertainty make foreign investors prefer the countries with more existing foreign investment, as they view the previous investment decisions by others as a good sign of favorable investment. We also found strong evidence that market size has significant positive impact on FDI due to market-seeking pattern of the inward FDI, especially, in recent years.

Though we got the expected results that confirm the hypothesis that countries with large external balance deficit and high levels of inflation distract the FDI, their magnitude is relatively small, especially, in the context of inflation.

The estimation results on policy variables, namely, reform indexes in a host country which are measured and published by EBRD (infrastructure, competition policy, Trade and foreign exchange system and Banking) are found out to be insignificant, which might be the result of imperfect proxies (or they may be correlated with each other or with other factors that also influence to investment decisions), and thus, their estimated coefficients are hard to interpret.

Thus, the results show that regardless of the presence of high investment risk in transition economies, the choice of FDI location always depends on a preliminary analysis of countries' advantages (FDI stock, market size, abundance in natural resources) and disadvantages at macro level (fiscal imbalance and inflation). These pre-existing conditions can always roughly predict the type of FDI (resource-seeking, market-seeking, efficiency-seeking).

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Appendixes

Appendix 1

Definitions of Variables

<i>Variable</i>	<i>Proxy</i>	<i>Source</i>
<i>Agglomeration effect</i>	amount of cumulative FDI stock of a country, in percentage of GDP.	The World Bank, World Development Indicators
<i>Market size</i>	real GDP per capita at constant US dollars of 2000.	The World Bank, World Development Indicators
<i>Inflation rate</i>	Inflation rate of a country measured by CPI, annual average, in percentage	The World Bank, World Development Indicators
<i>Fiscal Balance</i>	External balance on goods and services of a country, in percentage of GDP.	EBRD, Transition reports
<i>Infrastructure*</i>	EBRD index of infrastructure reforms in electric power, railways, roads, telecommunications, water and waste water.	EBRD, Transition reports
<i>Trade and Exchange Rate restrictions*</i>	EBRD index of reforms aimed to remove trade restrictions and exchange rate market restrictions.	EBRD, Transition reports
<i>Competition Policy*</i>	EBRD index of reforms towards creating a Competition Environment, including legislation and institutions, enforcement action on dominant firms, reduction in abuse of market power.	EBRD, Transition reports
<i>Banking Reforms*</i>	EBRD index of reforms in banking sector of a country.	EBRD, Transition reports
<i>Natural resources</i>	Dummy variable for the abundance in natural resources (1, if abundant; and 0, otherwise).	De Melo and others (1997)

* Notes on Transition indicators methodology:

The transition indicator scores reflect the judgment of the EBRD's Office of the Chief Economist about country-specific progress in transition. The scores are based on the following classification system: "+" and "-" ratings are treated by adding 0.33 and subtracting 0.33 from the full value, and they range from 1 to 4, as following :

Infrastructure:

The ratings are calculated as the average of five infrastructure reform indicators covering electric power, railways, roads, telecommunications, water and waste water;

Trade and foreign exchange system

- 1 Widespread import and/or export controls or very limited legitimate access to foreign exchange.
- 2 Some liberalisation of import and/or export controls; almost full current account convertibility in principle, but with a foreign exchange regime that is not fully transparent (possibly with multiple exchange rates).
- 3 Removal of almost all quantitative and administrative import and export restrictions; almost full current account convertibility.
- 4 Removal of all quantitative and administrative import and export restrictions (apart from agriculture) and all significant export tariffs; insignificant direct involvement in exports and imports by ministries and state-owned trading companies; no major non-uniformity of customs duties for non-agricultural goods and services; full and current account convertibility.
- 4+ Standards and performance norms of advanced industrial economies: removal of most tariff barriers; membership in WTO.

Competition policy

- 1 No competition legislation and institutions.
- 2 Competition policy legislation and institutions set up; some reduction of entry restrictions or enforcement action on dominant firms.

- 3 Some enforcement actions to reduce abuse of market power and to promote a competitive environment, including break-ups of dominant conglomerates; substantial reduction of entry restrictions.
- 4 Significant enforcement actions to reduce abuse of market power and to promote a competitive environment.
- 4+ Standards and performance typical of advanced industrial economies: effective enforcement of competition policy; unrestricted entry to most markets.

Banking reform and interest rate liberalization

- 1 Little progress beyond establishment of a two-tier system.
- 2 Significant liberalisation of interest rates and credit allocation; limited use of directed credit or interest rate ceilings.
- 3 Substantial progress in establishment of bank solvency and of a framework for prudential supervision and regulation; full interest rate liberalisation with little preferential access to cheap refinancing; significant lending to private enterprises and significant presence of private banks.
- 4 Significant movement of banking laws and regulations towards BIS standards; well-functioning banking competition and effective prudential supervision; significant term lending to private enterprises; substantial financial deepening.
- 4+ Standards and performance norms of advanced industrial economies: full convergence of banking laws and regulations with BIS standards; provision of full set of competitive banking services.

Appendix 2

Summary of the data used

<i>Variable</i>	<i>Number of observations</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Minimum</i>	<i>Maximum</i>
$(FDI/GDP)_{i,t}$	176	5.009822	6.301526	-14.36902	45.14587
$(lag_Cum_FDI_ST / GDP)_{i,t-1}$	176	23.54455	21.47134	0.23	140.49
$log_RGDP_PC_{it}$	176	6.63108	.7857637	4.8	8.02
Inf_CPI_{it}	176	48.61399	138.314	-8.5	1005.3
Ext_Bal_{it}	176	-7.175284	18.43715	-55.23	42.31
$Infrst_{it}$	176	1.728807	.5422906	1	2.67
TR_EX_{it}	176	3.088068	1.074981	1	4.33
$Comp_Pol_{it}$	176	1.9125	.3909761	1	2.33
$Bank_{it}$	176	2.037784	.5882382	1	3
DUM_NR_{it}	176	.8181818	.386795	0	1

Appendix 3

Correlation among the variables used

	<i>lag_Cum_FDI/GDP</i>	<i>Ln(RGDP_PC)</i>	<i>CPI_INFL</i>	<i>Ext_Bal</i>	<i>Infr</i>	<i>TR_EX</i>	<i>Comp_Pol</i>	<i>Bank</i>	<i>Dum_NR</i>
<i>lag_Cum_FDI/GDP</i>	1.0000								
<i>Ln(RGDPPC)</i>	0.2170	1.0000							
<i>CPI_INFL</i>	-0.2229	-0.1395	1.0000						
<i>Ext_Bal</i>	0.0178	0.5352	0.0461	1.0000					
<i>Infr</i>	0.3462	0.4607	-0.3157	0.0315	1.0000				
<i>TR_EX</i>	0.3372	-0.1015	-0.3275	-0.3299	0.6195	1.0000			
<i>Comp_Pol</i>	0.0638	0.1616	-0.1664	0.0693	0.5053	0.4612	1.0000		
<i>Bank</i>	0.3846	0.2276	-0.3073	-0.2186	0.7845	0.7879	0.5461	1.0000	
<i>Dum_NR</i>	0.1075	-0.0550	-0.0273	0.2789	0.0562	-0.0017	-0.1557	0.0053	1.0000

Appendix 4

Hadri Unit Root Test Results*

Variable	With no trend	With Trend
$(FDI/GDP)_{i,t}$	4.2641***	4.3874***
$(lag_Cum_FDI_ST/GDP)_{i,t-1}$	10.8672***	16.1523***
$log_RGDP_PC_{it}$	29.2377***	10.1547***
Inf_CPI_{it}	9.0215***	8.3431***
Ext_Bal_{it}	17.3057***	6.8598***
$Infrst_{it}$	22.1828***	9.4144***
TR_EX_{it}	16.2994***	8.2776***
$Comp_Pol_{it}$	24.5835***	7.8126***
$Bank_{it}$	23.5765***	8.9274***

* Notes: Hadri panel stationarity test performs a test for stationarity in heterogeneous panel data (Hadri, 2000). This Lagrange Multiplier (LM) test has a null of stationarity, and its test statistic is distributed as standard normal under the null. The series may be stationary around a deterministic level, specific to the unit (i.e. a fixed effect) or around a unit-specific deterministic trend. The error process may be assumed to be homoskedastic across the panel, or heteroskedastic across units. Serial dependence in the disturbances can also be taken into account using a Newey-West estimator of the long run variance. The residual-based test is based on the squared partial sum process of residuals from a demeaning (detrrending) model of level (trend) stationarity.

(Source: Hadri, Kaddour. *Testing for stationarity in heterogeneous panel data. The Econometrics Journal*, 3, 2000, 148-161.)

Appendix 5

Correlation among the variables used

	<i>lag_Cum_ FDI/GDP</i>	<i>Ln(RGDP_PC)</i>	<i>CPI_INFL</i>	<i>Ext_Bal</i>	<i>Infr</i>	<i>TR_EX</i>	<i>Comp_ Pol</i>	<i>Bank</i>	<i>Dum_NR</i>
<i>lag_Cum_ FDI/GDP</i>	1.0000								
<i>Ln(RGDPPC)</i>	0.2170	1.0000							
<i>CPI_INFL</i>	-0.2229	-0.1395	1.0000						
<i>Ext_Bal</i>	0.0178	0.5352	0.0461	1.0000					
<i>Infr</i>	0.3462	0.4607	-0.3157	0.0315	1.0000				
<i>TR_EX</i>	0.3372	-0.1015	-0.3275	-0.3299	0.6195	1.0000			
<i>Comp_ Pol</i>	0.0638	0.1616	-0.1664	0.0693	0.5053	0.4612	1.0000		
<i>Bank</i>	0.3846	0.2276	-0.3073	-0.2186	0.7845	0.7879	0.5461	1.0000	
<i>R</i>	0.1075	-0.0550	-0.0273	0.2789	0.0562	-0.0017	-0.1557	0.0053	1.000