WHAT ARE THE MAIN DETERMINANTS OF THE FDI INFLOWS INTO BELARUS?

by

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Abstract

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The topic of FDI inflow into economy in transition is of primary importance because of its crucial role in the building of new market economies. The investigation of factors that determined the FDI inflow into Belarus remains germane, because authors still fail to provide any empirical pieces of research for this country. To examine this issue the gravity equation model is applied to Belarus. The study is motivated in the context of the OLI paradigm and the most recent FDI literature. There was revealed that FDI flow of higher level comes from the countries with larger GDP. It has also been found that geographical proximity plays important role for the foreign investors. Besides, it was not discovered any evidence that difference in hourly compensation between source and recipient country had impact on FDI inflow in Belarus during 1993-2001. For other variables, the level of freedom and GDP in Belarus, the results are not so certain. In addition, during the investigation a proper functional from for the model was discussed. As a result this paper provides an empirical support to the theoretical models in the case of Belarus. Thus, this piece of research fills the gap in the empirical studies devoted to the determinants of FDI inflow into Belarus.

TABLE OF CONTENTS

LIST OF FIGURES AND TABLES

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GLOSSARY

CEEC. Central and Eastern Europe Countries, i.e. Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, FR Yugoslavia, FYR Macedonia, Hungary, Poland, Romania, Slovak Republic and Slovenia.

FDI. Foreign Direct Investment is the category of international investment that reflects the objective of a resident entity in one economy obtaining a lasting interest in an enterprise resident in another country. (IMF, http://www.imf.org/external/np/sta/di/index.htm)

Efficiency seeking investment. Investment motivated by the search of the low-cost host countries and the production is exported to the home country of foreign direct investment and/or other targeting markets. (Reiljan 2000)

Market seeking investment. Investment motivated by the search of the host country's (and neighbouring countries') market. (Reiljan 2000)

OECD. Organisation for Economic Cooperation and Development.

(Natural) Resource seeking investment. Investment motivated by the desire to reduce costs and provide access to raw materials.(Reiljan 2000)

Strategic asset seeking investment. Investment oriented towards acquiring resources and capabilities that the investing firm believes will sustain or advance its core competencies in regional or global markets. (Reiljan 2000)

Chapter 1

INTRODUCTION

The issue of foreign direct investment (FDI) inflows to the transition economies is widely discussed both by scholars and policymakers. It is not surprising, because FDI contributes substantially to the transformation process and economic growth in the majority of the post-soviet countries. Thus, many economists try to find the most important determining factors of the FDI inflow to the country in order to obtain necessary information for creating effective policy for FDI attraction. This issue is especially relevant for the countries like Belarus and Ukraine, because of their weak progress both in transformation process and attracting FDI. Therefore, the main question of the research will be as follows: "What are the main determinants of the FDI inflows into Belarus?"

Due to its importance and relevance the problem of the FDI inflows to transition countries has already been discussed very extensively in research and analytical papers. But the stated question does not loose its novelty for the following reasons. There is no any research on the determinants of FDI inflow to Belarus that is supported by the econometric analysis or any other formal methods. Furthermore, western researchers exclude Belarus from the analysis. (Bevan and Estrin, 2000) The most possible reason for doing so is the lack of the data.

For the transition countries the vast majority of the authors usually uses Dunning's OLI eclectic paradigm as a theoretical framework to explain FDI movements. (UN, 1998) According to this theory, a firm uses three types of the

advantages (ownership, internalization and location) that help it to undertake FDI[1].

Frequently, politicians, managers and economists in their research papers postulate that there are four the most important location determinants of the FDI inflow to the economy viz.:

- relative labour costs,
- domestic market characteristics and possibilities of access to the global and regional markets,
- geographical proximity,
- economic, political and social stability.

The influence of these and other factors on the FDI inflow to Belarus will be examined in this paper. The hypothesis for the research is that during the years of transition the determining factors of the FDI inflows to Belarus were the same as they were in the majority of CEECs in transition. For this purpose gravity equation model will be employed.

[1] The meaning of these advantages will be explained further in this work.

Chapter 2

THEORETICAL FRAMEWORK

Historically one can hardly find a theory, which is able to completely explain all the aspects of FDI, i.e. their existence per se, appearance of new FDI, investing into existing foreign branch, and etc. Scholars developed a number of theoretical foundations that are rather complementary than rival to each other. (Root 1994) The approaches are presented in Table 1.

Table 1 Mainstream Theories of FDI and Foreign Owned production (a selected sample)

Approach	Main idea
1	2
Theories of industrial organisation	Why firms of one nationality are able to penetrate (via FDI) the value added territory of firms of another nationality?
Theories of the firm: a). Resource based b). Transaction related c). Strategy related d). Internalisation process e). Option theory	Why (and how) firms expand their territorial boundaries outside their home countries?
Theories of trade: a). Micro (firm/industry oriented) b). Macro (country-oriented)	Why do firms engage in FDI rather than trade; and how does FDI effect extant trade theories

1	2
Theories of location: a). General b). Internalisation c). Clustering and agglomeration d). Exchange rate e). Knowledge enhancing f). Spatial transaction costs	What determines where firms locate their value added activities
Theories of FDI: a). Risk uncertainty b). Exchange rate/market imperfections	What explains the extent to which firms finance their foreign activities by equity capital exports from their home country? And what determines the location of such FDI

Source: on the basis of Dunning (2000)

Today one of the most popular theoretical foundations used to investigate the phenomenon of FDI is Dunning's OLI eclectic paradigm. One of the most appealing distinctive features of this approach is its ability to explain the patterns of the location of FDI in the world. (Root 1994) Besides, this theory absorbs the ideas of a number of approaches presented above (i.e. industrial organization, internalisation, etc.), covers all types of the foreign involvement of an enterprise (exporting, contractual agreements and FDI), and is relevant to all types of FDI. (Dunning 1981)

According to this paradigm, a stock of the FDI or changes in this stock in a country is determined by three sets of factors or advantages viz.: ownership, internalisation and location advantages. (Dunning 1981)

Dunning postulates that ownership specific advantages (O-advantages) indicate the degree to which home enterprises possess or can gain access to the assets (both tangible and intangible) that give them an ability to compete successfully with enterprises in foreign markets. These assets should be transferable across the borders. Internalisation advantages (I-advantages) exist when an enterprise finds it more efficient to internalise cross-border operations rather than use external markets. Location advantages (L-advantages) exist when an enterprise finds it efficient to operate in certain foreign market, i.e. local environment is enough attractive. The list of these advantages is presented in Appendix 1 and Appendix 2[2]. L-advantages are grouped according to their relevance to certain type of investment: resource seeking, market seeking, efficiency seeking, and strategic asset seeking. This representation is very important, especially for policy considerations. (Dunning 1998)

Further, Dunning argues that to choose the mode of foreign involvement an enterprise should possess a specific set of advantages. The matrix of possible decisions is presented in Table 2.

According to the theory, to undertake a foreign direct investment an enterprise should possess each type of the advantages. Certainly, ownership advantages are the prerequisite of any foreign operation.

At the same time, one should take into account that FDI is a complex venture, therefore home and host country characteristics, type, scale of an enterprise activity, strategy and characteristics of the particular enterprise play an important role.

[2] The list is aimed to provide just a main idea about OLI factors and does not provide a complete set of determinants

Table 2 – Alternative Routes of Servicing markets

		Advantages		
		ownership	internalisation	location
Route of servicing markets	FDI	yes	yes	yes
	Exports	yes	yes	no
	Contractual agreements	yes	no	no

Source: Dunning (1981)

However Dunning's approach is not undisputable. Resmini (1999) provides a good review of the drawbacks of this theory found by other scholars. The main flaws are as follows:

- Taxonomic character;
- Failure to consider alternative to FDI modes;
- Failure to pay particular attention to political and social elements;
- Static nature.

At the same time, Brouthers et. al (1999) provided empirical evidence that OLI theory is rather normative than descriptive one. Besides, Pedersen (2002) provided approach how on the basis OLI paradigm one can explain various modes of contractual agreements. Nevertheless, researchers investigating determinants of FDI flows to transition economies argue that OLI paradigm provides them with at least good taxonomic framework for estimation. (Bevan and Estrin 2000, Martin 1997, and others)

Chapter 3

EXTANT EMPIRICAL WORKS

This chapter is aimed to review the extant empirical works on the FDI inflows determinants mostly for transition economies. The chapter will be organized as follows. Firstly, general review will be provided in order to make a distinction between works for different types of economy. Then the methodology used for the transition economies is considered. Finally, this chapter provides the review of the empirical results for the most frequently used determinants.

A large number of scholars in their empirical works have investigated the determining factors of the FDI inflows into the economy. These works were conducted both for the different groups of countries and particular economies or regions.

Being in process of transformation to market economy, post-Soviet countries are characterized by weak and underdeveloped market mechanisms and institutional structure. (Bevan et. al. 2000) Thus, the cases of these countries are quite distinct and require cautious analysis. To allow for these differences researches usually have to consider this group of countries separately. Therefore the pieces of research devoted to the determinants of the FDI inflows for the countries with transition economies are of special interest for this research. Bevan and Estrin 2000, Bevan et. al. 2000, Caetano et. al. 2002, Garibaldi et. al. 2002; Reiljan 2001; Resmini 1999, Swain and Wang 1995 and others made most recent contributions to the empirical investigation of this issue.

Notwithstanding transition economies have a set of distinctive features, the evidence of the developed countries are also of great interest for understanding driving forces of the investors' choices. For instance, good lessons could be learned from the case of Spain, which, like Belarus, had a period of deliverance from an economic autarky and beginning of the integration to the European region. (Martin, 1997) Findings of Coughlin et. al. (1991) and Friedman et. al. (1996) who investigated state characteristics as the determinants of the spatial distribution of the FDI within the USA are also valuable. Works of Barrel and Pain (1996, 1997) for OECD countries could also give useful insights.

Besides, the experience of newly emerged markets like China could prove germane due to the similar processes being under way in these courtiers. (Liu et. al 1997) Moreover, Swain (1995) whilst investigating determinants of the FDI inflows in China and Hungary classified them in one group of "transforming economies".

The pieces of research mentioned above employ a number of various formal models and estimation techniques. To choose an approach for the estimation one could not neglect such crucial factor as availability of the data on FDI. This issue is aggravated by the fact that the data sets are too small for transition economies.

In the case of transition countries the most popular approach for estimating FDI inflows is gravity equation model, which could be presented as follows:

$$M_{ijk}=\alpha_k Y_i^{\beta k} Y_j^{\gamma k} N_i^{\delta k} N_j^{\varepsilon k} d_{ij}^{\zeta k} U_{ijk} \qquad (1)$$

Where M_{ijk} is the flow in the monetary units of good or factor k from country or region i to country or region j, Y_i and Y_j are incomes in i and j, N_i and N_j are the population in i and j, and d_{ij} is the distance between countries or regions i and j;

U_{ijk} is an error term. (Anderson 1979) For the explanatory variables should be used the proxies for the economic forces fostering or resisting the flows. For instance, in this way did Martin (1997), Bevan and Estrin (2000), Caetano (2002), and others employed gravity equation approach (however, they incorporated variables relevant for the FDI flows).

This approach is popular in explaining different types of flow (commodities, migration, commuting, and etc.) due to its high statistical explanatory power. (Anderson 1979, Bergstrand 1985) In addition, for transforming economies a gravity equation is popular because it allows constructing panel data set for particular country through the breakdown the FDI inflows by donors. Above all this breakdown makes this approach suitable to incorporate proxies for ownership and internalisation advantages within OLI framework (see Appendix 1). Thereby, almost all pieces of research for transition economies are conducted for bilateral FDI flows using panel data estimation.

Usually, log-liner (Caetano, and others) functional form of the equation is employed. Unfortunately, no author considered in this review explained the choice of the functional form. In this light the work by Cuarian et .al. (1993) who suggested the way of choosing the proper functional form is very useful.

Using gravity equation (and employing not only this approach) investigators filled it with the factors according to the OLI theory. To explain the patterns of the FDI inflows to the transition economies researches most frequently used determinants as follows: relative labour costs, host and home market characteristics and access to the regional and global markets, progress of transformation, and geographic proximity. To consider the peculiarities of countries, regions or group of countries researchers also included into their analysis other determinants viz.: human capital, degree of openness, industrial

concentration, etc. (Bevan and Estrin 2000, Resmini 1999, and others) Further in this chapter the most frequently used determinants will be considered.

In fact, no researcher casts doubt on the positive link between the progress in transformation and amount of FDI flows to transition economy. Moreover, this factor is recognized to be of primary importance. In the empirical works this progress is regarded as a complex issue. It means that investigators took some complex indicators that usually embody a set of various components viz.: legal framework, macroeconomic situation, privatisation approach, industrial structure, corruption and etc. For example, Resmini (1999) used Orientation Risk Index, which weights 15 different criteria; Bevan and Estrin (2000) used Institutional Investor magazine's country credit rating weighted on a number of indicators. Bevan et. al. (2000) used EBRD indices of reforms progress. However, Garibaldi (2002) included into the econometric model components of this complex indicator separately, i.e. real GDP growth, real domestic deposit rate, privatisation mode, and etc.

Conventionally, the level of labour costs is also recognized as one of the most important determinants of the FDI inflows into the transition economies. (UNCTAD, 1996) This factor is very important for resource/asset seeking and efficiency seeking investment, which dominates in post-soviet countries. (UN 1998)

Not surprisingly, recent investigations for transition economies almost unanimously showed relative labour costs to be statistically significant and to have negative relationship with FDI inflow. (Bevan and Estrin 2000, Bevan et. al. 2000, Caetano et. al. 2002, Garibaldi et. al. 2002; Reiljan 2001; Resmini 1999, Swain and Wang 1995) Furthermore, Barrel and Pain (1997) found that even in developed countries lower level of relative labour costs was still significant and

attracted FDI. Similar results declared by Liu et. al (1997) and Wang And Swain (1995) in the case of developing countries.

Unfortunately, the things could prove to be not so simple. For instance, the polls conducted among managers of the foreign companies showed that in the Central and Eastern Europe the cost of the labour was less important factor than other determinants. (EBRD, 1994) Moreover, explaining low FDI in countries with low level of wages Szyrmer (2000) argues that level of the average wage had quadratic relation with the per capita FDI in Central and Eastern Europe. Namely, the lowest levels of the average wage as an indicator of bad economic environment corresponds to the lowest levels of the per capita FDI. The medium wage level as an indicator of the relatively better economic environment and at the same time low labour costs compared to the developed countries corresponds to the highest levels of per capita FDI. Again highest levels (among transition countries) of wages deter FDI.

Other very important determinant of FDI inflow is domestic market characteristics. Market size is the most prominent among them.

All researchers reported that domestic market characteristics have positive influence on FDI inflow into the transition economies, i.e. the prospects of the high demand attract foreign investors. (Caetano 2002, Bevan et.al. 2000, Swain and Wang 1995, and others)

Thus, the most popular proxy for market size used for investigation is GDP or GDP per capita. Furthermore, the poles conducted among managers of the foreign companies showed that in the Central and Eastern Europe first of all foreign investors seek new markets and expected future economic growth as an indicator of prospective market size. (EBRD 1994)

However, the history of the economic growth tented not to affect current inflow of FDI. Econometric study showed that the growth of the real GDP appeared to be insignificant for explanation of the current FDI inflows. (UN 1998)

The effect of the geographical proximity is twofold. On the one hand, recent empirical evidence for CEECs suggests that a large distance between home and host countries induced foreign investors to undertake FDI in order to overcome high transactional costs. (Martin 1997, Bevan and Estrin 2000) On the other hand, researchers found that existence of the common borders between donor and recipient countries is an appealing factor. (Martin 1997, Bevan and Estrin 2000, Caetano 2002) At the same time, common borders could be regarded as an indicator of the potential access to the regional markets. However, researches usually incorporate separate variables for the distance and neighbourhood and obtain expected results (Martin 1997, Bevan and Estrin 2000, Caetano 2002).

Although the Belarussian scholars pay much attention to the FDI inflow to Belarus they usually produce intuitive and nonnumeric pieces of research. (Лыч 2000) One could hardly find a work, which is based on any mainstream theoretical framework for international production. If so the authors only state and describe possible host country determinants without employing econometric or any other formal methods. (Грачев 2000)

Thereby the aim of this research is to test empirically what determinants were the main driving forces for the FDI flows into Belarus. For this purpose gravity equation model will be employed. In this equation variables will be chosen according to the Dunning's OLI paradigm. Doing in this way allows incorporating into the model ownership and internalization variables and constructing panel data set. Another aim will be to find the most effective functional form for the equation to produce the estimation with higher explanatory power.

To explain the forces which aided or resisted the FDI flows into Belarus the variables for the model will be chosen on the basis of the previous experience for transition economies. Besides other set of variables will be incorporated in order to allow for the peculiar economic and politic situation in Belarus.

Chapter 4

FDI IN BELARUS: OVERVIEW[3]

During 1993-2001 foreign residents cumulatively invested in Belarus 440,809,385.36 US dollars (see Figure 1). 78% of this stock shared between 8 largest investors: Germany, USA, Cyprus, Great Britain, Poland, India, Italy, and Netherlands. The majority of this group is represented by the developed countries, which are historically the largest investors in the World. Surprisingly, investors from Japan made minor contribution.

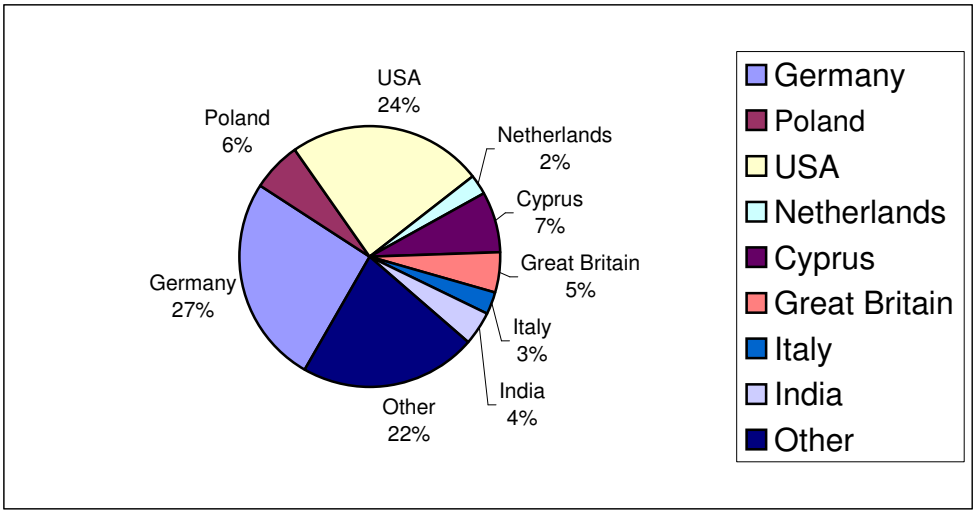

Figure 1. Shares of the largest donors in the total FDI cumulative inflow into Belarus, 1993-2001

It is interesting that third largest investor is Cyprus. However it is not surprising, because this country is known by its offshore legislation, which is very attractive for the re-investing of the capital. It seems that byelorussian businessmen invested through this area in order to obtain tax exemptions and other privileges,

[3] This chapter will be extended after the checking some aspects of the complementary data in hand.

which granted for foreign investors. This hypothesis will further in this work be tested empirically.

With exception of Ukraine, neighbouring countries are also among the "second large" investors (see Table in Appendix 3). It is remarkable that Russia invested much less than Poland, which has relatively smaller economy in terms of population, GDP, area. From the Figure 2 it becomes clear that neighbouring countries more successful in economic reforms were more consistent invertors that other neighbours.

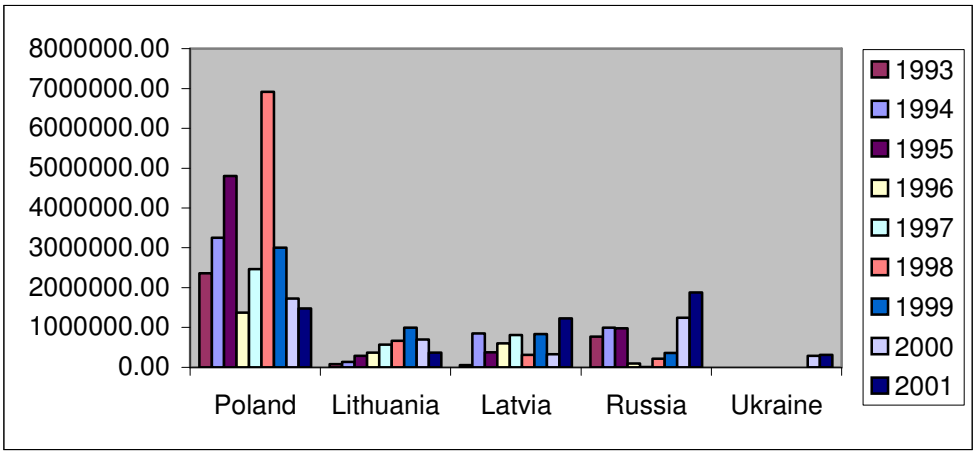

Figure 2 FDI inflows to Belarus from the neighbouring countries, 1993-2001

Among developing economies the greatest contribution into the stock of FDI is made by India. However, in this group of countries, recognized investors like China and "Asian tigers" made indeed negligible investments.

It is also should be noted that a great deal of FDI are mostly from the European region - developed countries and countries, which succeeded in transition. The exceptions here are USA, India and Canada. At a glance distant and less developed countries participated in the direct investment not regularly and with relatively small contributions.

Chapter 5

EMPIRICAL ANALYSIS

Data description

The analysis presented in this work applies to an unbalance panel of 43 countries. These countries are drawn into the sample from the set of 78 nations from which investors declared the intention to invest in Belarus[4]. The criteria for the selection into the sample were the availability of the complete data set needed for the model to be estimated and existence of non zero actual investment after the declaration of the new FDI (i.e. zeros for the dependent variables were eliminated from the sample). The list of the countries included into the sample is presented in Appendix 4.

The data observed from 1993 to 2001. However, due to the removing the zero observations for FDI, the number of observations within the groups varies from 1 to 9 years. Brief description of the main variables is presented in Table 3.

For the probit analysis there will be used the unbalanced panel data set including 379 observations. In this set there were included zero observations for the FDI variable, which were not used in the one described above[5].

It should be noted that observations for Cyprus, Luxemburg, and Bagham Islands are excluded from the sample. The reason for this is unusual nature of

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[4] According to the regulations accepted in Belarus, foreign investor should declare the volume of the authorized fund of a new firm to be registered.

[5] Zero observations were excluded from the main data set, because it is not possible to perform Box-Cox transformation to the zero values (namely for v=0 there should be done logarithmic transformation, see chapter "futher econometric issues').

direct investments from these areas, which is discussed in Chapter 4. Thus such observations have distorting influence on the analysis of determinants of foreign investments.

The data for the dependent variable $\mathbf{FDI_{it}}$ is collected on the basis of the obligatory quarterly reports, which every enterprise with foreign investments (joint ventures and enterprises wholly owned by foreign investors) submits to the Ministry of Statistics of Belarus. Every contribution of the foreign partner/owner into the authorized fund of the enterprise during its performance or at start of its life is recorded as FDI. Data set on the rest of the variables is obtained from the sources as indicated in the Table 3.

Table 3 - Data description

Variable	Description	Units	Source
FDI_{it}	FDI inflow into Belarus from country i in year t	US dollars	Special annual statistical report of the Ministry of statistics of Belarus
$WAGE_{it}$	Differential of compensation costs for production workers between donor country i and Belarus for year t	US dollars	US BLS (www.bls.org), ILO on-line database (www.ilo.org), national statistical agencies
GDP_HS_t	GDP of the host country in year t	US dollars	IMF on-line statistical database (www.imf.org)
GDP_HM_{it}	GDP of the home country i in year t	US dollars	IMF on-line statistical database (www.imf.org)
FREE	Index of freedom in recipient country in year t	score	Fredom House score (www.freedomhause.org)
$DIST_i$	Distance between capitals of recipient and donor country i	kilometres	On-line calculation device (*http://www.indo.com/distance/*)
LAG, LEAD	Dummy for the neighbouring countries[6]	-	-

[6] Neighbour countries are Lithuania, Latvia, Poland, Ukraine, and Russia. Variable LEAD is used as a proxy for the neighbour countries where the process of transformations from the planned communist economy to a market economy is successful (Lithuania, Latvia, Poland). Variable LAG is used for other countries.

The econometric model

To reveal the main determinants of the FDI inflow into Belarus during 1993-2001 the following econometric model was estimated.

$$\mathbf{FDI_{it} = \mathit{f}(GDP\_HM_{it}, GDP\_HS_{t}, WAGE_{it}, FREE_{t}, DIST_{i}, LAG, LEAD)} \qquad \mathbf{(2)}$$

This model is constructed on the basis of the gravity equation, which is widely used for the investigation of the bilateral trade and capital flows. The issue of the choosing the appropriate functional form of the model is discussed in the next section of this Chapter.

It should be noted that the model (2) is some kind of reduced from of standard gravity equation, because there is no FDI outflow from Belarus. Thus there is no bilateral capital flow and the data set consists of only FDI inflows from 43 countries during 9 years.

The selection of the variables corresponds to the OLI paradigm and accepted gravity equation set up. A more extensive discussion of the reasons for the choice of the regressors is presented below.

A GDP in the home country is a standard factor used in the gravity model. It is included into the set of the variables in order to determine the impact of the size of home economy on FDI inflow into Belarus. The variable is used as a proxy for ownership relative advantages of the investing foreign firm. A positive sign is expected. These expectations are based on the belief that larger economies (in terms of GDP) have more capacities to generate assets crucial for creating ownership advantages[7]. (Martin 1997)

[7] The list of the ownership advantages is presented in Appendix 1.

Gravity factor GDP in the host country is also comes from the accepted gravity equation set up. This variable is used to evaluate the impact of the host country market size on the level of FDI inflow. It acts as a proxy for the allocation gravity factors. It is expected that this determinant has positive influence on the level of FDI.

The variable WAGE is regarded as a proxy for location-specific advantage of FDI inflow. It is used in attempt to investigate the influence of the labour cost difference between economies on foreign investments. It is expected that that differential in labour compensation influence positively on the level of FDI.

The distance between countries is an established factor of the gravity model. The variable DIST is used as a proxy for transaction and transportation costs. The impact of the variable is not quit clear in advance. However it seems that high costs and more significant difference in traditional and cultural environment deterred the FDI inflow into Belarus.

However, the opposite situation could occur. For example, the investor can invest in Belarus so as to eliminate high transaction and transportation costs.

At the same time the businesses in the neighbouring countries had more propensities to undertake FDI. Variables LAG and LEAD are expected to have the positive sign. The reasoning for it is just the opposite as stated firstly for variable DIST. The neighbouring countries divided into two parts according to their progress in economic reforms. It is expected that countries with weak progress use their geographical proximity advantages to the lesser extent than other neighbours.

The variable FREE is used as a proxy for the level of civil and political freedom is expected to show a positive relation to the level of FDI inflow. Thus, the higher

the indicator of the freedom in Belarus (the lower the numerical value of the score) the higher is the volume of entering FDI (actually, the variable should show negative sign). The use of freedom index as a proxy for general conditions (including economic) is based on the belief that the most significant progress from the communist regime with suppressed economies to market economy is reached in the countries where the free democratic institutions were better developed.

Further econometric issues

This section provides the discussion of the method of the determining the appropriate functional form for the model. This issue is important, because proper choice of the functional form could help to produce estimation with higher explanatory power.

Researchers did not reach consensus on the issue of the most appropriate functional form for the bilateral factor flows model. For instance, Bergstrand (1985) provides theoretical foundations for gravity equation, which implies the log-linear functional form for the estimation. Further, most of the recent pieces of research on FDI bilateral flows stick to this functional form. However, the authors did not provide the arguments in favor of their choice.

At the same time, some authors argue that, in general, gravity equation approach is quite intuitive way of the explaining the factor flows. (Cuarian et. al. 1993) Hence, researchers avoid adhering only to the log-linear model and attempt to determine the optimal functional form though testing for different values of ν for Box-Cox transformation (see formula (3)). Thus, for the sake of completeness it is necessary to test for the appropriateness of the log-linear form of the model.

As it was mentioned above, log-linear and linear functional forms of the regression models are the particular cases of the more general Box-Cox model[8]. The Box-Cox transformation is as follows:

$$x^{(v)} = \frac{x^{v} - 1}{v} \tag{3}$$

Thus, the general set up of the regression model could be presented in the following way:

$$y^{(v)} = a + \sum_{k=1}^{K} \beta_k x_k^{(v)} + \varepsilon \tag{4}$$

Depending on the values of v, the model can take different functional forms. The most popular among them are those where $v = 0$, $v = 1$ and $v = -1$ (accordingly log-linear, linear and reciprocal functional forms can be derived).

The usual practice is to transform the data using Box-Cox transformation and then estimate linear in parameters regression model. This is quite straightforward (other things being equal) to estimate the model when the value of v is already known. However the estimation become more complicated when it is unknown. In this case the model becomes nonlinear in parameters. Such model can be estimated using MLE technique.

The maximum likelihood estimations of β and v for the model (4) can be obtained by maximizing the following function:

$$\ln L = -\frac{n}{2}\ln(2\pi) - \frac{n}{2}\ln\sigma^2 + (v-1)\sum_{i=1}^{n}\ln y_i - \frac{1}{2\sigma^2}\sum_{i=1}^{n}(y_i^{(v)} - \beta' x_i^{(v)})^2 \tag{5}$$

[8] The discussion relies on Green 2000.

The choice in favor linear or log-linear model can be made through the testing the restrictions $\nu = 1$ or $\nu = 0$ respectively. All the needed computations specified above are successfully performed by econometric software (Stata 8.0 version).

The analysis of empirical results

Before going into the analysis of the results of econometric estimation it is reasonable to check the validity of the functional form to be opted for the model. As discussed above, whilst investigating the determinants of the FDI flows, almost all researches adopted log-liner model.

As can be seen from the Table 4, the results of the LR test do not support the choice of the log-linear functional form.

Table 4 - Results of the LR test for different values of ν[9].

Test H_0	Restricted log likelihood	LR statistic χ^2	p-value Prob>χ^2
$\nu = -1$	- 6067.0691	4053.36	0.000
$\nu = 0$	- 4052.2454	23.71	0.000
$\nu = 1$	- 4769.3513	1457.92	0.000

The estimation of the model (5) suggests that analysis can be continued using Box-Cox transformation where $\nu = .08959$ (see Table 5).

Table 5 Estimation results of the parameter ν for the Box-Cox transformation

Model	Value of ν	Std. error	z	P > |z|
Initial model (46 countries)	0.08959	0.01900	4.71	0.000

After the transformation of the data, the model (2) was estimated. The results of the estimation are presented In Table 6. The Model B is estimated with data

[9] This test is automatically performed by Stata 8.0 software package as an integral part the Box-Cox transformation command.

transformed using ν = .08959. The Model A is estimated with data transformed using ν = 0 (logarithmic transformation). For all models the Wald test is conducted in order to test whether the variables with p-values equal or more than 0.3 are significantly different form zero. The results of the tests are presented in Appendix 5.

Table 6 – Regression results for Model A and Model B (random effects models).

Explanatory Variable	Panel regression (Model A)		Panel regression (Model B)	
Constant	2.471 (.683)	- .9260 (0.775)	***13.5 (.076)***	*10.511 (.024)*
gdp_hm	.6451 (.001)	.6768 (.000)	***.201 (.000)***	*.2161 (.000)*
gdp_hs	-.0872 (.728)	-	***-.029 (.748)***	-
wage	.1270 (.547)	-	***.314 (.548)***	-
dist	-.7443 (.032)	- .6452 (.035)	***-1.118(.018)***	*-1.061 (.011)*
free	.0455 (.705)	-	***.161 (.636)***	-
lag	- 1.4151(.277)	-	***-2.70 (.446)***	-
lead	2.069 (.050)	2.2522 (.028)	***6.20 (.031)***	*6.364 (.024)*
R^2	037.	.0974	***.3781***	*.3683*
Number of observations	288	288	**288**	288
Wald-statistics	*$\chi 2(7)=34.91$ (.0000)*	*$\chi 2(3)=37.46$ (.0000)*	***$\chi 2(7)=41.06$ (.0000)***	*$\chi 2(3)=37.46$ (.0000)*

Note: z-values are in the parentheses.

Before going into the discussion of the panel regression results it is reasonable to find proper method of estimation, viz. pooled, fixed, or random effects model. The results of the F-test, Breusch and Pagan Lagrange Multiplier test and Hausman test are almost identical for the both models (see Table 7). The first two tests are used to determine the existence of the group specific peculiarities, which differentiate each country form the rest. Thus, the ignorance of such information can lead to bias in estimates and miss of group-specific effects.

Basically, random effects estimation is more efficient than fixed effects one. However, under the random effects, when a non-zero correlation between individual effects and exogenous variables is ignored, inconsistent estimators are produced. Thus, Hausmam test for non-zero correlation between individual

effects and exogenous variables helps to discriminate between random and fixed effects panel regression techniques.

The F-test test rejects the hypotheses for the common intercept; hence the pooled OLS estimation could not be employed. Breusch and Pagan Lagrange Multiplier test favours using random effects model. Thus, formally panel regression estimation is more appropriate for the data set under analysis.

Table 7 - Results of the tests for the panel regression models

Test	Model A	*Model B*
Results of the tests before excluding the variables		
F test for common intercept	F(42,241)=5.38 (.0000)	F(42, 241)=5.46 (.0000)
Breusch-Pagan LM test for random effects	$\chi 2(1)$= 97.08 (.0000)	$\chi 2(1)$= 114 (.0000)
Hausman test	Model A	$\chi 2(4)$=5.62 (.2291)
	Model B	$\chi 2(4)$=4.58 (.3328)
Results of the tests after excluding the variables		
F test for common intercept	F(42, 244)=5.77 (.0000)	F(42,244)=5.67 (.0000)
Breusch-Pagan LM test for random effects	$\chi 2(1)$= 105 (.0000)	$\chi 2(1)$= 121 (.0000)
Hausman test	Model A	$\chi 2(1)$= .22 (.6375)
	Model B	$\chi 2(1)$= .17 (.6783)

Hausman test fails to reject the null of no correlation between the residuals and explanatory variables. Thus, random effects model will produce consistent and more efficient estimates.

Thus, taking into account the results of the performed tests the analysis of the regression stick to the random effects models. The results for Model A (logarithmic transformation of the data) are presented for the comparison reasons. The discussion presented below applies to the Model B, because it was

formally proved that v= .08959 for the Box-Cox transformation is more appropriate.

Freedom. The proxy for the level of freedom in Belarus appeared to be highly statistically insignificant and was excluded from the initial model (for Wald test see Appendix5). However it is not surprising, because the score defining the general conditions (economic, political, civil liberties, etc.) experienced minor changes during the period under analysis. Moreover it did not change at all from 1996 till 2001. This finding reflects relatively stable attitude to the problem of freedom that established in Belarus, especially after the inauguration of the President Lukashenko.

GDP in the host country. This determinant of the FDI inflow proved to be highly statistically insignificant and was excluded from the initial model too. It could be concluded that the he size of the domestic market has no significant influence on the investors' decisions in this particular case.

GDP in the source country. The size of the home country had positive effect on the FDI inflow into Belarus during 1993-2001. This finding perfectly fits to the theoretical explanations of the FDI inflow determinants. Namely the home countries with larger domestic market have greater potential to generate capital outflows. Moreover, the size of the source country (in terms of GDP) plays significant role in the creation of the ownership-specific advantages for the investing firms. However, it should be noted that the absolute value of the coefficient estimate for the variable is not high if compared with other statistically significant coefficients.

Distance between the capitals. The distance between countries has negative effect on the level of foreign investments in Belarus. This result rejects the hypothesis that high transaction costs encouraged producers to allocate production closer to the

target markets. Perhaps, transport costs plus lack of the information about the business environment in the host market deterred the possibility of the potential investors to undertake FDI.

Neighbouring countries. At the same time, the fact that countries have common boarders had a positive effect on the FDI inflow into Belarus. This finding corresponds to the results of the investigations conducted by the other authors. However, according to the estimates, these findings hold true only for the neighbouring countries with successful experience in economic reforms (variable LEAD). Such results are explained by the positive impact of the cultural, historical and business environment proximity between neighbouring countries. These factors accompanied with relatively small distance between countries significantly decrease the transaction costs. At the same time, the dummy variable for Ukraine and Russia appeared to be highly statistically insignificant (variable LAG) and was excluded from the initial model. It could be explained by the fact that during 1993-2001 theses countries experienced an economic crises accompanied by weak progress in economic reforms. Thus, they could not use the advantage of geographical proximity.

Difference in hourly compensations. The difference in the level of the hourly compensations between home and host country did not have significant impact on the FDI inflows into Belarus during 1993-2001. This outcome suggests that the divergence in labour costs between countries did not have the impact on the investors' decision to invest in Belarus.

It should be noted, that estimation of the model using the log-linear functional form gives quite comparable results. Namely, the same variables proved to be statistically significant and have identical signs.

For the completeness of the investigation it would be useful to conduct further analysis using information whether investors invested or not in Belarus in a certain year. It means that zero observations for FDI inflows will be used in the analysis. In the panel regression these observations were excluded from the sample since it would be impossible to perform Box-Cox transformation with them.

Such analysis will allow using extra information which was missed in the panel regression and hence obtaining more insights about the FDI determinates. In this case probit analysis is appropriate. The results of the panel probit estimation are presented in Table 8.

Table 8 - Estimation results for the panel probit model (random effects)*

Explanatory Variable	Estimation of initial specification	Estimation after exclusion of insignificant variables
Constant	.7981 (.278)	.7375 (.039)
gdp_hm	$2.84*10^{13}$ (.265)	$3.01*10^{13}$ (.217)
gdp_hs	*$9.31*10^{11}$ (.004)*	*$7.79*10^{11}$ (.001)*
wage	.0176 (.495)	-
dist	*-.0001 (.000)*	-.0002 (.000)
free	-.108 (.418)	-
lag	-.4955 (.534)	-
lead	*11.05 (1.000)*	-
Number of observations	*379*	*379*
Wald-statistics	$\chi 2(5)=14.88$ (.0109)	$\chi 2(1)=19.34$ (.0000)
LR test of $\rho=0$**	$\chi 2(01)=$ 65.22 (.000)	$\chi 2(01)=$ 66.24 (.000)

Notes: * z-values are in the brackets

**the results of this test suggest using panel estimation rather than pooled data estimation

According to the estimations only three determinants remained in the model, viz. GDP in the host country, distance, and GDP in the host country. All other estimations of the coefficients appeared to be statistically insignificant and were excluded (for Wald test see Appendix 5).

It should be noted, that these results are quite comparable with those of panel regression model. Particularly, the findings are dissimilar only for to variables. Namely, the level of GDP in Belarus appeared to have a significant influence on investors' decisions and the geographical proximity (neighbourhood) has no impact on FDI inflow.

Sensitivity analysis

To check the sensitivity of the model the same analysis was applied to the three sub samples of the initial data set. The sample was divided into the following three groups: Eastern European countries (further referred to as EE), Western European countries (further referred to as WE), and Asian and the rest of the countries (further referred to as AR). The list of the countries in each group is presented in Appendix 4.

At the first step the value of the parameter v in model (5) was estimated. The results considerably differ across the sub samples. (see Table 9) Only for the WE sample the magnitude of v is close to that in initial sample of 43 countries. For the AR sample v appeared to be not statistically different from 0. (see also Table 9)

Table 9 - Estimation results of the parameter v for the Box-Cox transformation

Model	Value of v	Std. error	z	P > |z|
Initial model	0.08959	0.01900	4.71	0.000
Eastern Europe	0.20897	0.03503	5.96	0.000
Western Europe	0.07778	0.03531	2.20	0.028
Asia and the rest	0.02934	0.04117	0.71	0.476

At next step the model (2) was estimated using the sets of the transformed data. The transformation applies the parameter v estimated earlier (see Table 9).

The test of the restrictions imposed on this parameter formally suggests that in all sub samples (excluding AR) none of the "popular" functional forms could be applied. (see Table 10) These findings correspond to those for the initial sample.

Table 10 - Results of the LR test for different values of v in the sub samples

Test H_0	Restricted log likelihood	LR statistic χ^2	p-value Prob>χ^2
Initial sample			
v = -1	- 6067.0691	4053.36	0.000
v = *0*	- 4052.2454	23.71	0.000
v = 1	- 4769.3513	1457.92	0.000
EE sub sample			
v = -1	- 2076.6278	1474.13	0.000
v = *0*	- 1360.7837	42.44	0.000
v = 1	- 1499.7196	320.31	0.000
WE sub sample			
v = -1	- 2320.3689	814.16	0.000
v = *0*	- 1915.7499	4.92	0.027
v = 1	- 2170.3263	514.07	0.000
AR sub sample			
v = -1	- 1122.0186	402.90	0.000
v = *0*	-920.8351	0.51	0.467
v = 1	- 1105.3769	369.61	0.000

As in the initial sample the results of tests suggests using random effects model. (see Table 11) Thus, the analysis will stick only to the estimations of this model.

Table 11 - Results of the tests for the panel regression models (sub samples)

Model	Test	Results
1	2	3
Before the excluding insignificant variables		
EE	F test for common intercept	F (13, 82) = 3.70 (.0001)
	Breusch-Pagan LM test for random effects	χ2 (1) = 13.21 (.0003)
	Hausman test	χ2 (4) = 6.22 (.1832)
WE	F test for common intercept	F (17, 110) = 6.11 (.0000)
	Breusch-Pagan LM test for random effects	χ2 (1) = 63.80 (.0000)
	Hausman test	χ2 (4) = .07(.9995)
AR	F test for common intercept	F (11, 49) = 8.48 (.0000)
	Breusch-Pagan LM test for random effects	χ2 (1) = 17.89 (.0000)
	Hausman test	χ2 (4) = 3.49 (.4791)
After the excluding insignificant variables		

1	2	3
EE	F test for common intercept	F (13, 82) = 3.82 (.0001)
	Breusch-Pagan LM test for random effects	$\chi 2$ (1) = 18.96 (.0000)
	Hausman test	$\chi 2$ (4) = 0.75 (.3865)
WE	F test for common intercept	F (17, 113) = 7.23 (.0000)
	Breusch-Pagan LM test for random effects	$\chi 2$ (1) = 89.03 (.0000)
	Hausman test	$\chi 2$ (4) = .01 (.9349)

In general, the findings during the sensitivity analysis supports the results reported for the initial model. (see Table 12) Particularly, coefficient estimates are statistically significant and have the identical signs for the same variables, viz. GDP in home country and flows from the neighbouring countries, which are successful in economic reforms.

Table 12 Regression results for the sub samples (random effects).

Explanator Variable	Panel regression (random effects)							
	All	**All***	**EE**	**EE***	**WE**	**WE***	**AR**	**AR***
Constant	*13.5 (.076)*	*10.511 (.024)*	9.783 (.835)	13.658 (.166)	7.482 (.677)	-3.91 (.669)	18.88 (.240)	-
gdp_hm	*.201 (.000)*	*.2161 (.000)*	.050 (.036)	.0446 (.001)	.2645 (.004)	.2851 (.006)	.3184 (.513)	-
gdp_hs	*-.029 (.748)*	-	-.017 (.647)	-	-.094(.582)	-	-.037 (.265)	-
wage	*.314 (.548)*	-	-.412 (.927)	-	1.024 (.568)	-	.4957 (.876)	-
dist	*-1.118(.018)*	*-1.061 (.011)*	.137 (.962)	-	-.690 (.610)	-	-1.823 (.311)	-
free	*.161 (.636)*	-	1.635 (.440)	-	-.027 (.954)	-	.0310(.894)	-
lag	*-2.70 (.446)*	-	- 8.626 (.649)	-	n.a.**	n.a.	n.a.	n.a.
lead	*6.20 (.031)*	*6.364 (.024)*	33.282 (.040)	34.658 (.000)	n.a.	n.a.	n.a.	n.a.
R^2	*.3781*	*.3683*	.5592	.5430	.2401	.1921	.4243	-
No. of observations	*288*	288	100	100	132	132	65	-
Wald-statistics	*$\chi 2(7)$= 41.06 (.0000)*	*$\chi 2(3)$=37.46 (.0000)*	$\chi 2(7)$=26.02 (.0005)	$\chi 2(2)$=33.91 (.0000)	$\chi 2(5)$=13.71 (.0175)	$\chi 2(1)$= 7.54 (.006)	$\chi 2(5)$= 2.90 (.8357)	-

Notes: * in this column results are presented after the excluding of the insignificant variables (Wald test is presented in Appendix 5)
** there is no neighbouring countries in the WE and AR samples

The exception here is the estimation for variable DIST, for which the coefficients are highly statistically insignificant in the sub samples. However it is not surprising since the countries in these samples appeared to be homogeneous in terms of geographical proximity to Belarus. It should be noted that for the AR sub sample Wald test indicated that the coefficients in the model are not jointly statistically significant from zero.

The results on the sensitivity analysis for the probit models are presented below.

Table 13 - The estimation results of the panel probit models (z-values are in the brackets)

Explanator Variable	Panel probit (random effects)							
	All	**All***	**EE**	**EE***	**WE**	**WE***	**AR**	**AR***
Constant	.7981 (.278)	.7375 (.039)	-1.130 (.473)	-1.1762 (.070)	-.9621 (.615)	-.677 (.189)	18.88 (.240)	-
gdp_hm	$2.84*10^{13}$ (.265)	$3.01*10^{13}$ (.217)	*$1.45*10^{11}$ (.196)*	*$7.95*10^{12}$ (.294)*	*$2.60*10^{12}$ (.066)*	*$2.59*10^{12}$ (.058)*	.3184 (.513)	-
gdp_hs	*$9.31*10^{11}$ (.004)*	*$7.79*10^{11}$ (.001)*	*$9.92*10^{11}$ (.115)*	*$1.15*10^{10}$ (.025)*	*$9.45*10^{11}$ (.068)*	*$1.14*10^{10}$ (.002)*	-.037 (.265)	-
wage	.0176 (.495)	-***	*.471 (.077)*	.8328 (.001)	.0135 (.808)	-	.4957 (.876)	-
dist	*-.0001 (.000)*	-.0002 (.000)	*-.0002 (.751)*	-	-.0002 (.700)	-	-1.823 (.311)	-
free	-.108 (.418)	-	.0392 (.881)	-	.1012 (.648)	-	.0310(. 894)	-
lag	-.4955 (.534)	-	-.8265 (.515)	-	n.a.	n.a.	n.a.	-
lead	*11.05 (1.000)*	-	10.775 (1.000)	-	n.a.	n.a.	n.a.	-
No. of observations	*379*	*379*	125	125	158	158	65	-
Wald/LR-statistics	$\chi2(5)=14.88$ (.0109)	$\chi2(1) = 19.34$ (.0000)	$\chi2*(7)= 21.43$ (.003)	$\chi2(1) = 11.23$ (.0000)	$\chi2(5) = 21.66$ (.000)	$\chi2*(2) = 20.74$ (.000)	$\chi2(5)= 2.90$ (.9753)	-
LR test of $\varrho=0$**	$\chi2(01)= 65.22.$ (.000)	$\chi2(01)= 66.24.$ (.000)	$\chi2(01)= 5.71$ (.008)	$\chi2(01) = 16.53$ (.0000)	$\chi2(01) = 8.46$ (.0002)	$\chi2(01)= 9.52$ (.001)	$\chi2(01) =27.32$ (.8357)	-

Notes: * here LR test was performed

** the results of this test suggest using panel estimation rather than pooled data estimation

*** the results of Wald test see in Appendix 5.

Generally, the findings for the sub samples support result obtained during the estimation of the model for initial data set. Only in the sub sample EE wage differential proved to be statistically significant.

Like in the sensitivity analysis for the panel regression model, variable DIST appeared to statistically insignificant and was removed from the models.

It should be noted that for the AR sample LR test indicated that all coefficients in the model are not jointly significantly different from zero. The findings for this sample are similar both for the panel regression model and panel probit model.

Both probit and panel regression analysis for the initial sample showed identical results (in terms of statistical significance and signs) for almost all variables. The exceptions here are only GDP in the host country and geographical proximity (only in the case of countries that are successful in economic reforms). In both models for the sub sample AR there were not found any statistically significant results.

To summarize, the sensitivity analysis showed the stable performance of the panel regression and panel probit models. Moreover, it could be said that these models produced quit similar results.

Chapter 6

SUMMARY AND CONCLUSIONS

The topic of FDI inflow into economy, particularly into the transition countries is of primary importance because of crucial role of foreign investments in the building new market economies in the post-Soviet area. The investigation of factors determined the FDI inflow into Belarus remains germane, because authors still fail to provide any empirical pieces of research for this country.

This work provides comprehensive illustration of recent research devoted to the determinants of the bilateral FDI flows in Europe, and particularly in transition economies. The gravity equation model is the most frequently employed by the researches. This approach is used in this work so as to investigate what factors determined the FDI inflow in Belarus during 1993-2001.

As additional tool, probit analysis was performed for the same explanatory set of variables. To conduct this study zero observations were restored in the initial data set.

The empirical results at a certain extent confirmed theoretical hypotheses stated at the beginning of this investigation and partially corresponds to the findings of the previous pieces of research, although devoted to other countries.

Firstly, employing the Box-Cox transformation it was determined that log-linear functional form is not appropriate to the gravity model in the case of Belarus. Such a finding is valuable, because, almost all researchers used log-linear models without performing in their works formal tests like this.

Secondly, it is appeared that almost all factors usually employed to explain FDI determinants for other countries also works well in the case of Belarus.

The volume of GDP in the home country has positive influence on the FDI flow from the source country to Belarus. This finding perfectly corresponds to the theoretical foundations of OLI paradigm and gravity approach.

Geographical proximity plays important role in FDI movements. Particularly, distance between home and host country constitutes a barrier for FDI inflow. This finding in some degree is supported by the fact that neighbouring countries are more willing to invest in Belarus. This is not true for the neighbouring countries with weak progress in economic reforms. At the same time, for the countries that are successful in economic reforms and have a capability to make investments abroad the geographical proximity plays an important role for investing in Belarus. However, this result was not supported by the additional probit analysis.

There is no evidence, that the difference in hourly compensation between source and recipient country had any impact on FDI inflow in Belarus during 1993-2001.

The GDP of the host country as a gravity factor appeared to be inappropriate in the case regarded in this work. However, this result was not supported by the additional probit analysis.

The proxy for level of freedom also failed to provide any insights about the influence of the political and civil liberties on the FDI inflow into Belarus.

The sensitivity analysis showed the stable performance of both panel regression model and panel probit models. Moreover, it could be said that these models produced quit similar results.

BIBLIOGRAPHY

Agarwal, J. (1980); "*Determinants of Foreign Direct Investment: A Survey*." Weltwirtschaftliches Archiv 166(4): 739-773.

Anderson, J. (1979); *"A Theoretical Foundation for the Gravity Equation"* The American Economic Review, Issue 1: 106-116.

Barrell, R., Pain, N. (1996); *"An Econometric Analysis of U.S. Foreign Direct Investment"* The Review of Economics and Statistics. Vol. 78, Issue 2: 200-207.

Barrell, R., Pain, N. (1997); *"Foreign Direct Investment, Technological Change, and Economic Growth Within Europe"* The Economic Journal, 107:1770-1786.

Bergstrand, J. (1985); *"The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence"* The Review of Economics and Statistics, Vol. 67, Issue 3: 474-481.

Bevan, A., Estrin, S. (2000); *"The Determinants of Foreign Direct Investment in transition economies."* CEPR Discussion paper No. 2638.

Bevan, A., Estrin, S. and Meyer, K. (2000); *"Institution Building and the Integration of Eastern Europe in International production"* working paper No. 16/01.

Brouthers, L., Brouthers, K., Werner, S., (1999); *"Is Dunning's Eclectic Framework Descriptive or Normative?"* Journal of International Business Studies, 30, 4: 831-844.

Caetano, J., Galego, A., Vaz, E., Vieira, C., Vieira, I. (2002); *"The Eastward Enlargement of the Eurozone Trade and FDI"* Eurozone Working Paper No. 7.

Coughlin, Cletus C.; Terza, Joseph V.; Arromdee, Vachira (1991); *"State characteristics and the location of foreign direct investment within the United States."* The Review of Economics and Statistics. Volume 73, Issue 4: 675-683.

Cuarian, R., Sanso, M., Sanz, F. (1993); *"Bilaterial Trade Flows, The gravity Equation, and Functional Form"* The Review of economics and Statistics, Volume 75, Issue 2: 266-275.

Dunning, J. (1981); *"Explaining the International Direct Investment Position of Countries: Towards a Dynamic or Developmental Approach"* Journal of International Business Studies, 117: 30-64.

Dunning, J. (1988); *"The Eclectic Paradigm of International Production: A restatement and Some Possible Extensions"* Journal of International Business Studies, 19, 1: 1-31.

Dunning, J.(1995); *"Reappraising the Eclectic Paradigm in a age of Alliance Capitalism"* Journal of International Business Studies, 26, 3: 461-491.

Dunning, J. (1998); *"Location and the Multinational Firm: A neglecting Factor?"* Journal of International Business Studies, 29, 1: 45-66.

Dunning J. (2000); *"A Rose by Any Other Name…? FDI Theory in Retrospect and Prospect"* Mimeo, University of Reading and Rutgers University.

European Bank for Reconstruction and Development (October 1994); *"Economic transitionin Eastern Europe and the former Soviet Union."* Transition report.

Friedman, J., Fung, H., Gerlowski, D., Silberman, J., (1996); "*A Note on* "*State characteristics and the location of foreign direct investment within the United States"* The Review of Economics and Statistics. Volume 78, Issue 2: 367-368.

Garibaldi, P., Mora, N. and Zettelmeyer (2002); *"What Moves Capital to Transition Economies?"* IMF Working Paper No. WP/02/64.

Green, W. (2000); "*Econometric Analysis"* 4th ed. Prentice Hall, Upper Saddle River, New Jersey.

Liu, X., Song, H., Wei, Y. and Romolly, P. (1997) *"Country Characteristics and Foreign Direct Investment in China: A Panel Data Analysis"* Weltwirtschaftliches Archiv 133: 313-329.

Martin, C., Velazquez, F. (1997); *"The Determining factors of Foreign Direct Investment in Spain and the rest of the OECD: Lessons for the CEECs"* CEPR Discussion paper No. 1637.

Pedersen, K. (2002); *"The Eclectic Paradigm: 25 Years Anniversary"* To be published in

Reiljian, E. (2001); "Determinants of Foreign Direct Investment Inflows in Estonia" in Varblane, U. (2001); *"Foreign Direct Investment in the Estonian Economy"* Tartu: Faculty of Economics and Business Administration, Univ. 2001

Resmini, L. (1999); "*The Determinants of Foreign Direct Investment into the CEECs: New Evidence from Sectoral Patterns*." Mimeo, LICOS and University of Bocconi.

Root, F. (1994); "*International Trade and Investment"* 7th ed. Cincinnati, Ohio: South-Western Publishing.

Szyrmer, Janusz (March 2000); *"Foreign Direct Investment and Growth";* Economist, 3: 33-37.

Swain, N., Wang, Z. (1995); *"The Determinants of Foreign Direct Investment in Transforming Economies: The Empirical Evidence from Hungary and China"* Weltwirtschaftliches Archiv 131: 359-382.

UNCTAD (1996); "*Sharing Asian's Dynamism: Asian direct investments in the European Union."* New York and Geneva.

United Nations (1998); *"World investment report: trends and determinants."* New York, Geneva: United Nations Publications.

Грачев Н.Н. (2000) *"ТНИИ: какие уроки может извлечь Беларусь из опыта стран с переходной экономикой"* Минск, Экономика, финансы, управление, №4: 87–97.

Лыч Г. (2000); *"Привлечение иностранных инвестиций в экономику Беларуси"* Минск, Финансы, учет, аудит, №7-8: 51-55.

APPENDIX 1

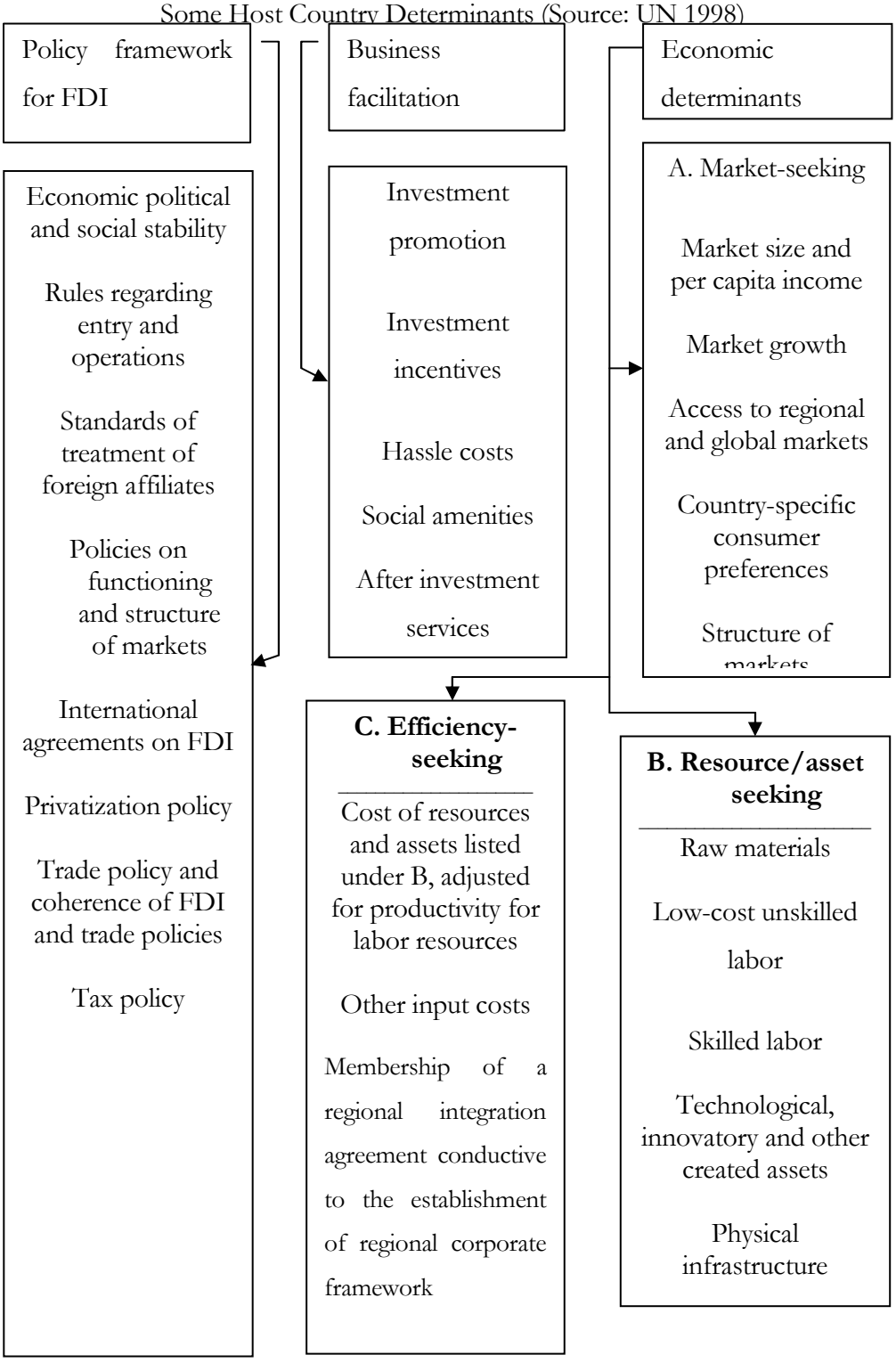
Some OLI Characteristics Varying According to Country, Industry and Firm Specific Considerations

	Country (home-host)	**Industry**	**Firm**
Owner-ship	Factor endowments, market size and character. Government policy towards innovation, protection of proprietary rights, competition and industrial structure. Government controls on inward direct investment	Degree of product or process technological intensity; nature of innovations; extent of product differentiation; production economies; etc.	Size extent of production, process of product diversification, extent to which enterprise is innovative, or market-oriented, or values security and/stability
Internali-sation	Government intervention and extent to which policies encourage MNEs to internalise transactions, government policies towards mergers; differences in market structures between countries; adequacy of technological, educational, communications, etc. infrastructure in host countries and ability to absorb contractual resource transfers	Extent to which vertical or horizontal integration is possible/desirable; extent to which internalising advantages can be captured in contractual agreements; use made of ownership advantages; extent to which local firms have complementary advantage to those of foreign firms; extent to which opportunities for output specialisation and international division of labour exist	Organisational and control procedures of enterprise; attitudes to growth and diversification, attitude toward subcontracting-contractual ventures; extent to which control procedures can be build into contractual agreements
Location	Physical and psychic distance between countries; government intervention, etc.	Origin and distribution of immobile resources; transport costs of intermediate and final goods products; industry specific tariff and non tariff barriers; nature of competition between firms in industry; significance of "sensitive" variables (tax incentives, energy and labour costs)	Management strategy towards foreign involvement; age and experience; psychic distance variables (culture, language, legal and commercial framework); attitude toward centralisation of certain functions (e.g. R&D); geographic office and market allocation etc.; geographical structure of asset portfolio and attitude to risk diversification

Source: Dunning (1981)

APPENDIX 2

Some Host Country Determinants (Source: UN 1998)



APPENDIX 3

Table – Shares of The Largest Investors

Country	Amount invested, USD	Share in the total amount invested, %
Germany	114,026,823	26
Poland	27,370,273	6
USA	105,958,628	24
Netherlands	10,972,657	2
Cyprus	32,903,979	7
Great Britain	22,421,734	5
Italy	12,521,431	3
India	17,861,949	4
Latvia	5,401,986	1
Czech Republic	7,075,094	2
Switzerland	7,871,904	2
Russia	6,532,229	1
Lithuania	4,144,728	1
Denmark	6,394,987	1
Ireland	6,381,814	1
Canada	5,616,853	1
Liechtenstein	4,955,221	1
Sweden	2,762,292	1
Other	39,634,802	9

APPENDIX 4

List of the countries for which the panel is constructed

Armenia, Australia, Austria, Baghams, Belgium, Bulgaria, Canada, China, Croatia, Cyprus, Czeck Republic, Denmark, Egypt, Finland, France, Germany, Great Britain, Hong-Kong, Hungary, Ireland, Israel, Italy, Japan, Latvia, Lithuania, Luxemburg, Moldova, Netherlands, Norway, Pakistan, Poland, Russia, Singapore, Slovakia, Slovenia, Spain, Sweden, Switzerland, Taiwan, Turkey, Ukraine, USA, India, Greece, Portugal, Estonia.

Sub sample for the Eastern European countries (EE sample)

Armenia, Bulgaria, Croatia, Czeck Republic, Hungary, Latvia, Lithuania, Moldova, Poland, Russia, Slovakia, Slovenia, Ukraine, Estonia.

Sub sample for the Western European countries (WE sample)

Austria, Belgium, Denmark, Finland, France, Germany, Great Britain, Ireland, Israel, Italy, Netherlands, Norway, Spain, Sweden, Switzerland, Turkey, Greece, Portugal.

Sub sample for the Asian and the rest countries (AR sample)

Australia, China, Egypt, Hong-Kong, Japan, Pakistan, Singapore, Taiwan, USA, India.

APPENDIX 5

Table – Results of the Wald tests

Hypotheses	**Results**
Initial model (panel regression, Box-Cox transformation v = .08959)	
Gdp_hs=wage=free=lag=0	$\chi 2(4)= 2.01$ (.7343)
Initial model (panel regression, Box-Cox transformation v = 0)	
Gdp_hs=wage=free=lag=0	$\chi 2(4)= 3.07$ (.5462)
Sub sample WE (panel regression, Box-Cox transformation v = .07778)	
Gdp_hs=wage=free=dist=0	$\chi 2(4)= 2.12$ (.7130)
Sub sample EE (panel regression, Box-Cox transformation v = .2090)	
Gdp_hs=wage=free=lag=dist=0	$\chi 2(5)= 1.05$ (.9583)
Initial model (panel probit model)	
Lead=wage=free=lag=0	$\chi 2(4)= 1.34$ (.5116)
EE sub sample (panel probit model)	
dist=lead=free=lag=0	$\chi 2(4)= 0.44$ (.9792)
WE sub sample (panel probit model)	
wage=free=dist=0	$\chi 2(3)= 0.96$ (.8100)
AR sub sample (panel probit model)	
-	-