

THE EFFECT OF FDI ENTRY-MODE ON ECONOMIC GROWTH:
UKRAINE

by

Anna Strelchuk

A thesis submitted in partial fulfillment of
the requirements for the degree of

MA in Economics Analysis

Kyiv School of Economics

2012

Thesis Supervisor: _____ Volodymyr Vakhitov

Approved by _____
Head of the KSE Defense Committee, Professor Irwin Collier

Date _____

Kyiv School of Economics

Abstract

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The aim of this study is to examine the effect of different FDI entry-mode on economic growth of Ukrainian regions. The empirical analysis was performed using the data on Ukrainian regions for 2000-2008 time period. Three estimation techniques were used in examining production function model and growth model: OLS, Fixed effect estimation and GMM. Empirical results suggest that both forms of FDI entry are beneficial for economic growth of Ukrainian regions. Therefore, government should perform economic policies targeted on FDI inflow stimulation, disregarding the FDI entry-mode.

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ACKNOWLEDGMENTS

I would like to express gratitude to my thesis advisor Professor Volodymyr Vakhitov for his valuable guidelines and constant support all along the thesis writing process. Also I would like to convey thankfulness to all professors for their support during the Research Workshop sessions.

Sincere thankfulness is addressed to Kyiv School of Economics for that valuable surrounding of high-motivated individuals, precious knowledge and experience.

Also I want to address sincere thankfulness to all my friends and dear classmates, particularly to Baloshenko Valentyna, Kolomiets Tatiana and Lyash Andriy for their constant support and advice.

Lastly, sincere thankfulness is addressed to my family, particularly to Deev Maksym and Opanasyk Mira for their constant inspiration.

G l o s s a r y

Foreign Direct Investments. Foreign direct investment (FDI) is a direct investments into production by foreign investor reflecting a lasting interest by foreign investor in targeted enterprise (direct investment enterprise).

Greenfield FDI. FDI entry-mode when FDI are targeted into the new facilities.

Acquisition FDI. FDI entry-mode FDI are targeted on merging or acquiring with an existing firm in the foreign county.

Chapter 1

INTRODUCTION

A lot of studies on economic growth were performed attempting to explain why different countries grow differently and what determines this difference. Nowadays studies examining the relationship between FDI and economic growth are of great concern among other studies on economic growth due to increased foreign investment activity. Most of these studies examine the effect of FDI on economic growth, viewing FDI as one of the sources of economic growth.

Economic theory states that FDI can influence economic growth of the country through technology transfers, international trade development, direct increase in tangible assets and contributing new managerial practices. All these factors may lead to higher economic growth of the country. Over the last years the major FDI flows have been directed to the developing countries' economies. Once the independence of Ukraine was proclaimed, the country started the transformation process to a market economy. A lot of state-owned manufacturing enterprises were involved into the rapid process of privatization and became potentially interesting for foreign and domestic investors. The domestic market started to become more and more attractive for foreign investments and the FDI flows into Ukraine have heavily increased (see Figure 1). Transition countries, as well as Ukraine, often consider FDI as one of the main source to finance the economic development. These expectations encourage the government of the country to liberalize FDI regimes and develop policies to attract FDI.



Figure 1. Foreign direct investments in Ukraine

But empirical evidence often states ambiguous effect of FDI flows on economic development of targeted countries, concluding that FDI effect depends mainly on the set of country specific characteristics and the form of FDI entry-mode.

Previous studies on economic growth of Ukrainian regions were mainly focused on determinants of economic growth. Tsyrennikov (2002), Tokarchuk (2006) studied the main determinants of regional economic growth. Akulava (2008) studied the effect of backward/forward vertical FDI and horizontal FDI on sectors' performance of the Ukrainian economy and concluded that the foreign firms more efficient compared with domestic in primary and secondary sectors. Lutz and Talavera (2004), Iurchenko (2009) were mainly focused on studying how FDI flows affect firm's performance in Ukraine.

So far, no studies were performed aimed to examine the effect of different FDI entry-mode on economic growth of Ukrainian regions. Since recent empirical studies have shown that different FDI entry modes may affect the economic development differently (Neto et. al., 2008; Nocke and Yeaple, 2008; Hams and Mean, 2011), it is necessary to examine the effect of

different FDI entry-modes on regional economic development of Ukraine. Hence, the purpose of this study is to examine the effect of different FDI entry-mode on economic growth of Ukrainian regions. The results of performed research will imply useful policy implication, offering guidelines on whether public policies should target all forms of FDI or encourage a particular form of FDI.

This work will be organized as follows. The section 2 will summarize the literature review and will be organized into three subsections. The first subsection will present the literature review on FDI effect on economic growth. The second subsection will summarize the review of recent theoretical and empirical studies on FDI entry-modes effect on economic growth of the country. And the third subsection will disclose common empirical approached used to evaluate the effect of FDI entry-mode on economic development. In section 3 the methodology will be discussed based on empirical literature review. The sections 4 will provide with data description needed for empirical analysis. In section 5 empirical results of the performed analysis will be discussed. Finally, in section 6 the conclusion will follow.

Chapter 2

LITERATURE REVIEW

The literature review section will be organized in the following way. The first subsection will contain the review of theoretical and empirical studies examining the linkage between the economic growth and FDI flows. The second subsection will provide the main studies examining effect of different FDI entry-modes on economic development. And in the final section the empirical approaches used earlier in evaluating the effect of different FDI entry-modes on economic growth will be discussed.

The following subsection will contain the review of theoretical and empirical studies examining the linkage between economic development of the country and FDI flows. The effect of FDI on economic growth can be decomposed into three main groups of factors (Nowbutsing, 2009): 1) the direct effect; 2) the indirect effect; and 3) the reverse effect. The direct effect is examined as direct relationship between FDI and economic growth. This relationship is observed from the production function and implies that FDI effect output through an increase in tangible assets (capital increase). The indirect effect emerges from spillovers caused by FDI. The main groups of FDI spillovers can be outlined: competition, linkages, skills and imitation. The reverse effect has been defined by the studies that examine the causality relationship between FDI and economic growth. This research is focused mainly on examining the direct effect of FDI on economic growth will be considered.

The country performance can be evaluated in terms of its economic indicators. Evaluating the economic development of the country, researches are mainly examining changes in gross domestic product (GDP). The economic theory defines GDP as a market value of goods and services produced by a country. There are different approaches to evaluate the

country's GDP, which yield the same result: expenditure, product and income approaches. For example, evaluating GDP using the expenditure approach is performed by summing four main elements: consumption (C), investments (I), government purchases (G) and net export (NE). Therefore, being a part of investment, FDI can have direct impact on the country GDP and therefore affect economic growth.

Economic theory explains the way FDI effect economic growth using neoclassic framework. Research papers of Solow (1957) have developed a basis for empirical growth analysis using neoclassical production function and testing it on macroeconomic data. The role of investment (respectively the role of FDI) was examined using neoclassical framework. Aggregated production function displays the relation between output (Y), capital (K), labor (L) and technology (A).

$$Y = A \cdot f(K, L) \quad (1)$$

According to neoclassical model capital accumulation can be define using the following equation that outlines the linkage between investment in tangible assets (I) and capital stock (K):

$$\Delta K_t = I_t - \alpha K_{t-1} \quad (2)$$

Based on neoclassical approach assumptions (competitive factor markets and constant return to scale) all inputs are paid their marginal products. The production model can be decomposed into the equation (3), where β_K , β_L are output shares contributed by capital and labor, and $\Delta \ln A$ – “Solow residual”:

$$\Delta \ln Y = \beta_K \Delta \ln K + \beta_L \ln L + \Delta \ln A \quad (3)$$

The relationships above disclose theoretical background for the direct linkage between investments and economic growth. Moreover, FDI may lead to technology improvements through transferring new technology.

Thereby, FDI may have positive effect on economic development through direct capital increase and productivity improvements. Empirical evidence often supports the positive FDI flow effect on economic growth of the receiving country (Jürgen Bitzer, Holger Görg, 2005).

Studies that examine relationship between FDI and economic growth can be divided into micro-level and macro-level studies. Micro-level studies often fail to state positive linkage between FDI and economic growth of the country whereas macro-level studies often conclude that FDI stimulate economic growth.

Micro-level studies are usually performed using firm-level data and examining the effect of FDI flows on economic growth through new technology transfers and productivity improvements. Aitken and Harrison (1999) examined the effect of FDI flows on firms' performance in Venezuela and found evidence that there is positive correlation between FDI and plant productivity. This relationship turned to be robust only for small enterprises, when for domestic firms it turned to be negative. Hence, the effect of FDI is insignificant on productivity of domestic firms in Venezuela. Therefore, authors concluded that the effect of FDI on economic growth is ambiguous.

Bitzer and Gorg (2005) showed that FDI have positive effect on productivity enhancing country economic growth. Obtained results were supported in later studies. Vacek (2010) studied the impact of FDI on productivity of manufacturing firms in Czech Republic using the firm-level data. The relationship between FDI and firm's productivity was examined through two channels: "spillover through forward linkages" (when Czech manufacturing firms can benefit from providing domestic goods to multinational firms) and "spillover through backward linkages" (whether Czech manufacturing firms can benefit from buying inputs from multinational firms). The research results gave evidence that FDI flows positively affect economic growth through creating productivity spillovers

for domestic manufacturing firms in the Czech Republic. But some studies found evidence that FDI negatively affect domestic firms' productivity, having adverse effect on country economic performance. To sum up, micro-level data studies state ambiguous conclusions concerning the relationship between FDI and economic growth of the country.

Macro-level studies examining the effect of FDI on the economic development usually find evidence that foreign direct investments can stimulate economic growth of the country. Berthelemy and Demurger (2000) performed empirical research to study whether China benefited from increased FDI inflows. The authors used cross-section panel data for Chinese manufacturing firms. It was shown that FDI effected Chinese GDP growth through three main channels: productivity, technology transfers, foreign trade facilitation and increased export. Researchers have shown that FDI played a critical role in economic growth of China.

Later studies often support the existence of positive linkage between FDI and country economic growth. Bhattarai and Ghatak (2010) examined the FDI effect on economic growth using panel data analysis for thirty OECD countries. The growth effect was theoretically studied using endogenous growth model and it was shown that the FDI flows have significant effect on economic growth of the country.

There were also studies trying to evaluate the dual relationship between FDI and country economic growth. Basu and Chakraborty (2002) studied dual relation between FDI and economic growth for 23 developing countries using a panel cointegration approach. The research found the evidence of positive relation between FDI flows and economic growth in the long run after allowing for country-specific effects.

Hence, most of the time macro-level studies support the existence of positive relationship between FDI flows and economic growth of the country.

The controversial results between micro-level and macro-level studies are due to different set of parameters defining economic environment. The studies trying to explain why FDI flows effect economic growth differently have shown that the effect of FDI on economic growth differs depending on certain set of parameters: wealth of the country (Blomstrom, 1994), level of human capital (Borensztein et al., 1998), trade policy regimes (Borensztein, 1998), level of financial market development (Alfaro, 2003), level of government regulation (Busse and Groizard, 2006) and FDI entry-mode (Neto et al., 2008). The researches argue that the host country's absorptive capacity may potentially be one of the key factors in explaining FDI impact on economic growth. Sjöholm and Lipsey (2006) explained the divergence of FDI effect for micro-level and macro-level studies by pointing out that positive effect of FDI spillovers can be significant for industry-level analysis, but this effect may not be sufficient for the whole economy. Moreover, recent studies have shown that the effect of FDI crucially depends on the form of entry (Maioli et al., 2005).

One of the main determinants of the FDI inflows are viewed to be openness, market size and export orientation. For country-level the following groups of parameters can be outlined: 1) fixed country specifics (natural resources, geographical location or level of education); 2) political factors (political stability or institutions' level of development); 3) macroeconomic factors (economic stability, inflation or export share); 4) economic policy variables (government economic policy and control, taxes, trade restrictions).

Next subsection will present review of studies examining the difference of FDI entry-modes. Earlier studies on theory of international trade and investments consider FDI firms being homogeneous. Recently Helpman (2006) contributed to new theories stressing the importance of considering various forms of FDI.

Choosing the appropriate entry-mode is one of the main firm's strategic decisions in its international business activity. The literature outlines two primary modes of investments (UNCTAD, 2011): Greenfield FDI (new capital investments) and Acquisition FDI (merging and acquiring already existing capital). Greenfield investments stand for direct investments in the new facilities and give investor an option to establish a completely new organization with its own specifics, but such entry-mode often implies a gradual market entry. Greenfield project often are of main interest for the host country because they involve creation of new production capacity, jobs and knowledge transfers. The following type of foreign investments often viewed as providing long-term benefits to local economy. But since Greenfield investments often require availability of resource access on the local market, this may create threats for foreign investor. Since the market infrastructure is often undeveloped and may serve as obstacle for efficient resource flow in the developing economies.

Acquisition FDI stand for merging or acquiring with an existing firm in the foreign county. Acquisition FDI entry-mode facilitates the access to local market and resources, increase the speed of entry, but the obstacles can arise as there is no guaranties that the acquired firm's organization will be corresponding to the entire organization of investor.

Both forms of FDI are viewed to effect economic growth differently: Greenfield FDI can have positive effect through direct increase in tangible assets bringing new capacities into the country, while Acquisition FDI can have positive effect through technology transfers, management improvements and enhanced competitive position. Since choosing the right FDI entry-mode is more a strategic decision for foreign investor, the effect of particular FDI entry-mode on economic growth differs. An increase in capital stock of the host country due to new capital inflows (Greenfield FDI) is viewed to have more pronounced output effect and therefore has higher effect on economic growth (Moosa, 2002). Nocke and Yeaple (2008)

have shown that more productive firms tend to enter the market via new capital investments (Greenfield FDI) rather than through acquiring domestic capital (Acquisition FDI). There was shown that foreign investors choosing Acquisition FDI entry-mode are driven by the incentive to exploit opportunities of comparative advantages. These results were supported by the Raff's study (2009) that has shown the same conclusion.

Andersson and Svensson (1994) empirically have shown that Greenfield FDI is more favorable and efficient for high technological firms. Balsvik and Haller (2007) provide empirical evidence that in case of Acquisition FDI there exist positive productivity spillover effect to domestic firms and negative productivity spillover effect in case of Greenfield FDI. The authors outline that the possible reason can be the increased competition caused by the Greenfield FDI.

The final subsection will give a review of different empirical approaches used to study the effect of FDI flows on economic development

Morris (2008) examining the effect of FDI on the host economy using the data on OECD countries and Canada. The empirical analysis was performed using OLS and TSLS models. The theoretical framework was used following the Cobb-Douglas production function approach used in Harrison (1996).

$$\Delta \ln Y_{it} = \beta_1 \Delta \ln K_{it} + \beta_2 \Delta \ln L_{it} + \beta_3 \Delta \ln FDI_{it} + f_i + e_{it} \quad (5)$$

Where Y_{it} - total output of the country i in time t ;

K_{it} - total capital stock in the country i in time t ;

L_{it} - total hours worked in the country i in time t ;

FDI_{it} - FDI stock in the country i in time t ;

f_i - country specific term that is constant over time accounting countries differences that are not included in the model;

e_{it} - error term.

Alfaro et al. (2002) examining the linkage between FDI and economic growth performed a cross-country analysis. The authors used approach similar to Mankiw et al. (1992) deriving the empirical specification based on the assumptions that countries are unlikely to be at their steady state and therefore transitional dynamics should be more important. The author estimated the direct effect of FDI the following econometric model:

$$Growth_i = \beta_0 + \beta_1 \log(initial\ GDP_i) + \beta_2 FDI_i + \beta_3 Controls_i + \varepsilon_i \quad (4)$$

The author included a number of controls that were present in Beck et al. (2000) and Levine (2000), Carkovic and Levine (2003). The control variables included in the regression are the following: initial income, human capital (average number of schooling years), population growth, government consumption. The dependent variable is the average annual real per capita growth.

The following variables that are frequently included as determinants of growth in cross-country studies (Barro et al., 1995; Borensztein et al., 1998): government consumption, the black market premium on foreign exchange rate, measure of political instability, proxy for financial development, inflation rate, measure of quality of institutions.

The concern of endogeneity of independent variables in the OLS model was tested using Hausman test. In order to deal with endogeneity problem the Generalized Method of Moments (GMM) developed by Arellano and Bond (1991) was used.

The previous studies were mainly aimed to examine the effect of FDI flows on economic growth of Ukraine treats FDI being homogeneous disregarding the FDI entry-mode decomposition. The scarce number of studies in the following direction can be explained mainly due to data limitation. Given the available data access to annual financial reports of Ukrainian manufacturing enterprises, the FDI can be decomposed into two main entry-modes. Current research will examine the effect of different FDI

entry-modes on economic growth. The results of this study will provide useful policy implication in form of guidelines on whether public policies should encourage all forms of FDI or target a particular one.

Chapter 3

METHODOLOGY

In order to study how different FDI entry-modes affect regional economic growth, the growth model approach will be used. Following Borensztein et al. (1998), Carkovic and Levine (2002), Alfaro et al. (2003) similar econometrical model specification will be used to study the effect of different FDI entry-modes on economic growth.

$$Growth_{it} = \beta_0 + \beta_1 \text{Initial RGP}_{it} + \beta_2 \text{Controls}_{it} + \beta_3 \overline{FDI}_{it} + \varepsilon_{it} \quad (6)$$

The *average real annual per capita gross regional product* (GRP) is taken as a dependent variable. For evaluating the link between FDI and economic growth, the following control variables are commonly used to account for other growth determinants (Alfaro, 2003; Beck et al., 2000): *initial income per capita* equals the logarithm of the real per capita GRP at the beginning of each period; *average years of schooling* as a proxy for human capital and equals the average years of schooling of the working-age population; *investments*; *inflation* equals the average growth rate in CPI; *government size* equals government consumption relative to GRP; *measure of openness to trade* equals the sum of export and import relative to GRP; *black market premium* equals the black market premium in the foreign exchange market; *private credits* equals credits to the private sector by financial establishments relative to GRP. Different FDI entry-modes are included into the econometrical model as additional explanatory variable \overline{FDI}_{it} .

Similar approach will be used, but due to data limitations not all of the appropriate control variables are available for Ukrainian regions. Therefore, the following control variables will be used: population growth, capital stock, openness to trade and number of graduated qualified workers as s

proxy for human capital. Hence, the econometrical model will be the following:

$$\begin{aligned} \Delta GDP_{it} = & \alpha_0 + \alpha_1 GDP_{it-1} + \alpha_4 Labor_{it} + \alpha_5 Capital_{it} + \alpha_6 Open_{it} \\ & + \alpha_3 FDI_{Acquisition}_{it-1} + \alpha_2 FDI_{Greenfield}_{it-1} + \\ & + \alpha_7 HumanCap_{it} + u_i + \varepsilon_{it} \end{aligned} \quad (7)$$

Where

i, t – subscripts identifying the region and time period, respectively;

GRP_{it} is the real gross regional product (GRP) per capita of region i in year t ;

$FDI_{Greenfield}_{it-1}$, $FDI_{Acquisition}_{it-1}$ are the corresponding FDI entry-modes, Greenfield FDI and Acquisition FDI, into the region i in year t ;

$Open_{it}$ – a measure of openness to trade for region i in year t , defined as sum of import and export of the region divided on GRP;

$HumanCap_{it}$ – a proxy for human capital for region i in year t defined as number of graduated qualified workers;

u_i – unobserved region-specific effect;

ε_{it} – error term.

The inclusion of the lagged GRP variable into the regression is due to economic theory, since it is likely that past value of GRP is correlated with current value of GRP. The Greenfield FDI and Acquisition FDI enter into the model with the lag, since the FDI that flow into the economy this year will affect the economic growth in the next periods.

The main hypothesis is to examine the confidants on Greenfield FDI and Acquisition FDI and to explain the difference.

In case if OLS estimating of the model will be performed, the following problems may arise:

1. The FDI and GRP have causal relationship that can run in both ways. Hence, FDI is assumed to be endogenous.

2. Time-invariant region-specific characteristics (fixed effects) may be correlated with the explanatory variables. The error term will collect the fixed effects consisting of unobserved region-specific effect and the observation-specific errors.
3. Including the lagged variable of GRP in the regression equation leads to autocorrelation.
4. Due to data specific, the panel has comparatively a shorter time horizon ($T = 9$) and a larger region dimension ($I = 27$).

The Generalized Method of Moments (GMM) will be used as a generalized form of the classic Method of Moments. More specifically, for samples with small time horizon and comparatively large country/region dimension, endogeneity issue and time-invariant region-specific effect the GMM approach is commonly used. The GMM approach can provide efficient estimators accounting the mentioned above issues, whereas the OLS will yield biased results.

The GMM has two main specifications – difference GMM and system GMM. For growth models with lagged dependent variable the difference GMM is commonly used. The first difference GMM estimation approach can be decomposed into two stages. First, first-difference is taken to remove unobservable fixed in time region-specific effects. Then, under the assumption of no serial-correlation between the varying in time disturbances, instruments for RHS variables are designed using levels of lagged series for two or more periods in the first-differenced equation.

The fixed region-specific effect α_i can be eliminated by taking first difference.

$$\begin{aligned}
\Delta GDP_{it} = & \alpha_1 \Delta GDP_{it-1} + \alpha_4 \Delta Labor_{it} + \alpha_5 \Delta Capital_{it} + \alpha_6 \Delta Open_{it} \\
& + \alpha_3 \Delta FDI_{Acquisition}_{it-1} + \alpha_2 \Delta FDI_{Greenfield}_{it-1} + \\
& + \alpha_7 \Delta HumanCap_{it} + \Delta \varepsilon_{it}
\end{aligned} \tag{8}$$

The unobserved region-specific effect has gone, but now GRP_{it-1} in ΔGRP_{it-1} is a function of the ε_{it-1} in $\Delta \varepsilon_{it}$. Therefore, by construction ΔGRP_{it-1} is correlated with $\Delta \varepsilon_{it}$. Anderson and Hsiao (1981) have proved that if ε_{it} is IID over i and t , ΔGRP_{it-2} will be a valid instrument for ΔGRP_{it-1} . Hence, estimator constructed as further lags of ΔGRP_{it-2} can be an instruments for ΔGRP_{it-1} .

In order to perform the GMM estimation, the following moment conditions are used under the assumptions of no serial correlation between error terms and weak ergogeneity of explanatory variables (no correlation between the explanatory variables and future series of the error terms):

$$\begin{aligned} E[Y_{i,t-s} \cdot (\varepsilon_{it} - \varepsilon_{i,t-1})] &= 0 \quad \text{for } s \geq 2; t = 3, \dots, T \\ E[X_{i,t-s} \cdot (\varepsilon_{it} - \varepsilon_{i,t-1})] &= 0 \quad \text{for } s \geq 2; t = 3, \dots, T \end{aligned} \quad (9)$$

The efficiency of the GMM approach depends crucially on the validity of the instruments. In order to take this issue into account, the following econometrical test should be performed. The Sagan/Hansen test of overidentifying restrictions tests the overall validity of the instruments by analyzing the sample along of the moment conditions used in the estimation process. The null hypothesis is that the instruments as a group are exogenous. Therefore, high p-value in Sagan test indicates that instruments are exogenous. Another test that is commonly used is the Arellano-Bond test for autocorrelation. The test is applied to the differenced error terms with the null hypothesis of no autocorrelation.

It is expected to have the following signs of the explanatory variables. The included lagged value of GRP is expected to have positive sign since economic theory indicates that it is positively correlated with the dependent variable. The variable Labor is expected to have negative sign due to the fact that the larger the population is the lower GRP per capita. The explanatory variable Capital is expected to have positive sign since the larger the regional

capital stock the higher can potentially be the GRP. The explanatory variable Openness is expected to have positive sign since the more economic active the region is the higher GRP is expected. The explanatory variable Human Capital is expected to have positive sign since the more educated labor force has higher productivity and contribute more to GRP. The sign of FDI entry-mode coefficients may be different based on evidence from similar empirical studies (Neto et al., 2008; Harms and Meon, 2011), hence one of the main tasks of this research is to evaluate the effect different of FDI entry-mode on economic growth in Ukraine.

The approach used in this research also has disadvantages and limitations. The FDI effect on economic growth may differ for the short-run and long-run. The model does not allow capturing the long-run effect of FDI. Also Barro (1996) pointed out that the panel-data approach has its limitation, as it is unable to account for business cycles effects.

Chapter 4

DATA DESCRIPTION

The data is taken from the State Statistics Committee of Ukraine. The data on FDI flows is constructed based on the firm-level data for Ukrainian industrial enterprises for 2000-2008 years. According to Ukrainian legislation industrial enterprises have to submit information on their operational activity on the annual basis to The State Committee of Statistics of Ukraine. For this research the data mainly comes from the following annual reports: “Report about the foreign direct investments flows in Ukraine”, “Balance” and “Financial results”. These reports were extracted from the database system Fenix. The sample consists of about 19000 industrial enterprises all around the country accounting for overall 105 884 observations for 2000-2008 years. The region division will be specified according to 24 oblasts, Autonomous Republic of Crimea and Kyiv.

The firm-level data on FDI inflows were aggregated to region-level by summing the corresponding forms of FDI inflows by region for each year. Data aggregation was performed based on matching unique firm number with firm registration regional code (KOATUU). Once the matching was performed the data on FDI inflows was aggregated across regions and years.

The State Statistical Committee of Ukraine records the FDI inflow using the following structure: cash deposits, securities, debt payment, income reinvestment, movable and real property, intangible assets, capital revaluation, state-owned property privatization, ownership transfer. FDI in a host country can come in two entry-modes: either in form of Greenfield investments or in form of Acquisition, depending whether new assets are involved in investment process or it is just a transfer of already existing assets. Very rarely the country FDI statistics account specifically for each FDI entry-mode separately and most of the empirical researches construct

Greenfield FDI subtracting the Acquisition FDI from the total FDI inflow (Cesar et al., 2002). Taking into account the initial data limitation the similar approach will be used, all components of FDI that are associated with acquisition, privatization and ownership transfer will be accounted as Acquisition FDI (Carderon and all., 2004). The total cumulative distribution of FDI entry-modes across time is represented in table 1.

Table 1. The total cumulative FDI flows distribution across regions
(thousands of dollars)

Year	Greenfied FDI	Acquisition FDI
2000	1522.555	1644.668
2001	2114.723	1078.678
2002	1501.312	1717.201
2003	3954.998	2556.05
2004	3791.583	4903.871
2005	2322.429	3224.024
2006	4286.02	3491.353
2007	6388.623	3558.077
2008	5197.581	2587.533

The data on FDI entry-modes are available only for those industrial enterprises that are obligated to submit official financial reports to the State Statistics Committee of Ukraine. Although the data-set accounts for more than 19000 industrial enterprises, it does not cover the whole FDI flows into Ukraine and as a result differs from total FDI statistic.

The summary statistics for each FDI entry-mode is represented in table 2.

Table 2. Summary statistics of different FDI entry-mode

Variables		Mean	Standard deviation	Min	Max	Obs
<i>Greenfield_{it}</i>	overall	105.818	162.01	0	1501.5	N=234
	between		75.84	24.18	324.53	n=26
	within		143.86	-158.9	1377.16	T=9
<i>Acquisition_{it}</i>	overall	132.82	161.34	0	1316.29	N=234
	between		73.01	24.18	282.7	n=26
	within		43.01	40.2	1260.15	T=9

The data on Gross Regional Product (GRP), population, fixed capital stock, education and openness are taken from statistical yearbooks “Annual statistical report of Ukraine: Ukrainian regions”. The panel data is collected within 26 regions (24 oblast, AR Crimea and Kyiv) for the time period 2000-2008 years. The choice of such time horizon is mainly explained by the data availability.

The final dataset contains the following variables:

- *Greenfield FDI* – measured as a share of GRP, %
- *Acquisition FDI* – measured as a share of GRP, %;
- *Gross regional product* (GRP) per capita, thousands \$;
- *Population growth* – measured as a growth rates of regional population, %;
- *Fixed capital stock*, thousands \$;
- *Human capital* – measured as a share of graduated qualified specialists divided on regional population and is used as a proxy for Human Capital;
- *Openness* – measured as a sum of export and import divided on GRP.

The descriptive statistics is represented in Table 3. More detail summary statistics is present in table A1, appendix A.

Table 3. Summary statistics of the control variables

Variables	Mean	Standard deviation	Min	Max	Obs.
<i>GRP_{it}</i>	1508.693	1470.508	144.6	12318.4	N=234
<i>PopGrowth_{it}</i>	-0.831	0.493	-2.144	1.038	N=234
<i>Capital_{it}</i>	10966.83	13469.26	2233.4	142664	N=234
<i>Openness_{it}</i>	0.769	0.796	0.148	8.562	N=234

Table 3 shows high variation in Gross Regional Product (*GRP*) per capita, fixed capital stock (*Capital*) and measure of trade openness (*Openness*). Variation between regions indicates high inequality of regional development and variation within time reveals high volatility.

All the variables are identified for each region across the 2000-2008 years. Therefore, the panel data is constructed accounting 234 observations for total 26 regions across 9 years. For empirical analysis certain variables will be transformed into logarithm form.

Chapter 5

EMPIRICAL RESULTS

In order to study how the FDI entry-mode effect GRP (Gross Regional Product) the difference GMM specification is used. OLS estimation and the Least Squares Dummy Variables (LSDV) estimation accounting for fixed effect in the model are used for comparison.

The regression results for total FDI estimation revealed positive and significant effect of total FDI on economic growth (see table A2, appendix A). In order to examine the effect of each FDI entry-mode similar estimation models are analyzed accounting for Greenfield FDI and Acquisition FDI. Given the data limitation, both econometrical approaches discussed in Literature review section will be used and further analyzed: production function estimation and economic growth model. The estimation results are represented in table 4 following similar approach used in Borensztein et al. (1998), Carkovic and Levine (2002), Alfaro et al. (2003).

Table 4. Production function estimation

Variables	<i>Production function estimation</i> (1)
L1.LnGreenfield	0.035** (3.17)
L1.LnAcquisition	0.036** (3.45)
L1.Log (Population Growth)	0.095* (2.04)
Log (Human capital)	-0.063 (-1.31)
Log (Openness)	0.08** (2.03)
Log (Initial GRP)	0.071** (2.09)
Observations	207
R²	0.836

t-statistics in parentheses
*p<0.1, **p<0.05, ***p<0.001

The coefficients associated with Greenfield FDI and Acquisition FDI are both positive and significant. All variables except the Human capital have expected sign. The coefficient associated with Human capital is negative but insignificant.

Econometric growth estimation is viewed to be more relevant approach in evaluating the effect of FDI on economic growth, since it helps to incorporate dynamics into the model. Economic theory predicts that there is a lagging relationship between the explanatory variables FDI entry-modes (Greenfield FDI and Acquisition FDI) and Capital, with economic growth. Therefore, these explanatory variables should be included in regression with lags. Variables were transformed into logs values and can be interpreted as sensitivity of response.

The empirical results are presented in table 5.

Table 5. OLS, Fixed effect regression and GMM estimation results

Variables	<i>OLS estimation</i> (1)	<i>Fixed effect estimation</i> (2)	<i>GMM estimation</i> (3)
L1.LnGreenfield	0.0135** (1.77)	0.012* (1.65)	0.138** (2.48)
L1.LnAcquisition	0.01 (0.73)	0.018** (2.46)	0.127** (2.39)
L1.Log (Population Growth)	0.007 (0.48)	-0.08** (-2.27)	0.562 (1.38)
L1.Log(Capital)	0.113*** (8.29)	0.345*** (7.18)	0.565** (3.41)
Log (Human capital)	-0.122* (-6.31)	0.132** (2.41)	1.775** (3.52)
Log (Openness)	0.096*** (4.31)	-0.03 (-0.84)	-0.512* (-2.04)
L1.LnGRP	-0.174*** (-11.37)	-0.29*** (-10.71)	-0.590** (-3.14)
Observations	207	207	181
R²	0.908	0.92	-

t-statistics in parentheses
*p<0.1, **p<0.05, ***p<0.001

The average years of schooling is often used as a proxy for human capital, control variable in growth model. There is no available information of average years of schooling for region-level. Another variable was used as a proxy – number of graduated qualified workers and weighed on total population.

The following post-estimation specification tests were used: Sargan test and Arellano-Bond test. The Sagan test is performed to check the null hypothesis that the overidentifying conditions and model are valid. The

Arellano-Bond test checks the presence of serial correlation in the first-difference disturbances. The test outcomes are presented in table 6.

Table 6. Post-estimation Sargan and Arellano-Bond tests

The Sargan test	The Arellano-Bond test		
H_0 : overidentifying restrictions are valid	H_0 : no autocorrelation		
	Order	z	Prob > z
chi2(27) = 0.2	1	-1.62	0.105
Prob > chi2 = 0.903	2	-1.83	0.067

The Sargan test states that the null hypothesis cannot be rejected, therefore the overidentifying restrictions are valid. The Arellano-Bond test states that the under the 10% level of significance the null hypothesis of no autocorrelation cannot be rejected and concludes that there is no autocorrelation in the error terms. The results of the tests proved that the estimated GMM model specification is efficient for analysis.

In contract to our expectations, all the estimated models revealed the significant negative effect of the lagged GRP value on economic growth. This finding contradicts our expectations based on economic theory. Vergeer et al. (2006) had similar problem in estimating the growth model and it explained that this finding was mainly due to high correlation with the non-lagged GRP. Marturana (2009) commented that the possible reason of the negative sign on the lagged GDP can be inherent stationarity created by computing the GDP growth rates. Jochen (2009) commented that the coefficient on lagged GDP can be negative in case when growth is endogenous.

The coefficients on Capital stock and Human capital have expected positive and significant signs. The Population growth variable is insignificant. Previous studies on economic growth often conclude that population growth has negative effect in the short-run and positive effect in the long-run on economic growth. Therefore, the sign of Human capital coefficient

may differ depending on the number of lags included into the estimation model. The sign of Openness coefficient is not the same as expected and is negative, but not significant with 5% level of significance.

The coefficients associated with Greenfield FDI and Acquisition FDI are both positive. In table 7 the statistical analysis is represented testing whether the obtained coefficients are statistically different one from another. The null hypothesis is the mean difference between coefficients on Greenfield FDI and Acquisition FDI is equal to zero.

Table 7. Paired t-test for Greenfield FDI and Acquisition FDI

Paired t-test		Statistics
Mean(diff)=mean(GreenfieldFDI – AcquisitionFDI)		t=1.919
Ho:mean(diff)=0		df=232
Ha: mean(diff)<0 Pr(T<t)=0.972	Ha: mean(diff)≠0 Pr(T > t)=0.056	Ha: mean(diff)>0 Pr(T>t)=0.028

The first and the third columns are the one-tailed tests, the second test is the two-tailed test. For all tests the p-value shows that the null hypothesis cannot be rejected at the 1% level of significance. Therefore, the coefficients associated with different FDI entry-modes are not statistically different.

The following limitation and weaknesses are discussed below that could affect the model. One of the weaknesses is the small data size. The model specification is defined in difference to account for growth, it reduces the initial sample size twice. The longer time period should be considered, but due to data limitation the information for a earlier time period is not available.

Another weakness of the model is omitting important explanatory variables the determinant of growth that could better define the model. The frequently included as determinant of growth (Barro et al., 1995; Borensztein et al.): black market premium on foreign rate, measure of

political instability, measure of financial development, measure of quality of institutions. These variables are not available for region level. Therefore, our model cannot take into account all the growth determinants and may result in weak estimation results.

The obtained results confirm previous findings in works studying the effect of FDI entry mode on economic growth. It was shown that both Greenfield FDI and Acquisition FDI have positive effect on economic growth. The performed research concluded that the FDI entry modes, Greenfield FDI and Acquisition FDI, are not statistically different.

This finding is in line with Wang et al (2009), where it was proved that both FDI entry-modes can be beneficial to economic growth depending on set of country characteristics.

Chapter 6

CONCLUSIONS

Foreign direct investments, especially in developing countries, are often viewed by the policy makers as a quick way to boost the economic growth. But recent studies on FDI more precisely revealed that not all of the FDI entry-modes can be beneficial. Hams et al. (2011) studying the effect of FDI decomposition for developing countries found that the Acquisition FDI has no effect on economic growth, whereas Greenfield FDI enhances growth. After the independence of Ukraine was proclaimed, the FDI inflows have increased gradually raising the need to understand whether all FDI entry-mode are beneficial for economic growth of the country.

The study is aimed to fill the gap in examining the effect of FDI entry-mode decomposition on economic growth. In particular, this study investigates whether particular FDI entry-modes can be more beneficial for the country.

The regional information dataset for 2000-2008 was used in order to perform empirical analysis. Three estimation models were used: OLS, Fixed effect regression and GMM.

Despite the fact that many other studies (Doytch et al., 2011) have found the evidence of no or negative effect of Acquisition FDI on economic growth, this study provides support that both FDI entry-modes have significant positive effect on economic growth of Ukrainian regions. This finding is in line with Wang and Wong study (2009), the authors found evidence that both Acquisition FDI and Greenfield FDI can be beneficial for the country given the certain set of parameters. In case of Ukraine, empirical analysis proved that the coefficients associated with Greenfield FDI and Acquisition FDI are not statistically different, yielding that both FDI entry-modes have the same effect on economic growth.

The results of the performed study can give useful policy implications. Since the empirical evidence proved that both FDI entry-modes enhance economic growth, it is beneficial for the country to implement policy encouraging FDI flows into the country disregarding the entry-mode. Therefore, Ukrainian government should perform policies targeted on attracting all FDI flows into Ukrainian economy, since both FDI entry-mode effect positively economic growth of the country.

Future studies examining the linkage between FDI and economic growth are valuable for better understanding whether FDI flows are beneficial for Ukrainian economy and through what channels they enhance economic growth of the country. Next studies may incorporate the spatial analysis across regions to account for unequal FDI distribution and interaction between regions.

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APPENDIX A

Table A1: Panel data summary statistics of the control variables

Variables		Mean	Standard deviation	Min	Max	Obs.
<i>GRP_{it}</i>	overall	1508.693	1470.508	144.6	12318.4	N=234
	between		867.555	853.978	5256.933	n=26
	within		1198.159	-3360.84	8570.16	T=9
<i>PopGrowth_{it}</i>	overall	-1.236	6.256	-96.230	1.038	N=234
	between		2.228	-11.969	0.381	n=26
	within		5.860	-85.497	9.521	T=9
<i>Capital_{it}</i>	overall	10966.83	13469.26	2233.4	142664	N=234
	between		9418.205	2925.344	39689.12	n=26
	within		9596.215	-17408.09	113941.7	T=9
<i>HumanCap_{it}</i>	overall	0.0065	0.01	0.003	0.156	N=234
	between		0.004	0.004	0.024	n=26
	within		0.009	-0.011	0.139	T=9
<i>Openness_{it}</i>	overall	0.769	0.796	0.148	8.562	N=234
	between		0.445	0.215	2.068	n=26
	within		0.665	-0.425	7.263	T=9

Table A2: Total FDI OLS estimation

<i>OLS estimation</i>	
Variables	(1)
L1.LnTotalFDI	42.86** (2.34)
Log (Capital stock)	714.21*** (7.69)
L1.Log (Population Growth)	-963.19*** (-7.57)
Log (Human capital)	-977.93*** (-4.08)
Log (Openness)	257.73*** (5.07)
Observations	208
R²	0.81
t-statistics in parentheses	
*p<0.1, **p<0.05, ***p<0.001	