THE EFFECTS OF FOREIGN DIRECT INVESTMENTS IN A TRANSITION ECONOMY: THE CASE OF UKRAINE

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ABSTRACT

The question of foreign direct investments (FDI) attraction has been always among top-priorities for policy makers from all over the world. Transition economies are eager to attract FDI since they promise to have a positive influence on the performance of receiving firm; however, despite all attractiveness, FDI can also indirectly affect domestic firms without foreign capital bringing both positive and negative spillover effects. Therefore, two main questions are addressed in the thesis: (1) do firms with FDI perform better than domestic ones? (2) do domestic firms benefit from spillover effects of FDI?

In this work, I investigate the dependence of Foreign Direct Investment on the performance of Ukrainian firms. Using the unique sample of 2438 Ukrainian firms, I employ fixed effects estimators identification strategy for the panel data for the 2008-2013 period. The results are robust to possible sources of endogeneity.

According to my findings, only in Kirovohrad, Zaporizhzhya, Zakarpattya and Zhytomyr regions, on average, firms with FDI perform better than domestic ones. At the same time, firms receiving FDI in such regions as Chernivtsi, Dnipropetrovsk, Kyiv and Odesa, on average, show lower performance. Moreover, the results suggest that there are positive spillovers to domestic firms in Western Ukraine and Kyiv region, while the real estate sector suffers from the highest negative spillover effect.

Keywords: FDI, direct effects, indirect effects, spillovers, transition economy, Ukraine.

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CHAPTER 1. INTRODUCTION

The question of attracting foreign direct investment has been one of the most prioritized in many economies all over the world. While for most economies FDI has positive effects, such as transfer of technology, more efficient allocation of resources or increasing qualification of domestic workers, it might also produce a bunch of negative economic effects, such as labor productivity decrease or exiting of weak domestic firms from the market. Why does this happen? What effects might FDI have in the host country? Is it always better for the country to attract FDI? During recent years many economists have raised this questions.

After the Soviet Union break down in 1991, Ukraine and 14 other independent countries were created. With a total land area of 605,500 square kilometers and population of over 50 million, the country was the second largest economy in the former Soviet Union. Yegorov (1999) states that in 1980s Ukraine produced 16-18% of the Soviet industrial output and 23-25% of its agricultural output, more precisely, in 1989 it produced 34% of Soviet steel, 23.5% of coal, 46% of iron ore and 56% of sugar. Since that times Ukraine has been going through the tough and tense process of transition from the planned to open market economy. Despite high interest rates, cheap cost of labor, low competition from domestic firms and high consumption were supposed to attract foreign investors from all over the world, the economic potential of the country was not adequately realized. According to the World Bank, Ukraine has somewhat mixed results in FDI performance over the period between 2000 and 2013 in comparison to benchmark countries such as Poland and Romania. For instance, in 2000 Ukraine attracted approximately 1.9 billion USD while Poland managed to get 5.4 billion USD, in contrast, Ukraine showed FDI net inflows of 4.65 billion USD in 2012 versus 1.47 billion USD for Poland.[1] However, due to the recent military

[1] Source: https://goo.gl/QIOOjB

conflict in the eastern part of Ukraine in 2014, the level of FDI fell dramatically to 634 million USD, which is lower than the level of 1995. Hence, we can observe a substantial variation in FDI during the last years in Ukraine.

While for most transition economies the attractiveness of FDI is out of doubts, we cannot ignore different spillover effects that foreign presence can bring. Nonetheless, the question of the influence of FDI in Ukraine has been little studied so far. Lutz and Talavera (2003) using unpublished firm-level data for Ukrainian firms for 1998-1999 years employ different econometric models with export volume and labor productivity as main measures of performance and found that in general, the presence of foreign ownership has positive effect on firms' performance both with and without FDI, however, domestic firms has lower performance than firms with other types of ownership. Even though authors argue that they did not find any significant differences in firms' performance for Kyiv, Kharkiv, Odesa and Lviv regions, they emphasize that the topic could be further investigated by studying the effect of regional spillovers and regional differences in firms' performance. Indeed, for a period of 1998-1999 regional differences might not have any significance due to the fact that FDI was substantially lower and the political approach of the former President of Ukraine Leonid Kuchma was aimed to balance the eastern and western interests.[2] However, following the Orange Revolution of 2004, Ukraine has been more than ever before the split into two camps: western and eastern. It is obvious that such political changes could not pass without affecting firms' performance in regions.

Taking latter into account, I am motivated to explore the following questions: whether the performance of firms with FDI differs from ones without FDI? Secondly, are there are any spillover effects on firms without FDI? Do firms without FDI benefit from FDI through spillover channels?

[2] Source: https://en.wikipedia.org/wiki/Leonid_Kuchma#President_.281994.E2.80.932005.29

Do regional differences in firms' performance between the western and eastern parts of Ukraine exist?

The study employs fixed effects estimation technique as identification strategy. I use balance sheet panel data for 2438 Ukrainian firms from Amadeus and Zephyr online databases for 2008-2013 years. Unlike Talavera and Lutz (2003), I include sales as the main performance indicator; moreover, I expand the time range from 2 to 5 years, include 25 regions and 12 industry classifications. To the best of my knowledge, there are no recent studies on the Ukrainian firms focusing particularly on the direct and indirect effects of FDI.

The results suggest that FDI has positive influence on firms located in Kirovohrad, Zaporizhzhya, Zakarpattya and Zhytomyr regions, and negatively on such regions as Chernivtsi, Dnipropetrovsk, Kyiv and Odesa. I also find positive spillover effects in Western Ukraine and Kyiv region, while rreal estate sector exhibits significant negative external effects from FDI presence.

The remainder of the paper is structured as follows. Chapter 2 describes the theoretical background of the work including literature review, model development, issues related to the FDI in Ukraine and transition economies and the overview of the legislative basis of FDI in Ukraine. Chapter 3 deals with the data description, empirical model, and analysis of results. Finally, Chapter 4 concludes.

CHAPTER 2. THEORETICAL BACKGROUND OF FOREIGN DIRECT INVESTMENT

When considering the impact of foreign presence on the productivity of the host country, policy-makers usually classify potential benefits that FDI can bring to the host economy as direct and indirect. Direct effects answer the question whether the firms with foreign ownership are more productive than comparable domestic firms. In its turn, indirect effects, or so-called "spillovers", refer to the question whether there is any positive influence from the presence of FDI on domestic or other foreign-owned firms (Girma S., Gong Y., Görg H., Lancheros S., 2014). In other words, "spillovers" should be treated as positive or negative external effects on local firms derived from the presence of MNCs that result in an increase or decrease in the domestic firms' productivity, competition, and efficiency.

In the relevant literature, researchers distinguish between six main drivers of spillover effects: technology transfer, competition effect, training effect, catch-up effect, demonstration effect and foreign linkage effect. In this light, much attention should be paid to this issue. Table 1 describes sources of productivity gain for each possible spillover channel as follows.

Table 1. Channels of spillover effects [3]

Spillover channels	*Source of the productivity gain*
Technology transfer	• Introduction of new technology and production methods • Introduction of new management practices
Competition	• Reduction of inefficiency • Domestic firms act more efficiently to protect their shares
Training (human capital)	• Labor productivity increase • Tacit knowledge • Flow of human capital from foreign to local firms
The catch-up effect	• Foreign firm captures the share of local market
Demonstration effect	• Local firms try to act the same way as foreign firms do
Foreign linkage (forward and backward).	• Usage of local suppliers and distributors by foreign firms • Local industry development

[3] Source: Author's own adaptation based on Blomström et al.(1999); Görg and Greenway (2001); Lall (1992); Nelsa Celestina Massingue da Costa (2012); Talavera O. and Lutz S. (2004)

2.1. Literature review

Previous empirical studies concerning the effect of FDI on the host country performance yielded ambiguous results, which could be partly explained by different approaches taken to studying its direct and indirect influence. The pioneers in the field were Caves (1974), Globerman (1979), and Blomstrom & Persson (1983), whose empirical models have been modified and extended; however, the basic approaches remained the same.

According to the detailed analysis of 40 studies on horizontal productivity spillovers in manufacturing industries conducted by Holger Görg and David Greenaway (2004), at least half report unambiguously positive and statistically significant horizontal indirect effects on local firms; however, all but eight use cross-sectional data which may be the source of biasedness. Therefore, firm-level panel data should be used as the most appropriate framework for the investigation of direct and indirect effects due to the possibility of studying over a longer period of time and investigation of spillovers after all other factors being controlled (Gorg and Strobl, 2001). Taking this into account, and the fact that almost all of these studies were conducted for developed economies, the evidence of positive horizontal spillovers becomes much weaker. A lot of studies on transition economies report some evidence on negative spillover effects (Görg H. and Greenaway D., 2004). Konings (2001) and Aitken & Harrison (1999) explain negative indirect effects by the fact that MNCs have lower marginal costs. Consequently, they can steal a part of domestic firms' demand, force them to cut the production and reduce productivity, which is a competition effect.

In line with Beata Smarzynska Javorcik (2004), the literature on this subject could be classified into three kinds. First, there are many very informative case studies, which include valuable information (Theodore H. Moran, 2001), but in most cases, they are limited to the

particular FDI project in a specific country for which the data was available. Therefore, problems with a generalization of the results from such researches often arise. Second, a lot of industry-level studies have been conducted showing that FDI and the average value added per worker are positively correlated. Nonetheless, due to the cross-sectional nature of the data, it is hard to establish the direction of the causality, i.e. foreign investors might initially seek for more developed regions or high-productive industries to invest in rather than cause spillover effect. Finally, there are many types of research based on the unpublished firm-level panel data examining the effect of the presence of FDI on the domestic firms' performance.

In their research Talavera O. and Lutz S. (2004), using unpublished micro-level annual panel data for 292 Ukrainian firms, examine direct and indirect effects of the FDI presence on the performance of domestic firms with and without foreign ownership. They find that FDI positively affects both labor productivity and exports of firms receiving FDI. Moreover, small positive spillover effect was found for those without foreign ownership. Studying spillover effects of FDI in Mozambique, Nelsa Celestina Massingue da Costa (2012), argues that spillover effects do not arise automatically and depend on various economic, social and politic factors in the country. Even though indirect effects should be evident in host countries, the strict concentration of FDI around a particular industry (e.g. mineral resources making) could make it difficult to benefit from aforementioned effects. Empirical studies of Blomstrom and Sjoholm (1999), Ponomareva (2000) and Smarzynska (2002) suggest that positive effects of FDI on different indicators of firm's performance were found in Indonesia, Russia and Lithuania. They imply that an FDI increase leads to an increase in the local capability and competition level between firms. However, the results vary across countries and across industries within a particular country. Barrel and Holland (2000), Dries and Swinnen (2004), Yudaeva (2003), Kolasa (2008) found growth effects of FDI in transition economies on local industry. Moreover, Aitken and Harrison (1999), Konings (2000)

found negative spillovers for Venezuela, Romania, and Poland. Therefore, there is a theoretical evidence of direct and indirect impacts of FDI and its contribution to differences between firms with and without FDI.

Table 2 sums up results of the most important research works in the field of FDI in Ukraine and some other transition economies.

Table 2. Summary of the relevant studies in the field of FDI in Ukraine and other transition economies

Year	*Author*	*Country*	*Period*	*Data*	*Aggregation Level*	Results
2015	Novak J., Cywiński L., Dzyuma-Zaremba U., Harasym R.	Poland, Ukraine	1992-2012	Not specified	Not specified	Policy implications for Ukraine and Poland; managerial implications for Polish direct investors in Ukraine
2015	Gorodnichenko Y., Svejnar J., Terrell K.	18 transition market economies	2002-2005	Panel	Firm-level	Positive backward spillovers
2012	Kokko A., Kravtsova V.	Ukraine	1999-2003	Panel	Firm-level and industry-level	Negative spillovers in eastern and positive in western Ukraine
2008	Kudina and Jakubiak	Ukraine, Moldova, Kyrgyzstan, and Georgia	Not specified	Not specified	Firm-level	Policy recommendations
2004	Beata Smarzynska Javorcik	Lithuania	1996-2000	Panel	Firm-level	Positive spillovers from FDI through backward linkages; no robust evidence of spillovers through forward or horizontal channels.
2003	Lutz S., Talavera O.	Ukraine	1998-1999	Panel	Firm-level, unpublished	Positive direct and indirect effects
2001	Talavera O.	Ukraine	1999-2001	Panel	Firm-level, unpublished	Positive direct effects
1998	Mohammed Ishaq	Ukraine	1992-1997	Not specified	Macro	Policy recommendations
1997	Mohammed Ishaq	Ukraine	1992-1996	Not specified	Macro	Policy recommendations
2001	Konings Jozef	Bulgaria, Romania, and Poland	1993-1997	Panel	Firm-level	Positive direct effects only in Poland; no evidence of positive spillovers, negative spillovers in Bulgaria and Romania

Taking into account the analysis of the previous literature, it is obvious that despite sufficient amount of studies in the field of FDI in transition economies little research has been performed so far focusing particularly on its direct and indirect effects in Ukraine.

2.2. Model development

As was mentioned in the previous section, the first empirical works on the analysis of an FDI influence on the domestic firms' productivity became widely used in subsequent studies, such as Talavera and Lutz (2003), Talavera (2001), Konings (2000), Ponomareva (2000).

Initially, Caves (1974) explored the spillover efficiency of FDI in Australia, while Globerman (1979) studied Canada; however, the first econometric research focusing particularly on the underdeveloped economy was conducted by Blomstrom & Persson (1983) (Talavera, 2001).[4] They studied the performance of Mexican firms using the Mexican 1970 Census of Manufacturers data. Authors consider the plant as a "foreign" if the total share of foreign investment is at least 15%. The econometric model is specified as follows:

$$VL^d = f(KL^d, H, SCALE^d, AD, (LQ_1, LQ_2), FS) \text{ , where}$$

VL^d - value-added of the domestically-owned private plants over the number of employees of this plant

KL^d - the ratio of total assets to the total number of employees;

H - Herfindahl index;

$SCALE^d$ - the ratio of the economy of scale;

AD - average effective working day;

LQ_1 - white-collar to blue-collar workers ratio $LQ_1 = a + b_1 FS + e$;

[4] Source: https://goo.gl/bRoLBs

LQ_2 - the error term in the regression LQ_1;

FS - the share of employees in an industry employed in the foreign plant.

The more recent work by Konings (2000) focuses on such emerging economies as Poland, Bulgaria, and Romania. He was able to collect the data from Amadeus database for 262 firms in Poland (1993-1997 period), 2.321 firms in Bulgaria (1993-1997 period) and 3.844 firms in Romania (1994-1997). The author uses fixed-effects estimators for the following regression model:

$y_{it} = \alpha_i + \alpha_1 n_{it} + \alpha_2 k_{it} + \alpha_3 m_{it} + \alpha_4 \eta_t + \alpha_5 FDI_i + \alpha_6 FDI_i XT_i + \alpha_7 Spill_{it} + \varepsilon_{it}$, where

y_{it} - log of output,

n_{it} - log of employment,

k_{it} -log of capital,

m_{it} -log of material inputs,

η_t - stands for time effects,

FDI_i - the fraction of share held by foreign investors,

$FDI_i XT_t$ - the interaction of foreign ownership with the time trend,

$Spill_t$ - measures the sector level spillovers from FDI,

ε_{it} - white noise error term.

In this specification, Konings estimates direct and indirect effects simultaneously. This econometric model is very similar to the work of Ponomareva (2000), except in this case author adds the logarithm of material inputs.

Furthermore, in their research Talavera and Lutz (2003) using unpublished data on Ukrainian firms for the 1998-1999 period, estimate four different econometric models: two models for direct effects and two for spillovers, respectively. They use export volume and labor

productivity as main proxies for firm's productivity.[5] In econometric Model 1, labor productivity is assumed to be the performance indicator:

$$\ln\frac{Y_{it}}{L_{it}} = const + \alpha_1 \ln\frac{K_{it}}{L_{it}} + \alpha_2 FDI_i + \sum_{\rho=1}^{3} R_\rho REGION_{\rho i} + \sum_{\sigma=1}^{6} S_\sigma INDUSTRY_{\sigma i} + \sum_{\sigma=1}^{6} O_\delta OWN_{\delta i} + \varepsilon_{it,} \quad \text{where}$$

$\ln\frac{Y_{it}}{L_{it}}$ - log of labor productivity calculated as the export volume of the company over the number of employees,

$\ln\frac{K_{it}}{L_{it}}$ - log of capital productivity estimated as capital (fixed assets) over the number of employees,

FDI_i - dummy for foreign direct investment, taking value 1 if the firm ever received FDI,

$REGION_{\rho i}$, $INDUSTRY_{\sigma i}$ - region and industry dummies, respectively,

R_ρ - stands for regional category division,

S_σ - industry category division,

$OWN_{\delta i}$ - dummies, which determine the ownership type,

O_δ - division by different ownership types.

In this model, they test whether FDI has any influence on labor productivity of the receiving firm. Model 2 has the same structure, but uses the logarithm of export value as performance indicator and logarithms of fixed assets and number of employees as independent variables.

[5] Note: Lutz and Talavera would prefer to use value added or vale added per worker as performance indicator, but unable to do this because of unavailable data.

In the second part of the study Talavera and Lutz use Model 3 and Model 4 to deal with the problem of spillover effects. Authors specify Model 3 as follows:

$$\ln \frac{Y_{it}}{L_{it}} = const + \alpha_1 \ln \frac{K_{it}}{L_{it}} + \lambda SPILL_{\sigma\delta i} + \sum_{\sigma=1}^{6} O_\delta OWN_{\delta i} + \sum_{\sigma=1}^{6} S_\sigma INDUSTRY_{\sigma i} + \varepsilon_{it,} \quad \text{where}$$

$SPILL_{\sigma\delta i}$ - spillover variable is the percentage of FDI in region multiplied by the percentage of FDI in the industry of non-FDI firm.

Moreover, to address possible sources of endogeneity authors suggest two-step procedure, i.e. they constructed the measure $FDI_i^* = const + \alpha \ln EXP_{it} + \varepsilon_{it}$ and use estimated values with GLS to avoid heteroscedasticity.

Finally, Beata Smarzynska Javorcik (2004) in her study on Lithuanian firms argues that spillover effects might not appear on the same level, but spread through other channels, such as forward or backward linkages. Following the experience of previous studies, the author estimates all effects simultaneously and specifies the econometric model as follows:

$$\ln Y_{ijrt} = \alpha + \beta_1 \ln K_{ijrt} + \beta_2 \ln L_{ijrt} + \beta_3 M_{ijrt} + \beta_4 Foreign\,Share_{ijrt} + \beta_5 Horizontal_{jt} + \beta_6 Backward_{jt} + \beta_7 Forward_{jt} + \alpha_t + \alpha_r + \alpha_j + \varepsilon_{ijrt}, \text{ where}$$

$\ln Y_{ijrt}$ - real output of the firm *i* operating in sector *j* and region *r* at time *t*;

$\ln K_{ijrt}$ - capital, as the value of fixed assets at the beginning of the year;

$\ln L_{ijrt}$ - labor, in terms of efficiency units, which are computed by dividing the wage bill by the minimum wage;

M_{ijrt} -material inputs;

$Foreign\,Share_{ijrt}$ -measures the share of firm's total equity owned by the foreign investor;

$Horizontal_{jt}$ - proxy for spillovers, the extent of foreign presence in sector *j* at time *t*;

$Backward_{jt}$ - proxy for the foreign presence in the industries that are being supplied by sector *j*;

$Forward_{jt}$ - the weighted share of output in upstream sectors produced by firms with foreign participation;

ε_{ijrt} - error term.

Having considered all mentioned above, we can conclude that the basic approach of addressing the issue of FDI influence on firm's performance remains the same. Nevertheless, many studies attempt to use various econometric techniques along with different input variables depending on the data availability. Therefore, based on the information above, I develop the model described in the empirical part of the thesis.

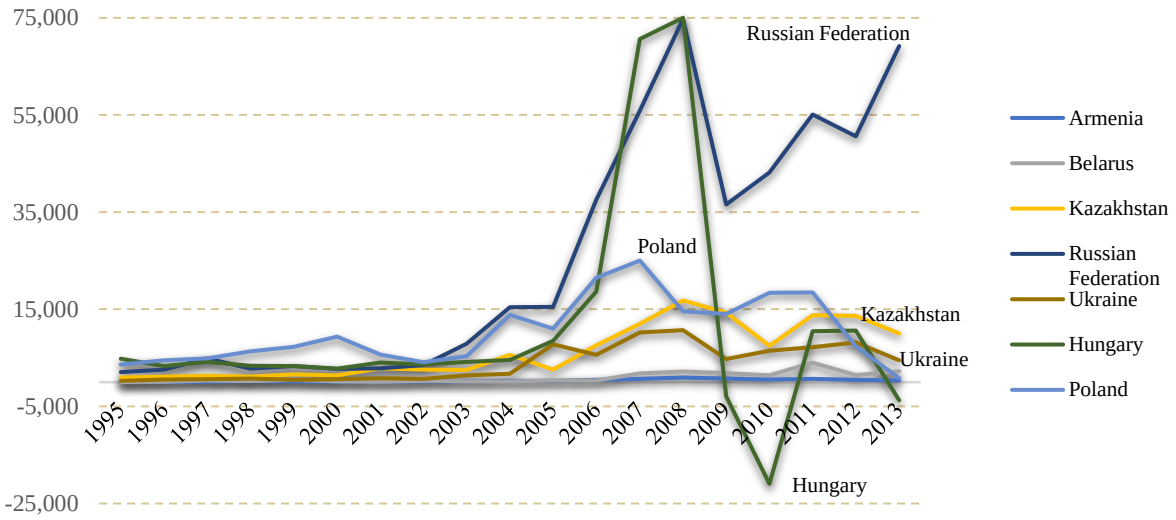
2.3. FDI in transition economies

Transition economy usually characterized by changing and creating of governmental institutions, private enterprises, independent financial institutions, etc. Among benefits for foreign investors are unrealized production capabilities, cheap labor force, and high productivity growth. Below I describe the main trends and features of such economies as Hungary, Poland, Russian Federation, Armenia, Belarus, and Kazakhstan. Although Ukraine is also present in this set of countries, I will discuss it more detailed in subsection 2.4.2.

The first official statistics of FDI in most post-Soviet countries became available from 1992-1995. In order to show the dynamics of FDI in transition economies, I decided to choose countries both from EU (Hungary and Poland) and from CIS (Armenia, Belarus, Kazakhstan and

Russian Federation), which could be considered as essential benchmark countries for Ukraine. **Figure 1**depicts how the net inward FDI in these countries evolved during the 1995-2013 period.[6]

Figure 1. Net FDI inflows in Ukraine and benchmark countries, mln. USD, 1995-2013



As revealed by the figure, the main recipients of FDI in this group of countries have been Russian Federation, Hungary, Poland and Kazakhstan, while Ukraine was ranked near the bottom of the list. Almost all countries in the set were more or less hit by the 2008 Global Economic Crisis and partially recovered their foreign investment positions during the following years.

It is worth saying that in 2008 Hungary due to its fundamental economic reforms and outward orientation attracted near 75 billion USD, which is as much as Russian Federation managed to get for the same year. However, following the global economic downturn, declining exports, domestic consumption, and investment, Hungary had to obtain an IMF/EU/World Bank financial assistance package worth 25 billion USD.[7] This explains sharp decline on the graph for 2009-2010 years. Nonetheless, nowadays Hungary remains to be one of leading regions in Central and Eastern Europe for attracting FDI.

[6] World Bank Database: http://data.worldbank.org/indicator/BX.KLT.DINV.CD.WD
[7] Source: https://www.cia.gov/library/publications/the-world-factbook/geos/hu.html

Unlike Hungary, Poland was the only country in the European Union to avoid economic downturn of 2008-2009 due to its policy of economic liberalization since 1990.[8] According to 2016 Investment Climate Statement, Poland's main assets are proximity to major markets, a well-educated labor force with relatively low cost of work and strong prospects for future growth.[9] It is ranked 25 of 189 by the World Bank's 2015 Doing Business Report "Ease of Doing Business".[10] All before mentioned allowed Poland to finish the year of 2013 with cumulative FDI of $172.42 billion. The major investing countries are USA, Germany, France, Netherlands, Luxembourg and Italy.[11]

Russian Federation and Kazakhstan being rich for natural resources, such as oil and gas, managed to attract relatively large amounts of FDI into its extractive industries. However, other sectors suffered from a lack of FDI due to unfavorable investment climates, such as high levels of corruption and large distance from world markets. Despite its favorable location between EU and Russian Federation, Belarus failed to attract enough FDI during considered period, except the invested capital in the Yamal pipeline construction on the territory of Belarus (Shukurov S., 2016).

In general, considered countries are attractive for foreign investors due to geographical location, proximity to markets and open-market policies (Hungary, Poland) and substantial amounts of natural resources and growth opportunities (Russia, Ukraine, Kazakhstan). However, such factors as political instability and bribery make the last subset of countries less attractive for foreign investors.

[8] Source: https://www.cia.gov/library/publications/the-world-factbook/geos/pl.html
[9] U.S. Department of State, source: https://www.state.gov/e/eb/rls/othr/ics/2016/eur/254403.htm
[10] Source: http://www.doingbusiness.org/rankings
[11] National Bank of Poland, source: http://www.nbp.pl/homen.aspx?f=/en/publikacje/ziben/ziben.html

2.4. Determinants of FDI in Ukraine

2.4.1. Legislative basis of FDI in Ukraine

In order to create appropriate conditions for the effective attraction of foreign capital into Ukrainian economy, much attention is paid to improving the legal and regulatory framework regarding the state regulation of foreign investments. Nowadays, various laws and legal acts regulate the regime of foreign investment in Ukraine. Among others, the following laws should be mentioned (Table 3).[12]

Table 3. The main laws regulating the investment activities in Ukraine

Dated	*Authority*	*Name of the Law*	*Features*	*Status*
30 January 1997	CMU[13]	"On Approval of the Procedure of State Registration of Agreements (Contracts) on Joint Investment with Foreign Investors "	Determine the registration, government agencies, the list of documents required for registration, deadlines for issuing registration certificates, etc.	Active
7 August 1996	CMU	"On Approval of the Procedure of State Registration of Foreign Investments"	The same features as the previous one has	Active
19 March 1996	VRU[14]	"On the Foreign Investment Regime"	The main law regulating the foreign investment regime in Ukraine	Active
17 December 1993	CMU	"On State Program Of Encouraging Foreign Investment in Ukraine"	Canceled by the Law "On the foreign investment regime", dated 19 March 1996	Inactive
20 May 1993	CMU	"On the Foreign Investment Regime"	Canceled by the Law "On the foreign investment regime", dated 19 March 1996	Inactive
13 March 1992	VRU	"On Foreign Investments"	Previous main law on foreign investments, canceled by the Law "On the foreign investment regime", dated 19 March 1996	Inactive
25 June 1993	VRU	"On the Scientific and Technical Information"	Allows foreign legal and natural persons, and stateless persons to invest into development areas of scientific and technical information of Ukraine in accordance with applicable law.	Active
28 March 1991	VRU	"On Banks and Banking Activity"	Provides the right to create commercial banks with foreign legal and natural persons.	Active

[12] Source: http://www.amb-ucraina.com/TEM/Ucraino/Zakoninvest.htm
[13] Cabinet of Ministers of Ukraine, http://www.kmu.gov.ua/
[14] Verkhovna Rada of Ukraine, http://rada.gov.ua/en

Following the sharp decrease in the foreign direct investments level in 2014, which was caused by the military conflict in the East of Ukraine, the National Investment Council was created as a consultative and advisory body to the President of Ukraine. According to the latest Presidential Decree №365/2016 "On the National Investment Board", the main tasks of the Board are:

- Developing proposals in order to stimulate development and investment activity in Ukraine, form favorable investment image of Ukraine, including taking into account international best practices;
- Stimulating a major policy direction to improve the investment climate in Ukraine;
- Elaborating proposals on strategic directions of Ukraine's investment potential, stimulation of foreign and domestic investment in the national economy;
- Exploring potential initiatives and proposals for investment projects, and practicing of investment interaction with government authorities;
- Analysis and synthesis of problems that hinder investment in Ukraine's economy, preparing proposals for their solutions, in particular regarding the actions to increase investor protection;
- Participation in the elaboration of the draft legislation on investment.[15]

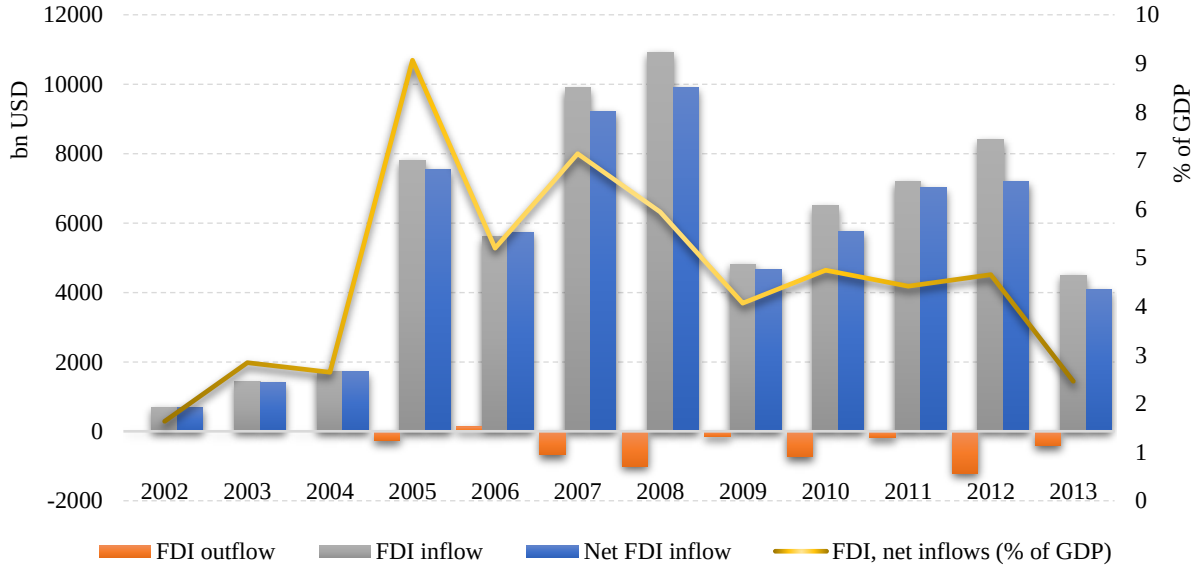
Although numerous laws and regulations regarding the regulation of the foreign investment climate in Ukraine have been implemented, such problems as an extremely high level of bribery and corruption, unstable macroeconomic situation, and other causes may slow down the foreign investment activity.

[15] Presidential Decree translation adapted by the author;
Source: http://www.president.gov.ua/documents/3652016-20441

2.4.2. Investment trends in Ukraine during 2002-2013

Considering the investment trends in Ukraine, the essential starting point is the analysis of the inward and outward FDI inflow development and, as a result, the net FDI inflow. Based on the data availability in the database of National Bank of Ukraine I choose the period of 2002-2013. This period captures the part of the presidential period of Leonid Kuchma, as well as presidential periods of Victor Yuschenko (2005-2010) and Victor Yanukovych (2010-2014). Nonetheless, significant quantitative changes in the level of FDI were achieved after the Orange Revolution of 2004, which brought Victor Yuschenko to power and marked the beginning of the new era in Ukrainian politics and economics. Figure XX depicts the dynamics of the aforementioned indicators.

Figure 2. Inward and outward FDI in Ukraine, 2002-2013.[16]



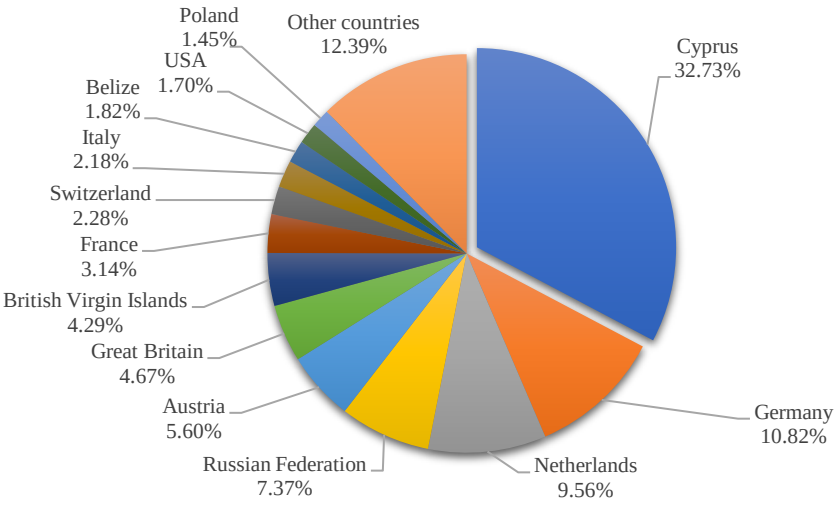
Kirchner, Kravchuk and Ries (2015) analyzing the trends of FDI in Ukraine including the year of 2014, suggest that it is possible to distinguish between three different phases of FDI

[16] Adapted by the author, based on Kirchner, Kravchuk, Ries (2015);
Sources: World Bank database, link: https://goo.gl/Idp4dy
National Bank of Ukraine, link: https://goo.gl/zoj0bg

attraction during this period of time. Namely, the "boom" until the 2008 global economic crisis, the "recovery" until 2012 and the "decline" after 2013. After the President Viktor Yushchenko came to power the amount of FDI significantly increased, but the crisis of 2008 resulted in a substantial drop in the index by almost 50% in 2009. Nonetheless, during the period of "recovery", FDI started gradually increasing until 2012 until the drop in 2013 due to economic stagnation.

Continuing the analysis of FDI trends in Ukraine, it is reasonable to look for the sources of FDI by countries. Figure 3 contains the information about the country breakdown of inward FDI stock in Ukraine.

Figure 3. Country breakdown of inward FDI stocks in Ukraine, 2013 [17]

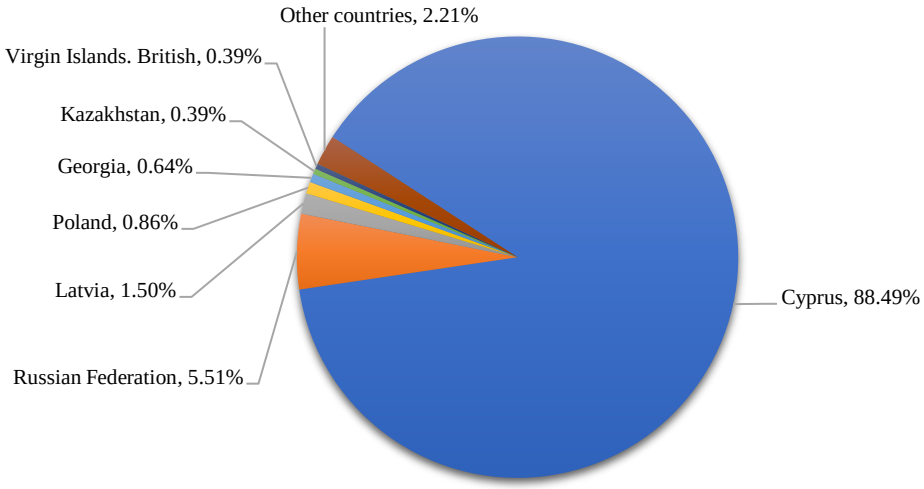


According to the State Statistic Office of Ukraine, more than 30% of all inward FDI stock in 2013 goes to Cyprus, which could be the source of "round-tripping" of domestic funds (Kirchner, Kravchuk and Ries, 2015), since Ukrainian investors often use Cyprus as the "safe harbor" for their money. It is fair to say that Cyprus is used by investors from all over the world, therefore it is hard

[17] Source: http://ukrstat.gov.ua/

to establish the exact causal relationship between the outward and inward stock of FDI coming to and from Cyprus in Ukraine. Among others, Germany, Netherlands, Russian Federation[18], Austria, Great Britain and the British Virgin Islands.

Figure 4. Ukraine's FDI stock breakdown by target country, 2013 [19]



Furthermore, looking at the distribution of Ukrainian outward FDI stock (*Figure 4*), we can see impressive investments share of approximately 88% which goes to Cyprus. Kirchner, Kravchuk, and Ries (2015) argue that this fact supports the idea of "round-tripping" of the domestic funds, which allows avoiding taxes or provides better legal protection. Indeed, Cyprus offshore economy has been an important player providing the shelter for Ukrainian money and giving domestic producers the opportunity to develop and allocate money. However, during the Ukrainian Revolution of 2014, numerous facts of corruption and bribery were revealed, and, unfortunately, even among the highest echelons of power. Although it is difficult to estimate the real portion of

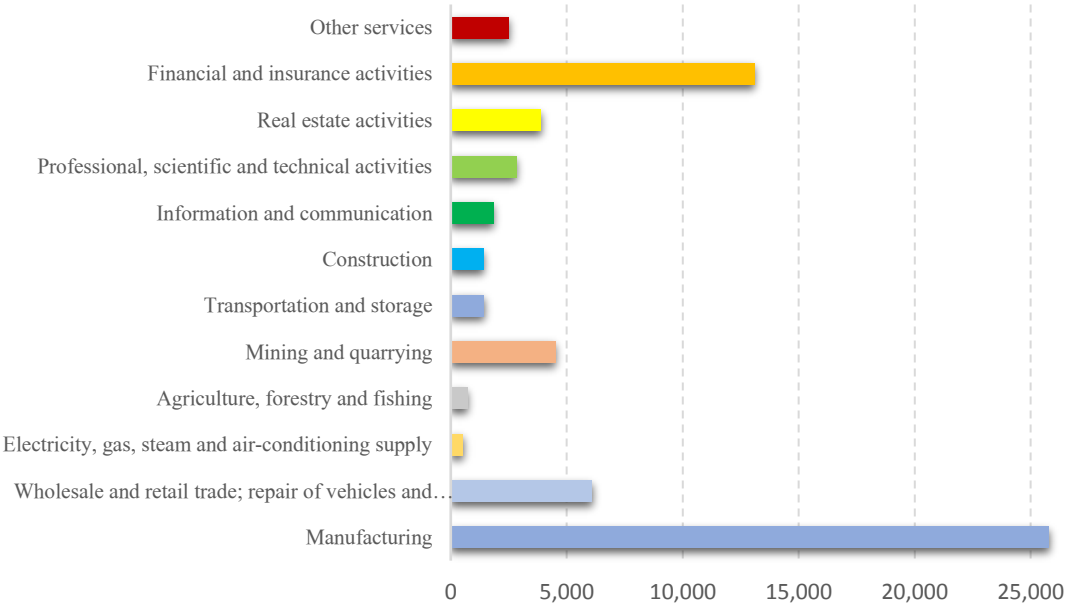
[18] According to the Ukraine Presidential Decree №133/2017 "On the personal application of the special economic and other restrictive measures (sanctions)", dated 15 May 2017, sanctions against Russian Federation prohibit any activity of 468 Russian owned or jointly owned enterprises on the territory of Ukraine for the period from 1 to 3 years. Such actions will affect the position of Russian Federation in the list of inward FDI stock countries during the following years.

[19] Source: http://ukrstat.gov.ua/

FDI stock in Cyprus which belongs to corrupted politicians, the true aim of Ukrainian outward FDI which goes to Cyprus becomes questionable. Moreover, the State Statistic Office of Ukraine reports that in 2013 Ukraine had the total FDI stock of approximately $ 5.8 billion, while inward FDI stock from Cyprus was $ 19 billion, which is roughly 3 times higher. According to the 2015 Ukraine Investment climate statement, this indicates the presence of other foreign investors, such as Russian Federation, who channel their FDI through Cyprus, just as the Ukrainian investors do, due to a favorable bilateral tax treaty.[20]

Finally, it is worth looking on the FDI stock in Ukraine by economic activity (Figure 5**Figure 1**).

Figure 5. Distribution of inward FDI stock by industry, 2013, (mln. USD)[21]



Obviously, the highest level of FDI goes to the manufacturing sector, which includes such subsectors as the manufacture of basic metals and fabricated metal products, manufacture of coke and refines petroleum products, machine building, food processing, etc. In terms of the sectoral

[20] Source: https://www.state.gov/documents/organization/241993.pdf
[21] Source: http://ukrstat.gov.ua/ , including own calculations.

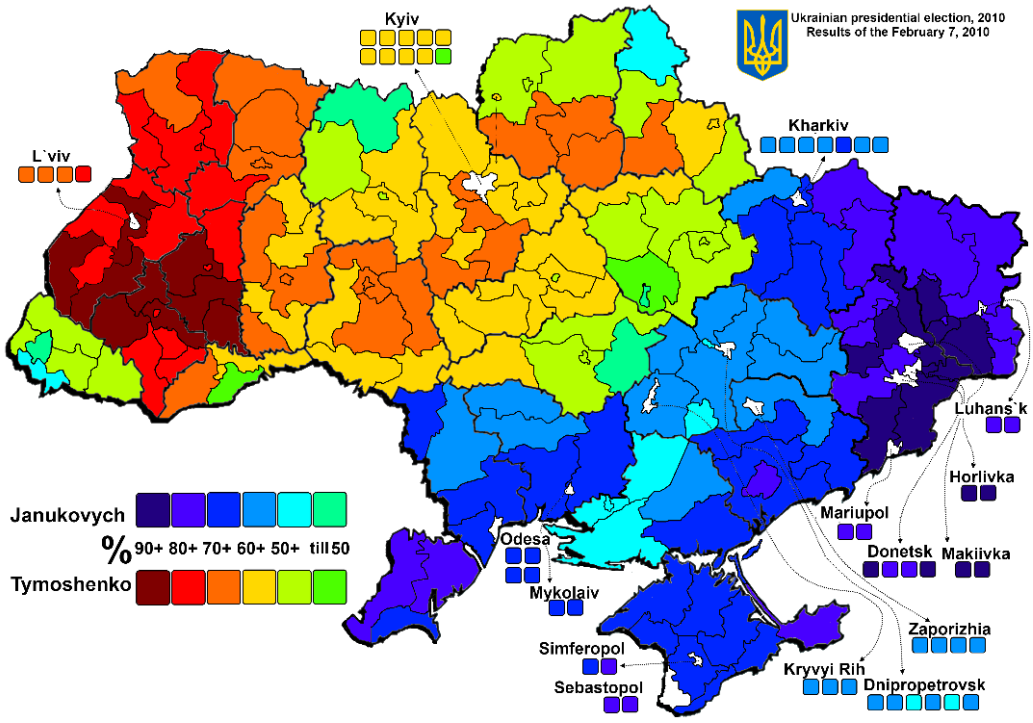
structure of manufacturing industry, metallurgy holds the leading position being the main beneficiary in Ukraine, while food processing is on the second place. Moreover, financial sector also shows a high level of FDI attraction holding the second position after manufacturing industry, which indicates the high level of FDI attraction by domestically-oriented entities.

2.4.3. Regional characteristics of FDI in Ukraine

Since the independence of Ukraine, various academic studies reported strong regional political division between western and eastern parts of the country. During the Orange Revolution of 2004, when the president Viktor Yuschenko and his Party Our Ukraine came to power, Ukraine was more than ever before the split into two camps: the eastern one and the western one. The Western part of Ukraine supported Viktor Yushchenko, while the Eastern one backed up Viktor Yanukovych. This tacit division of the country remained the same during the Ukrainian presidential election of 2010. The best representation of East-West regional division in Ukraine is the results of Ukrainian presidential election of 2010 plotted on the map (Figure 6). [22]

[22] Source: https://goo.gl/8xpwDy

Figure 6. Allocation of votes during the 2010 Ukrainian presidential election



As it revealed by Figure 6, again, the eastern Ukraine strongly supported Viktor Yanukovych and Region's Party, while the western part of the country voted for Yulia Tymoshenko, who came after Viktor Yuschenko. According to the results of the election, Viktor Yanukovych became a President of Ukraine with 48.95% of the votes versus 45.47% for Yulia Tymoshenko.

Kokko (2012) suggests that such outcome represents clear regional differences in people's opinion about the further economic direction which Ukraine should stick to. In fact, differences between these two regions are deeper than just "political beliefs", e.g. people in the western part of the country speak preferably Ukrainian, while the Russian language dominates in the eastern Ukraine. Various studies emphasize such differences as religion, economic structure, attitudes towards the European Union and Russian Federation, etc. (Kokko, 2000; Birch, 2000; Christensen et al., 2005; Liber, 1998; Wolczuk, 2006; Kubicek, 2000). Obviously, such differences may lead to different attitudes towards the presence of foreign investors. Kokko (2000) also mentions that the Region's Party mainly represents the business interests of the regional Donbas elites, who came

to power and acquired extensive assets taking advantage on the opacity and laxness of the legal and economic situation in the country in the 1990s. Thus, it is naturally to expect that eastern regions of the country will be more financed than western ones. Taking latter into account, I am motivated to explore the regional differences in firms' performance related to the presence of FDI.

CHAPTER 3. EMPIRICAL ANALYSIS

Considering the theoretical background of the topic, it is obvious, that little study has been performed so far focusing particularly on the direct and indirect effects of FDI in Ukraine. Moreover, there are no other studies focusing on the post-crisis periods of Ukrainian development. Therefore, the main questions of the paper are: (1) do firms with FDI perform better than domestic firms without FDI? (2) Do firms without FDI benefit from spillover effects?

2.5. Data description

The data used in this research consist of the merged firm-level information from Zephyr and Bureau Van Dijk Amadeus databases.[23] This dataset includes micro-level balance sheet information on firms' fixed assets, sales, the number of employees, mergers, and acquisitions, and industry-region information.

I collected the data for the 2008-2013 period. The choice of this time period is due to the fact that despite being a President till 2010, the political power of Yuschenko and his affiliates was already constrained in 2006 when Yanukovych became a Prime Minister (Miller, 2015). Moreover, the 2008 Global Economic Crisis significantly affected Ukrainian economy, which is obviously influenced the behavior of foreign investors. In addition, following the 2014 military conflict in the East of Ukraine many foreign investors began to withdraw assets, a lot of firms significantly reduced production and the amount of labor force employed making it impossible to conduct qualitative analysis for the most recent periods.

Although various estimators of fixed assets could be found in the empirical literature, following Lutz and Talavera (2003), I use the balance sheet value of fixed assets as the main

[23] Bureau Van Dijk web page: https://www.bvdinfo.com/en-gb/home

reliable proxy for capital. The balance sheet value of fixed assets is the best available measure of the firms' real capital capacities available in the Amadeus database.

The dataset consists of observations of different Ukrainian firms. In the sample, 550 out of 2438 received FDI. Table 3 describes statistic characteristics of variables in the dataset.

Table 4. Descriptive statistics of main variables in the dataset

Variable	*Description*	*Obs.*	*Mean*	*Std. Dev*
Dependent variables				
sales	Balance sheet value of total sales, th EUR	14628	48246.72	255447.73
logsales	Log of sales	14628	8.88	1.77
Independent variables				
logsales_1	First lag of logsales	14628	8.88	1.77
fixedassets	Book value of fixed assets, th EUR	14628	29271.11	247147.01
logfixedassets		14628	7.76	2.07
labor	Total number of employees	14628	955.87	3852.52
loglabor		14628	5.52	1.46
Years		2008-2013		

Following Blomstrom (1983), I assume the firm to be with FDI if:

- It has reported that the change in FDI, such that the total share of stocks owned by a foreign investor is at least 15% of total shares outstanding;
- It was previously acquired by a foreign owner.

Possible operations associated with the foreign investment activities in the dataset are the following:

- Acquisition of the whole company or a controlling stake;
- Institutional buyout of a controlling stake;
- Acquisition of a majority stake;
- Acquisition of a minority stake.

The data set covers 25 regions. These regions represent East, West, South, North and Center of Ukraine, however, according to the presidential elections results of 2004 and 2010, I can conditionally split Ukrainian firms by Eastern and Western-oriented ones. Table 4 represents the regional distribution of firms with its frequencies.

Table 5. Regional distribution of firms

Id	*Region*	*FDI firms*		*All firms*	
		Frequency	%	Frequency	%
	Western Ukraine				
1	Kyivska	159	28.91%	542	22.23%
2	Poltavska	21	3.82%	121	4.96%
3	Cherkaska	22	4.00%	82	3.36%
4	Lvivska	13	2.36%	112	4.59%
5	Ivano-Frankivska	12	2.18%	38	1.56%
6	Volynska	9	1.64%	57	2.34%
7	Vinnytska	11	2.00%	69	2.83%
8	Sumska	10	1.82%	51	2.09%
9	Zhytomyrska	11	2.00%	50	2.05%
10	Kirovohradska	8	1.45%	66	2.71%
11	Ternopilska	8	1.45%	52	2.13%
12	Khmelnytska	6	1.09%	56	2.30%
13	Chernihivska	4	0.73%	46	1.89%
14	Zakarpatska	4	0.73%	30	1.23%
15	Chernivetska	1	0.18%	14	0.57%
16	Rivnenska	2	0.36%	45	1.85%
	Total, West	**301**	**54.73%**	**1431**	**58,70%**
	Eastern Ukraine				
17	Donetska	62	11.27%	181	7.42%
18	Dnipropetrovska	57	10.36%	221	9.06%
19	Zaporizhska	32	5.82%	104	4.27%
20	Kharkivska	26	4.73%	193	7.92%
21	Odeska	21	3.82%	116	4.76%
22	Crimea, Autonomous Republic	19	3.45%	36	1.48%
23	Luhanska	11	2.00%	57	2.34%
24	Mykolayivska	13	2.36%	56	2.30%
25	Khersonska	8	1.45%	43	1.76%
	Total, East	**249**	**45.27%**	**1007**	**41.30%**
	Total, Ukraine	***550***		***2438***	

As can be seen from the table above the allocation of firms between Eastern and Western parts of Ukraine is almost equal.

In addition, the dataset includes 12 industries representing the most developed sectors in Ukraine.

Table 6. Industrial distribution of firms

Id	*Industry*	*FDI firms*		*All firms*	
		Frequency	*%*	*Frequency*	*%*
1	Manufacturing	265	48.18%	580	23.79%
2	Wholesale and retail trade	62	11.27%	433	17.76%
3	Electricity, gas, steam and air conditioning supply	56	10.18%	101	4.14%
4	Agriculture, forestry and fishing	40	7.27%	596	24.45%
5	Mining and quarrying	33	6.00%	71	2.91%
6	Transportation and storage	22	4.00%	177	7.26%
7	Construction	19	3.45%	166	6.81%
8	Information and communication	13	2.36%	50	2.05%
9	Professional, scientific and technical activities	9	1.64%	55	2.26%
10	Real estate activities	8	1.45%	85	3.49%
11	Financial and insurance activities	8	1.45%	26	1.07%
12	Others	15	2.73%	98	4.02%
Total		***550***		***2438***	

2.6. Econometric model used

Finding a good proxy for the firm productivity is very important part of work on this topic because there is no single variable that could perfectly explain volatility in firm's performance. Although Talavera and Lutz (2003) argue that an added value could be the best measure for this purpose, it turned out that it is impossible to use this variable in practice because many firms report negative values, which makes applying the log-linear form of econometric models meaningless. Miller (2015) argue that productivity could be estimated with Cobb-Douglas function; however, this approach requires more information on material inputs, which is not available in this database. Therefore, following Konings (2000), I decided to use sales as the proxy for firm's performance, since it is the best available measure. I use Producer Price Index to convert the data into 2008 producer prices.[24]

[24] Available at NBU web-site:

Estimating the effects of an FDI influence on firm's performance requires a deep understanding of the reasons that may cause productivity growth or decline. Except for the particular effect of FDI and control variables, I assume that change in productivity also depends on other unobservable factors, which are time dependent, but do not vary across regions or industries, and those that are region or industry dependent, but time invariant. It is assumed that idiosyncratic factor is uncorrelated with any of the explanatory variables. The example of a time-dependent factor could be the presence of a global economic crisis. To address this issue I introduce time dummies. In its turn, region and industry dependent factors may include religion, climate change, political views, and attitudes towards FDI, allocation of resources or proximity to markets. Using the same approach for aforementioned factors will lead to over specification of the model. Thus, I cannot include dummies for these factors. Furthermore, Figure 8. and Figure 8 illustrate the presence of unobserved heterogeneity between regions and years, respectively.

Figure 8. Unobserved heterogeneity across regions

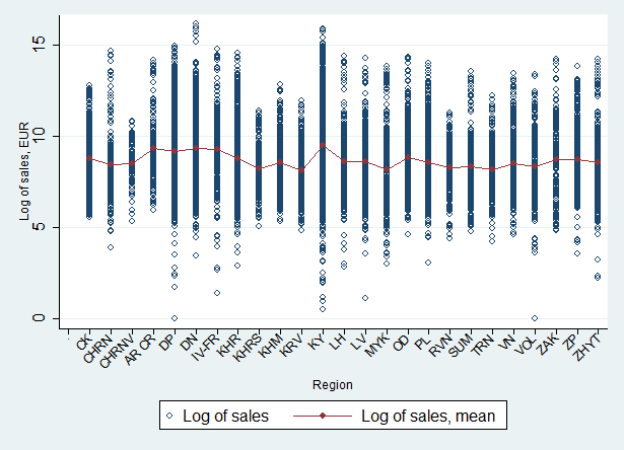
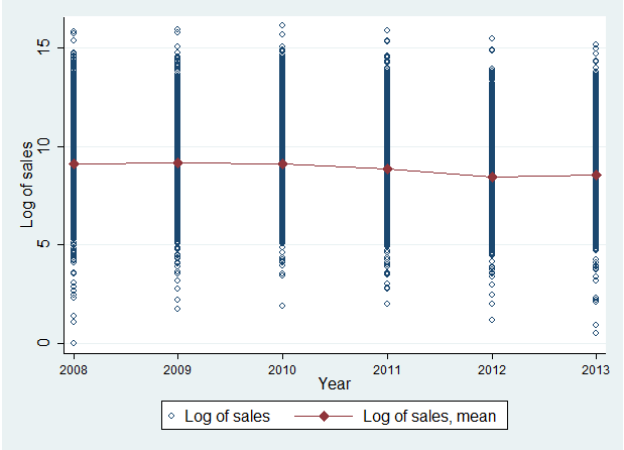


Figure 7. Unobserved heterogeneity across years



Thus, I can conclude that due to unobserved heterogeneity, the correlation between one of the variables and the residual term is not zero. Hence, because of the endogeneity problem, pooled OLS which ignores the panel structure of the data, and simply estimates regression betas, will produce biased and inconsistent estimators. I deal with this problem by using a fixed effects model specification. This modification allows for the canceling out the country-specific effects, intercept, and

the time-invariant regressors. The new assumption now is that the covariance between the idiosyncratic error term and any of the explanatory variables is equal to zero. In other words, the fixed effects model provides unbiased and consistent estimators of regression coefficients. To check for a correct econometric specification I employ Hausman specification test. I also include the first lag of logarithm of sales as an explanatory variable, since the value of Durbin-Watson statistics indicated the presence of autocorrelation in the residuals.

In order to estimate direct and indirect effects of FDI on firm's performance, I specify two different econometric models. Model 1 is used to estimate the direct effects of FDI, while Model 2 deals with spillover effects.

Model 1. In this specification, the logarithm of sales is assumed to be the proxy for firm's performance. Therefore, I specify the following econometric model in the log-linear form:

$$\ln Sales_{it} = \beta_1 \ln Sales_{it-1} + \beta_2 \ln Capital_{it} + \beta_3 \ln Labor_{it} + \beta_4 FDI_{it} + \beta_5 Scale_{it} + \sum_{\delta=1}^{6} \eta_\delta Year_{\delta i} + \varepsilon_{it},$$

where i – index for the firm, t – index for the year

$\ln Sales_{irt}$ - log of sales of the firm

$\ln Sales_{it-1}$ - first lag of the log of sales

$\ln Capital_{irt}$ - log of fixed assets

$\ln Labor_{it}$ - log of the number of employees

FDI_{irt} - a dummy variable for foreign investments taking value 1 if the firm received the investment in a particular year and remains the same until the end of the observation period

$Scale_{irt}$ - proxy for the economy of scale calculated as the firm's production over the average production in the industry

η_δ - dummy for a year

ε_{it} - error term.

Unlike random effects, fixed effects model specification does not allow including dummy variables for region and industry. Therefore, the coefficient β_4 will only show the average effect of FDI presence in the country. Taking latter into account, I am motivated to investigate the influence of FDI in different regions and industries by estimating Model 1 in 25 regions and 12 industries separately. Moreover, according to the regional differences in Ukraine mentioned in part 2.4.3, there is a reason to investigate differences between Eastern and Western Ukraine, and Kyiv region separately.

Model 1.1 for differences between Eastern Ukraine, Western Ukraine, and Kyiv region takes the form:

$$\ln Sales_{imt} = \beta_1 \ln Sales_{imt-1} + \beta_2 \ln Capital_{imt} + \beta_3 \ln Labor_{imt} + \beta_4 FDI_{imt} + \beta_5 Scale_{imt} + \sum_{\delta=1}^{5} \eta_\delta Year_{\delta i} + \varepsilon_{imt},$$

where $m = 1..3$ – index of the region.

Model 1.2 for regional differences takes the following form:

$$\ln Sales_{irt} = \beta_1 \ln Sales_{irt-1} + \beta_2 \ln Capital_{irt} + \beta_3 \ln Labor_{irt} + \beta_4 FDI_{irt} + \beta_5 Scale_{irt} + \sum_{\delta=1}^{5} \eta_\delta Year_{\delta i} + \varepsilon_{irt},$$

where $r = 1..25$ – index of the region.

Model 1.3 for industry differences is specified as follows:

$$\ln Sales_{ikt} = \beta_1 \ln Sales_{ikt-1} + \beta_2 \ln Capital_{ikt} + \beta_3 \ln Labor_{ikt} + \beta_4 FDI_{ikt} + \beta_5 Scale_{ikt} + \sum_{\delta=1}^{5} \eta_\delta Year_{\delta i} + \varepsilon_{ikt},$$

where $k = 1..12$ – index of the industry.

The hypothesis for Model 1 and its specifications is:

H₀: $\beta_4 = 0$ - FDI does not directly affect the productivity of foreign-owned firms

H₁: $\beta_4 \neq 0$ - receiving FDI has a positive or negative influence on firm's productivity.

Model 2. This specification deals with the spillover effects among firms without foreign investments. In other words, I want to check whether a domestically owned firm can take advantage of FDI presence in its region-industry. Therefore, Model 2 is specified as follows:

$$\ln Sales_{it} = \alpha_1 \ln Sales_{it-1} + \alpha_2 \ln Capital_{it} + \alpha_3 \ln Labor_{it} + \alpha_4 Spill_{krt} + \alpha_5 Scale_{it} + \sum_{\delta=1}^{6} \eta_\delta Year_{\delta i} + \varepsilon_{it},$$

where $Spill_{rtk}$ – measure of FDI concentration in a specific industry and region calculated as the percentage of FDI in industry multiplied by the percentage of FDI in the region of a firm without FDI.[25] I also estimate the spillover effects for each region and industry the same way as it was done for Model 1 and its specifications.

Model 2.1 for differences between Eastern Ukraine, Western Ukraine, and Kyiv region takes the form:

$$\ln Sales_{imt} = \alpha_1 \ln Sales_{imt-1} + \alpha_2 \ln Capital_{imt} + \alpha_3 \ln Labor_{imt} + \alpha_4 Spill_{krt} + \alpha_5 Scale_{imt} + \sum_{\delta=1}^{5} \eta_\delta Year_{\delta i} + \varepsilon_{imt},$$

Model 2.2 for regional differences takes the following form:

$$\ln Sales_{irt} = \alpha_1 \ln Sales_{irt-1} + \alpha_2 \ln Capital_{irt} + \alpha_3 \ln Labor_{irt} + \alpha_4 Spill_{krt} + \alpha_5 Scale_{irt} + \sum_{\delta=1}^{5} \eta_\delta Year_{\delta i} + \varepsilon_{irt},$$

Model 2.3 for industry differences is specified as follows:

$$\ln Sales_{ikt} = \alpha_1 \ln Sales_{ikt-1} + \alpha_2 \ln Capital_{ikt} + \alpha_3 \ln Labor_{ikt} + \alpha_4 Spill_{krt} + \alpha_5 Scale_{ikt} + \sum_{\delta=1}^{5} \eta_\delta Year_{\delta i} + \varepsilon_{ikt},$$

The hypothesis for Model 2 and its specifications is:

H2: $\alpha_4 = 0$ - FDI concentration does not affect the productivity of domestically owned firms

H3: $\alpha_4 \neq 0$ - FDI concentration positively or negatively influences the productivity of non-FDI firms.

[25] Adapted by author from Talavera (2001).

2.7. Analysis of results

In this subsection, I present the results of the fixed effects estimation of Model 1, Model 2 and their specifications described above. Table 7 compares the regression results of Model 1 using OLS and fixed effects estimation techniques.

Table 7. Regression results of Model 1, OLS versus fixed effects estimations

	Fixed effects (1)		*OLS (1)*	
	Coefficient	*Std. error*	*Coefficient*	*Std. error*
Dependent variable				
Log of sales				
Independent variables				
First lag of log of sales	0.1334***	0.0054	0.6336***	0.0125
Log of fixed assets	0.1297***	0.0077	0.0815***	0.0063
Log of number of employees	0.5103***	0.0122	0.1679***	0.0094
FDI	-0.0463**	0.0201	0.0246	0.0192
Scale	0.0815***	0.0030	0.0710***	0.0052
Constant	4.0809***	0.0875	1.7611***	0.0631
Year (2008 omitted)				
2009	-0.0805***	0.0125	-0.3678***	0.0242
2010	-0.0917***	0.0126	-0.3920***	0.0241
2011	-0.3172***	0.0129	-0.6237***	0.0247
2012	-0.6049***	0.0134	-0.7934***	0.0244
2013	-0.5226***	0.0137	-0.5013***	0.0240
Region				
Chernihivska			-0.0552*	0.0292
Khmelnytska			-0.0550**	0.0252
Kyivska			0.0876***	0.0152
Luhanska			-0.0926***	0.0343
Lvivska			-0.0581***	0.0258
Sumska			-0.0723**	0.0330
Ternopilska			-0.0308**	0.0298
Volynska			-0.0607*	0.0369
Zakarpatska			-0.0873**	0.0403
Zaporizhska			0.0410**	0.0249
Zhytomyrska			-0.0980**	0.0422
Industry				
Construction			0.1472***	0.0272
Electricity, gas, steam and air conditioning supply			0.4668***	0.0316
Financial and insurance activities			0.5266***	0.1510
Information and communication			0.2223***	0.0371
Manufacturing			0.4647***	0.0208
Mining and quarrying			0.3510***	0.0400
Others			0.1982***	0.0516
Transportation and storage			0.0735***	0.0205
Wholesale and retail trade			0.7907***	0.0282
R-squared	0.6410		0.8756	

Note: *p<0.1, **p<0.05, ***p<0.01; standard errors in parentheses

As it was mentioned in the previous subsection, OLS estimates are biased and inconsistent. Moreover, the coefficient of FDI when controlling for industry and region becomes insignificant. The most interesting finding from the table above is that in the fixed effects model specification an FDI influence is negative and statistically significant at 5% confidence level, which means that we statistically reject the hypothesis H_0. Foreign-owned firms, on average, perform worse than domestically owned ones.

In order to test the hypothesis that FDI may have different influence in different regions, I estimate Model 1.1 and Model 1.2, and present the results in the Tables 5-6 below.

Table 8. Regression results of Model 1.1 for Kyiv region, Eastern, and Western Ukraine

	Region		
	Western Ukraine	*Eastern Ukraine*	*Kyiv region*
Dependent variable			
Log of sales			
Independent variables			
First lag of log of sales	0.1279***	0.1123***	0.1746***
	(0.0091)	(0.0079)	(0.0123)
Log of fixed assets	0.1515***	0.1117***	0.1292***
	(0.0131)	(0.0115)	(0.0167)
Log of number of employees	0.5289***	0.5745***	0.3936***
	(0.0198)	(0.019)	(0.0267)
FDI	0.0065	-0.0614**	-0.1047**
	(0.0374)	(0.0287)	(0.0441)
Scale	0.0716***	0.0878***	0.0914***
	(0.0044)	(0.0057)	(0.0064)
Year (2008 omitted)			
2009	-0.0676***	-0.0729***	-0.1200***
	(0.0195)	(0.0187)	(0.0308)
2010	-0.1049***	-0.0676***	-0.1178***
	(0.0197)	(0.0188)	(0.0311)
2011	-0.3518***	-0.2835***	-0.3209***
	(0.0202)	(0.0192)	(0.0316)
2012	-0.6167***	-0.6154***	-0.5615***
	(0.0213)	(0.0201)	(0.0326)
2013	-0.5953***	-0.4999***	-0.4449***
	(0.0216)	(0.0206)	(0.0332)
Constant	3.6547***	4.0125***	4.7589***
	(0.1348)	(0.1392)	(0.1974)

Note: *p<0.1, **p<0.05, ***p<0.01; standard errors in parentheses

Table 9. Regression results of Model 1.2

	Region							
	Chernihiv	*Dnipropetrovsk*	*Kirovohrad*	*Kyiv*	*Odesa*	*Zakarpattya*	*Zaporizhzhya*	*Zhytomyr*
Dependent variable								
Log of sales								
Independent variables								
First lag of log of sales	-0.0475	0.0909***	0.1328***	0.1746***	0.1278***	0.0632	0.0243	-0.0149
	(0.078)	(0.0158)	(0.0328)	(0.0123)	(0.0239)	(0.0457)	(0.0206)	(0.0291)
Log of fixed assets	-0.3050**	0.0941***	0.1795***	0.1292***	0.0974***	-0.0828*	0.0325	0.1440***
	(0.1368)	(0.021)	(0.053)	(0.0167)	(0.0258)	(0.0481)	(0.0433)	(0.0557)
Log of number of employees	0.2999*	0.5238***	0.3350***	0.3936***	0.5431***	0.7301***	0.5527***	0.2991***
	(0.1551)	(0.0409)	(0.1014)	(0.0267)	(0.0537)	(0.1076)	(0.0657)	(0.1065)
FDI	-0.5154*	-0.1315**	0.3061**	-0.1047**	-0.3931***	0.6897***	0.1051*	0.4033***
	(0.3005)	(0.0634)	(0.1257)	(0.0441)	(0.0927)	(0.137)	(0.0639)	(0.1122)
Scale	1.8807***	0.0702***	0.4338***	0.0914***	0.2635***	0.1024***	0.2145***	0.2598***
	(0.2501)	(0.0107)	(0.0517)	(0.0064)	(0.033)	(0.0208)	(0.0282)	(0.0344)
Year (2008 omitted)								
2009	0.0987	-0.0948**	-0.0510	-0.1200***	-0.0551	-0.0975	-0.0657	-0.0451
	(0.1089)	(0.0416)	(0.0587)	(0.0308)	(0.0539)	(0.0709)	(0.0449)	(0.0658)
2010	0.1675	-0.0574	-0.1312**	-0.1178***	-0.0388	-0.0629	-0.0549	-0.0116
	(0.1098)	(0.0417)	(0.0604)	(0.0311)	(0.0543)	(0.0721)	(0.045)	(0.0664)
2011	0.0149	-0.2749***	-0.3072***	-0.3209***	-0.2053***	-0.3891***	-0.2004***	-0.2194***
	(0.1219)	(0.0424)	(0.0655)	(0.0316)	(0.0549)	(0.0738)	(0.0464)	(0.0695)
2012	-0.2429	-0.6038***	-0.6131***	-0.5615***	-0.4169***	-0.7179***	-0.6152***	-0.4971***
	(0.1294)	(0.0441)	(0.0745)	(0.0326)	(0.056)	(0.0771)	(0.0524)	(0.0771)
2013	-0.0270*	-0.4843***	-0.5739***	-0.4449***	-0.2999***	-0.7129***	-0.6370***	-0.6179***
	(0.1261)	(0.0445)	(0.0747)	(0.0332)	(0.0558)	(0.0796)	(0.055)	(0.0818)
Constant	8.6752***	4.8150***	4.0244***	4.7589***	4.0407***	4.9071***	5.2645***	5.9455***
	(1.0443)	(0.308)	(0.5845)	(0.1974)	(0.3687)	(0.6737)	(0.5096)	(0.5838)

Note: *p<0.1, **p<0.05, ***p<0.01; standard errors in parentheses

From Table 8 it could be concluded that FDI presence, on average, negatively affects firm's performance both in Kyiv region and in Eastern Ukraine. Thus, I can suggest that hypothesis H_0 could be statistically rejected at 5% confidence level. In contrast, the coefficient of FDI in Western Ukraine is statistically insignificant, therefore, we cannot conclude anything about the effect of FDI in this part of the country. Such results could support the "round-tripping" theory of domestic funds, which means that Ukrainian investors might channel their funds through Cyprus to avoid taxes and obtain better legal protection. Obviously, this type of FDI cannot increase the performance of such firms.

Taking latter into account, the results from Table 9 imply interesting conclusions. I found, on average, positive statistically significant effects of FDI on firms' performance in Kirovohrad, Zaporizhzhya, Zakarpattya and Zhytomyr regions, while negative statistically significant effects were found in Chernivtsi, Dnipropetrovsk, Kyiv and Odesa regions.

Such results may serve as an additional evidence for "round-tripping" theory of domestic funds. In its turn, regions with positive FDI influence have such common characteristics as high export orientation and high level of FDI attraction. For example, Kirovohrad and Zaporizhzhya regions have high agricultural potential, which makes them very attractive for foreign investors. In addition, the Zaporizhzhya is among the top regions in terms of metallurgical production and has worldwide known enterprises of ferrous and non-ferrous metallurgy. In its turn, Zakarpattya having the same board with the European Union attracted a lot of FDI during the last years. As a result, many firms in light industry carried out the reconstruction and modernization of the production and managed to increase the competitiveness of products in the domestic and foreign markets. The proximity to European markets, relatively low cost of labor, growth opportunities, and developed tourist industry makes Zakarpattya very attractive for foreign investors. Finally, Zhytomyr region

being rich in natural resources is mostly known for its developed machine building, metal processing, and food industries.

Along with the "round-tripping" theory of domestic funds, one of the factors explaining the negative influence of FDI presence on the performance of firms located in Chernivtsi, Dnipropetrovsk, Kyiv and Odesa regions might be the fact that Ukrainian currency has been significantly devaluing since 2008 economic crisis. This, in turn, might have stimulated foreign investors to buy undervalued companies, "kill" the company, "cut" it into pieces and just sell all assets. In addition, financial and insurance sector holds the second position in Ukraine in terms of FDI attraction. Most financial companies and banks' headquarters located in Kyiv and Dnipropetrovsk regions. There were many occasions of bank runs during the 2010-2013 period, which may indicate previously described tendency. Moreover, negative statistically significant effects of year dummies on firms' performance were found mostly between 2011 and 2013 years, which is exactly the period when President Viktor Yanukovych had the most powerful influence.

The next step of the analysis is an estimation of FDI effects on firms' performance in different industries. As revealed by Table 10, statistically significant negative effects of foreign presence present in financial and insurance sector and in wholesale and retail trade, which supports the ideas of bank runs and "killing" weak undervalued companies.

Finally, I test for spillovers influence of foreign funds presence on non-FDI firms by estimating Model 2.1, Model 2.2 and Model 2.3 (Table 11). According to the results, the spillover variable is positive and statistically significant at 5% level in Western Ukraine and Kyiv region, while it is negative and statistically significant at 1% in Sumy region. It should be mentioned that negative effect in Sumy region is quite high, compared to those in Kyiv region and Western Ukraine.

Table 10. Regression results of Model 1.3

	Industry	
	Financial and insurance activities	*Wholesale and retail trade*
Dependent variable		
Log of sales		
Independent variables		
First lag of log of sales	-0.0413 (0.0541)**	0.1798*** (0.0132)
Log of fixed assets	0.1550 (0.074)	0.0862*** (0.0135)
Log of number of employees	0.5530 (0.3044)	0.5180*** (0.0254)
FDI	-0.9606** (0.4408)	-0.1352** (0.0559)
Scale	0.1314*** (0.0348)	0.0644*** (0.0069)
Year (2008 omitted)		
2009	0.5208* (0.2869)	-0.1703*** (0.0289)
2010	0.7216** (0.2989)	-0.1374*** (0.0291)
2011	0.4097 (0.3028)	-0.3909*** (0.0292)
2012	0.1677 (0.3002)	-0.6477*** (0.029)
2013	0.5065 (0.3245)	-0.4738*** (0.0289)
Constant	5.2834 (1.0276)	5.0127*** (0.1752)

Note: *p<0.1, **p<0.05, ***p<0.01; standard errors in parentheses

One reason is that light and food industries of Sumy region reported a decrease in the production volumes during the 2010-2013 period. Another interesting finding is that real estate activities create negative externalities for domestic firms, which is logical, because during 2005-2008 the global housing boom stimulated growth of the real estate market in Ukraine, economy was growing at 8% rate per annum, but in 2008 foreign demand and investments pushed housing prices beyond the average level in Ukraine making household unable to rent or buy apartments.[26] Furthermore, positive and statistically significant at 5% confidence level spillover effects is found

[26] R. Wynveen, I. Chantefort; Shelter Cluster Team for Ukraine, November 2016

in wholesale and retail industry. This could be explained by the fact that many wholesale and retail firms trying to mimic the behavior of foreign enterprises because it is easily observable. I suggest that in this industry positive demonstration and training effects take place.

Table 11. Regression results of Model 2.1, Model 2.2 and Model 2.3

	Model 2.1	*Model 2.2*		*Model 2.3*	
	Western Ukraine	*Kyiv region*	*Sumy region*	*Real estate activities*	*Wholesale and retail trade*
Dependent variable					
Log of sales					
Independent variables					
First lag of log of sales	0.1127*** (0.0079)	0.1744*** (0.0123)	0.1465*** (0.0268)	0.0965*** (0.0282)	0.1816*** (0.0132)
Log of fixed assets	0.1119*** (0.0115)	0.1308*** (0.0167)	0.2269*** (0.0479)	0.3446*** (0.0517)	0.0853*** (0.0135)
Log of number of employees	0.5743*** (0.019)	0.3927*** (0.0267)	0.3858*** (0.0994)	0.7949*** (0.0676)	0.5139*** (0.0253)
Scale	0.0885*** (0.0056)	0.0920*** (0.0064)	0.2536*** (0.044)	0.0519*** (0.011)	0.0657*** (0.0068)
Spillover	0.0186** (0.0076)	0.1268** (0.0547)	-0.9131*** (0.2729)	-2.2213** (0.8339)	0.1366** (0.0647)
Year (2008 omitted)					
2009	-0.0700 (0.0188)	-0.1055*** (0.0319)	-0.1744** (0.0722)	-0.0851 (0.0839)	-0.1441*** (0.0323)
2010	-0.0667 (0.0188)	-0.0982*** (0.0332)	-0.2808*** (0.0751)	0.0588 (0.0885)	-0.1158*** (0.0319)
2011	-0.2828 (0.0192)	-0.3171*** (0.0318)	-0.5212*** (0.0811)	-0.1354 (0.0889)	-0.3776*** (0.0309)
2012	-0.6151 (0.0201)	-0.5540*** (0.0334)	-0.7692*** (0.0896)	-0.3016 (0.0962)	-0.6310*** (0.0315)
2013	-0.5010 (0.0203)	-0.4361*** (0.0346)	-0.7086*** (0.0933)	-0.1988** (0.105)	-0.4639*** (0.0307)
Constant	3.9829 (0.1396)	4.6945*** (0.1978)	3.7874*** (0.5406)	0.6839* (0.4574)	4.9486*** (0.1779)

Note: *p<0.1, **p<0.05, ***p<0.01; standard errors in parentheses

CHAPTER 4. CONCLUSIONS

The issue of FDI and its direct and indirect effects deserves special attention among researches due to several reasons. First, the problem of an FDI attraction is highly relevant for all transition economies, because of its possible positive influence on the receiving firms' productivity. Secondly, along with positive, FDI may cause negative effects as well. While direct effects arise when domestic firm receive FDI, indirect or spillover effects comes from the interactions between firms with FDI and non-FDI ones. Finally, the existing empirical research on this topic in Ukraine is extremely limited.

The main goal of this study was to test whether the presence of foreign direct investments affects the performance of Ukrainian firms both with and without FDI through direct and indirect effects, respectively. Using the balance sheet firm-level annual data for 2438 Ukrainian firms during 2008-2013, I employ the fixed effects identification strategy estimating effects for 25 regions, 12 industries and also dividing the country by Eastern Ukraine, Western Ukraine, and Kyiv region.

The results reported in the thesis suggest that there are positive statistically significant direct effects in Kirovohrad, Zaporizhzhya, Zakarpattya and Zhytomyr regions, while negative direct effects were found in Chernivtsi, Dnipropetrovsk, Kyiv, and Odesa regions. The negative significance of FDI in some regions serves as a support for the "round-tripping" theory of domestic funds through offshore zones, such as Cyprus. Negative direct effects can be also explained by the fact that due to the huge devaluation of Ukrainian hryvnia during 2008-2013 weak undervalued firms might have been acquired by foreign investors in order to turn down the business and sell all assets.

Positive significant effects of FDI are observed in export-oriented regions involved mainly in light industry and metallurgy production; however, Zakarpattya region is also highly attractive to foreign investors due to its proximity to European markets and relatively cheap cost of labor.

Another finding is that negative direct effects are present both in wholesale and retail, and financial and insurance activities sectors, which supports the idea of bank runs and "killing" of weak underperforming firms. Another possible explanation could be the government subsidies and tax privileges provided to domestic firms (Talavera, Lutz, 2003). Moreover, according to the results, positive significant spillover effect is present in Western Ukraine and Kyiv, while Sumskiy region suffers from negative FDI externalities. The highest negative spillover effects are found in the real estate sector due to the aftermath of 2008 economic crisis.

Thus, I can conclude that benefits from FDI presence are ambiguous. While some regions and industries directly benefit from FDI, others may suffer from negative externalities. Problems with corruption and government policies regarding foreign-owned firms should be taking into the examination.

Finally, while some empirical works exploring FDI influence on firm's performance in Ukraine already exist, there is no work employing such big dataset and focusing particularly on post-crisis and "pre-war" period. Consequently, I would want to explore the effects of FDI on firm's performance during the period of military conflict in Eastern Ukraine, as well as include other indicators, such as value added and material inputs. I believe this study brings a contribution to the accumulation of knowledge in the field because it sheds light on the reasons for direct and indirect effects of FDI on firm's performance.

APPENDICES

A1. The results of the second tour of the Presidential elections in Ukraine, 2010

Region	*Yanukovych*	*Tymoshenko*	*Against everyone*
Crimea, Autonomous Republic	78.24 %	17.31 %	3.23 %
Vinnitsia region	24.26 %	71.10 %	3.32 %
Volyn region	14.01 %	81.85 %	3.11 %
Dnipropetrovsk region	62.70 %	29.13 %	6.75 %
Donetsk region	90.44 %	6.45 %	2.26 %
Zhytomyr region	36.70 %	57.50 %	4.53 %
Zakarpattia region	41.55 %	51.66 %	4.46 %
Zaporizhia region	71.50 %	22.22 %	5.07 %
Ivano-frankivsk region	7.02 %	88.89 %	2.84 %
Kiev region	23.61 %	69.71 %	5.10 %
Kirovohrad region	39.61 %	54.66 %	4.46 %
Luhansk region	88.96 %	7.72 %	2.34 %
Lviv region	8.60 %	86.20 %	4.16 %
Mykolaiv region	71.53 %	22.95 %	4.30 %
Odessa region	74.14 %	19.52 %	4.61 %
Poltava region	38.99 %	54.20 %	5.75 %
Rivne region	18.91 %	76.24 %	3.65 %
Sumy region	30.40 %	62.89 %	5.33 %
Ternopil region	7.92 %	88.39 %	2.83 %
Kharkiv region	71.35 %	22.43 %	5.12 %
Kherson region	59.98 %	33.73 %	5.04 %
Khmelnytskyi region	24.94 %	69.74 %	3.84 %
Cherkasy region	28.84 %	65.37 %	4.48 %
Chernivtsi region	27.64 %	66.47 %	4.11 %
Chernihiv region	30.95 %	63.63 %	4.22 %
Kyiv	25.72 %	65.34 %	8.05 %
Sevastopil	84.35 %	10.38 %	4.35 %
Ukraine	***48.95 %***	***45.47 %***	***4.36 %***

A2. Stata 12.1 do-file

```
use "H:\FDI 2.dta", clear
xtset firm_id year

gen logsales=ln(sales)                    // Log of sales converted to 2008 PPI
gen loglabor=ln(labor)                    // Log of number of employees
gen logfixedassets=ln(fixedassets)        // Log of fixed assets converted to 2008 PPI
gen logsales_1=logsales[_n-1]             // The first lag of log of sales

tabulate regions, gen(region)             // creates dummies for each region
tabulate industries, gen(industry)        // creates dummies for each industry
tabulate regdummy, gen(regns)             // creates dummies for Eastern, Western Ukraine and Kyiv region

// Estimation of FDI direct effects //
// OLS //
reg logsales_ppi lnsal1 logfixedassets_ppi loglabor fdi_dummy

// graph - unobserved heterogeneity across regions //
bysort region_id: egen logsales_mean=mean(logsales)
twoway scatter logsales region_id, msymbol(circle_hollow) || connected logsales_mean region_id

// graph - unobserved heterogeneity across years //
bysort year: egen logsales_mean1=mean(logsales)
twoway scatter logsales year, msymbol(circle_hollow) || connected logsales_mean1 year, msymbol(diamond) || ,
xlabel(2008(1)2013)

//Hausman test//
xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale, fe // fixed effects estimation of FDI direct effects
estimates store fixed

xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale, re // random effects estimation of FDI direct effects
estimates store random
hausman fixed random

// Model 1.1 //
// fixed effects estimation of FDI influence in different regions //
bysort regns1: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe // East
bysort regns2: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe // West
bysort regns3: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe // Kyiv region

// Model 1.2 //
// fixed effects estimation of FDI influence in different regions //
bysort region1: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe  // Cherkaska
bysort region2: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe  // Chernihivska
bysort region3: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe  // Chernivetska
bysort region4: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe  // Crimea, AR
bysort region5: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe  // Dnipropetrovska
bysort region6: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe  // Donetska
bysort region7: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe  // Ivano-Frankivska
bysort region8: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe  // Kharkivska
bysort region9: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe  // Khersonska
bysort region10: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe // Khmelnytska
bysort region11: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe // Kirovohradska
```

A2.1. Stata 12.1 do-file

```
bysort region12: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe // Kyivska
bysort region13: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe // Luhanska
bysort region14: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe // Lvivska
bysort region15: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe // Mykolayivska
bysort region16: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe // Odeska
bysort region17: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe // Poltavska
bysort region18: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe // Rivnenska
bysort region19: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe // Sumska
bysort region20: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe // Ternopilska
bysort region21: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe // Vinnytska
bysort region22: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe // Volynska
bysort region23: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe // Zakarpatska
bysort region24: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe // Zaporizhska
bysort region25: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe // Zhytomyrska

// Model 1.3 //
// fixed effects estimation of FDI influence in different industries //
bysort industry1: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe  // Agriculture, foresty
bysort industry2: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe  // Construction
bysort industry3: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe  // Electricity, gas, steam
bysort industry4: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe  // Financial and insurance
bysort industry5: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe  // Information and comm.
bysort industry6: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe  // Manufacturing
bysort industry7: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe  // Mining and quarrying
bysort industry8: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe  // Others
bysort industry9: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe  // Prof., sc. and tech.
bysort industry10: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe // Real estate activities
bysort industry11: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe // Transportation and stor.
bysort industry12: xtreg logsales logsales_1 logfixedassets loglabor fdi_dummy scale i.year, fe // Wholesale and retail

// Estimation of FDI spillover effects //
// Model 2.1 //
bysort regns1 : xtreg logsales logsales_1 logfixedassets loglabor scale spill i.year, fe // East
bysort regns2: xtreg logsales logsales_1 logfixedassets loglabor scale spill i.year, fe  // West
bysort regns3: xtreg logsales logsales_1 logfixedassets loglabor scale spill i.year, fe  // Kyiv region

// Model 2.2 //
// fixed effects estimation of FDI spillovers in different regions //
bysort region1: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe  // Cherkaska
bysort region2: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe  // Chernihivska
bysort region3: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe  // Chernivetska
bysort region4: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe  // Crimea, AR
bysort region5: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe  // Dnipropetrovska
bysort region6: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe  // Donetska
bysort region7: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe  // Ivano-Frankivska
bysort region8: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe  // Kharkivska
bysort region9: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe  // Khersonska
bysort region10: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe // Khmelnytska
bysort region11: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe // Kirovohradska
bysort region12: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe // Kyivska
bysort region13: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe // Luhanska
bysort region14: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe // Lvivska
```

A2.2. Stata 12.1 do-file

```
bysort region15: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe // Mykolayivska
bysort region16: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe // Odeska
bysort region17: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe // Poltavska
bysort region18: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe // Rivnenska
bysort region19: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe // Sumska
bysort region20: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe // Ternopilska
bysort region21: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe // Vinnytska
bysort region22: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe // Volynska
bysort region23: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe // Zakarpatska
bysort region24: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe // Zaporizhska
bysort region25: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe // Zhytomyrska

// Model 2.3 //
// fixed effects estimation of FDI spillovers in different industries //
bysort industry1: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe  // Agriculture, foresty
bysort industry2: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe  // Construction
bysort industry3: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe  // Electricity, gas, steam
bysort industry4: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe  // Financial and insurance
bysort industry5: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe  // Information and comm.
bysort industry6: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe  // Manufacturing
bysort industry7: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe  // Mining and quarrying
bysort industry8: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe  // Others
bysort industry9: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe  // Professional, scientific
bysort industry10: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe // Real estate activities
bysort industry11: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe // Transportation and storage
bysort industry12: xtreg logsales logsales_1 logfixedassets loglabor scale spillover i.year, fe // Wholesale and retail trade
```

GLOSSARY

Acquisition – a corporate action in which a company acquires a majority stake in the target company and holds control over it. Such actions could be performed for various reasons, such as achieving economies of scale, synergy, increasing market share, etc.

Economies of scale - is the cost advantage that arises with increased output of a product due to the inverse relationship between the quantity produced and per-unit fixed costs; i.e. the greater the quantity of a good produced, the lower the per-unit fixed cost because these costs are spread out over a larger number of goods.[27]

Controlling Interest – occurs when a shareholder, or a group acting together, holds a majority of the company's stock, i.e. 50% of the outstanding shares plus one share.[28]

Foreign Direct Investments (FDI) - is an investment made by a company or individual in one country in business interests in another country, in the form of either establishing business operations or acquiring business assets in the other country, such as ownership or controlling interest in a foreign company.[29]

Home country – country where the headquarters of Multinational Corporation is located.

Horizontal merger – is a merger or business consolidation that occurs between firms that operate in the same space, as competition tends to be higher and the synergies and potential gains in market share are much greater for merging firms in such an industry.[30]

Host country / Domestic country– country, where MNC establishes its business, i.e. FDI recipient.

[27] http://www.investopedia.com/terms/e/economiesofscale.asp#ixzz4hifs0RnC
[28] http://www.investopedia.com/terms/c/controllinginterest.asp
[29] http://www.investopedia.com/terms/f/fdi.asp
[30] http://www.investopedia.com/terms/h/horizontalmerger.asp#ixzz4hTaimPhM

Multinational Corporations (MNCs)/Multinational Enterprises (MNEs) – businesses headquartered in either advanced or developing countries, which have facilities and other assets in at least one country other than their home country.[31]

Transition economy - is an economy which is changing from a centrally planned economy to a market economy and undergoing a set of structural changes intended to develop market-based institutions, such as economic liberalization, removing trade barriers, privatization of state-owned enterprises, etc.

[31] Adapted by the author, based on: https://goo.gl/i73Di0 , https://goo.gl/YVySMB

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