

IMT School for Advanced Studies, Lucca

Lucca, Italy

Essays on Investment Patterns in Ukraine

PhD Program in Management Science

XXX Cycle

By

Olena Kulynych

2018

The dissertation of Olena Kulynych is approved.

Program Coordinator: Prof. Massimo Riccaboni, IMT School for Advanced Studies Lucca

Supervisor: Prof. Massimo Riccaboni, IMT School for Advanced Studies Lucca

Supervisor: Prof. Armando Rungi, IMT School for Advanced Studies Lucca

The dissertation of Olena Kulynych has been reviewed by:

Prof. Jan Hagemeyer, University of Warsaw

Prof. Francisco Requena-Silvente, University of Valencia

IMT School for Advanced Studies, Lucca

2018

Contents

List of Figures	vii
List of Tables	ix
Acknowledgements	xi
Vita and Publications	xii
Abstract	xiv
1 Introduction	1
2 Ukrainian Policies in Times of War	5
2.1 Background	5
2.2 Ukraine on the way to macroeconomic stability	9
2.2.1 Macroeconomic stability	9
2.2.2 Macro-financial stability	12
2.2.3 Reforms in Ukraine	16
2.3 Ukraine’s trade policy	21
2.3.1 Current situation	21
2.3.2 Relations with Russia and the EU	27
2.4 Concluding remarks and recommendations	33
Appendix A	35
Appendix B	37

3	Location and Agglomeration of Firms in Ukraine before the Conflict	43
3.1	Introduction	43
3.2	The institutional framework	46
3.3	Data and preliminary evidence	50
3.3.1	Data	50
3.3.2	Preliminary evidence	54
	An industrial divide	54
	Language divide	55
	Foreign investment divide	56
3.4	Empirical strategy	58
3.4.1	Alternative-specific conditional logit model	58
3.4.2	Postestimation	61
3.4.3	Conditional logit model in period 2001-2014	63
3.5	Conclusions	67
	Appendix C	69
4	Organizing the Global Value Chains: the case of Ukraine	77
4.1	Introduction	77
4.2	Literature review	79
4.3	Data and preliminary evidence	83
4.4	Empirical analysis	89
4.4.1	General pattern	89
4.4.2	Robustness check	92
4.4.3	Smile curve	94
4.5	Conclusions	96
	Appendix D	97
	References	105

List of Figures

1	Map ATO on 16.08.2014	7
2	Map ATO on 03.06.2018	7
3	The Net Value of External Debt and GDP of Ukraine	14
4	The Ratio of External and Public Debt to GDP	14
5	Dynamics of Export and Import, % (to the same period of the previous year)	22
6	Top-10 partners in export in 2016, thsnd USD	23
7	Top-10 partners in import in 2016, thsnd USD	23
8	12 Months Moving Average of Ukrainian Export	24
9	12 Months Moving Average of Ukrainian Import	24
10	Export of goods	25
11	Import of goods	26
12	Ukrainian trade with EU and Russia in 2004-2015, thsnd USD	28
13	Export in regions of Ukraine for individual economic group- ings of countries	29
14	Ukrainian import of gas	32
15	EU import of gas	32
16	Specialization patterns, Krugman specialization index	55
17	Share of revenues of foreign firms by region	57
18	Predicted Probabilities, Regions now in conflict	61
19	Predicted Probabilities, Language divide	61

20	Parents' and affiliates' downstreamness from sample . . .	86
21	Downstreamness of Firms by Quartiles (<i>DownMeasure</i>) . .	88
22	Quadratic fit of firm-level value added content on downstreamness metrics	95

List of Tables

1	Indicators of Ukrainian macroeconomic stability	10
A1	Gross External Debt Position by Sector (millions USD) . . .	35
A2	External Creditors of Ukraine	36
A3	Top-10 partners of Ukrainian trade	36
B4	Variables Definition	38
B5	Extensive and Intensive Margins of Ukrainian Trade in the period 2010-2014	41
B6	Extensive and Intensive Margins of Ukrainian Trade in the period 2005-2009	42
2	Number of privatized firms during 1992-2015	49
3	Number of Enterprises by Region	51
4	Language spoken by regions, % of population	56
5	Location choice	60
6	Location Choice of Firms in Ukraine	64
C1	Sample coverage by industry	69
C2	Descriptive statistics	70
C3	Descriptive statistics for the variables in the period 2001- 2014	70
C4	Variables Definitions	71
C5	Number of offshore companies	72
C6	Regional choice	73
C7	Probit model	74

7	Sample coverage: Regional distribution	84
8	Highest and lowest values of downstreamness metrics from domestic sample	85
9	Downstreamness across firms	86
10	The number of firms by downmeasure	87
11	Baseline estimations, impact of parents on all affiliates	90
12	All affiliates, Difference Dummy (mlogit)	93
D1	Number of affiliates with respect to parents by quartiles of downstreamness	97
D2	Firm controls	98
D3	Baseline estimations, impact of parents on first investment	98
D4	Baseline estimations, impact of parent on successive investments	99
D5	Baseline estimations, impact of first on successive investments	99
D6	Dependence of the Difference between First Affiliates and Parents	100
D7	Dependence of the Difference between Successive Affiliates and Parents	101
D8	Dependence of the Difference between Successive Affiliates and Parents	102
D9	Description of Variables	103
D10	Least squares results	103

Acknowledgements

1. **Chapter 3** “*Location and Agglomeration of Firms in Ukraine before the Conflict*” is a project started with Armando Rungi.
2. **Chapter 4** “*Organizing the Global Value Chains: the case of Ukraine*” is a project started with Armando Rungi and Davide Castellani.

Vita

- 1992** Born. Cherkasy, Ukraine
- 2009-2013** B.Sc. in International Economics
The National Technical University of Ukraine
“Igor Sikorsky Kyiv Polytechnic Institute”
Kyiv, Ukraine
- 2013-2014** Semester Abroad
Warsaw University of Technology
Warsaw, Poland
- 2013-2014** M.Sc. in International Economics
The National Technical University of Ukraine
“Igor Sikorsky Kyiv Polytechnic Institute”
Kyiv, Ukraine
- 2017** Visiting Period
Henley Business School, University of Reading
Reading, United Kingdom
- 2014-2018** Ph.D. in Management Science
IMT School for Advanced Studies Lucca
Lucca, Italy

Presentations

1. O. Kulynych, A. Rungi “Location and Agglomeration of Firms in Ukraine before the Conflict”, at *Economics PhD Workshop in collaboration with KU Leuven*, Lucca, Italy, 2017.
2. O. Kulynych, A. Rungi “Location and Agglomeration of Firms in Ukraine before the Conflict”, at *44th Academy of International Business (UK & Ireland Chapter) and 6th Reading International Business Conference*, Reading, UK, 2017.
3. O. Kulynych, A. Rungi “Location and Agglomeration of Firms in Ukraine before the Conflict”, at *ETSG 2017*, Florence, Italy, 2017.
4. O. Kulynych, “The Ukrainian Policies in Times of War”, at *IMT School for Advanced Studies Lucca*, Lucca, Italy, 2018.
5. O. Kulynych, A. Rungi, D. Castellani, “Organizing the Global Value Chains: the case of Ukraine”, at *IMT School for Advanced Studies Lucca*, Lucca, Italy, 2018.

Abstract

The events in Ukraine in 2014 had an impact on the global economic and political relations. The annexation of Crimea and the “hybrid” war in the East of the country stopped many international agreements and brought about changes in the Ukrainian economy. Against this background, we analyze the location choices of firms in Ukraine, how they realize their competitive advantages, and we also estimate a mechanism of deepening integration through participation to Global Value Chains (GVCs).

The main aim of this thesis is to provide different perspectives on the study of a firm’s location choice in Ukraine and positioning of Ukrainian firms in the GVCs. Nevertheless, in the second chapter, we also provide some descriptive analyses of macroeconomic stability and international trade in Ukraine during the conflict and provide some recommendations. In the third chapter, we estimate the location behavior of firms before the conflict and find that the negative impact on the location choice in the regions currently in conflict began long time ago. We relate their possible relations to the privatization processes. Moreover, we investigate the general pattern of location choice of firms in Ukraine, using a unique dataset of 251,201 firms, showing the impact of key drivers, that have a significant impact on the location of new and innovative economic activities. Finally, in the fourth chapter, we estimate the position of Ukrainian firms on the supply chain with respect to their parents, showing that subsidiaries of multinational enterprises in Ukraine are closer to final goods production.

Chapter 1

Introduction

Economic openness and attractiveness for foreign direct investment (FDI) are key drivers for a country's economic growth. However, during the past 4 years, Ukraine has faced an unprecedented political and economic crisis. An armed confrontation in the East of the country and the annexation of the Autonomous Republic of Crimea by the Russian Federation still challenge the economic perspectives of Ukraine, with important changes in the economic and political relations of the country with the rest of the world.

In general, Ukraine has a significant potential to attract investments from abroad in labor-intensive industries, considering also its big internal market. In addition, Ukraine has a favorable geo-location with easy access to different strategic markets, including the European Union (the EU), Russia, and the Middle East. In addition, the country is rich of natural resources and skilled employees. Nonetheless, the country's risk of doing business is still high due to an instability of the economic legislation and, of course, because the current conflict with Russia is still unresolved. Fluctuations in infrastructure, prices, and exchange rates tend to decrease the attractiveness of the Ukrainian market. Finally, a high level of corruption and an absence of transparency in the judicial system make new investors feel unsafe.

It is true that the strategic goals in Ukraine have changed. First, the

country has to preserve its territorial integrity, improve the integration with the EU, and solve peacefully the ongoing conflict in the East. Only in a second instance, the country can think of improving its attractiveness to new foreign and domestic business activities. Somehow following the same order of priorities, this thesis starts from considering Ukrainian policies in times of war, in connection with the association agreement with the European Union. Then we study the determinants of the location choice by new firms. After, we study the participation and the benefits of integration into global value chains (GVCs) with a focus on multinational enterprises. Throughout the thesis several econometric models, network metrics and big data algorithms have been used to quantitatively assess the different research questions.

After the present introduction, Chapter 2 describes the Ukrainian policies in times of the on-going war with the Russian Federation in Donbas. The chapter analyses the macroeconomic stability in Ukraine, together with providing the statistical information on its indicators, which show the negative impact of the last tragic events in Ukraine and very weak signs of overcoming the political and economic crises. Further, the study describes the stages of financial management in the country and potential aspects that caused debt overhang in Ukraine. Considering that macroeconomic stability is impossible without reforms, we describe some of the important reforms during the last few years and the possible ways of their improvement. The following part on Ukraine's trade policy considers the general analysis of the current situation of Ukrainian exports and imports, highlighting the change in trade partners and the possible reasons for such activity. We separately report Ukrainian relations with EU and Russia, as currently, it has a special importance in the further direction of Ukrainian growth, development, and positioning in the global market. Finally, we provide some possible recommendations for the improvement of the current situation of the national economy and policy.

Moreover, in this chapter we show that during the last 4 years the Ukrainian policy on production and foreign affairs has undergone revisions. First, their internal economic relations have changed owing to a

catastrophic production decrease in Donetsk and Lugansk regions, and total loss of production in Crimea¹. As a result, another problem arose, which is related to the destabilisation of the links of “material - production - sales” between the regions in conflict and the rest of Ukraine. Further, the foreign affairs of Ukraine have changed significantly, particularly in terms of trade policy. Currently, the direction of trade is more oriented towards the EU², while trade turnover with Russia has decreased owing to global sanctions. Furthermore, Ukrainian exports and imports have witnessed the significant recession starting from 2014. For example, one of the main problems of the export decrease was an excessive dependence of Donbas region on external conditions in markets of major export commodities. In addition, Appendix B provides the estimation of extensive and intensive margins of Ukrainian trade during 2005-2014 based on the study of Hummels and Klenow (2005). The results show that exports and imports of Ukraine mostly occur on the intensive margin.

Therefore, considering the macroeconomic and macro-financial situation in the country, it is equally important to analyse the investment patterns in Ukraine. The investigation of the location and agglomeration patterns of firms can provide a possible explanation to the industrial divide and positioning of the country in the global value chains.

In Chapter 3, we study the changing determinants of location and agglomeration of firms in Ukraine before the conflict started in 2014. In this context, we provide the institutional framework behind the Ukrainian privatization process. We perform empirical investigations on the entry of new firms in the period 1992-2015. To define the location choice of firms in Ukraine, we train different empirical models, such as conditional logit model, alternative-specific conditional logit model and probit model with specifically divided data into foreign and offshore firms.

¹Ukraine lost at least 20% (KMU, 2014) of its economic potential during the undeclared war.

²From 1 January 2016 to June 2017, the free-trade zone was working de-facto as the Ukraine-European Union Association Agreement entered into force on 1 September, 2017. This agreement helps Ukraine to cooperate with new markets and overcome the economic recession.

First, we provide some interesting descriptive statistics on the present industrial specialisation patterns at the regional level. In this case, we find a strong dependence on choices of industrial policies that were made well before the transition to market as well as during the first episodes of mass privatization. The impact is particularly relevant for Eastern regions that are now under conflict. Hence, we observe that new and innovative firms more likely to choose to locate in Western regions starting from 2007. The language divide across the regions appears to be an important factor in location choices between majority Russian-speaking and majority Ukrainian-speaking areas. However, the regions that are now in conflict had already started to be less attractive since 2000. Further, a differential pattern of investment is found in terms of industrial specialisation and geographic location, where we separate FDI from the case of foreign firms whose ultimate ownership is tracked in a financial offshore country.

In Chapter 4, we test at the firm-level, the optimal organisational pattern of parents' and affiliates' positioning along the supply chain. Considering this purpose, we exploit an own-built dataset of 7,824 parents, which control 15,584 affiliates located in Ukraine. For our purpose, we source the data on the industry-level metrics of downstreamness directly from Antràs and Chor (2013). Assuming the industrial orientation of the supply chain from the intermediate to final goods, we positively estimate the relative upstream or downstream position of the affiliates with respect to the parent and the successive investments with respect to the first investment. Further, we find that in general, affiliates in Ukraine tend to be more downstream. Moreover, once the successive decision to invest is controlled, we presume that a vertical integration strategy prevails for those parents that have a bigger number of affiliates. We use network tools for preliminary statistics and train other econometric models, such as OLS, multinomial logit model. Eventually, we use methodology described by Rungi and del Prete (2017) and challenge the existence of the "smile curve" in Ukraine. Thus, the results of this chapter are robust after different specifications.

Chapter 2

Ukrainian Policies in Times of War

2.1 Background

Kyiv is the capital of Ukraine, which was also the centre and the capital of Kyivan Rus, the first Slavic state and one of the largest and powerful states in Europe that existed in the period 882-1240. After the fall of Kyivan Rus, the political, economic, and cultural centre was in the Kingdom of Galicia-Volhynia. However, at the end of the 15th century, Ukraine was absorbed by different states. Only at the beginning of the 15th century, the Ukrainian uprising movement started and in the 17th century, a Ukrainian Cossack state, Hetmanate, was created, but in the following century, Ukraine ended up under the control of the Russian Empire. During the revolution in 1917, Ukrainian People's Republic was created, which was changed by the Ukrainian Soviet Socialist Republic during the USSR times. Finally, on 24 August 1991, Ukraine became an independent state.

Since its independence, Ukraine was under the management of oligarchs, well-connected businessmen, and politicians, who manipulated both the government and population for their profit. Thus, before every presidential election, the language question was the key driver of the

main manipulations of the electors from the East of Ukraine, although the Ukrainian ethnicity is 78% of the total population and Russians are 17%. The first pro-Russian manipulation started in 2004, during the questionable elections with the leader Viktor Yanukovich, which completed with the "Orange Revolution" that supported former president Viktor Yushchenko. In February 2010, Viktor Yanukovich was elected again, mainly with the support of oligarchs from Donbas and pro-Russian supporters. The time of Yanukovich's governance was criticised for nepotism, a very high level of corruption, political repressions, and selective attitude to international cooperation, in particular, flirting with Moscow.

During 2010-2013, the dissatisfaction of the Yanukovich's governance was growing, and in the end, revolutionary events in the middle of Kyiv began on the night of 21 November 2013, after refusal by the president to sign the Ukraine-European Union Association Agreement. However, the main wave of protests started after the night of 30 November 2013, when the police used its force against students who stayed at Maidan Nezalezhnosti (where all the events were taking place). In totality, the Ukrainians started their full revolution against the corrupt government and lawlessness. The main tragic events took part on 18-20 February 2014. During those days, snipers killed more than 100 people (Heaven Hundred) through governmental order.

Subsequent to the revolution, the temporary government took over. In this situation of weakness, the Russian government made a pro-Russian campaign in Crimea and soon issued an order to bring the military to the peninsula. Ukrainian military bases were blocked, ships were attacked, and Ukrainian soldiers had to make a choice: join the Russian army or leave the military or Crimea. Ukrainians were pushed to take up Russian citizenship as in another case, all their property would be given to the "government".

Subsequently, international politics, EU, and United Nations started to call for justice and indignation as Russia broke all international rules and agreements. The punishment that Europe and the U.S. chose for Russia was sanctions on different levels. However, after the occupation

of Crimea, Russia undertook the next step: a massive campaign with bribes and provocations on the eastern part of Ukraine, which led to the intervention of Russian army in the independent territory of Ukraine. The response of the West was immediate, but too powerful and strict.

Western leaders hoped that financial crisis and limitation of a different type of cooperation would hold the Russian Federation from further operations in the Eastern regions of Ukraine. In the end, sanctions hurt Russia, but they did not prevent Russia from waging a “hybrid” war, an unofficial war in the East of Ukraine, that was called from 13 April 2014 to 30 April 2018 “Anti-terrorist operation” and from 30 April 2018 “Joint forces operation”. Fig. 1-2 (RNBO, 2018), with the help of maps, show how the situation changed during these 4 years of on-going war.



Figure 1: Map ATO on 16.08.2014



Figure 2: Map ATO on 03.06.2018

Many agreements were cancelled, many international offices on the territory of Russia were closed, and the financial accounts and entrance to other countries were limited to many Russians. The Russian Federation as the country-aggressor that invaded the territory of the independent country and in the same moment suffering from sanctions changed the global economic relations.

Nevertheless, the Russian aggression can also be related to the economic factors and strategies. Russia spent 17 years in negotiations on membership to the World Trade Organization (WTO), whereas Ukraine

was accepted first (4 years before Russia). Therefore, Ukraine was one step ahead to improve cooperation with the EU, which was a negative factor for Russian policies. For example, the membership to the WTO does not allow Russia to manipulate with the trade embargo or other requirements, and quotas for Ukrainian exports and imports. Another important factor was the willingness of Ukraine to participate in the North Atlantic Treaty Organization (NATO). Such an initiative led to the strong opposition of the Russian government, which argued that the NATO's military proximity to their borders poses a certain danger to the country. Paradoxically, the country, which was concerned about their security and was obligated to protect the independence, sovereignty, and existing borders of Ukraine with respect to Budapest Memorandum on Security Assurances¹, started a war in Ukraine and illegally annexed a part of its territory.

Moreover, this conflict is the last chance for Russia to maintain control over Ukraine, as the Ukrainian choice to proceed towards the agreements with the EU brings new opportunities to the national economy and provides financial support. As a result, Ukraine will become more independent of Russian partnership and non-volatile. For example, the latest European External Investment Plan (EIP) is associated with the package of a significant financial support for countries of Eastern Partnership (including Ukraine). This plan considers the development of the three pillars, which are related to sustainable development, technical assistance, and reforms. The successful implementation of EIP in Ukraine will strengthen the cooperation with the EU as well as attract investments along with the support of the small and medium business, which will focus on job creation. Thus, Ukrainian policies in times of war along with the implementation of economic reforms with respect to the EU agreements are an important topic that motivates our discussion.

Finally, the situation in Ukraine is a very interesting case and hot topic in the news, but limited evidence is provided on the economic consequences of this conflict and the long-run possibility of Ukraine to develop, while sustaining the "hybrid" war. Here, we sketch an overview

¹See http://zakon3.rada.gov.ua/laws/show/998_158

based on the first comparison of trade relations between Ukraine and the EU/Russian Federation. Moreover, we devote a specific effort to update information on 2013-2016, as these are the years of structural changes.

2.2 Ukraine on the way to macroeconomic stability

2.2.1 Macroeconomic stability

During the independent years, the Ukrainian government developed the economy and attempted to enhance the standards of living in the state with respect to the developed countries. Although many changes and reforms were implemented, Ukraine still had problems with corruption and shadow economy, a high level of poverty, and demographic crisis. Further, the problem with the security of the country and significant increase of external debt became the new challenges during the last few years. Thus, the growth of the national economy is impossible without macroeconomic stability, which is associated with sustainability and balance of all the economic parameters (e.g., GDP, unemployment rate, inflation, and exchange rates).

Table 1 reports the indicators of macroeconomic stability in Ukraine. We observe that the real GDP growth was almost negative since the global economic crisis with an exception in 2011 (5.5%). In 2016, the GDP growth became positive (2.3%) that signalled a slow overcoming from the economic recession (among other factors, with the help of a large amount of harvest). It is necessary to mention that the reforms in the period 2014-2015 had a positive impact on stabilisation and increasing investment attractiveness. In addition, the real growth of GDP increased owing to a higher domestic demand.

Furthermore, Ukrainian exports and imports decreased significantly during the period 2013-2016. Nonetheless, an increase in domestic demand caused an increase in imports, while exports decreased mainly owing to Russia forbidding Ukrainian imports. Moreover, at the beginning of the conflict, we report the change of the inflation rate for 1 year (from

Table 1: Indicators of Ukrainian macroeconomic stability

Year	Real GDP growth, %	Public Debt, mln USD	Public debt, % of GDP	Exports, mln USD	Imports, mln USD	Inflation rate, %	Unemployment rate, %	Exchange rate, %
1999	-0.20	19,238	58.96%	11581.6	11846.1	22.68	11.90	4.13
2000	5.93	14,151	43.79%	14572.5	13956	28.20	11.48	5.44
2001	9.23	13,891	35.34%	16264.7	15775.1	11.96	10.79	5.37
2002	5.34	14,235	32.34%	17957.1	16976.8	0.76	9.63	5.33
2003	9.52	14,723	28.30%	23066.8	23020.1	5.21	9.06	5.33
2004	11.80	16,065	23.89%	32666.1	28996.8	9.04	8.59	5.32
2005	3.07	15,236	17.09%	34228.4	36136.3	13.52	7.19	5.12
2006	7.57	15,950	14.26%	38368	45038.6	9.08	6.81	5.05
2007	8.22	17,572	11.82%	49296.1	60618	12.84	6.35	5.05
2008	2.24	36,988	19.66%	66967.3	85535.3	25.20	6.36	5.27
2009	-15.14	41,535	34.12%	39695.7	45433.1	15.90	8.84	7.79
2010	0.26	55,206	40.63%	51405.2	60742.2	9.37	8.10	7.94
2011	5.47	60,192	36.88%	68364.2	82608.2	7.96	7.86	7.97
2012	0.24	65,923	37.54%	68830.4	84717.6	0.57	7.53	7.99
2013	-0.03	72,757	40.52%	63320.7	76986.8	-0.26	7.25	7.99
2014	-6.83	93,036	70.32%	53901.7	54428.7	12.10	10.49	11.89
2015	-14.30	72,134	79.33%	38127.2	37516.4	48.70	9.10	21.84
2016	2.30	75,794	81.25%	36361.7	39249.8	13.50	9.30	25.55

a creeping inflation to a galloping one), but in the beginning of 2017, it became 13.5%. Thus, the goal of the National Bank of Ukraine (NBU) was reached². On the one hand, the decrease in inflation (from 48.7% in 2015 to 13.5% in 2016) was possible owing to the following factors: smooth demand growth, low level of global commodity prices, increase in NBU's discount rate, insignificant volatility of exchange rate with respect to the positive situation in the external markets, large amount of harvest in 2016, and finally, the success of the government to hold the state budget deficit within the target limits. On the other hand, the negative impact on inflation rate is due to an increase in the tariffs of housing and communal services, an increase in the price of alcohol and tobacco goods after an increase in the license price, and an increase of the global price of oil.

Moreover, the exchange rate caused significant problems and risks,

²The Monetary Policy Strategy defines the inflation at the level of 12% for the period 2016-2020.

as during the last 3 years, the national currency devalued significantly (from 8 to 25 UAH for a 1 USD) as the demand for foreign currency grew faster than the supply. Thus, it had an essential impact on the increase of debt and relevant payments, which were made with a foreign currency.

Considering the dynamics of public debt, it can be observed that it has an increasing tendency. In the end of 2016, it was 81.25% of the GDP, which is a critical level for the Ukrainian economy. The key drivers, which caused an increase in public debt in 2014, were as follows (Londar, 2015):

- Political crisis and “hybrid” war demanded additional financing for the state defense.
- Deep economic recession tended to the necessity of economic reforms and was related to the loss of governmental control in Autonomous Republic of Crimea and parts of Donbas region; revocation of the agreements of economic cooperation with Russia; internal and external factors, which demanded additional financial resources and had an impact on budget implementation.
- Social and other maturities of the state that are mandatory for implementation, despite the economic instability.
- The financial support of the governmental institutions and banks, which was implemented by an increase in their authorised capital.

In general, we argue that Ukrainian economic development during the last 4 years was driven by the conflict in the East and South of the country. The complexity of its negative impact arises not only owing to production and investment reduction, but also owing to the risk of expansion of the conflict and mutual sanctions between Ukraine and Russia (e.g. the moratorium for Ukraine on the direct transit of goods to Kazakhstan through Russia, Ukraine revoked the trade preferences for Russian import).

2.2.2 Macro-financial stability

Macroeconomic stability cannot be reached without financial stability. In the end of 2010, the index of Ukrainian external debt to the GDP was 85% (Korbushko, 2012). In 2014, it was 95.1% and in the end of June 2015, it was 122.8% (National Bank of Ukraine, 2015), although the crucial level of external debt to GDP was 80-100% (Iurchyshyn, 2011). Such a ratio is associated with the lack of national resources and investments, along with the shortage of budget deficit coverage. Furthermore, it is related to the stabilisation of currency rate and the fulfilment of the requirements of debt obligations that were accumulated earlier.

Furthermore, the link between external debt and economic growth has been shown in the literature according to which borrowing could provide the necessary financing and macroeconomic stability for the country at low levels of external debt as long as it is not constrained by political instability and weaknesses or other distorted policies. However, the situation in Ukraine is related to the second case, where under a certain threshold, external debt reduced economic growth. The existing literature assumes that the governmental borrowing policy of many developing countries is mainly focused on external debt. Chenery and Strout (1966) pointed out that foreign assistance is used to fill the gaps between savings and investments, and exports and imports. Eichengreen and Hausmann (1999) showed three views of relations between the exchange rate and financial fragility. One of the three views is called the "original sin" hypothesis. It shows how external debt is affected by the exchange rate of the national currency. Krugman (1979) related the external debt crisis to the currency crisis. Thus, it is very important to have efficient tools of administration for external debt management, such as negotiation with creditors, foreign debt monitoring, and correlation between debt and macroeconomic performances of the state (Klein, 1992; Krugman, 1985; Sachs and Williamson, 1986). The management of debt contract renegotiation was described by Myers (1977). He mentioned that it is possible and costly owing to the fact that if creditors find themselves in a position where the debtor is not able to pay the promised

price, but simultaneously the agreement has a positive net value, both sides are interested in renegotiation (i.e., it generally leads to an arrangement when creditors get less than what was expected, but they get the securities of payment).

Thus, the debt overhang inhibits the development of Ukraine and decreases its position in the international ranking (Table A1). The accumulation of government debt in Ukraine started long before the international conflict. Essentially, we distinguish four stages of debt management on a timeline starting in 1991, which is effectively still in progress in recent years.

The first stage (1991-2000) involved an unsystematic creation and accumulation of debt through direct loans of the NBU. Moreover, the government guarantees of foreign loans were provided for Ukrainian companies and the debt settlement with Russia was initiated. Since 1994, the Ukrainian government has intensified relations with international financial institutions and consequently, the ratio of the gross external debt to GDP increased (81.98%). In 1999, the governmental debt was already larger than the critical value (approximately 82% of GDP).

In the second stage (2000-2007), Ukraine did not open any new loan programme ³. Fig. 3 shows the dynamics of the net value of external debt (approximately half of the GDP net value). Furthermore, Fig. 4 shows that public debt to GDP decreased from 43.79% to 17.09%, while the ratio of external debt to GDP decreased from 61.03% to 45.90% from 2000 to 2005, respectively.

In the years 2008-2011, the third stage was characterised by a “stop effect”, which was associated with the global economic crisis in 2008. Private capital exited the Ukrainian market and as a consequence, the internal and external demand for Ukrainian goods and services decreased. As a result, during 2008-2010, there was significant growth of external debt. Meanwhile, in 2009, Ukraine received the second tranche from the International Monetary Fund (IMF) and the first loan of the World Bank

³In 2002, Ukraine was not allowed to take credits from the International Monetary Fund (IMF) and from the end of 2004, the cooperation was limited to consulting and technical services.

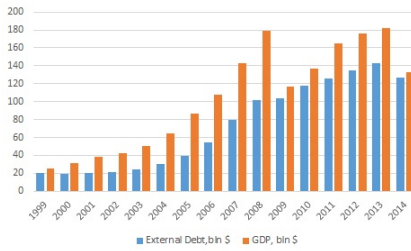


Figure 3: The Net Value of External Debt and GDP of Ukraine

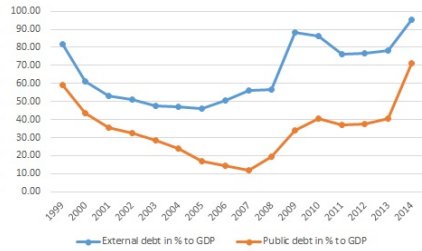


Figure 4: The Ratio of External and Public Debt to GDP

to rehabilitate the financial sector. Thus, a rapid jump of external debt growth was observed (88.26% of GDP and production decrease by 35%). In 2011, the level of external debt growth was increasing, mostly owing to the exchange rate growth and issue bonds growth (0.1 billion USD in 2010 versus 1.5 billion USD in 2011). Accumulated loans during 2009-2010 caused a threat to the financial situation in 2011, and new debts were almost equal to the payments of previous loans.

The last and fourth stage began in 2011. In 2014, Ukraine faced a combination of political, financial, and economic crises. The conflict in the East of Ukraine, along with accumulated macroeconomic distances of previous years, almost destroyed the macro-financial stability in the country. Moreover, the economic situation in Ukraine shows that one of the key factors that is slowing down the development of the country is the increase of debt burden threat and excessive raise of funds due to the rather unfavourable conditions in addition to its irrational usage. Thus, it prevents long-term economic growth and financial insecurity. Nonetheless, a tendency to increase public debt also lasted during the recent years in Ukraine and is associated with the risks of a high exchange rate, an unstable situation with the refinancing debts of previous years, and debt payments pressure on public finances. Table A2 presents the main external creditors of Ukraine.

Following the impact of conflict on the macro-financial stability, we report the main stages of financial management during 2014-2015. The key driver, which helps to overcome the financial crisis owing to the debt

overhang, is debt restructuring⁴. The Ukrainian government used the mechanism of renegotiation of debt restructuring. We report the key results as follows. The deadline for payments was shifted from 2015-2023 to 2019-2027, which allows making the main payment during the time up to 2019. As a result, the Ukrainian economy will receive significant financial relief and will gain an opportunity to stabilise its economic system and growth. Thus, Ukraine could apply the value recovery instrument, which resolves around the issue of new securities related to GDP growth.

To conclude, we argue that macro-financial stability is very important for a country's competitiveness in the international market. In the Global Competitiveness Report 2016-2017 (Schwab, 2016b), Ukraine's rank is 85 among 138 countries, which we relate to the following key problems:

- Instability of the banking system, which tends to the worsening of financial market development.
- Reduction of investors' securities and as a result, decrease in direct investments.
- Necessity of employees in the top-management.
- Migration of highly skilled employees.
- The absence of tax privileges and the ineffectiveness of special economic zones.
- Violation of intellectual property rights.
- Ineffective anti-monopoly legislation and the lack of mechanisms to stimulate the development of small businesses.

Hence, the new reforms should be called for stabilising the financial system, lowering the business barriers for new investors, and deepening the integration with other countries in international trade. In addition, one of the main challenges is reforms in higher education and research activity in Ukraine, which should be upgraded and be more oriented towards international standards. An effective system of attracting new in-

⁴The negotiations on the restructuring of Ukrainian debt between the Minister of Finance and creditors started in March 2015 and were completed on 27 August 2015. The results of this agreement are associated with a write-off of 20% (3.6 billion USD) of debt and an extension of 4-year maturity for the Ukrainian Eurobonds.

vestors with the renewal of education system should decrease the problem of unemployment.

2.2.3 Reforms in Ukraine

Ukraine faced a challenging situation, which is associated with the war in the East of Ukraine and recession of the economy with limited evidence that growth will return soon. The government has been implementing many reforms, which are called to stabilise the situation and develop the Ukrainian economy with respect to EU standards. In 2016, 22 reforms were implemented, and 2017 became the year of total changes and transformations. The growth of GDP and relatively macroeconomic stability during 2016 are signalling the necessity and efficiency of the reforms in Ukraine. We report the main reforms in Ukraine as follows⁵.

Governmental renovation considers lustration⁶, which is associated with the prevention of doing a governmental job by individuals, who by their decisions, actions/inactions implemented orders, which were related to the usurping power of the former President V. Yanukovich, and also illegal actions with respect to the national security and defence of Ukraine. At the end of December 2016, 936 individuals were listed in the register by The Law of Ukraine (2014) on lustration. We argue that the main shortcoming of this reform is the absence of a unified independent agency, which will implement lustration. Such an agency exists in EU and works with high standards and strict rules. In the case of Ukraine, every governmental agency should make all the legal regulations with respect to their own decisions. Thus, such implementation causes many disadvantages, such as prejudices towards a person that tends to dismiss his/her or on the contrary, saving the position of an employee owing to personal ties. Furthermore, EU sponsors the *public administration reform*, which has a purpose to create a professional and efficient executive sys-

⁵The other reforms are: *Decentralisation, National police reform, Educational reform, Judicial reform, Constitutional reform, National security and defense reform, The reform of the Armed Forces of Ukraine, Digital Ukraine, Reform of infrastructure, Project "GoGlobal", and Cultural reform.*

⁶Lustration is an order by the law of Ukraine, which prohibits certain individuals to occupy certain positions in any governmental agency for a period of 10 years. See *The Law of Ukraine (2014)* <http://zakon0.rada.gov.ua/laws/show/1682-18>

tem in Ukraine. This reform is needed to stabilise the political situation in Ukraine, to reduce the administrative burden of state regulation, and to make administrative actions transparent and anti-corrupt. Nonetheless, this reform is on the initial level of development, as some of the laws (that were not voted in Verkhovna Rada), as well as the constant normative turbulence, which is caused by the lack of common standards along with the lack of clarity and transparency of strategic priorities, are delaying the implementation of the reform.

The anti-corruption reform is a package of laws that is associated with fighting against corruption in the country and was implemented at the end of 2014. Within this reform, the following agencies were established: National Anti-corruption Bureau (NACB), a specialised anti-corruption prosecutor's office, State Bureau of Investigations, and National Agency for the Prevention of Corruption. In addition, the new system of "E-declarations" was created. Nonetheless, the World Bank also recommends establishing an independent anti-corruption court as soon as possible. In 2017, this reform faced significant criticism owing to many disadvantages, for example, transparency of election of the candidates to the NACB. Another main problem considers NACB's disability to thoroughly check all the information given through online declarations. However, the most negative impact on the full implementation of this reform was caused by the fact that NACB is still under significant influence of the government.

It is necessary to make changes in the NACB as follows. The international experience shows that the NACB should be totally independent of the government and should systematically check every governmental agency. In this case, Ukraine can use a mix of Singaporean, South Korean, and Japanese systems against corruption. Thus, the NACB should have total political and functional autonomy; it should implement continuous check-ups on politicians, with annual reports about their activities and full access to any accounts of the suspected person. The additional implementation of the E-system similar, to "OPEN" in South Korea, can easily decrease the level of corruption owing to the exclusion of the interaction of "officer-citizen". Finally, special control and prohibitions against

politicians should be implemented, which will guarantee that the government officer will be neutralised regarding private businesses.

The public procurement reform is one of the most successful reforms implemented in Ukraine during the past years. It is associated with the “ProZorro” portal for public procurement, which is completely open and where anyone can monitor the integrity of public procurement together with all relevant information and documents about the tender. This platform not only decreases corruption, but also increases the efficiency of procurement. The reform saves the state funds and time, avoiding paperwork. “ProZorro” performed well and it has even international nominations, and is already considered for implementation in other countries. Nevertheless, it still has a weakness, which is associated with governmental monitoring and control of violations. The disorders made in the electronic system by particular users are very easy to distinguish; however, the absence of the punishment for such loopholes leads to compromising of all the benefits of “ProZorro” and reform in general.

Deregulation is one of the top-priority reforms in Ukraine, which implements a new model of Ukrainian development and deepens the integration with EU. It is very important for Ukraine to support and develop this reform as it is one of the necessary aspects for increasing investment attractiveness and living standards in the country. In addition, deregulation can decrease the unemployment rate in the country. The results of this reform can be observed in the annual report of *Doing Business-2018* (The World Bank, 2017), where Ukraine changed its ranking from the 80th to the 76th position among 190 countries in 1 year. The key drivers of such changes are an increase in construction permits with respect to the reduction of fees, protecting minority investors, and easier procedure for paying taxes owing to the recent *tax reform*. Finally, the development of this reform with respect to the laws and strategic plans of Ukraine along with using all instruments to increase the business climate in the country will lead to the primary plan which is to be in the top-40 of the “Doing Business” ranking.

In 2016, the IMF provided the third tranche for *financial reform* in Ukraine. This financial help allowed the country to improve the support

of Ukrainian reforms by international agencies. The reform of the financial sector influenced the growth of GDP and led to the decrease of the inflation rate. One of the biggest events during the last few years was the nationalisation of the private bank “PrivatBank”. Although a bulk of special laws on the credits’ and banks’ activities were adopted during 2016, the government still did not create an efficient regulatory environment for the financial sector. Moreover, the government is expected to provide fiscal consolidation, which will stop the uncontrollable debt growth. It is also necessary to increase external liquidity and flexibility, which lead to attraction of the external financial resources.

Following the financial support of international agencies, it is important to mention some key reforms promoted by the EU, IMF, and the World Bank. Thus, the reforms supported by the EU are approved by the priorities of the *Neighborhood Investment Facility* for the period 2014-2020. This regulation highlights the main directions for development as follows (Mission of Ukraine to the EU, 2017):

- cooperation in the energy sector with respect to the use of renewable energy to boost the infrastructure network between the neighbourhood countries;
- implementation of the last recommendations of the regulations on climate change and sustainable development;
- support of investments for implementation of EU agreements (i.e., agreement on deep and comprehensive free trade area);
- support of the growth of small- and medium-sized entrepreneurship.

Moreover, the IMF has been supporting Ukraine and providing tranches of financial support from the beginning of the conflict. Nonetheless, the final tranche was “frozen” until the last requirements are implemented in Ukraine. Thus, while the *pension reform* and *reform of the health system* were already approved by the government, the IMF requires increasing the gas tariffs for the population within *the energy programme*. Furthermore, the IMF and World Bank expect the full implementation of *reform of the state property management* and particularly, *privatization*. Cur-

rently, almost half of the state enterprises are completely unprofitable or not working at all. Note that these economic activities absorb significant amounts of money and lead to losses to the budget. Thus, the privatization process can fix this situation with the help of new investors and additional money from sales of these state enterprises. Unfortunately, the privatization process was not successful during past years (i.e., in 2014, only 2.7% of all the planned objects were privatized, while the result of 2015 was 0.9%). Nonetheless, on 9 November 2017, Verkhovna Rada approved the new law “On the privatization of state property”, which makes the mechanism of privatization easier (i.e. instead of five methods of privatization, the government left only two, auction and redemption of privatization objects) and planned to obtain 22 billion UAH from privatization in 2018. It is necessary to mention that privatization is needed to increase the efficiency of the economy and to decrease corruption, particularly while political oligarchs try to control a given industry. If Ukraine succeeds in this economic reform, it will not only gain the next tranche from the IMF, but will also attract new FDI, which in turn will create new jobs, bring innovations to old enterprises and will lead to the improvement of the business-climate.

Furthermore, the reforms that are required by both the IMF and World Bank are privatization, creation of anti-corruption courts, and land reform in Ukraine. While the first two are necessary and highly supported by citizens and leading economists, *land reform* is one of the most important and problematic aspects in *agricultural reform*. International agencies require the cancellation of the moratorium on the sale of Ukrainian land. Although the international practice shows positive dynamics in this reform, we argue that the sale of the Ukrainian land should not be allowed for now. The reasons for such statements are as follows. Ukraine is at war with Russia and in a deep political and economic crisis, which have had a negative impact on the Ukrainian currency and inflation rate. In this situation, the price of land has decreased significantly. Thus, follows the next question, “For whom it is profitable to sell/buy the land in times of war?”. The answer is obvious, the oligarchs and large multinational enterprises in the agriculture sector are more than interested to

buy Ukrainian land for nothing. Note that land in Ukraine is almost a quarter of all black soil reserves on the planet. Moreover, for state and land-owners, such sales will be unprofitable. Thus, another approach could be used to avoid a potential risks: introducing a long-term lease of agricultural land from 14 to 50 years that is successfully used by many other countries and attracts new FDIs. Ukraine should use its strategic advantage in the agricultural sector and not only follow all the requirements, but also argue against them if they threaten national interests and possible state integrity.

2.3 Ukraine's trade policy

2.3.1 Current situation

In this section, we discuss the dynamics and changes in Ukrainian trade, given that international trade is one of the key drivers of formation of a successful and competitive country. It is important to analyse the dynamics of Ukrainian exports and imports. The monthly data for exports and imports are sourced from UN Comtrade database (UNCD, 2016) for Ukraine and from the State Statistics Service of Ukraine (2017) for the period 2010-2016. We define the beginning of the Russian aggression against Ukraine in March 2014 as the breaking-point for pre- and post-periods of Ukrainian trade and economic development. As the conflict is ongoing, we report the last available monthly data and present it as an end-interim period.

Fig. 5 illustrates the dynamics of Ukrainian exports and imports with respect to the same period of the previous year. Thus, the recession of trade in Ukraine started long before the war in Donbas, in May 2011. It can be explained by the fact that the debt maturity of the country increased, and exports decreased during that period. Further, the lowest ratio of exports and imports was in May 2015 (-42% and -41%, respectively). However, Ukrainian trade started a slow recovery period after almost 1.5 years. Thus, in November 2016, Ukrainian exports and imports started to show a positive trend (15% for exports and 19% for im-

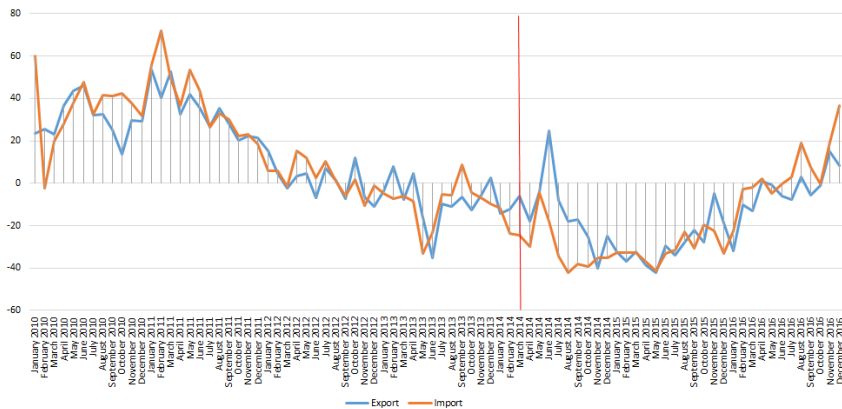


Figure 5: Dynamics of Export and Import, % (to the same period of the previous year)

ports).

Furthermore, the dynamics of Ukrainian trade during the 7 years show that the time of V. Yanukovych’s governance (from 25 February 2010 to 22 February 2014) was characterised by a negative trend of exports and imports. It can be related to the political views of the governmental party, which did not make any concrete agreements with neither EU, Organization for Security and Co-operation in Europe, Commonwealth of Independent States (CIS), nor with the U.S. or, China. Given such a policy of multi-vector orientation, the foreign affairs of Ukraine lost its “searchlight”. Moreover, one of the significant strategic mistakes was to sign the agreement to provide enriched uranium to the U.S. This event showed that Ukraine was not able to protect its strategic priorities at the international level. Thus, other potential partners slowly stopped to be attracted to cooperate with Ukraine. In addition, the relations with EU were damaged, mainly owing to the cutback of democratic achievements in Ukraine during previous years.

Furthermore, it is natural that Ukraine started to experience problems with trade after the revolution, annexation of Crimea and beginning of the war. Moreover, the country’s trade is more sensitive to external fac-

tors also owing to its distribution within extensive and intensive margins. Thus, we analyse the extensive and intensive margins of Ukrainian trade for the period 2005-2014 in Appendix B. Table B5 provides the results, which show that intensive margins prevails for both export and imports (70%). Note that an intensive margin considers that the country concentrates all its exports/imports on a small number of market categories, whereas an extensive margin allows to spread a country's export/import thinly over many market categories. Thus, these results can explain such significant decreases in trade during the war as Ukraine was more sensitive to external factors, along with the concentration of trade within the large economies. We argue that a new strategy should be created for Ukrainian trade, which will be more concentrated on extensive margins, which will allow the country to be more stable in the time of crisis.

Further, it is necessary to understand who the main partners of Ukraine in trade are. Fig. 6-7 show the top 10 export and import partners in 2016. Although Russia still has the largest share in Ukrainian trade, Table A3 reports a significant decrease of export to Russia in 2016 (five times with respect to 2013 and three times with respect to 2014). Moreover, it can be observed, that Ukraine improved cooperation with EU, as we observe 5 EU-countries in the top 10.

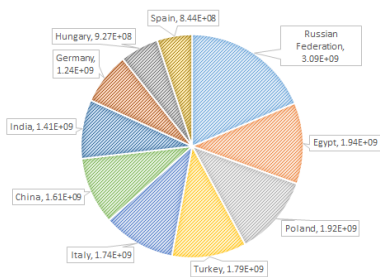


Figure 6: Top-10 partners in export in 2016, thsnd USD

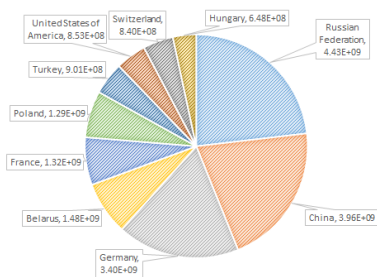


Figure 7: Top-10 partners in import in 2016, thsnd USD

Nonetheless, it is necessary to understand that if the country has positive/negative dynamics, estimating the direction of the current trend of

the trade is essential. Thus, Fig. 8-9 show the 12 months moving average of Ukrainian exports and imports with the Russian Federation, China, the U.S., CIS-countries (without Russia), and EU-countries. In January 2013, we observe the switching point of Ukrainian trade, which signals the change of the direction of partnership (exports to Russia was 21.8% and to EU it was 29.9%). At the end of 2016, exports to EU became 37.8% and to Russia it was 9.8%. Considering Ukrainian imports, the switching point was in February 2013, although Russian imports in 2013 was 30.2% and for EU it was 35%; while in 2016, it became 13% and 43%, respectively.

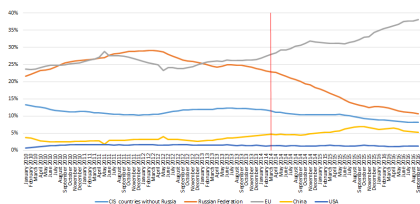


Figure 8: 12 Months Moving Average of Ukrainian Export

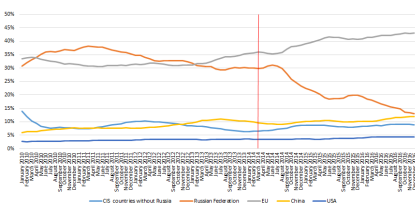


Figure 9: 12 Months Moving Average of Ukrainian Import

The change is due to the association agreement EU-Ukraine Deep and Comprehensive Free Trade Area (DCFTA), which started to work in Ukraine from the beginning of 2016 and allowed Ukraine to trade more freely with other countries improving Ukrainian competitiveness in the global market. Furthermore, Ukrainian cooperation with China has become more significant during the last 2 years as the growth level of imports from China is almost the same as from Russia. It can be related to the fact that China considers Ukraine as a platform for Chinese exports to the EU. Nonetheless, the current trend can also be related to the fact that Ukraine established new cooperation in trade with different countries, such as from 1 August 2017, the free trade zone is working between Canada and Ukraine. Thus, the Ukrainian government slowly started to use the mechanism of broader exporting that is a positive factor for the national economy.

Moreover, it is important to understand the dynamics of Ukrainian

exports and imports in terms of groups of goods. Thus, in Fig. 10-11, we plot the dynamics of exports and imports of different groups of goods using monthly data, which we classify by broad economic categories and basic classes of System of National Accounts (SNA)⁷.

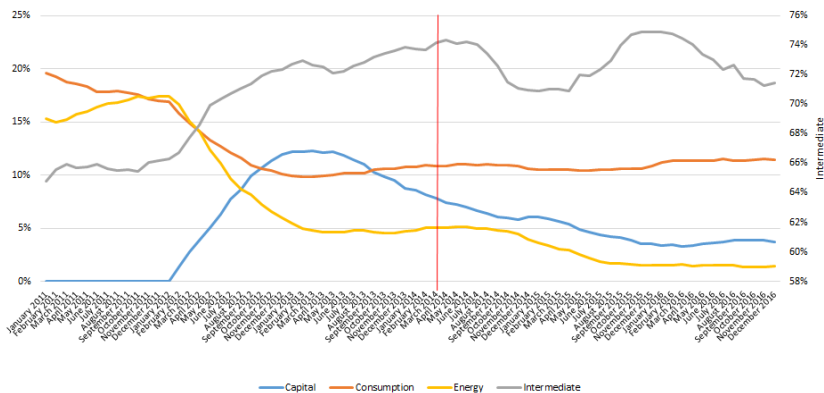


Figure 10: Export of goods

Fig. 10 illustrates the 12 months moving average of Ukraine exporting goods to other countries from 2011 to 2016. The value of intermediate goods has a larger share in the total export value. More importantly, the share of intermediate goods has occupied a large share (65%) since 2011, which is a direct consequence of the production fragmentation and growth of the vertical supply chains. The export shares of consumption, capital, and energy goods decreased gradually. Nonetheless, at the end of 2016, the export value of consumption goods was approximately equal to the value at the beginning of the conflict (approximately 11%).

Fig. 11 shows the 12 months moving average of importing goods from other countries to Ukraine in the period 2011-2016. At the beginning of 2011, intermediate goods trade accounted for 34% of the total

⁷The SNA consists of three groups: capital goods, consumption goods, and intermediate goods. As we are also interested in energy, we drop the “31 Fuels and lubricants, primary” and “322 Fuels and lubricants, processed, other” from intermediate goods. For energy, we use separated data provided by the State Statistic Service of Ukraine for mineral fuel, petroleum, and petroleum distillation products (including coal, crude oil, and natural gas).

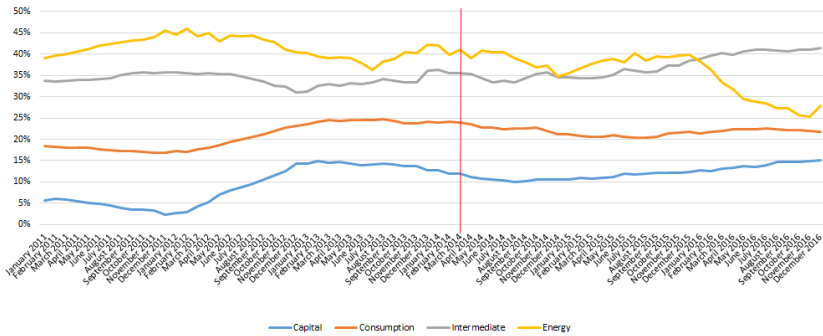


Figure 11: Import of goods

goods trade value, while that of consumption goods was 19%, capital goods was 6%, and energy goods was 39%. The share of imported intermediate goods reached the highest point at the end of 2016 (41%), while the share of energy goods decreased to 28%. In general, capital and consumption goods occupied stable growth in the share of total import goods value.

To conclude, the exporting value of Ukraine in 2016 was 46.2 billion USD, of which approximately one fourth was the export of services and rest was the export of goods. Interestingly, the export of information technology (IT) services is one of the most profitable industries in the service segment. It is necessary to mention that Ukraine is in the top-20 of the biggest IT-exporters globally. Moreover, Ukraine as an agricultural country is a global leader in exporting sunflower oil, which is already a final good. Furthermore, Ukraine is among the top five global exporters of honey and its export value increased by five times over the last 6 years. Thus, Ukraine as a country with a big agricultural potential and a very good platform for innovations has already started using its comparative advantages in trade, which will allow it to become a competitive partner in the international market and develop its national economy.

2.3.2 Relations with Russia and the EU

Considering the question, how will this change the cooperation of Ukraine with respect to the conflict in the country, we provide the statistics of Ukrainian exports and imports with the EU and Russian Federation in trade values. Fig. 12 shows the dynamics of exports and imports during the period 2004-2015. We divide the changes in trade into stages as follows. The first stage was 2005-2010, when the government was led by president V. Yushchenko, who had a programme of deepening the integration with EU. Furthermore, Ukraine became a member of the WTO in 2008, which was one of the most important events during this stage⁸. Therefore, Ukraine applied a number of WTO's requirements, such as the mechanism of non-discrimination, which leads to the decrease of product costs, and reduction of the prices of the final goods and services, and ensures licensing of some Ukrainian products. Thus, a membership in the WTO provided the fulfilment of all necessary requirements to sign the Free Trade Agreement with the European Free Trade Association⁹ in 2010, which entered into force in 2012. In totality, it was the base-ground for the political and economic parts of Ukraine-EU Association Agreement.

The second stage was during the period of the next government in 2010-2013, which was led by the pro-Russian political part of president V. Yanukovich. Consequently, the number of agreements with EU decreased and international trade focused on Russian integration (58% and 67% increase in exports and imports respectively, compared to the previous year). In 2012, exports and imports decreased significantly owing to economic and political instability. The year after the revolution showed that exports to Europe were increasing and those to Russia were decreasing, while the imports to both partners decreased, as during political and economic uncertainty, the country should cut spending. Particularly in 2015, exports and imports with Russia in comparison to 2014 decreased (51% in 2014 and 47% in 2015).

⁸Note that Russia was accepted 4 years later, in 2012.

⁹EFTA is a regional trade organization, which includes European countries, such as Iceland, Liechtenstein, Norway, and Switzerland.

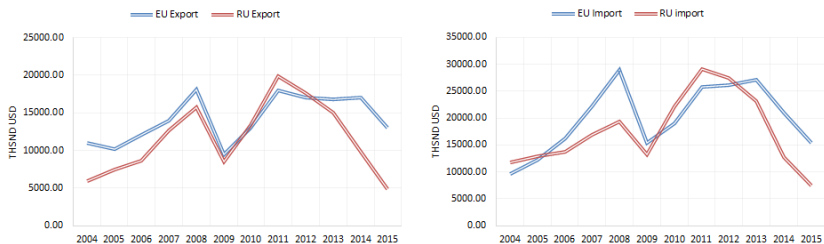


Figure 12: Ukrainian trade with EU and Russia in 2004-2015, thsnd USD

Further, we report the decomposition of Ukrainian export at the regional level in Fig. 13. The regional divide of exports shows that due to intensive trade with EU in the last few years, there are no regions in Ukraine, which have more than 50% exports to CIS-countries, although Kharkivska “oblast” was the last region that had such a share in 2015, which became 43.7% in 2016. In addition, Sumy region had the same level, while Chernigiv and Mykolaiiv regions had a bigger share of exports to CIS than to EU. However, the main exports remain to be to other countries.

The general pattern of Ukrainian trade in the regional level shows that the Western part of Ukraine has a positive tendency to export to the EU. Hence, nine regions export more than 50% to the EU. Further, surprisingly, Donbas (which includes Donetsk and Lugansk) also has a share of exports to the EU of more than 50% in regional structure. This means that foreign investors make new agreements with businesses in this area despite the conflict. In addition, it can be associated with the goods produced in these regions, as they are more unique with respect to the production of goods in other regions. In the other 10 regions, the main share of exports belongs to other countries. Nonetheless, the second partnership is with EU-countries. Moreover, the share of Ukrainian export to the EU is not only associated with a decrease in the share of exports to CIS, but also to the absolute growth of exports in the country that we mentioned previously.

Another important aspect of improving Ukraine-EU relations is the

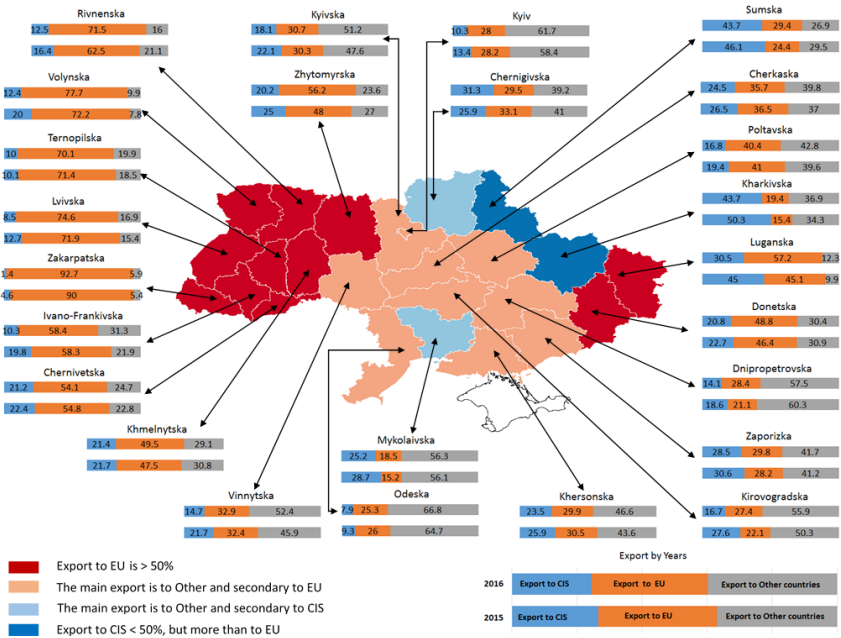


Figure 13: Export in regions of Ukraine for individual economic groupings of countries

bilateral agreement on *DCFTA*, which implies the progressive elimination of tariffs and quotas on imports from the EU, and also the development and implementation of various laws, norms and regulations for creating the conditions where the Ukrainian economy will align with the EU standards¹⁰.

Moreover, the *DCFTA* opens new consumer markets for Ukraine and contributes to the adaptation of trade rules for different sectors. Ukraine has a comparative advantage in the export of raw materials (iron, steel, mining products, and agricultural products), chemical products, machinery, transport equipment, and manufactured goods. However, the producers in Ukraine have some challenges in exporting the agricultural

¹⁰EU legislation includes: competition, public procurement, customs and trade facilitation, protection of intellectual property rights, and trade-related energy aspects, including investment, transit, and transport.

products as they have experienced the limitation of quotas owing to the food safety standards and the low demand at some EU markets. This is the reason why it is so important to adopt the technical standards and modernisation for manufacturing and other leading industries in Ukraine as soon as possible. The elimination of such barriers will help to develop the comprehensive strategy and harmonised legislation, which in turn will help to position Ukrainian enterprises as competitive exporters to the EU markets.

In addition, the DCFTA considers the development of the dynamic and competitive sector of services in Ukraine. Ukraine has huge potential in tourism, financial, business, IT, research, and construction services, which can increase the export of the country, and therefore deserves precedence in terms of attention. Particularly, IT and research and development (R&D) services are one of the most promising in Ukraine, which attracts new subsidiaries of big international firms in the sphere of E-commerce, gaming, software development, and telecom. Thus, the DCFTA will have an influence on the IT-sector, mainly through legislation, which is associated with the protection of intellectual property rights. Nonetheless, a higher protection of investments on innovations reflects increasing the attractiveness of FDIs.

Note that for small business, this agreement has particular importance as the EU provides financial support (grants) from the programme of *“Small and Medium sized Enterprises Flagship Initiative”*. This initiative is provided for the Eastern Partnership countries¹¹, including Ukraine, which has the goal to make prominent contributions to economic growth considering the characteristic of each country and to allow the adaptation of national economies to the global market.

Another important policy support of the EU’s is associated with the ban of imports from Crimea (including Sevastopol), which is in line with the policy of not recognising the illegal annexation of Crimea by Russia. This provides Ukraine the chance to fight back against the Russian aggression and motivation to improve the foreign affairs with the rest of

¹¹The countries of the Eastern Partnership are Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova and Ukraine.

the world, particularly with the EU.

The cooperation with Russia decreased significantly, mainly owing to Ukrainian and global sanctions. Ukraine totally suspended any cooperation in military and security sectors. In 2014, Verkhovna Rada adopted the Law of Ukraine “On Sanctions”¹², which aims to protect national security and territorial integrity of Ukraine, and is directed against the Russian Federation and any terroristic activity. In 2017, the Ukrainian government enacted the decision to forbid some Russian IT-services as a response to the “informational war” and Russian propaganda. In response to the international and Ukrainian sanctions, Russia also implemented some restrictions, particularly for trade in goods. Considering the last available information, the Russian government prolonged a ban on the import of certain types of agricultural products, raw materials, and food from Ukraine to Russia from 1 January to 31 December, 2018.

However, the main driver of successful trade between Ukraine and Russia was trading in energy. Thus, it is necessary to consider the trade dynamics of natural gas between Russia and Ukraine, and also EU. The export pricing for natural gas from Russia to Ukraine was not linear during the independence timeline. From 1992 to 2005, the price was 50 USD, while from 2006, the price started to increase and it became 179 USD in 2008¹³ (Fig. 14).

Fig. 15 shows the gas price for EU, that is significantly lower. This difference in prices was not economically fair for Ukraine, particularly taking into consideration the financial capability of Ukraine and EU-countries and their economic development¹⁴. Indeed, 2015 a “breaking point” between the Ukrainian-Russian partnership in gas infrastructure.

¹²See <http://zakon2.rada.gov.ua/laws/show/1644-18>.

¹³Such an increase in price was caused owing to the signing of a gas transit agreement between “Gasprom” and “Naftogaz Ukraine” for the period 2009-2019 that changed the system of pricing. It was determined by a formula with a reference to the cost of oil and its products in the global market. According to the high level of oil prices, this agreement was disadvantageous for the Ukrainian economy. Simultaneously, Russia started to use the gas aspect as one of the key factors to achieve the political goals on the territory of post-USSR countries, including Ukraine.

¹⁴In order to become an energy-independent country, the Ukrainian government has designed programmes for gas supply replacement. Currently, it is associated with the opening of reverse deliveries from EU-countries and development of domestic production.

Previously, Russia was a monopolistic distributor of gas to Ukraine and the value of gas imports was 40 billion cubic meters, whereas in 2015, the exports of Russian gas to Ukraine decreased to 6.1 billion cubic meters (in 2014 it was 14.5 billion cubic meters) and the value of gas from the European market increased almost twice (from 4.9 to 9.2 billion cubic meters). As a result, the Ukrainian government completely refused to buy Russian gas in November 2015. Currently, Ukraine receives gas resources from more than 10 foreign distributors.

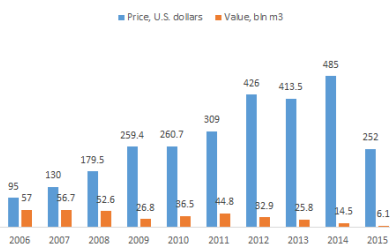


Figure 14: Ukrainian import of gas

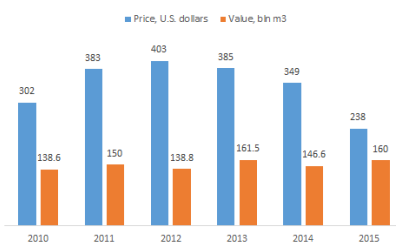


Figure 15: EU import of gas

Source: made by author based on Ekonomichna Pravda (2015)

Thus, Ukraine has not been buying Russian natural gas for the past 2 years. In 2016, Ukraine imported all gas from EU-countries. Furthermore, using the alternative energy together with energy saving programmes has an impact on the efficient development of alternative sources of energy, both for the production of heat and electricity. Consequently, the development of “green” economy can make the Ukrainian energy sector more cost-effective. In addition, it will have a significantly positive influence on the ecology and level of public health. Moreover, Ukraine is a potentially attractive country for “green” investments, which will create new jobs, innovations, and will make the country not only non-volatile, but also more competitive in the international energy market.

2.4 Concluding remarks and recommendations

This chapter describes the Ukrainian policy in times of war with the Russian Federation. We define the main problems, which had a negative impact and increased the external and public debts in the country. Furthermore, this chapter exploits the mechanism of financial management and provides the key results of debt renegotiation.

The recommendations for financial management consider:

- the necessity of domestic stock market growth, which allows to develop the internal market of loan capital and to protect national economy from the negative impact of national currency devaluation, international capital moving, and financial crisis;
- the development of rational strategy on the minimisation of external debt, which is associated with the reduction of external maturity and currency outflow from the country;
- stabilisation and accumulation of funds from privatization, which should be used as an effective tool for the debt obligations payment;
- the support of acceptable level of budget deficit, which can be undertaken by increasing internal financing.

Further, we argue that Ukraine had a negative impact on international trade in 2014 not only owing to the conflict, but also owing to the fact that Ukrainian exports and imports were more concentrated on intensive margins. Thus, such a distribution is highly dependent on few market-categories, which, in case of any conflict with one of the partner-country, could cause relatively big loses. Furthermore, this study confirms that Ukraine totally changed its approach to partnership in international trade. In 2015-2016, there was no region in Ukraine that had more than 50% of trade with CIS-countries. Although Russia is still one of the main partners in trade (in terms of net value), while considering the real growth dynamic of Ukrainian exports and imports, we report that the EU has approximately 20% difference in trade growth in comparison to Russia.

The recommendations for international trade of Ukraine are as follows. First, it is necessary to improve the Ukrainian foreign economic policy in regards to the support of national producers through the increase of their export potential. Further, the new mechanism should involve an implementation of optimisation of the commodity and geographical structure of exports-imports, as well as the decrease of import substitution effect. To reduce the negative impact of intensive margin on trade, it is necessary to increase the share of the final goods in exports and to reduce the share of energy and consumer goods in imports. Second, the modernisation of production, implementation of innovations and development of R&D, increase of sustainable development, improvement of mechanisation and automation of production, and preparing high-skilled employees in the top management should tend to increase the output of domestic products and services. Third, the management of foreign economic activity should involve new strategic approaches, using marketing research and analysis with effective information support (for example, using the experience of developed countries and their successful models). Finally, it is necessary to increase the level of competitiveness of national goods in the global market.

Appendix A

Table A1: Gross External Debt Position by Sector (millions USD)

	General Government	Central Bank	Deposit-Taking Corporations, except the Central Bank	Other Sectors	Direct Investment: Intercompany Lending	Sum
United States	6,279,766	601,821	2,726,336	6,388,768	1,567,691	17,564,382
United Kingdom	784,967	38,851	4,465,103	2,330,934	623,161	8,243,016
Euro area	2,871,185	411,341	4,139,660	3,261,809	2,923,464	13,607,459
Japan	1,017,225	55,237	1,201,467	661,082	14,764	2,949,775
Australia	210,206	4,894	658,946	334,193	192,387	1,400,626
Brazil	184,553	4,001	147,361	123,366	205,711	664,992
Argentina	69,726	14,118	4,333	38,499	31,115	157,791
Russian Federation	30,551	11,033	126,202	209,902	138,159	515,847
Turkey	84,448	1,327	164,021	141,947	6,296	398,039
Poland	136,404	5,469	54,626	52,720	79,227	328,446
Hungary	50,168	1,963	18,500	18,308	71,380	160,319
Czech Republic	28,412	2,901	34,126	29,412	31,301	126,152
Ukraine	35,959	6,708	12,823	54,677	8,562	118,729

Source: combined by author based on The World Bank (2016).

The biggest creditor is Franklin Templeton (FT), an investment fund that started to buy Ukrainian bonds in 2013. The first purchase was foreign government bonds, which was worth 5 billion USD. This investment fund is one of the biggest investment companies in the U.S. and globally, and is also part of the U.S. holding, Franklin Templeton Investments. This fund is famous for its risk activity: FT buys debts of countries (that have financial problems) and then, it looks for funds, which will be

Table A2: External Creditors of Ukraine

Creditor	Amount of debt holder
Franklin Templeton	6,5 billion USD
Russian Federation	3 billion USD
PIMCO	289 million USD
Black Rock	258 million USD
Stone Harbor Investment Partners	237 million USD
Fidelity	228 million USD
Ashmore Investment Management	154 million USD

given to these countries. Thus, ultimately, these funds will end up with FT itself. In totality, Ukraine was very attractive for FT, as it is a country with long-term potential, extremely high level of human capital and agricultural funds, and more importantly, with strategic geo-location between Europe and the East.

Table A3: Top-10 partners of Ukrainian trade

2013		2014		2015		2016	
Export							
Russian Federation	14000.00	Russian Federation	9190.00	Russian Federation	3630.00	Russian Federation	3090.00
Turkey	3130.00	Switzerland	3460.00	Turkey	2870.00	Egypt	1940.00
Egypt	2430.00	Turkey	2700.00	Italy	1850.00	Poland	1920.00
China	2380.00	Poland	2340.00	Egypt	1680.00	Turkey	1790.00
Poland	2280.00	Egypt	2220.00	Germany	1470.00	Italy	1740.00
Kazakhstan	2030.00	China	2180.00	India	1410.00	China	1610.00
Italy	1980.00	Italy	1740.00	Poland	1320.00	India	1410.00
Belarus	1850.00	Germany	1560.00	Spain	1020.00	Germany	1240.00
India	1650.00	Belarus	1490.00	Hungary	823.00	Hungary	927.00
Switzerland	1640.00	India	1430.00	Belarus	800.00	Spain	844.00
Import							
Russian Federation	15400.00	Russian Federation	11000.00	Russian Federation	5680.00	Russian Federation	4430.00
China	5420.00	Germany	4330.00	Germany	3100.00	China	3960.00
Germany	4490.00	China	3870.00	Poland	2930.00	Germany	3400.00
Poland	2750.00	Belarus	2950.00	Belarus	2420.00	Belarus	1480.00
Belarus	1960.00	Poland	2000.00	Hungary	1220.00	France	1320.00
USA	1820.00	Hungary	1340.00	Turkey	1010.00	Poland	1290.00
Turkey	1170.00	Switzerland	1250.00	Kazakhstan	944.00	Turkey	901.00
France	1160.00	USA	1200.00	Italy	923.00	USA	853.00
United Kingdom	1010.00	United Kingdom	1030.00	USA	801.00	Switzerland	840.00
Switzerland	941.00	France	1030.00	Lithuania	681.00	Hungary	648.00

Appendix B

The extensive and intensive margins

We estimate the extensive and intensive margins of Ukrainian trade with the rest of the world. The intensive margin has been modeled for the first time by Armington (1969). Flam and Helpman (1987) and Grossman and Helpman (1991) show that if a country is richer, it will produce and export higher-quality goods. Hummels and Klenow (2005) focus on the cross-country differences and find that extensive margin accounts for 60% exports from larger economies. Timothy and Ruhl (2013) and Bergin and Glick (2015) argue that in the earlier stages of trade liberalization, an increased variety of traded goods played a more important role in explaining trade growth. A positive impact of the extensive margin on economic growth has been found by Evenett and Venables (2002). On the contrary, a large body of work has found that the intensive margin has a bigger impact. Amurgo-Pacheco and Pierola (2008) showed that exports in the intensive margin account the most for overall trade growth, while in the extensive margin, geographic diversification is more important than product diversification, particularly for developing countries. Besedes and Prusa (2011) argue that developing countries would experience significantly higher export growth if they were able to improve their performance in terms of intensive margin. Amiti and Freund (2010) reported that intensive margin played a more important role in the growth of China's exports during 1992-2005.

For our purpose, we source data from the UN Commodity Trade

Statistics Database, which collects data on Ukrainian trade with approximately 160 countries by all categories of HS commodities in the period 2010-2014. The observations in our dataset correspond to each country, which undertaking the exports/imports activity with Ukraine. The data on national employment and GDP PPP in 2010-2014 is sourced from the World Bank Database and State Statistic Service of Ukraine. Except for our dataset, we also use other variables that are presented in Table B4.

Table B4: Variables Definition

Variable	Definition
<i>Overall Export</i>	the ratio of nominal export of country j and nominal Ukrainian exports
<i>Intensive Margin</i>	a country's share of world exports in those market-categories in which it exports
<i>Extensive Margin</i>	fraction of the world exports that occur in those market categories in which country j exports
Y/L	the ratio of GDP ppp to employment
Y	log of GDP ppp
L	log of employment

Further, we base the analysis on the model that was presented by Hummels and Klenow (2005). They decompose each country's exports into the product of extensive (countries ship a larger set of goods to more markets) and intensive (countries ship larger values of a common set of goods) margins. Hence, regression samples are cross-sections (Ukrainian export or import with other countries) in a given year and we compute the overall export as follows:

$$Overall\ Export = \frac{x_j}{x_W} \quad (2.1)$$

where x_j = nominal exports of country j , and x_W = nominal global exports (from all countries to all countries).

The intensive export margin measures a country's share of global exports in those market-categories in which it exports. The extensive margin for a country measures the fraction of exports that occur in those global market-categories in which country j exports¹⁵. We compute these

¹⁵This extensive margin is a cross-country and export analogue of Feenstra's (1994) mea-

variables as follows:

$$Intensive\ Margin = \frac{x_j}{\sum_{i \neq j} \sum_{S \in X_{jis}} x_{Wis}} \quad (2.2)$$

$$Extensive\ Margin = \frac{\sum_{i \neq j} \sum_{S \in X_{jis}} x_{Wis}}{x_W} \quad (2.3)$$

where x_{Wis} is the global exports to country i in product category s , and X_{jis} is the set of market-category (i, s) pairs for which $x_{jis} > 0$, where x_{jis} is nominal exports of country j to country i in product category s .

As we are estimating exports and imports only for Ukraine, the estimation of extensive and intensive margins for imports is analogous.

Estimation of extensive and intensive margins

Table B5 includes the results from OLS regressions on GDP per worker and number employed jointly, and also regressions on total GDP. For the observations, we consider each country that was undertaking international trade during 2010-2014 with Ukraine in 100 categories. All of the coefficients in the tables are significantly different from zero (p-value < 0.01).

In the first part of the table, we obtain the margins for Ukrainian exports, where the second and third rows report that, with respect to GDP, approximately two-thirds of the Ukrainian exports occur on the intensive margin and one-third on the extensive margin. As it can be observed, Ukraine exports larger values of goods as the intensive margin is more than 70%. Thus, it means that Ukraine concentrates all its exports on a small number of market-categories. In other words, Ukraine exports more than 70% on intensive margin to larger economies.

Nonetheless, during 2010-2012 (the pre-period of conflict), the extensive margin has been decreasing as the international agreements did not

sure of import variety growth across time for a given country.

consider the increase of goods values, but the increase of markets. During 2013-2014, the extensive margin started to increase and the percentage level reached the same level of 2010. Hence, we find that the economic interest is associated with trade development. In this case, the country is more dependent on the values of exports owing to the fact that if extensive margin would be higher than the intensive margin, then Ukraine would not be dependent and would not have a significant decrease in the trade during conflict with one of the countries. Essentially, the extensive margin allows the country to spread its exports thinly over many market-categories. The second part of the table decomposes exports for a sample of countries exporting to Ukraine during 2010-2014 (import of Ukraine). The first row corresponds to the results that larger economies will export substantially more to Ukraine. The next rows show that the intensive margin accounts to 64%, 67%, and 69% in 2010, 2011, and 2012 respectively, of the additional exports to Ukraine by larger economies and in 2013 and 2014, the figure was 64%. In addition, the table shows that the intensive margin plays a more prominent role for economies with more workers (73%, 77%, 74%, 80%, and 78%) than for richer economies (55%, 58%, 60%, 64%, and 64%).

Table B6 provides the results on extensive and intensive margins of Ukrainian trade during the 2005-2009. Note that in this period approximately one-fifth of the Ukrainian exports occur on the extensive margin, and the rest of it belongs to intensive margin. Nonetheless, the extensive margin of Ukrainian export slightly increased in 2009. Thus, Ukraine exported more than 80% on intensive margin to larger economies during 2005-2009 that was almost 10% more than in following 5 years.

Furthermore, if we compare the margins of Ukrainian imports, we observe that during the 2005-2009 extensive margin had higher percentage. It can be related to the fact that during this period the Ukrainian trade policy was oriented on attraction new markets instead of just increasing the volumes of trade. Nonetheless, results still show the pattern which shows a more prominent role of intensive margin for economies with more workers (69%, 66%, 69%, 68%, 70%) than for richer economies (46%, 50%, 53%, 63%, 54%).

Table B5: Extensive and Intensive Margins of Ukrainian Trade in the period 2010-2014

		Export														
		2010			2011			2012			2013			2014		
Independent Variable →	Dependent Variable ↓	Y/L †	L	Y	Y/L †	L	Y	Y/L †	L	Y	Y/L †	L	Y	Y/L †	L	Y
Overall Export		0.983*** -0.223	1.142*** -0.123	1.174*** -0.099	1.058*** -0.235	1.130*** -0.136	1.242*** -0.106	0.869*** -0.229	1.025*** -0.13	1.061*** -0.106	1.028*** -0.218	1.197*** -0.128	1.225*** -0.099	1.245*** -0.212	1.159*** -0.124	1.262*** -0.095
Intensive Margin		0.641*** -0.168	0.893*** -0.093	0.870*** -0.077	0.799*** -0.177	0.891*** -0.103	0.947*** -0.081	0.718*** -0.18	0.807*** -0.103	0.828*** -0.084	0.774*** -0.165	0.922*** -0.097	0.932*** -0.076	0.937*** -0.156	0.860*** -0.091	0.934*** -0.07
Extensive Margin		65% -0.342**	78% 0.250***	74% 0.304***	76% 0.259**	79% 0.239***	76% 0.296***	83% 0.15	79% 0.218***	78% 0.233***	75% 0.254**	77% 0.275***	76% 0.294***	75% 0.308***	74% 0.299***	74% 0.328***
		-0.103 35%	-0.057 22%	-0.048 26%	-0.092 24%	-0.053 21%	-0.044 24%	-0.087 17%	-0.049 21%	-0.042 22%	-0.084 25%	-0.049 23%	-0.04 24%	-0.088 25%	-0.051 26%	-0.042 26%
Observations		158	160	153	159	154										
		Import														
		2010			2011			2012			2013			2014		
Independent Variable →	Dependent Variable ↓	Y/L †	L	Y	Y/L †	L	Y	Y/L †	L	Y	Y/L †	L	Y	Y/L †	L	Y
Overall Export		1.649*** -0.269	1.244*** -0.155	1.457*** -0.12	1.697*** -0.265	1.193*** -0.153	1.435*** -0.121	1.497*** -0.268	1.240*** -0.153	1.449*** -0.119	1.696*** -0.258	1.219*** -0.151	1.479*** -0.113	1.769*** -0.272	1.316*** -0.159	1.594*** -0.118
Intensive Margin		0.901*** -0.208	0.908*** -0.112	0.939*** -0.098	0.980*** -0.204	0.914*** -0.118	0.963*** -0.098	0.905*** -0.213	0.921*** -0.121	0.997*** -0.099	1.080*** -0.213	0.980*** -0.125	1.087*** -0.098	1.127*** -0.224	1.031*** -0.131	1.150*** -0.102
Extensive Margin		55% 0.748***	73% 0.336***	64% 0.518***	58% 0.717***	77% 0.279***	67% 0.472***	60% 0.592***	74% 0.318***	69% 0.452***	64% 0.615***	80% 0.239***	73% 0.392***	64% 0.642***	78% 0.285***	72% 0.444***
		-0.109 45%	-0.063 27%	-0.049 36%	-0.106 42%	-0.062 23%	-0.05 33%	-0.096 40%	-0.055 26%	-0.044 31%	-0.088 36%	-0.052 20%	-0.042 27%	-0.094 36%	-0.055 22%	-0.043 28%
Observation		161	163	161	161	156										

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
† Marginal effects for elasticity

Table B6: Extensive and Intensive Margins of Ukrainian Trade in the period 2005-2009

		Export														
		2005			2006			2007			2008			2009		
Independent Variable →	Dependent Variable ↓	Y/L †	L	Y	Y/L †	L	Y	Y/L †	L	Y	Y/L †	L	Y	Y/L †	L	Y
Overall Export		1.007*** -0.177	0.777*** -0.109	0.928*** -0.0835	1.064*** -0.178	0.942*** -0.106	1.029*** -0.0841	0.859*** -0.2	0.850*** -0.122	0.979*** -0.0952	1.020*** -0.213	1.029*** -0.127	1.121*** -0.0992	0.945*** -0.218	1.117*** -0.123	1.119*** -0.1
Intensive Margin		0.822*** -0.142	0.649*** -0.0878	0.759*** -0.0677	0.835*** -0.142	0.750*** -0.0843	0.819*** -0.0668	0.619*** -0.144	0.687*** -0.0883	0.761*** -0.0681	0.833*** -0.158	0.845*** -0.0939	0.903*** -0.0729	0.618*** -0.161	0.897*** -0.0912	0.835*** -0.0765
Extensive Margin		0.184*** -0.053	0.127*** -0.0326	0.170*** -0.0264	0.230*** -0.0625	0.191*** -0.0372	0.210*** -0.0314	0.240** -0.084	0.163*** -0.0512	0.219*** -0.0428	0.187* -0.083	0.184*** -0.0493	0.218*** -0.0412	0.327** -0.102	0.220*** -0.0581	0.284*** -0.0485
Observations		18%	16%	18%	22%	20%	20%	28%	19%	22%	18%	18%	19%	35%	20%	25%
		152	153	153	156	160	160	160	160	160	160	160	160	160	160	160
		Import														
		2005			2006			2007			2008			2009		
Independent Variable →	Dependent Variable ↓	Y/L †	L	Y	Y/L †	L	Y	Y/L †	L	Y	Y/L †	L	Y	Y/L †	L	Y
Overall Export		1.489*** -0.271	1.151*** -0.175	1.450*** -0.131	1.541*** -0.267	1.211*** -0.167	1.457*** -0.131	1.582*** -0.266	1.149*** -0.165	1.431*** -0.126	1.931*** -0.255	1.356*** -0.148	1.583*** -0.117	1.627*** -0.264	1.213*** -0.151	1.400*** -0.122
Intensive Margin		0.679*** -0.199	0.789*** -0.129	0.859*** -0.102	0.764*** -0.199	0.802*** -0.125	0.845*** -0.103	0.844*** -0.201	0.793*** -0.125	0.871*** -0.101	1.219*** -0.199	0.927*** -0.116	1.042*** -0.0946	0.883*** -0.199	0.844*** -0.114	0.876*** -0.0961
Extensive Margin		0.809*** -0.125	0.362*** -0.0807	0.591*** -0.0633	0.778*** -0.112	0.410*** -0.075	0.613*** -0.0586	0.737*** -0.122	0.355*** -0.0758	0.560*** -0.0596	0.712*** -0.101	0.420*** -0.059	0.541*** -0.0473	0.744*** -0.114	0.368*** -0.0651	0.524*** -0.0532
Observation		54%	31%	41%	50%	34%	42%	47%	31%	39%	37%	32%	34%	46%	30%	37%

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
† Marginal effects for elasticity

Chapter 3

Location and Agglomeration of Firms in Ukraine before the Conflict

3.1 Introduction

Ukraine has a large territory, significant industrial and scientific potential, rich natural resources. In addition, the geography of Ukraine makes the country one of the main connecting subregions between the West and the East, the North and the South. Access to the Black Sea gives an opportunity to have trade routes towards other continents. The unique location of Ukraine in between the Euro-Atlantic, Eurasian and Islamic geopolitical array brings costs and benefits for business activities.

The choice of initial location of a firm may have a significant impact on its future perspectives. The question of “where do firms locate in Ukraine?” is very interesting, especially considering that the country is involved in an international conflict started on 18 March 2014.

We use the data in the period before the conflict started to estimate the location pattern of firms in Ukraine. In particular, this chapter studies the location choice of firms in Ukraine with respect to the regions now in conflict and the possible factors that could influence the attractiveness of

different regions during the period 1992-2014.

We use a unique firm-level dataset which provides the information on incorporation date, investors' country of origin and their economic activity. Specifically, we use data on location choice of 251,201 firms active in Ukraine between 1992 and 2014, and over a set of 27 administrative regions in Ukraine. Thus, this is the first study on Ukraine, which analyzes a large-scale dataset to estimate the location choices, while other works (Zvirgzde et al., 2013) have studied the location of multinational companies (MNEs) based on enterprise surveys and small samples; or the foreign direct investments (FDI) of one particular country to Ukraine (Nowak et al., 2015).

Eventually, our analysis generates a rich set of interesting findings. First, the chapter characterizes economic activities in regions, analyzing and visualizing an actual industrial, language and foreign investment divide. Second, we argue that firms located in regions now in conflict specialize in the production of an oligopolistic nature. Then, the study provides the evidence of the presence of companies in Ukraine that are registered in offshore zones. Thus, we observe that foreign firms more likely will choose the regions close to the EU-border, while offshore firms will locate more in the East of Ukraine.

Most important, we find that regions now in conflict lost appeal already before the conflict started. We argue that the pattern established by economic reforms and in particular by privatization is a possible driver. In the recent literature, studies show that privatizing the firm makes the big country a relatively more attractive location for the investment (Amerighi and de Feo, 2007). Nonetheless, our research goes in partial contradiction to this statement with respect to the regions now in conflict, although we observe that most of the regions with a higher level of privatization were more attractive to firms during the period of a transition economy.

Furthermore, our analyses provide some important features of regions that drive the attraction for doing business in Ukraine. First, it is the level of *agglomeration economies* in each region. We argue that one of the main drivers which makes an impact on the location choice of

firms in Ukraine is the regional economy. A stream of the literature has singled out two types of external economies (among others, Feldman and Audretsch (1999)): so-called specialization externalities, which create intra-industry spillovers (firms within the same sector of industry) associated with Marshall (1920); and diversity externalities, which favor the creation of inter-industry spillovers (firms across the different industrial sectors) originally suggested by Jacobs (1970). Also, Paci and Usai (1999) investigated the process of spatial agglomeration of innovation and production activities in the context of specialization and diversity externalities.

Then, many studies show that agglomeration has an impact on location choices made by multinational enterprises (Belderbos and Carree (2002); Hilber and Voicu (2010); Halvorsen (2012)), while our research can contribute to the issue whether domestic firms-entrants are affected by agglomeration. The existing literature presents fewer results on domestic investments within the country (Shaver (1998); Zaheer et al. (2009); Mayer et al. (2010)) comparing to the literature on FDI location choice.

Our study can contribute to the literature on the impact of agglomeration externalities. The contributions on Ukraine specific case were few (Brümmer et al., 2010; Vakhitov and Bollinger, 2010), whereas there are many studies that give us results on location choice in different countries (United States (Coughlin et al., 1991), Portugal (Guimaraes et al., 2000), Hungary (Boudier-Bensebaa, 2005), Japanese firms in U.S. (Head et al., 1995)). Among the empirical studies on location choice, Nowak et al. (2015) analyzes Ukraine's location advantages and disadvantages for Polish FDI in Ukraine, while Zvirgzde et al. (2013) use empirical data of firms' surveys of 153 foreign firms in three regions of Ukraine to analyze the location choice of FDI.

Moreover, we determine the impact of the language spoken in regions as the driver for firm's location, that was largely ignored in the literature. We expect the similar effect of language as family ties or co-ethnic-bonds have (e.g., if the firm is owned by ethnic polish, she will establish a firm in the region closer to the border with Poland). For example, Jean et al.

(2011) showed the impact of ethnic ties on FDI location choice. Chand and Ghorbani (2011) investigated the higher possibility to locate the firm in regions with the larger ethnic community to which belong the owner. Nonetheless, we find that foreign-owned firms locate in regions that possess higher openness to trade, innovation potential, and demand.

Our particular interest is how the geolocation of Ukrainian regions with respect to national borders affects the investor's decision on location the economic activity. Allocation of the firm close to the borders considers geoeconomic and geostrategic aspects that play a significant role in the strategic partnership for a high degree of mutual interest. The importance of border effects for foreign firms was investigated by Cieřlik (2005), who showed the importance of being next to the EU-border. Except for border with other countries, another important region in each country is the capital.

The remainder of our chapter is organized as follows. Section 3.2 provides the institutional framework on privatization. In section 3.3 we describe the data that shows the preliminary analysis of the Ukrainian situation. In section 3.4 we introduce methods and results. Section 3.5 concludes this chapter.

3.2 The institutional framework

After Ukraine became independent, a transition to a market economy started. A privatization mechanism was designed to open state-owned firms to private property. The objective was to improve the allocation of resources in the productive sector. Among other Eastern-European countries, the Ukrainian privatization process picked up momentum later and under the conditionality of IMF funding. In fact, we can distinguish three stages (Pashaver and Verhovodova, 2003) on a timeline starting in 1992 and effectively still in progress in recent years.

A first stage involved the privatization of 1,240 medium and large-scale enterprises. In the years 1992-1994, managers and associations of employees signed lease buyout contracts with the government. Nonetheless, a moratorium postponed the impact of this first stage until a new

national currency, which was actually introduced only in 1996. A partial failure of this stage negatively affected the support of following efforts, when some, so-called strategic industries, were systematically excluded from privatization (e.g., shipbuilding, fuel and energy, mining). The focus was on rapid distribution to the public and development of capital markets.

In the second stage (1995-1998), mass privatization involved the issue of privatization certificates, also called “vouchers”, which attracted the public to purchase the stakes, both in large and medium-sized enterprises and so-called “small objects”¹. In this case, the main purpose was to obtain a faster and transparent competitive system, although revenue generation was a lower priority. However, as the public was not accustomed to property rights, a lack of knowledge in how properly using the vouchers system triggered an increase in speculative behavior. When salaries and pensions were not paid, and an increase in poverty level started to bite, about 30 million people (Padalka, 2012) lost the ownership of their certificates, selling them to special trust funds, to monetize these rights. As a result, financial intermediaries concentrated a significant part of the privatized assets. In reality, more than often, a barter of vouchers started, such that previously appointed directors of firms acquired control of companies becoming the major shareholders of their own companies (i.e., oligarchs). At the same time, privatized companies were often monopolists in their industry of activity.

From 1999, the third stage of privatization started to identify strategic investors case-by-case (Zorome, 2007). The focus this time was on cash privatization, to maximize revenues via stock exchange sales. More effort was put on establishing a long-term competitive environment. Finally, the last purpose of the third stage privatization program was to promote and attract more funds to the state budget. However, strategic enterprises were actually privatized in period 2000-2002, following the requirements indicated in Pashaver and Verhovodova (2003)².

¹In the jargon of the reform, small objects include not only small companies but also property rights in other non-productive activities, including objects of social and cultural destination. For example, property rights in real estate. (Verkhovna Rada of Ukraine, 1992)

²The investor had to be interested in the preservation of the market shares at least for

The process of privatization is still going on. In Table 2, we report the number of firms, which were objects of privatization, by regions in the period 1992-2015. We observe that regions now in conflict have seen the privatization of about 20% of the total, although the main region where we can find a higher number of firms is Lviv in the West of the country.

If we look at the industry level, the sectors mostly involved in privatization process were (Pashaver and Verhovodova, 2003): wholesale and retail trade (including the sale of vehicles and their repair) - 39,9% of total firms, other services - 16.9%, manufacturing - 9.8%.

Interestingly, another 17% of the total number of firms is located in regions next to the conflict (Dnipropetrovska, Harkivska, and Zaporizka). At the beginning of 2016, 131,503 objects were privatized, including 29,326 (22.3%) and 102,177 (77.7%) objects that belong to communal and state property, respectively.

The overall impact of the privatization process on economic development has been long debated since the transition to market economy started in several countries after the fall of the iron curtain in Europe. Previous works identified models of privatization as dependent on how property rights are distributed (Schmidt, 2000), i.e., mass privatization destined to the general public or case-by-case privatization after identification of strategic investors. Another useful categorization of reform design is whether it involves insiders (managers, workers or both) or outsiders (the general population). If we follow the Ukrainian timeline, we can find a combination of the general a case-by-case privatization, although the open to outsiders mass privatization prevails, as it was perceived as fair. Unfortunately, the process led to unexpected consequences, since the system of "vouchers" required also an institutional environment where shareholders are aware of the value of the property rights embedded in an equity stake. Instead, a cheap barter of stakes by the public with shorter run advantages generated an undervaluation of the privatized companies, which accelerated bankruptcy or resulted in the concentration of corporate power in the hands of former directors.

the following 3 years; the investor was required to produce the same goods (services) and keep the same suppliers as before privatization for no less than one year.

Table 2: Number of privatized firms during 1992-2015

Region	State property	Communal property	Total number of firms	% from total
<i>Donetska</i>	4177	9150	13327	10.1
<i>ARC</i>	393	6534	6927	5.3
<i>Luganska</i>	1680	4199	5879	4.5
<i>Sevastopol</i>	215	635	850	0.6
<i>Lvovska</i>	16533	11368	27901	21.2
<i>Kyiv</i>	1152	11996	13148	10.0
<i>Dnipropetrovska</i>	1857	6391	8248	6.3
<i>Harkivska</i>	1635	6431	8066	6.1
<i>Zaporizka</i>	1342	4533	5875	4.5
<i>Odeska</i>	1473	3543	5016	3.8
<i>Ivano-Frankivska</i>	490	3999	4489	3.4
<i>Mykolaiivska</i>	1124	2931	4055	3.1
<i>Poltavska</i>	929	2503	3432	2.6
<i>Sumska</i>	868	2385	3253	2.5
<i>Ternopil'ska</i>	776	2451	3227	2.5
<i>Chernivetska</i>	501	2653	3154	2.4
<i>Kyivska</i>	1089	2065	3154	2.4
<i>Zakarpatska</i>	430	2643	3073	2.3
<i>Zhytomyrska</i>	1258	1781	3039	2.3
<i>Vinnytska</i>	1312	1657	2969	2.3
<i>Kirovogradska</i>	698	2092	2790	2.1
<i>Cherkaska</i>	827	1798	2625	2.0
<i>Volynska</i>	705	1919	2624	2.0
<i>Khmelnitska</i>	607	2000	2607	2.0
<i>Hersonska</i>	584	1939	2523	1.9
<i>Rivnenska</i>	880	1504	2384	1.8
<i>Chernihivska</i>	671	1077	1748	1.3
Total	29326	102177	131503	100

Source: combined by author based on State Property Fund of Ukraine (2015)

In other countries different institutional environments brought up better outcomes ³.

³For further details, see Matolcsy (1991), Branyiczki et al. (1992) for the case of Hungary; for the case of Poland see Grosfeld and Hare (1991), Puntillo and Ipsen (1996); Czech and Slovak Republics (Shafil, 1995), Russia (Frydman et al., 1996), Bulgaria (Miller, 2006)

3.3 Data and preliminary evidence

3.3.1 Data

We source our data from Orbis by Bureau Van Dijk (BVD), which collects financial accounts and other firm-level information on about 372,578 firms that have been active in Ukraine some time until 2015. We assume the date of incorporation is the birth date of each firm and we keep the “oblast” where the firm has been active as the location choice of its productive activities. Further, we use financial accounts and industrial sectors to characterize firm-level activities.

At first, we validate our sample using the demographics provided by the State Statistics Service of Ukraine (Derzhkomstat). In particular, Table 3 reports a comparison between the geographic coverage of our sample and the one provided by the National Statistics Offices. To compare numbers before and after the beginning of the conflict, we report both years 2013 and 2014 in Table 3. Note that official statistics do not report for the numbers of firms in AR Crimea and the zone of ATO in 2014, whereas in our dataset they are reported in continuity with boundaries before the conflict started. We find an almost perfect match for our sample, with 0.99 correlation with Derzhkomstat coverage by region.

As expected, Table 3 shows that Kyiv has the largest concentration of enterprises, with almost a quarter of the total. Dnipropetrivska and Donetska (7%), Kharkivska and Odeska (6%), Lvivska (5%) regions follow, as these are the regions with the largest number of population. In columns (4) and (5) of Table 3, we further show the firms that were incorporated after 1992. This is the subsample on which we study the location choice, by 67% of incumbent firms. Looking at the Table 3, the distribution across regions does not differentiate from overall distribution.

In our analysis, we make use of further controls for characteristics of the regions. We build an index for the possible language divide catching the peculiarity of a country whose population is polarized between Ukrainian-speaking and Russian-speaking. For this purpose, we make use of data provided by the All-Ukrainian Population Census and Surveys by Rukh Dobrovoltsiv “Prostir Svobody” (2015). We report the per-

Table 3: Number of Enterprises by Region

Regions	All firms in sample, 2014	% of total	Entering firms in sample	% of total	All firms in Derzhkomstat*, 2013	% of total
<i>Autonomous Republic of Crimea</i>	13404	3.60	8888	3.54	16228	4.13
<i>Cherkaska</i>	7858	2.11	5353	2.13	7931	2.02
<i>Chernigivska</i>	5732	1.54	4163	1.66	4160	1.06
<i>Chernivetska</i>	4125	1.11	3003	1.20	6220	1.58
<i>Dnipropetrovska</i>	26428	7.09	17596	7.00	28194	7.17
<i>Donetska</i>	25770	6.92	17763	7.07	28731	7.30
<i>Ivano-Frankivska</i>	7108	1.91	5345	2.13	7996	2.03
<i>Kharkivska</i>	24047	6.45	17552	6.99	26086	6.63
<i>Khersonska</i>	7866	2.11	4693	1.87	8104	2.06
<i>Khmelnitska</i>	6906	1.85	4752	1.89	6925	1.76
<i>Kirovogradska</i>	7292	1.96	3914	1.56	7381	1.88
<i>Kyiv</i>	87954	23.61	58011	23.09	86845	22.08
<i>Kyivska</i>	16386	4.40	10975	4.37	18676	4.75
<i>Luganska</i>	10310	2.77	6727	2.68	11385	2.89
<i>Lvovska</i>	17977	4.83	14031	5.59	18762	4.77
<i>Mykolajivska</i>	10363	2.78	5763	2.29	10767	2.74
<i>Odeska</i>	22993	6.17	14942	5.95	26016	6.61
<i>Poltavavska</i>	9906	2.66	6394	2.55	10129	2.58
<i>Rivnenska</i>	5128	1.38	3804	1.51	5174	1.32
<i>Sevastopol</i>	3316	0.89	2075	0.83	4288	1.09
<i>Sumska</i>	5672	1.52	4160	1.66	5817	1.48
<i>Ternopil'ska</i>	4802	1.29	3442	1.37	5234	1.33
<i>Vinnitska</i>	8954	2.40	5848	2.33	9321	2.37
<i>Volynska</i>	5316	1.43	3564	1.42	5511	1.40
<i>Zakarpatska</i>	5946	1.60	3983	1.59	6024	1.53
<i>Zaporizka</i>	14457	3.88	9793	3.90	14777	3.76
<i>Zhytomyrska</i>	6562	1.76	4667	1.86	6645	1.69
Total	372578	100	251201	100	393327	100

*Without Autonomous Republic of Crimea, Sevastopol and ATO

Source: combined by author based on Bureau Van Dijk (2016), State Statistics Service of Ukraine (2017)

centage of the population using either Ukrainian or Russian as an every-day language by region. Then, we use an average data on GDP per capita and population, provided by Derzhkomstat to observe the impact of the size and richness of the region. Finally, we control for market openness and size, agglomeration economies, border effect, characteristics of the local input market according to the existing literature.

Market openness is evaluated by the openness index that is a measure of country openness and integration on the world economy. We compute the openness index for regional level, as a ratio of the regional sum of export and import to GDP of each region:

$$OI_j = \frac{Ex_j + Im_j}{GDP_j} \quad (3.1)$$

where $j = 1, \dots, 27$ administrative regions in Ukraine; Ex is the exports and Im is the imports; GDP indicates gross domestic product. Openness index captures the dependence of domestic producers on external markets and their trade orientation. The higher is the index, the larger the influence of trade on domestic activities. Nonetheless, a low level of the openness index does not always imply high obstacles to foreign trade. It can be explained by country size and geographic remoteness from potential trading partners⁴. We expect that regions with a high openness index will be more attractive to the new investors.

Agglomeration economies have been presented as a key determinant of location in recent empirical literature (Feldman and Audretsch, 1999). Specialization in particular industry could be more favorable for business because allocation next to all necessary resources could influence on location choice more than the distance to the consumer market. We consider Marshallian specialization externalities to find the regional specialization and we use the production structure specialization index (PS) pioneered by Feldman and Audretsch (1999) and Paci and Usai (1999), defined as follows:

$$PS_{ij} = \frac{N_{ij} / \sum_i N_{ij}}{\sum_r N_{ij} / \sum_i \sum_j N_{ij}} \quad (3.2)$$

PS_{ij} measures the extent to which region j is specialized towards economic activity i , with the specialization is evaluated with the concentration of technologically and functionally specialized productions.

Then, we capture the degree of a region's industrial diversity with Shannon index, defined as:

⁴The dynamic of Ukrainian economy shows significant changes starting from 2008. Such changes are driven by a number of external and internal negative factors that are destabilizing the economic activity. Also, the instability of Ukrainian economy is associated with high integration in global economy and dependence of Ukrainian producers on trade in foreign markets. Given that, instability in Ukraine intensifies with higher openness index.

$$PD_{ij} = - \sum_i^j N_i \log(N_i) \quad (3.3)$$

where $i = 1, \dots, 15$ and indicates industries by Nace Rev.2 classification, with the difference that we grouped eight economic activities into two groups (*BCDE* and *OSTU*); $j = 1, \dots, 27$ administrative regions in Ukraine; N is the number of firms. Diversification leads to the establishment of new firms and penetration into other spheres of economic activity and the higher it is, the more it leads capital merger and conglomerates creation.

We control also for the number of *characteristics of the local input market*. We use indicators to measure the average regional salary, unemployment rate and share of graduate students for the labor market, provided by Derzhkomstat. We expect that the impact of salary and unemployment in the region could be twofold. On the one hand, the region associated with lower salary on average may attract investors seeking for the cheap labor force, but the high salaries may represent high skilled employees. On the other hand, the unemployment rate may attract new firms, because of the high demand at the job market and low proposition, or discourage them because of very competitive or even rigid labor market. We expect the positive impact of the share of graduate students in a given region, since, the population with a higher education should increase productivity and profitability in a region.

The *measure of population* is introduced as an agglomeration of consumers, which may increase the attractiveness of a certain region. We measure the regional stock of infrastructure by the stock of firms for each year within the regions. Thus, we expect that the higher the number of firms in a region, the more the region will be attractive to new investors. Finally, we provide a *measure of R&D* in a region by the share of industrial firms with innovations. It is highly possible that the higher technological knowledge produced in the region should attract more investors.

The *geographic peculiarity* is measured through the border effect and language spoken. We expect that the Russian-speaking regions will attract more Russian companies and Ukrainian-speaking regions should

be more attractive to other foreign investors. Further, we expect that firms from EU would choose the regions in the West of Ukraine (closer to EU-border⁵) and Russian firms will go in the East of the country (closer to CIS-border⁶). Finally, firms are expected to be concentrated in the capital (Kyiv) and its region, because capital usually is more developed and have more possibilities and connections. The chosen independent variables are further summarized in Table C4.

3.3.2 Preliminary evidence

An industrial divide

We consider the Krugman specialization index (Krugman, 1991a) as a measure of the regional specialization. It is given by:

$$KSI_r = \sum_k |s_{kr} - x_k| \quad (3.4)$$

where the index k refers to any industry in the classification by NACE Rev.2, r to any region in Ukraine. We take the sum of the absolute value of the differences between the share of industry k 's turnover in the region r in the total turnover of region r and the share of industry k 's turnover in total Ukrainian turnover x_k .

The index ranges from zero, when a region r has the industrial structure similar to Ukraine as a whole, until the maximum value of two when a region's industrial structure is relatively more concentrated such that one or more industries are present only in that region (Fig. 16).

In this context, Luganska, Zaporizka, Khersonska, Poltavaska regions and Crimea are more specialized in their own sectors. For example, Luganska, Poltavaska, Zaporizka "oblasti" and Crimea are the areas where most of the manufacturing industries are located.

⁵Border with EU-countries (Romania, Hungary, Slovakia, and Poland) have following regions: Chernivetska, Ivano-Frankivska, Lvivska, Vinnytska, Volynska, Zakarpatska, Zhytomyrska, Odeska.

⁶Border with CIS-countries (Moldova, Belarus, and Russia) have following regions: Chernigivska, Donetska, Kharkivska, Luganska, Sumska, Volynska, Kyivska, Rivnenska, and Zhytomyrska.

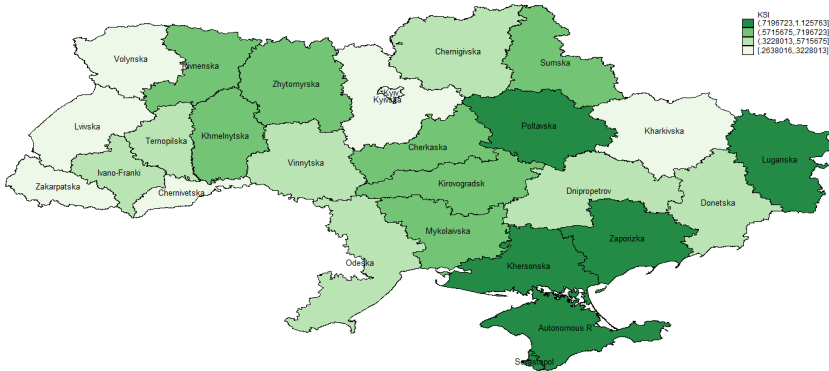


Figure 16: Specialization patterns, Krugman specialization index

Language divide

Although Ukraine has only one official language - Ukrainian - minorities, speaking 18 different languages (Rukh Dobrovoltsiv “Prostir Svo-body”, 2015), are present on its territory. However, the main separation is among people that belong to the Ukrainian ethnicity (78%) or the Russian ethnicity (17%), with a residual 5% belonging to other nationalities. Nonetheless, almost all Ukrainian residents know and are able to use both Ukrainian and Russian. We expect the presence of a majority of people preferring one language over the other makes a difference in the location of productive activities, as the language and the leading culture can affect the entrepreneurial patterns.

For each region in Table 4, we show the percentage of the population speaking Ukrainian (column (1)), indifferently Ukrainian and Russian (column (2)), Russian (column (3)) or other languages (column (4)) in their everyday routine. Clearly, we find an orientation from West to East of the country towards a decreasing preference in using Ukrainian as a daily language⁷.

⁷It can be seen from Table 4, that South-East regions are mostly Russian-speaking. This could be explained by ethnicity of the population (ethnic Ukrainians are only 24% in ARC and 22% in Sevastopol). In particular, Crimea had been influenced more from the East than from the West of Ukraine. Moreover, Eastern regions have a more Russian-speaking

Table 4: Language spoken by regions, % of population

Region	Ukrainian	Ukrainian & Russian	Russian	Other
Rivnenska	97	1	2	0
Volynska	97	1	2	0
Ternopil'ska	96	3	0	1
Lvivska	93	5	2	0
Ivano-Frankiv'ska	92	3	4	1
Zakarpatska	79	11	3	7
Zhytomyr'ska	79	13	6	2
Khmelnytska	76	15	9	0
Vinnitska	70	5	15	0
Chernivetska	66	24	7	3
Cherkaska	52	25	19	4
Poltavska	47	36	15	2
Chernigiv'ska	27	31	41	1
Kyiv'ska	27	40	32	1
Kirovograd'ska	25	49	26	0
Sumska	17	51	27	5
Kherson'ska	11	25	62	2
<i>AR Crimea</i>	10	20	58	12
<i>Donetska</i>	9	14	76	0
Dnipropetrov'ska	8	32	58	2
Mykolaiv'ska	6	23	71	0
Odeska	6	15	78	1
Kharkiv'ska	4	11	84	1
Zaporizka	3	30	66	1
<i>Luganska</i>	3	8	89	0

Foreign investment divide

Then, we show the presence of the foreign direct investment in the country. In Fig. 17, we report the revenues of firms that are controlled by parent companies abroad. Approximately 1.7% of companies are foreign-owned, and they are responsible for 29.5% of total sales of the overall country.

Geographically, we observe the concentration of FDI activities in the

population with similar circumstances (an ethnic group of Ukrainians is 56% in Donetsk region, history, and politics), but the most important impact is sharing the border with the Russian Federation.

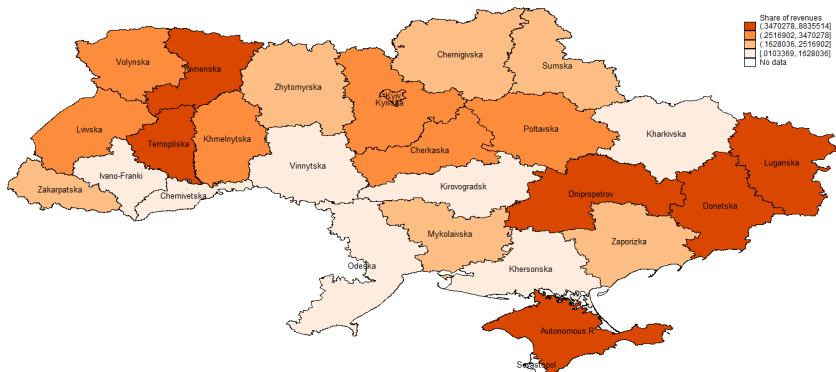


Figure 17: Share of revenues of foreign firms by region

Eastern regions and with exception of Lvivska and Ivano-Frankivska regions in the West. As expected, Kyiv, as the capital, attracts many foreign investors, although their impact becomes less relevant once we weigh for revenues generated by investment operations. Indeed, in Kyiv, most of FDI operations come in small business services.

Once we look at the countries of origin of parent companies, we find that top investors are Cyprus (32% of foreign subsidiaries), British Virgin Islands (5.9%), Great Britain (5.6%), Germany (5.4%), Russia (4.8%), and U.S. (4.5%). That is, the first two investing countries are offshore financial centers⁸. Therefore, the investors may actually come from other partners or from Ukraine, but they can hide their investment operations. We will explore more the difference between investments coming from offshore financial centers and the rest of the world in following analyses. It is worth noting here that a concentration of investment from offshore financial centers can be detected in conflict regions. For example, about 68% of foreign subsidiaries in Donetsk are from Cyprus. In Table C5, we further describe the distribution of offshore investment operations

⁸ In line with international standards, we define an offshore financial center as a country that provides financial services to nonresidents on a scale that is incommensurate with the size and the financing of its domestic economy. For further details, see *Zorome (2007), IMF WP/07/87*

by region and their relevance on overall FDI operations. The numbers reported in Table C5 analyses can be compared to VoxUkraine (Ostapchuk, 2016) in 2016, according to which Ukraine has 1,689 firms. Apparently, we have a slightly higher number of companies (2,227 firms), but our sample is related to 2014.

3.4 Empirical strategy

To answer our research question, where economic activities locate in Ukraine before the international conflict, we take the baseline alternative-specific conditional logit model and compare with other location choice models in the literature (Head et al., 1995; McFadden, 1973). The probit model (Table C7) and the most simple conditional logit model are exploited to compare our results.

3.4.1 Alternative-specific conditional logit model

The baseline of our analysis of location choices by firms is estimated by McFadden (1973) model. The alternative-specific model allows us to estimate the preferences of firm's choice over the baseline. We describe the model as follows.

We have a set of regions $R = 27$ (alternatives). Let y_{ir} , where $r = 1, \dots, R$ be a choice of firm i (case). That is, $y_{ir} = 1$ if firm i choose region r and $y_{ir} = 0$ otherwise. The independent variables come in two forms: alternative specific and case specific. We have p alternative-specific variables (language, regions now in conflict, population, GDP per capita, borders with EU and CIS) so that for firm i we have a $R \times p$ matrix X_i (in our case 27×5).

Further, we have q case-specific variables (age, foreign, offshore, leading sector) so that we have a vector $1 \times q$ vector Z_i for firm i .

Our random utility model is:

$$U_i = X_i\beta + (Z_iA)' + \epsilon_i \quad (3.5)$$

Here is β is a $p \times 1$ vector of alternative-specific regression coefficients

and $A = (\alpha_1, \dots, \alpha_R)$ is a $q \times R$ matrix of case-specific regression coefficients. We set $\alpha_k = 0$, where k is Odesa region. The region r chosen by firm i is the one that maximizes utility. Vector U_i quantifies the utility that firm gains from R regions.

Therefore, we have 251,201 firms (cases) and 27 regions (alternatives) for a total of 6,782,427 observations. We take the Odesa region as the reference alternative since its regional GDP is the closest to median value (i.e., 31,268 UAH per person).

Thus, we compare the estimated results of the alternative-specific conditional logit model with the results of the conditional logit model in Table 5. As expected, column (1) shows that the increase of population and GDP per capita in a given region affects positively the attractiveness of region, although we add additional control variables. The regions now in conflict seems to discourage firms to locate there their economic activities and although, with the addition of control variables this effect is decreasing, it is still significant. In column (1), the language variable is not significant. This result can be associated with the inclusion of additional variables, such as borders with EU and CIS, and also, regions now in conflict. As the regions with EU-border are mostly Ukrainian-speaking and regions now in conflict are more Russian-speaking, these variables can have a confounding effect as the language used alone in the total impact. Thus, we observe that the regions with EU-border will attract more investors, while regions now in conflict will discourage potential investor to start their business in these regions.

Thus, from the obtained results in Table 5, the negative Language coefficient of -0.846 means that if the region is Ukrainian-speaking, then the probability of location choice for that region decreases. The same negative effect we see for the GDP in the region. Note that our expectation on the location closer to the borders is confirmed. Thus, firms choose not only by geographic allocation but also by markets, partners, location, customers, etc. Being next to the border means the reduction of costs for transportation, more possibilities at the labor market and sometimes special border tariffs agreements.

Table C6 provides the results of the alternative-specific conditional

Table 5: Location choice

	(1) Clogit	(2) Asclgit
Language	0.00112 (0.00536)	-0.846*** (-0.123)
(Log) Population	0.758*** (0.00714)	0.224 (-0.154)
(Log) GDP per capita	1.229*** (0.00616)	-0.546*** (-0.125)
Regions now in conflict	-0.149*** (0.00712)	0.0844 (-0.157)
Border with EU	0.273*** (0.00613)	1.150*** (-0.128)
Border with CIS	0.00560 (0.00482)	1.009*** (-0.138)
<i>Number of Observations</i>	6782427	6782427

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

logit model, showing that older firms choose regions in West, AR Crimea and Luganska “oblast” with a higher probability than the Odesa region. Further, it can be seen that relatively young firms locate in Kyiv-city and its region. Looking at companies’ age in Kyiv, we find that new (especially small) firms will choose the capital-city to enter the Ukrainian market. This can be motivated by the fact that usually in the capital region will be a highly concentrated pool of customers and suppliers with more possibilities to establish a new partnership and to attract investors (especially foreign one). The foreign firms choose only Kyiv, AR Crimea (including Sevastopol), Kharkivska and Luganska regions over the base region. Comparing to other regions, Odeska “oblast” attracts more FDI,

as this region has a very particular location. It has the exit to the sea, borders with EU and CIS countries, and also, air connection (airport). Offshore firms have a higher probability to establish their economic activities in Kyiv and its region, and also, in Sumska and Dnipropetrovska regions. The “leading sector” variable (firm is specialized in the same sector, which has the largest share of total revenues in the region) shows that firms will choose those regions over the Odeska “oblast”.

3.4.2 Postestimation

Based on previous estimates of the alternative-specific conditional logit model, we calculate the predicted probabilities of the location of each firm in a given region. Then, we combine the results by the incorporation date focusing on: the probabilities of location in regions now in conflict and the others; the probabilities of location choice in Ukrainian-speaking and Russian-speaking regions.

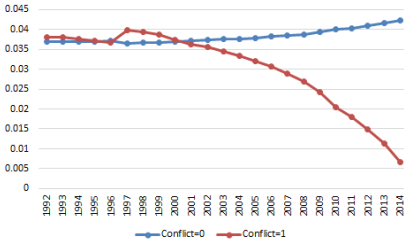


Figure 18: Predicted Probabilities, Regions now in conflict

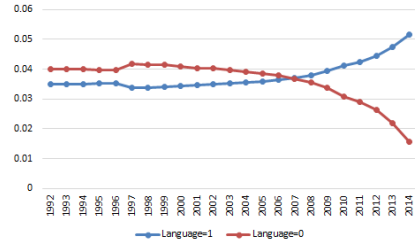


Figure 19: Predicted Probabilities, Language divide

Donetsk, Lugansk, and ARC (including Sevastopol) regions started to have problems with the attraction of new business activities even before the international conflict. Thus, Fig. 18 illustrates that, in 1992, the average probability of firm’s location choice in the regions now in conflict was 0.038 versus 0.037 for regions without conflict, while the probability of location in 2000 was 0.037 for all regions. After 2000, the probability for Donetsk, Lugansk, and ARC (including Sevastopol) started to decrease and, in 2014, it was 0.007 versus 0.042 (for the other 23 regions).

Moreover, we observe that the Russian-speaking regions stopped to attract new investments more than six years ago. Thus, Fig. 19 shows that the probability of the firm allocation in Ukrainian-speaking region in 1992 was lower compared to the probability of allocation in Russian-speaking region. This situation changed in 2007 when the probability of firm's establishment was about 0.037 overall Ukraine. In 2014, there is total change with Ukrainian-speaking regions having a probability of location choice higher than Russian-speaking regions.

We argue this phenomenon with the way of governance, which is associated with the change of the president, parliament, and way of policymaking. The switching point could be related to the effect of the privatization process, an important economic reform in Ukraine during the 1992-2008 and, which is ongoing. The transition to a market economy had a significant impact on new investors, as it implied the risk to lose the firm in case of insufficient fulfillment the requirements⁹ of privatization policy.

Moreover, the privatization had a historical impact. The Western regions have not been under the influence of the communist regime as long, as the Eastern ones. Thus, we presume the European legacy had a stronger impact on the privatization process in the West, and the East has been facing some similar patterns of the privatization process in post-soviet countries.

Indeed, the results for regions now in conflict report that Donbas and Crimea (regions that historically had more influence from Russia) had a significant increase of the probability of location choice only during the second stage of privatization (mass or "voucher" privatization), in 1995-1998. During this stage, a lot of enterprises were privatized through a mechanism similar to Russian mass privatization (Frydman et al., 1996).

⁹It includes further requirements: if investors satisfy the requirements of the contract, they have a right to further purchase shares of governmental ownership; at the auction, at the same time more than one stake of the technologically connected enterprises could be sold; in case of not satisfying requirements of the contract, shares should be returned to the government; further alienation of any part of shares is forbidden until complete implementation of the sale. In these conditions, big clusters concentrated in the ownership of the small group of people, who did not allow new investors to enter the market (especially metallurgy and mining sectors).

On the one hand, the legacy of the Soviet past had a significant influence on the Eastern regions, especially because of the socialist industrialization legacy and heavy industries. These regions had the insufficient distribution of industries and were based on planned development rather than economic efficiency. Thus, after the collapse of the Soviet Union, more Eastern regions left with a certain socialist mentality that influenced the privatization mechanism in these regions. Another key factor leading to regions in conflict not being attractive anymore is that, from 1998, Ukrainian government suspended the sales of firms that could increase the number of investors, such as strategic enterprises, i.e., firms of heavy industries and energy sector that are located mostly in the East. Furthermore, the creation of oligopoly (Gurieff and Rachinsky, 2005) in the East decreased the probability for new firms to enter the market.

On the other hand, Western regions lead in terms of agriculture, farming, and forestry production combined with more democratic and European experience of using the vouchers during the privatization. Also, Western regions had different effect after the second stage of privatization, because the borders with European countries, together with the less post-communist social context, attracted more FDI.

We are also interested in understanding if including additional variables, which are used in the literature for estimation of location choice models, will validate the results obtained with the previous analysis.

3.4.3 Conditional logit model in period 2001-2014

Since we have some variables available only from 2001, we show another estimation including all variables to see how results are changed. We report the results of the conditional logit model for different subsets of data occurring on the period 2001-2014 for all the firms in the sample. As we are interested in observing the location behavior of different groups of firms, we apply our model considering Ukrainian firms only, firms with foreign ownership (excluding offshore financial zones) only and, finally, only firms with offshore ownership. The results are reported in

Table 6.

Table 6: Location Choice of Firms in Ukraine

	(1) General	(2) Ukrainian	(3) Foreign	(4) Offshore
Specialization index (zPS)	0.243*** (0.00234)	0.271*** (0.00656)	0.437*** (0.0254)	0.367*** (0.0210)
Diversification index (zPD)	0.0342*** (0.00476)	0.0330** (0.0143)	0.112* (0.0659)	-0.108* (0.0571)
Regions now in conflict	-0.0951*** (0.0183)	-0.510*** (0.0572)	-1.015*** (0.321)	-0.0710 (0.239)
Language	-0.0895*** (0.0146)	0.159*** (0.0408)	0.144 (0.196)	0.227 (0.165)
Population	0.456*** (0.0291)	0.793*** (0.0852)	2.166*** (0.439)	0.755** (0.356)
Stock of Firms	0.546*** (0.0243)	0.411*** (0.0663)	-0.379 (0.294)	0.737*** (0.279)
Unemployment rate	-0.00672*** (0.00243)	0.0132* (0.00700)	0.0111 (0.0319)	-0.0908*** (0.0299)
Salary	0.301*** (0.0452)	0.367*** (0.117)	-0.758 (0.580)	-0.485 (0.515)
Share of Students	15.65*** (0.740)	17.63*** (1.958)	39.19*** (8.303)	26.33*** (7.284)
Openness Index	-0.0780 (0.0889)	0.125 (0.263)	4.218*** (0.971)	1.784* (0.968)
Share of Industrial Firms with Innovations	1.021*** (0.0506)	0.454*** (0.153)	0.273 (0.789)	0.207 (0.655)
Border with CIS-countries	0.0642*** (0.0101)	0.128*** (0.0279)	-0.412*** (0.127)	0.214* (0.116)
Border with EU-countries	0.110*** (0.0124)	-0.0246 (0.0356)	0.466*** (0.168)	0.0395 (0.153)
Capital Region	0.394*** (0.0242)	0.186*** (0.0677)	2.093*** (0.280)	0.300 (0.272)
Pseudo R^2	0.1705	0.1444	0.3887	0.3206
<i>Number of Observations</i>	3,541,428	370,413	31,941	31,617

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Column (1) shows that in the whole sample the probability of firm location in one region increases with an increase in the specialization index (PS), while the probability is less significant if the diversification index (PD) is considered. Regions now in conflict and the Ukrainian speaking regions resulted to be less attractive, while the increase of the population and the stock of firms, attract more investments. The impact of the unemployment rate, level of salary, the share of students, and R&D in a given region confirms our expectations that investors are seeking for the skilled labor force, and also, for regions characterized by higher education and innovation potential. Moreover, the probability to locate in the capital city and in Kyivska “oblast” is relatively high for all investors, because these two regions are a big hub of economic development and potential.

In columns (2)-(4) of Table 6, we show the results of separate regressions obtained considering domestic (column (2)) and non-domestic investors (columns (3)-(4)). Findings for domestic firms (column (2)) are consistent with the literature on location choice (Belderbos and Carree, 2002; Halvorsen, 2012; Hilber and Voicu, 2010). We observe a significance of PS-index and PD-index, which means that domestic firms will make their decisions in line with their specialization and with respect to the industrial diversity of the region. Moreover, more populated regions are more attractive for Ukrainian investors if the stock of firms (preferably domestic) is already present there. The results of the conditional logit model also confirm our expectations on the impact of average salary, which is significantly positive, showing that domestic firm will seek high-skilled labor force while preferring regions with the higher unemployment rate.

In column (3), we show the findings on the location choice for the subset of foreign firms. The specialization of the region become even more important for foreign investors, while the diversification is less significant. We find interesting results with respect to the language measure, as language does not have a significant impact on foreign firms’ choice. We observe high coefficients for regional market openness and share of students in a region, which confirm our intuition for an impact on regional

attractiveness for FDI of these factors. The allocation next to the border will have a positive effect if the regions with a border with EU (mostly West of Ukraine) and opposite effect for regions next to CIS-countries.

In column (4), we report the results of estimation on the offshore firms (firms that are registered in offshore financial zones) sample. We find interesting peculiarities in the location of offshore firms. For example, the PD-index has a negative correlation to the location choice, while the PS-index, stock of firms and population measures have a positive significance for location choice of offshore firms, repeating the pattern of domestic firms. The main differences in results between offshore and foreign firms are related to the measure of unemployment and the location in the capital and its region. In particular, in the case of offshore companies, the measure of unemployment is associated with a negative coefficient, meaning that a high unemployment rate will discourage the location of offshore firms in a given region. The location in the capital and its region seems to be not significant, while it is significant for foreign firms. Additionally, the share of students and innovations in a given region increases the probability.

Moreover, language tends to affect more the location choice of domestic firms, which will prefer to establish a new economic activity in Ukrainian speaking region. We notice that foreign and offshore firms will go in the regions with a higher openness index because trade is the key determinant for investors. Furthermore, regions located next to CIS-countries will more attract domestic and offshore firms, while the presence of CIS border will decrease the probability of choice of foreign firms. Regions that shares borders with the European Union will have a high probability of a foreign investor to establish a new economic activity.

We can conclude that our considerations on foreign and offshore firms in Ukraine are significant and robust. The impact of language divide may become not significant when we control for the presence of the border in a given region.

3.5 Conclusions

In this chapter, we study the determinants of the location choice of firms in Ukraine in the period after its independence and before the annexation of Crimea and Russian armed aggression in Donbas. We argue that the possible key driver of the location behavior of economic activities in Ukraine can be related to the effect of the privatization process, important economic reform in Ukraine.

We argue that the regions now in conflict (the part of Donbas and Crimea) stopped to attract new business activities long before (right after 1998) the conflict started. These results can be associated with the second stage of the privatization process (mass privatization). Moreover, firms located in Donetsk and Lugansk regions produce the specific group of goods, which make these regions strategically important for national development. The analysis showed that language divide started to affect the investment decisions of entrepreneurs only after the global financial crisis. In particular, after 2007, firms were located more in regions with a Ukrainian speaking population.

Our findings on the location of firms by foreign divide show that off-shore companies are located more in the East and, especially, in the conflict regions. Furthermore, we employ a conditional logit model to capture what is the location choice of firms within regions in Ukraine during 2001-2014. We find that firms will choose to locate their economic activities in the regions with a higher share of innovations combined with more skilled employees and with a higher openness to trade. European border plays a prominent role in the location of foreign firms. The findings on the effect of CIS borders show that closeness to CIS-countries has a positive effect on domestic firms only, while it has a negative effect on foreign firms. The specialization externalities always show a positive effect for all firms. In particular, new firms prefer to go in the region with more specialized production. Note that specialization may depend on the characteristics of the region itself, such as natural resources and specifically trained employees.

The regional diversity has an impact not only on the macroeconomic

situation of the country but also on attracting new FDI and local investments.

Appendix C

In Table C1 we also report the coverage of our sample by industry and confront it with Derzhkomstat figures. In this case, our sample correlates very well with official statistics figures.

Table C1: Sample coverage by industry

	All firms in sample, 2014	% of total	All firms in Derzhkomstat*, 2013	% of total
Agriculture, forestry and fishing (A)	46782	13%	46012	13%
Manufacturing (B, C, D, E)	49039	13%	42187	12%
Construction (F)	33586	9%	29785	9%
Wholesale and retail trade; repair of motor vehicles and motorcycles (G)	109907	30%	93972	28%
Transporting and storage (H)	14837	4%	14909	4%
Accommodation and food service activities (I)	9662	3%	7885	2%
Information and communication (J)	14242	4%	13319	4%
Financial and insurance activities (K)	5576	2%	4410	1%
Real estate activities (L)	24408	7%	31201	9%
Professional, scientific and technical activities (M)	31785	9%	30028	9%
Administrative and support service activities (N)	16829	5%	15177	4%
Education (P)	2157	1%	2081	1%
Human health and social work activities (Q)	4907	1%	4093	1%
Arts, entertainment and recreation (R)	2678	1%	1946	1%
Other personal service activities (O, S, T, U)	5042	1%	3996	1%
Total (NACE Rev.2)	371437	100%	341001	100%

*Without Autonomous Republic of Crimea, Sevastopol and ATO

Source: combined by author based on Bureau Van Dijk (2016), State Statistics Service of Ukraine (2017).

Table C2: Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>(Log) Age</i>	251201	2.562924	.3258406	0	3.135494
<i>(Log) GDP per capita</i>	251201	9.939785	.5990234	9.038577	10.93169
<i>(Log) Population</i>	251201	7.663191	.4413171	5.941263	8.421196

Table C3: Descriptive statistics for the variables in the period 2001-2014

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>zPS</i>	131164	.0051097	1.003364	-2.909385	5.838013
<i>zPD</i>	131164	.0697848	.9788354	-1.540696	2.867805
<i>(Log) Population</i>	131177	7.694403	.4245571	5.935891	8.484898
<i>Stock of Firms</i>	131177	10.03743	1.025811	7.825645	12.00298
<i>Openness Index</i>	131177	.1479138	.0665784	.0159968	.2709088
<i>Salary</i>	131177	6.680581	.6170864	5.468271	10.56054
<i>Unemployment rate</i>	131177	7.184931	2.663649	3.1	16.1
<i>Share of Industrial Firms with Innovations</i>	131177	6.120608	.4065431	4.29046	6.749931
<i>Share of Students</i>	131177	3.138635	1.133134	.6825588	4.947866

Table C4: Variables Definitions

Variable	Definition
<i>Language</i>	1 if the population is more Ukrainian-speaking more, 0 - if Russian
<i>(Log) Population</i>	log of average number of population in a given region
<i>(Log) GDP per capita</i>	log of average GDP per capita in a given region
<i>Regions now in conflict</i>	1 if the region belongs to the territory of Ukrainian-Russian conflict and 0 otherwise
<i>Border with EU</i>	1 if the region share the border with EU-countries and 0 otherwise
<i>Border with CIS</i>	1 if the region share the border with CIS-countries and 0 otherwise
<i>Age</i>	log of the firm's age (the difference between 2015 and the year of incorporation)
<i>Foreign</i>	1 when company has owner different from Ukraine and 0 otherwise
<i>Offshore</i>	1 when company has a country of origin that belongs to the official offshore zone and 0 otherwise
<i>Leading Sectors</i>	1 when the firm belongs to the leading sector in a given region and 0 otherwise
<i>zPS</i>	standardized value of production structure specialization index
<i>zPD</i>	standardized value of production structure diversification index
<i>Stock of Firms</i>	log of the cumulative number of firms within the region
<i>Population</i>	log of population in a given region
<i>Unemployment rate</i>	regional unemployment rate
<i>Salary</i>	log of average salary in the region
<i>Openness Index</i>	exports plus imports/to the regional GDP
<i>Share of Industrial Firms with Innovations</i>	number of industrial firms with innovations total number of firms in region
<i>Share of Students</i>	number of students/total population in region
<i>Capital Region</i>	1 if the region is Kyiv or Kyivska, 0 otherwise

Table C5: Number of offshore companies

Region	Amount of offshore firms	% from all FDI in region	% from all FDI in Ukraine
Autonomous Republic of Crimea	68	61.82%	1.56%
Cherkaska	39	52.70%	0.90%
Chernigivska	38	67.86%	0.87%
Chernivetska	10	52.63%	0.23%
Dnipropetrovska	174	61.05%	3.99%
Donetska	212	75.44%	4.87%
Ivano-Frankivska	27	48.21%	0.62%
Kharkivska	74	52.48%	1.70%
Khersonska	25	47.17%	0.57%
Khmelnytska	35	59.32%	0.80%
Kirovogradska	23	74.19%	0.53%
Kyiv	822	45.79%	18.87%
Kyivska	110	44.18%	2.52%
Luganska	42	56.00%	0.96%
Lvivska	64	34.97%	1.47%
Mykolaiivska	32	53.33%	0.73%
Odeska	109	55.33%	2.50%
Poltavska	55	53.92%	1.26%
Rivnenska	16	42.11%	0.37%
Sevastopol	9	37.50%	0.21%
Sumska	51	79.69%	1.17%
Ternopil'ska	16	44.44%	0.37%
Vinnytska	43	65.15%	0.99%
Volynska	28	58.33%	0.64%
Zakarpatska	21	20.59%	0.48%
Zaporizka	54	61.36%	1.24%
Zhytomyrska	30	46.15%	0.69%

Table C6: Regional choice

	Age	Foreign	Offshore	Leading Sector	Observations				
	West								
<i>Chernivetska</i>	0.612***	(-0.0671)	-0.0995	(-0.0608)	-0.753**	(-0.349)	0.0831*	(-0.0448)	6,782,427
<i>Ivano-Frankivska</i>	0.686***	(-0.0534)	-0.145***	(-0.0481)	-0.383*	(-0.232)	0.156***	(-0.0354)	6,782,427
<i>Khmelnitska</i>	0.265***	(-0.053)	-0.255***	(-0.0491)	0.134	(-0.2)	-1.044***	(-0.0498)	6,782,427
<i>Lvivska</i>	0.666***	(-0.0384)	-0.193***	(-0.0358)	-0.383**	(-0.164)	0.233***	(-0.0261)	6,782,427
<i>Rivnenska</i>	0.419***	(-0.0585)	-0.457***	(-0.0505)	-0.429	(-0.278)	-0.441***	(-0.0457)	6,782,427
<i>Ternopilska</i>	0.650***	(-0.0628)	-0.452***	(-0.0523)	-0.322	(-0.278)	-0.0715	(-0.0437)	6,782,427
<i>Volynska</i>	0.471***	(-0.0602)	-0.442***	(-0.052)	0.184	(-0.221)	0.323***	(-0.0402)	6,782,427
<i>Zakarpatska</i>	0.805***	(-0.0606)	-0.338***	(-0.0509)	-0.196	(-0.246)	0.0482	(-0.0402)	6,782,427
	North								
<i>Chernigivska</i>	0.474***	(-0.0571)	-0.339***	(-0.0503)	0.288	(-0.2)	-0.700***	(-0.0473)	6,782,427
<i>Kyiv</i>	-0.620***	(-0.028)	0.0747**	(-0.0293)	0.589***	(-0.108)	0.234***	(-0.0207)	6,782,427
<i>Kyivska</i>	-0.115***	(-0.0383)	-0.132***	(-0.0388)	0.305**	(-0.143)	0.201***	(-0.0279)	6,782,427
<i>Sumska</i>	0.506***	(-0.0574)	-0.304***	(-0.0508)	0.569***	(-0.181)	-0.988***	(-0.0518)	6,782,427
<i>Zhytomyrska</i>	0.440***	(-0.0539)	-0.490***	(-0.0466)	-0.201	(-0.232)	-0.0785**	(-0.0387)	6,782,427
	Center								
<i>Cherkaska</i>	0.300***	(-0.0506)	-0.351***	(-0.046)	-0.00218	(-0.202)	-0.541***	(-0.0408)	6,782,427
<i>Dnipropetrovska</i>	0.02	(-0.0344)	-0.0371	(-0.0351)	0.219*	(-0.131)	0.546***	(-0.0242)	6,782,427
<i>Kirovogradska</i>	0.549***	(-0.0591)	-0.350***	(-0.0512)	-0.231	(-0.251)	-0.599***	(-0.0471)	6,782,427
<i>Poltavska</i>	0.360***	(-0.0481)	-0.219***	(-0.0447)	0.0931	(-0.182)	-0.744***	(-0.0402)	6,782,427
<i>Vinnitska</i>	0.305***	(-0.0488)	-0.355***	(-0.0446)	0.0182	(-0.193)	0.310***	(-0.0336)	6,782,427
	South								
<i>AR Crimea</i>	0.613***	(-0.045)	0.568***	(-0.0492)	-0.567***	(-0.2)	-1.045***	(-0.0385)	6,782,427
<i>Khersonska</i>	0.380***	(-0.0543)	-0.0447	(-0.0521)	-0.468*	(-0.251)	0.187***	(-0.0369)	6,782,427
<i>Mykolajivska</i>	0.206***	(-0.0493)	-0.0592	(-0.0482)	-0.217	(-0.209)	-0.667***	(-0.041)	6,782,427
<i>Sevastopol</i>	0.0438	(-0.0751)	0.510***	(-0.0892)	-1.971***	(-0.715)	-0.706***	(-0.0644)	6,782,427
<i>Zaporizka</i>	0.278***	(-0.0414)	-0.114***	(-0.0401)	-0.288	(-0.178)	-0.686***	(-0.0338)	6,782,427
	East								
<i>Donetska</i>	0.448***	(-0.0355)	-0.121***	(-0.0344)	0.198	(-0.132)	0.404***	(-0.0244)	6,782,427
<i>Kharkivska</i>	0.134***	(-0.035)	0.0675*	(-0.0357)	-0.563***	(-0.159)	-0.562***	(-0.0275)	6,782,427
<i>Luganska</i>	0.618***	(-0.0491)	0.179***	(-0.0484)	-0.488**	(-0.218)	-0.553***	(-0.0375)	6,782,427

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Probit model

We use a probit model to check if the similar determinants have a similar effect on foreign and offshore firms. We stress offshore firms, as it is peculiar for Ukraine as the way of doing business in a country.

Table C7 shows the findings of the probit model. The main result is that the probability to choose regions now in conflict and regions based on the language pattern (for foreign and offshore firms) is persistent even if we use additional control variables. Thus, we can confirm our expectation, i.e., offshore firms have different ownership (different from foreign, for example, it can be the domestic owner, who registered firm in offshore) and are driven by different factors from the general pattern for foreign firms.

Table C7: Probit model

	(1)	(2)	(3)	(4)
	Regions now in conflict	Language	Regions now in conflict	Language
Foreign	-0.558*** (-11.53)	0.586*** (18.26)	-0.316*** (-4.77)	0.343*** (8.78)
Offshore	0.383*** (6.19)	-0.322*** (-7.38)	0.203* (2.41)	-0.183*** (-3.42)
(Log) Population			1.606*** (157.98)	-2.095*** (-238.66)
(Log) GDP per capita			-2.061*** (-127.17)	1.899*** (235.54)
Border with CIS			0.122*** (13.88)	-0.276*** (-42.44)
Border with EU				1.320*** (168.71)
Constant	-1.071*** (-343.10)	0.151*** (59.68)	6.927*** (56.92)	-2.798*** (-43.80)
<i>Number of Observations</i>	251254	251254	201715	251254

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

When we add the controls for population, gross regional product and border effect, there is a higher probability to observe the activities of the foreign firm in regions that do not have a conflict and preferably

Ukrainian-speaking, although the coefficients decreased from -0.558 to -0.316 for regions in conflict. A similar decrease can also be noticed for regions by language divide (from 0.586 to 0.343).

For offshore firms, we observe the opposite effect, as the regions now in conflict are more attractive as well as Russian-speaking regions. The coefficients also decrease (from 0.383 to 0.203 for regions now in conflict, and -0.322 and 0.183 for language divide) with additional controls, but still are significant in probability.

Moreover, the results of the probit model show that FDI was mostly choosing regions closer to the border with EU-countries, while the offshore firms were located mostly in the East and North of the country.

Chapter 4

Organizing the Global Value Chains: the case of Ukraine

4.1 Introduction

In times of globalization, the new trade agreements arise, and the cross-borders boundaries decrease. As a consequence, it makes a significant impact on the firm's development and investment, which involves a wide network of affiliates with diverse production stages. Now, not only the research and development, production of parts, but also recruitment and marketing, design and sales can be fragmented across the firms and even countries. Multinational companies together with their affiliates consist a large share of worldwide production, and it is important to understand their upstream or downstream position on the supply chain.

In this chapter, we follow the definition of upstream production, as the production of goods that will locate at the beginning of the supply chain and will be used in the different stages of input of other products. We define the downstream production, as the production of goods that will locate close to the end of the value chain and will be intended for the final consumer.

The aim of this contribution is to test the organization of global value chain at the firm-level in Ukraine by foreign and domestic multinational companies (MNEs). As global value chains (GVCs) have become an important component of the global economy, we argue that it is essential for Ukraine to meet the requirements and challenges of the regional economic integration with other countries through bilateral and multilateral trade and economic development.

The research on GVCs aspect in Ukraine is a very interesting topic, as the country had and still has some difficulties related to the trade and investment barriers. According to GVCs development, Ukraine decreased its ranking in the international list in one year for six positions (85 out of 138 in 2016-2017 versus 79 in 2014-2015 (Schwab, 2016a)). Thus, it is important to understand the current situation of Ukraine in the global supply chains and to provide possible recommendations to improve the situation.

Note that GVCs also provide an expansion of export in a country. Firms can be easily concentrated on one specific production, in which they have competitive advantages. Considering this, the small firms also can become competitive in the international market and fully participate in GVCs. For example, Ukraine is positioning in GVCs as leading exporter of finished iron goods, iron ore, wheat, corn, barley and seed oil. Moreover, the FDI in Ukraine is concentrated more in metallurgy, where the final goods are sold in the global market. Thus, we expect the affiliates in Ukraine to be more downstream, although it is a resource-rich country with a relatively cheap cost of intermediate production.

Furthermore, this chapter improves on the existing empirical literature on GVCs in at least two ways. We build a unique firm-level sample using the data on 15,584 firms active in Ukraine until 2014. It is the first time when the empirical analysis on the organization of GVCs is made for Ukraine with the firm-level data. Moreover, we investigate the impact of parent downstreamness on affiliates and in particular, we show the results on the positioning of successive investments along the supply chain. We observe that the foreign multinational companies control fewer affiliates (only around 7% of total number of affiliates in Ukraine)

than the domestic parents.

One of our main findings is that the multinational companies which establish affiliates in Ukraine are already more downstream. Nonetheless, we find that with an increase in the number of affiliates in the group, the firms tend to be even more vertically integrated. Another key point is that the foreign multinational companies will have subsidiaries, which are oriented more close to the intermediate production, while the domestic MNEs will locate their economic activities closer to the final consumer.

The remainder of this chapter is organized as follows. Section 4.2 reviews the literature. Section 4.3 presents the construction of data sample. In Section 4.4, we show estimated results and robustness check. Section 4.5 concludes.

4.2 Literature review

Nowadays, the unbundling process leads to a fragmentation of production process of final good among different firms, while before, the producers preferred to implement the full cycle of good on their own. Note that the production process has different stages and with an increase of the international dispersion of GVCs, these stages can also be located in different economies. Thus, intermediate inputs will be produced in one country and then exported to other countries, until then it will reach the final consumer.

Already back in 80's, different works studied the fragmentation of production. For example, Dixit and Grossman (1982) analyzed the multi-stage vertical production, where some value is added to intermediate input and ready for the next stage. Jones and Kierzkowski (1990) focused on the process of fragmentation at the international level. Yeats (1997) analyzed the global production sharing. Feenstra (1998) argued that the increase of worldwide integration has led to disintegration in the production process, where activities can be located domestically or outsourced abroad for higher profitability. Hummels et al. (2001) presented a vertical specialization because production processes increasingly involve a

sequential, vertical trading chain stretching across many countries, with each country specializing in particular stages of a goods production sequence. de Backer and Yamano (2011) described increasing importance of GVCs in times of international production and trade, where different stages of production are located across different economies and growing spread of international production networks.

Consequently, the supply contracts evolved with spreading the idea of the supply chains in production. There are two possible ways of producing the good. On the one hand, all production can be done within the same firm: firstly, the parent creates a subsidiary and then, delegates the further stages of production to it. On the other hand, a company signs the contract with an external supplier, which is totally independent of a given firm. Although the first kind of relations is more strong than a contract, not every firm can proceed with it. Thus, considering the necessity of supply contracts, Acemoglu et al. (2007) were the first, who studied the possibility of signing contracts with several suppliers by headquarters. They show that greater contractual incompleteness leads to the adoption of less advanced technologies. Moreover, further work of Acemoglu et al. (2009) found greater vertical integration in countries that have both greater contracting costs and greater financial development more favorable financial environment.

Also, in the series of works Baldwin (2006), Baldwin (2011) and Baldwin (2016), the author studied the new paradigm of globalization and unbundling process. He argued that probably the most important aspect of contemporary globalization is a second unbundling when production stages previously performed in close proximity across national borders are dispersed to reduce production costs. The study of Baldwin and Lopez-Gonzalez (2015) provides a portrait of the global pattern of supply-chain trade with help of World Input-Output Database. Finally, elementary theory of global supply chains was developed by Costinot et al. (2013). They also made a first look at how vertical specialization shapes the interdependence of nations.

Another key factor for integrating stages is the elasticity of substitution of the intermediate supplier. Antràs and Chor (2013) argued whether

inputs are sequential complements or sequential substitutes turns out to be determined only by whether the elasticity of final-good demand is (respectively) higher or lower than the “technological” elasticity of substitution among inputs. For GVCs the elasticity of substitution has particular importance, as a high elasticity considers ease of substitution one producer with another in the total supply chain of the good, while the low elasticity signals the difficulties with replacing the particular intermediate producer. Thus, among others, Alfaro et al. (2017) found whether a firm integrates suppliers located upstream or downstream depends crucially on the size of the elasticity of demand faced by the firm. To summarize, the more firm is upstream and the more unique good it produces, the more it is difficult to substitute such firm in the supply chain, as it can stop all the process of the production from its early stages.

Furthermore, our study can contribute to the literature on the firm-level analysis of affiliates allocation along the supply chain with respect to the parents at the case-specific (Ukraine), whereas study of del Prete and Rungi (2017) test at the firm level the optimal allocation of ownership rights along a productive sequence and find new insights for firm-level heterogeneity along supply chains of affiliates that operate in 185 countries. The recommendations for Ukraine on effective integration into the global value chains were described by Guzhva (2015). Considering Taglioni and Winkler (2016), it is important to study participation of the country in GVCs, as it leads to the increase of competitiveness and to the efficient development. Another important study in line with our research is Rungi and del Prete (2017), where the authors detect a non-linear U-shaped relationship between the value added generated by firms and their position on a productive sequence.

Moreover, we analyze the dataset based on the foreign and domestic MNEs, which locate their subsidiaries in Ukraine. We define the affiliates as upstream or downstream with respect to parents based on recent studies. Thus, a stream of literature on *downstreamness* divides into two parts, the literature on upstream and downstream location along the supply chain. Antràs et al. (2012) argue that upstreamness indicates the product at the beginning of production line on the supply chain, which

is going through different stages of input of other products. Already in further work, Antràs and Chor (2013), authors show that the incentive to integrate suppliers varies systematically with the relative position (upstream versus downstream) at which the supplier enters the production line. Also, they developed the downstreamness metrics, which we use in our further estimations.

It is necessary to mention that multinational firms use two ways of strategic organization, either vertical or horizontal integration. The bulk of literature distinguish the strategy of horizontal integration for foreign investment to mean situating production facilities so as to avoid trade costs (Brainard, 1993; Markusen, 1984) and the strategy of vertical integration represents firms attempts to take advantage of cross-border factor cost differences (Helpman, 1984; Helpman and Krugman, 1985). The results of vertical integration are presented in work of Atalay et al. (2014), who find that vertical ownership is not primarily motivated by facilitating the efficient intra-firm transfers of goods along a production chain.

Following our question, our interest is to estimate the role of Ukraine in GVCs, because as it is a relatively cheap European country with rich resources, it has a high probability to play a crucial role in global supply chains. Moreover, it is necessary to understand what is upstream or downstream country. The World Bank (2014) defines upstream countries, as countries that are associated with the production of raw materials (involved in the first stage of production), while the downstream countries are specialized in processed products or customer services. The recent study of Cingolani et al. (2017) suggested that while emerging and developing countries tend to secure central positions at upstream and mid-stream production stages, high-income countries tend to exert prevailing roles at downstream stages. Moreover, the comparative advantages of countries were studied by Dai (2013), who found that while the advanced economies continue to dominate tasks at the upstream of supply chains and the emerging economies remain prominent in downstream tasks like assembly, participation in global supply chains has been dynamic over time.

4.3 Data and preliminary evidence

We use the dataset from Orbis by Moody's Analytics on firms active in Ukraine till 2014. It collects firm-level data on financial accounts, when available, incorporation dates and investor's country of origin. Moreover, we use the global ultimate owner code as the identification of parent company (headquarter) and then, we build the network of affiliates, whose economic activity is controlled by a parent company.

We can sequence our sample with the information on the first investment and successive investments on the basis of date of incorporation. We obtain the subset of 7,824 parent companies that locate and control the economic activities of their 15,584 affiliates in Ukraine, of which, 7,760 affiliates belong to the successive investments.

Table 7 reports a geographic coverage of our sample by 27 administrative regions. Note that the majority of affiliates are controlled by domestic parents (90.5%), 6.7% of total affiliates have foreign ownership and 2.8% are controlled by offshore firms¹. We observe peculiar differences, which exist between groups of affiliates. On the one hand, all offshore-parent firms invest only once in a given region. On the other hand, the foreign-owned parent is significantly less attracted to make successive investments, while a high number of the first investment attracts even bigger number of successive domestic investments.

As expected, in the whole sample the highest distribution of affiliates are in the capital city and its region (Kyiv with 21% of all affiliates in Ukraine and Kyivska, 5.1%), in regions now in conflict (Donestka (8.7%), Crimea (4.1%), Luhanska (3.4%)), in West of Ukraine (Lvivska (7.3%) and Khmelnytska (2.9%)) and Kharkivska (6.9%), Odeska (5.9%), Dnipropetrovska (5.1%) "oblasti".

For the purpose of our research, we link activity and financial information of firms with industry-level metrics of downstreamness. We source the data for the last directly from Antràs and Chor (2013), according to which the relative location of industry in production processes is

¹We define an *offshore firm* as a firm, whose ownership belongs to the countries located in offshore financial centers.

Table 7: Sample coverage: Regional distribution

Region in country	Affiliates by domestic parent			Affiliates by foreign parent			Affiliates by offshore parent	
	All affiliates	First investment	Second+ investments	All affiliates	First investment	Second+ investments	All affiliates	First investment
<i>AR Crimea</i>	625	268	357	12	9	3	9	9
<i>Cherkaska</i>	328	122	206	14	10	4	16	16
<i>Chernihivska</i>	265	95	170	10	8	2	17	17
<i>Chernivetska</i>	154	43	111	4	2	2	1	1
<i>Dnipropetrovska</i>	700	278	422	53	33	20	37	37
<i>Donetska</i>	1305	803	502	25	12	13	31	31
<i>Ivano-Frankivska</i>	238	88	150	17	9	8	13	13
<i>Kharkivska</i>	1022	616	406	35	20	15	12	12
<i>Khersonska</i>	188	74	114	8	1	7	3	3
<i>Khmelnitska</i>	417	222	195	18	12	6	14	14
<i>Kirovohradska</i>	212	82	130	5	2	3	13	13
<i>Kyiv</i>	2656	1553	1103	524	346	178	99	99
<i>Kyivska</i>	725	387	338	57	40	17	18	18
<i>Luhanska</i>	497	251	246	19	10	9	7	7
<i>Lvovska</i>	1076	536	540	43	40	3	12	12
<i>Mykolajivska</i>	195	96	99	10	4	6	10	10
<i>Odeska</i>	861	504	357	36	25	11	16	16
<i>Poltavska</i>	351	134	217	32	12	20	27	27
<i>Rivnenska</i>	231	81	150	7	7	0	8	8
<i>Sevastopol</i>	82	25	57	3	0	3	1	1
<i>Sumska</i>	234	68	166	3	1	2	16	16
<i>Ternopilska</i>	215	77	138	11	9	2	8	8
<i>Vinnitska</i>	346	131	215	12	5	7	6	6
<i>Volynska</i>	227	92	135	14	12	2	4	4
<i>Zakarpatska</i>	202	62	140	32	30	2	9	9
<i>Zaporizka</i>	398	172	226	9	4	5	10	10
<i>Zhytomyrska</i>	334	118	216	15	9	6	8	8
Total	14109	6987	7122	1041	681	360	434	434

measured as the distance from final consumers, thus, giving an orientation to technological processes over different stages of production, eventually leading to the production of final goods. Hence, downstreamness metrics are normalized on a range from zero to one, where one is equal to the full proximity to final demand and zero is the initial start of production life-cycle.

Considering the absence of the detailed Input-Output table for Ukraine, we use the 2002 Input-Output Tables by US Census Bureau to obtain average measures of the relative position of each industry in the production processes. Moreover, we exploit the *DuseTuse* measure of downstreamness metrics, which is built as the ratio of the aggregate direct use of an input to the aggregate total use of that industry and *Down-Measure*, which weighs for the average position of that industry in the supply chain at which an industrial output is used. After converting the 4-digit codes of Nace Rev. 2 to 6-digit of the Naics Rev. 2007, we merge our sample with downstreamness metrics and then, we use an average

of parents' and affiliates' primary activities to obtain their positioning along the supply chain.

Table 8 reports the ten highest and lowest values of *DuseTuse* and *DownMeasure*. The lowest downstreamness values refer to the industries in the mining of metal ores (iron, uranium, thorium or non-ferrous metals), forestry and logging, wireless telecommunications, while the highest values tend to be in construction, hunting and other service activities, footwear, explosives, and mattresses manufacturing.

Table 8: Highest and lowest values of downstreamness metrics from domestic sample

Nace Rev.2	Industry label	<i>DuseTuse</i>	Nace Rev.2	Industry label	Down
Lowest 10 values			Lowest 10 values		
0710	Mining of iron ores	.0084538	0210	Silviculture and other forestry activities	.2176004
0220	Logging	.0242411	0710	Mining of iron ores	.2288953
0210	Silviculture and other forestry activities	.0458819	0220	Logging	.2335644
0729	Mining of other non-ferrous metal ores	.0834818	0240	Support services to forestry	.2456087
0721	Mining of uranium and thorium ores	.0834818	0729	Mining of other non-ferrous metal ores	.2488951
0990	Support activities for other mining and quarrying	.0970084	0721	Mining of uranium and thorium ores	.2488951
4312	Test drilling and boring	.0970084	6010	Radio broadcasting	.2491208
0240	Support services to forestry	.1289696	6120	Wireless telecommunications activities	.2491208
1091	Manufacture of prepared feeds for farm animals	.1385337	0161	Support activities for crop production	.2576531
Highest 10 values			Highest 10 values		
8790	Other residential care activities	1	4120	Construction of residential and non-residential buildings	1
8720	Residential care activities for mental retardation, mental health and substance abuse	1	4321	Electrical installation	1
8810	Social work activities without accommodation for the elderly and disabled	1	4211	Construction of roads and motorways	1
8899	Other social work activities without accommodation n.e.c.	.9996711	4322	Plumbing, heat and air conditioning installation	1
8610	Hospital activities	.9988837	9603	Funeral and related activities	1
1520	Manufacture of footwear	.9967057	4399	Other specialised construction activities n.e.c	1
2051	Manufacture of explosives	.995351	4329	Other construction installation	1
9602	Hairdressing and other beauty treatment	.9836294	4110	Development of building projects	1
9604	Physical well-being activities	.9836294	4311	Demolition	1
3103	Manufacture of mattresses	.9779319	0170	Hunting, trapping and related service activities	1

Table 9 reports the average downstreamness for parent and affiliates, which we also present in groups of first and successive investments. Thus, an average parent has a *DownMeasure* around 0.57 with a range from a minimum 0.21 to a maximum of 1, what cannot make an initial and absolute positioning on a supply chain, as it can be far from the final consumer. In fact, *DuseTuse* as the unweighted downstreamness (we take it as a reference), varies from 0.04 to 1. We argue that the key driver for affiliates' positioning on the supply chain is the relative positioning of the parent and not an absolute. Looking further at affiliates divide, we observe that for parent company it is important to have affiliates in intermediate and final production with respect to parent specialization.

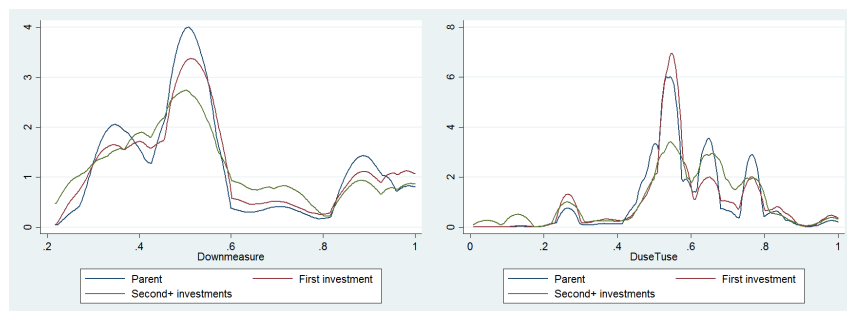
Fig. 20 shows the difference on the *DownMeasure* for the length of the supply chain, which is evident with respect to distributions of *DuseTuse*

Table 9: Downstreamness across firms

		Obs.	Mean	Std. Dev.	Min	Max
Parent	<i>DuseTuse</i>	7758	0.5918959	0.1340894	0.0458819	1
	<i>DownMeasure</i>	7773	0.572182	0.2110365	0.2176004	1
All affiliates	<i>DuseTuse</i>	15312	0.5843613	0.1723158	0.0084538	1
	<i>DownMeasure</i>	15386	0.5730618	0.2200015	0.2176004	1
<i>of which</i>						
First investment	<i>DuseTuse</i>	7766	0.5869945	0.154813	0.0084538	1
	<i>DownMeasure</i>	7783	0.5841195	0.21936	0.2176004	1
Successive investments	<i>DuseTuse</i>	7554	0.5832959	0.1853899	0.0084538	0.9996711
	<i>DownMeasure</i>	7607	0.560547	0.217194	0.2176004	1

metrics for parent/affiliate companies. It starts at the value of .2176 in our firm-level sample. Further, parents and affiliates show a thicker right tail in both *DownMeasure* and *DuseTuse* distributions.

Figure 20: Parents' and affiliates' downstreamness from sample



Moreover, in Table 10, we report the number of affiliates in Ukraine compared to the *DownMeasure* with their parent. Note that the majority of affiliates is more downstream with respect to parents (52% of total affiliates in Ukraine), while almost 33% of firms are more upstream and only 15% of total affiliates work within the same industry as parents. Looking at the comparison of parents to first investment *DownMeasure*, we observe that the decision to establish affiliate closer to the final production is higher by 5%. It is necessary to mention that only 8.6% of successive investments work in the parent's industry.

Table 10: The number of firms by downmeasure

	All Affiliates		First investment		Successive investments	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Parent DM = Affiliate DM	2,339	15.01	1,675	21.41	664	8.56
Parent DM > Affiliate DM	5,083	32.62	2,878	36.78	2,205	28.41
Parent DM < Affiliate DM	8,162	52.37	3,271	41.81	4,891	63.03
<i>Total</i>	15,584	100.00	7,824	100.00	7,760	100

We use the SankeyMATIC (2017) tools to map the distribution of affiliates, which includes first investment and successive investments with respect to parents. First, we divide the *DownMeasure* metrics for parent firms into quartiles: $q_1 \in [0, 0.413)$; $q_2 \in [0.413, 0.608)$, $q_3 \in [0.608, 0.804)$, $q_4 \in [0.804, 1]$. Then, we use the same quartiles for the first investment and successive investments. Therefore, we group firms by the set of ranges. We end up with 1,820 parents in the first quartile, 3,731 in the second, 450 in the third and 1,737 in the fourth. Thus, we see that parents firms are more midstream and downstream. Fig. 21 illustrates the visualization of parents decisions².

Moreover, if the 51.4% of parents firms from the first quartile establish the first investment in Ukraine more downstream, the 48.9% of the parents from the fourth quartile will position Ukrainian subsidiary in the more upstream industry with respect to their primary activity. Only 16.2% of parents firms from the second quartile will choose more upstream positioning for their Ukrainian firm and 22.4% downstream. Finally, 45.8% of parents firms from the third quartile will work in more upstream economic activity with respect to the primary one and 14.2% in downstream. Also, we observe that a big share of affiliates stays in the

²In the Fig. 21 first column (*Fq1-Fq4*) stands for the firms of the first investment, the second column (*Pq1-Pq4*) for the parent companies, finally, the third column (*Sq1-Sq4*) for the firms of successive investments. The numbers should be interpreted with a help of Table D1 as following. 6,943 is a number of all affiliates that have their parent in the first quartile (*Pq1*). It is important to notice that only 885 firms of first investments and 1,602 firms of successive investments are also in the first quartile. Thus, other 4,456 affiliates are more downstream than their parent. Further numbers of parents column should be interpreted analogously. *Fq* and *Sq* columns should be read as, for example, 1,736 firms of first investment located in the first quartile include 885 firms with the parents of the first quartile (*Pq1*), 604 of *Pq2*, 51 of *Pq3*, 196 of *Pq4*.

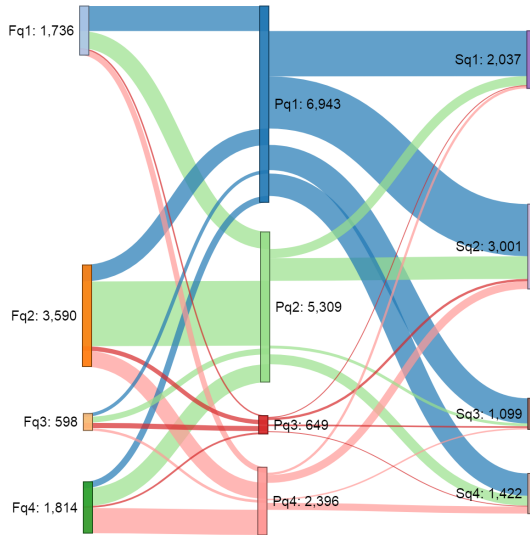


Figure 21: Downstreamness of Firms by Quartiles (*DownMeasure*)

same range of parents positioning.

We expect that the location decision pattern of parents along the supply chain is similar to the first and successive investments. In addition, the first conclusion, which we can make is the pattern of the positioning of firms on the supply chain in Ukraine is more downstream with respect to our preliminary results. Moreover, the distribution of *DownMeasure* metrics is already signaling the location of firms more close to the final production. Our findings show that successive investments will distribute as follows: 26.9% of total affiliates of successive investments are in the more upstream range, 39.7% are relatively in the middle, and 33.4% belong to industries of more final production.

Finally, Table D2 reports the summary statistic of the measures that we use in both parts of empirical estimation. The first part of the table presents the parent level variables (number of affiliates in Ukraine, additionally we use dummy parents' country of origin) and the controls for affiliates (the time fixed effect for investment, labor productivity, capital

intensity and size of the company). The second part of the table shows statistics for the firm-level controls of first and successive investments (size of the company, labor productivity, capital intensity).

4.4 Empirical analysis

The purpose of this section is to explain the position of subsidiaries of MNEs in Ukraine along the value chain as a function of a parent’s downstreamness. We divide our analysis into two parts, which show the correlation of downstreamness between parents, first and successive investments and the direction of this correlation. We use the OLS and multinomial logistic method to estimate the probability of affiliates downstreamness with respect to the parents downstreamness (*DownMeasure* or *DuseTuse*) and their positioning on the supply chain. Also, we provide the robustness check of our results together with introducing the “smile curve” for Ukrainian affiliates.

4.4.1 General pattern

We start the first baseline with estimation of the following equation:

$$Y_{i(j)} = \beta_0 + \beta_1 Y_j + \beta_2 P_j + \beta_3 A_i + \varepsilon_{i(j)} \quad (4.1)$$

where $Y_{i(j)c}$ is the i th affiliate downstreamness, measured for *DownMeasure* and *DuseTuse* (Antràs and Chor, 2013), integrated by the j th parent. Further, we define independent variables, where Y_j stand for j th parent downstreamness, P_j collects parent’s control measures for total number of controlled affiliates and country of ownership, A_i collects affiliates firm-level control measures for labor productivity, capital intensity, size and establishing order.

Table 11 reports results for the first baseline. We confirm our expectation that the affiliates in Ukraine will go more downstream with respect to the parent. Moreover, our findings show that parent downstreamness affects significantly positive the affiliate downstreamness in all specifications, as we reject the null hypothesis with 95% confidence.

Table 11: Baseline estimations, impact of parents on all affiliates

	(1)	(2)	(3)	(4)	(5)	(6)
	Affiliate Downmeasure	Affiliate Downmeasure	Affiliate Downmeasure	Affiliate DuseTuse	Affiliate DuseTuse	Affiliate DuseTuse
Parent <i>Downmeasure</i>	0.260*** (27.05)	0.256*** (26.59)	0.245*** (25.49)			
Parent <i>DuseTuse</i>				0.315*** (26.21)	0.312*** (26.01)	0.307*** (25.45)
Foreign	-0.0283*** (-3.89)	-0.0206** (-2.80)	-0.00153 (-0.20)	-0.00263 (-0.46)	0.00145 (0.25)	0.0138* (2.30)
Offshore	-0.0276* (-2.11)	-0.0175 (-1.32)	0.000654 (0.05)	0.0129 (1.26)	0.0180 (1.74)	0.0284** (2.71)
Affiliates number	0.000855 (0.87)	0.00213* (2.14)	0.00155 (1.52)	0.00406*** (5.37)	0.00475*** (6.18)	0.00367*** (4.66)
Constant	0.439*** (71.04)	0.456*** (68.85)	0.515*** (54.54)	0.399*** (53.55)	0.406*** (52.85)	0.450*** (47.61)
Affiliates firm level controls						
Establishing order	YES	YES	YES	YES	YES	YES
Size	NO	YES	YES	NO	YES	YES
Other controls	NO	NO	YES	NO	NO	YES
Observations	15292	15292	15198	15209	15209	15116

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

In columns (1)-(3), we report that affiliates in Ukraine are relatively close to their parents on the supply chain, as the more downstream parent leads to more downstream affiliate, which is confirmed also by including the affiliates firm-level controls. Columns (4)-(6) show the effect of the parent *DuseTuse* metrics, which is even more positive and significant. The larger number of affiliates tends to increase their downstreamness, although these results are statistically significant only for *DuseTuse*, which suggests an increase of the contribution of goods from an industry that parents are specialized on.

Furthermore, Table D3 reports the results of the same model 4.1, but instead of all affiliates, the dependent variable is the first investment. Tables D4-D5 show the results of our baseline estimation with the difference that we estimate the correlation of the downstreamness measure of successive investments (the dependent variable) with parents or first investments downstreamness (independent variables).

Thus, we see that results do not significantly change from the overall

model. The results of the downstreamness measures confirm that there is a high correlation between parents and first/successive investments. Also, it is necessary to mention that the subsidiaries are staying proximate to the parents, even when we test the dependency of successive investments from the first investment. Moreover, these results are in line with the findings of del Prete and Rungi (2017), who argued that parent companies and affiliates tend to be located in proximity to supply chains.

Subsequently, we argue that such results on the proximity of parents versus affiliates can be explained by the low integration of Ukrainian production in GVCs. The existing barriers of the Ukrainian economy and law regulations make a negative impact on business attractiveness for new FDIs. Moreover, the problems with business environment tend to the failure of integration to the worldwide production, where MNEs play a crucial role. Moreover, the Ukrainian export-import has a very complex, corrupted and bureaucratized system, which leads Ukraine to be a trade outsider. Nonetheless, other factors, including trade tariffs and restrictions, the efficiency of border management, etc., demand the new trade agreements and policies to ensure the more deep integration with the international supply chain. Thus, the recent agreement with EU (DCFTA³) can improve the Ukrainian competitiveness and consequently, will involve Ukrainian business more in the global supply chains.

Considering that Ukraine has comparative advantages in the production of manufacturing goods, it has a high probability to become one of the global logistics hub, which will be focused on the high technologies and innovations. For this, the negotiations on promoting the Ukrainian exports should be one of the priorities if the country wants to be highly integrated into the global supply chains.

³Deep and Comprehensive Free Trade Areas (DCFTA) are free trade areas between EU and Ukraine, Georgia and Moldova. Also, it is associated with the free trade access to the EU's internal market in selected sectors for Ukraine, Georgia, and Moldova. For Ukraine it was working de-facto from 1 January 2016, officially from 1 September 2017.

4.4.2 Robustness check

For the robustness check, we use the multinomial logit model to explain the possible discrete choices of what happen with the direction of correlation between parents and affiliates: “will subsidiaries go relatively upstream or downstream?”. We divide affiliates into three groups by downstreamness with respect to the parents downstreamness. For this, we define the dummy variables for the difference between affiliates and parents downstreamness, as follows:

$$\begin{cases} D = 0, & \text{if } (I_a - I_p) = 0 \\ D = 1, & \text{if } (I_a - I_p) > 0 \\ D = 2, & \text{if } (I_a - I_p) < 0 \end{cases} \quad (4.2)$$

where D is a dummy variable, I_a is an affiliates downstreamness (*DownMeasure* or *DuseTuse*) and I_p is parent’s downstreamness. We use $D = 0$ as a baseline for our estimation models, which means that the downstreamness of affiliates and parents is the same (e.g., they specialized in totally the same production).

Table 12 reports the results, which correspond to the fact that investments in Ukraine will position more downstream on the supply chain. Moreover, Tables D6-D8 show the similar results.

Note that Ukraine is a more upstream country, which is specialized in the production of raw goods or goods that are at the beginning of the production cycle (e.g., manufacturing in metallurgy, mining, agriculture and chemical sectors, etc.). Besides the fact that Ukraine is already included in GVCs with raw materials, it concentrates mostly at the low margin level. Thus, it is necessary for the Ukrainian government to consider the increase of integration into the global value chains with respect to the production of the goods, which will create a high value-added. Furthermore, the absence of Ukrainian export’s promotion to foreign markets, especially to the EU-market, has been associated with a number of barriers, which are mainly related to the exporting tariffs. As a consequence, the foreign investments in Ukraine are mostly concentrated in the services sector (e.g., finance and retail trade) and a relatively small share be-

longs to manufacturing (mostly concentrated in metallurgy), that gives us an explanation for the more downstream result. It is also important to understand that for any investor it could be more beneficial to go mid-stream or downstream if the country is more upstream.

Table 12: All affiliates, Difference Dummy (mlogit)

	(1) Dummy DownMeasure	(2) Dummy DownMeasure	(3) Dummy DownMeasure	(4) Dummy DuseTuse	(5) Dummy DuseTuse	(6) Dummy DuseTuse
Dummy>0						
Parent <i>Downmeasure</i>	-5.297*** (-31.69)	-5.270*** (-31.44)	-5.249*** (-31.11)			
Parent <i>DuseTuse</i>				-4.043*** (-16.99)	-3.981*** (-16.68)	-3.938*** (-16.30)
Foreign	0.224* (2.22)	0.196 (1.91)	0.341** (3.17)	0.401*** (4.05)	0.344*** (3.43)	0.510*** (4.83)
Offshore	0.778*** (4.12)	0.746*** (3.90)	0.787*** (4.08)	1.156*** (6.14)	1.084*** (5.69)	1.138*** (5.91)
Affiliates number	0.409*** (17.24)	0.403*** (16.93)	0.384*** (15.93)	0.494*** (21.43)	0.483*** (20.83)	0.461*** (19.63)
Second investment	-0.297*** (-3.57)	-0.291*** (-3.50)	-0.285*** (-3.39)	-0.263** (-3.24)	-0.250** (-3.07)	-0.235** (-2.86)
Third+ investment	-0.533*** (-5.42)	-0.524*** (-5.32)	-0.524*** (-5.28)	-0.578*** (-6.01)	-0.555*** (-5.76)	-0.551*** (-5.67)
Constant	3.347*** (35.17)	3.288*** (32.45)	3.730*** (26.85)	2.711*** (19.49)	2.565*** (17.87)	3.090*** (17.76)
Affiliates size	NO	YES	YES	NO	YES	YES
Other controls	NO	NO	YES	NO	NO	YES
Dummy<0						
Parent <i>Downmeasure</i>	1.274*** (10.52)	1.361*** (11.13)	1.377*** (11.08)			
Parent <i>DuseTuse</i>				5.476*** (23.12)	5.566*** (23.38)	5.656*** (23.46)
Foreign	0.228* (2.18)	0.108 (1.02)	0.227* (2.04)	0.336** (3.21)	0.229* (2.14)	0.263* (2.36)
Offshore	0.0539 (0.25)	-0.0870 (-0.40)	-0.0803 (-0.36)	0.179 (0.85)	0.0370 (0.17)	0.00431 (0.02)
Affiliates number	0.413*** (17.00)	0.393*** (16.12)	0.372*** (15.07)	0.436*** (18.43)	0.418*** (17.56)	0.408*** (16.89)
Second investment	-0.188* (-2.28)	-0.168* (-2.04)	-0.166* (-1.99)	-0.213* (-2.56)	-0.196* (-2.34)	-0.202* (-2.40)
Third+ investment	-0.534*** (-5.35)	-0.495*** (-4.95)	-0.497*** (-4.94)	-0.500*** (-5.04)	-0.462*** (-4.65)	-0.478*** (-4.77)
Constant	-0.378*** (-4.45)	-0.610*** (-6.60)	-0.208 (-1.57)	-2.893*** (-19.44)	-3.103*** (-20.15)	-3.019*** (-16.34)
Affiliates size	NO	YES	YES	NO	YES	YES
Other controls	NO	NO	YES	NO	NO	YES
Observations	15481	15481	15386	15466	15466	15371

t statistics in parentheses
 * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Moreover, in the recent years, the Ukrainian government together with European programs started to improve the integration and increased the cooperation in particular industrial sectors with international markets and particularly, with EU market. Thus, new agreements between Ukraine and EU/other countries (e.g., Canada) will give more opportunities to the first to be more involved in the global supply chains and to grow the value-added. Note that the high value-added is a very important “export guide”, on which the country should be oriented.

Another key point of the global value chains importance for Ukraine considers the perspective for the renovation of Donbas and its structural adaptation, especially considering that now it is involved in the armed confrontation and in the state of deep economic recession. Then again, the uniqueness of the specialization of this region can help to develop the favorable conditions for the economy openness and doing business, which will contribute to the integration into GVCs.

4.4.3 Smile curve

In this section, we stress the previous robustness check with respect to the data on financial accounts of the firms in Ukraine. We use the methodology described by Rungi and del Prete (2017). It is important for us to understand, where exactly on the supply chain the more value added is created. For this purpose, we challenge the existence of the “smile curve” in Ukraine. We start to estimate the equation for this test as follows:

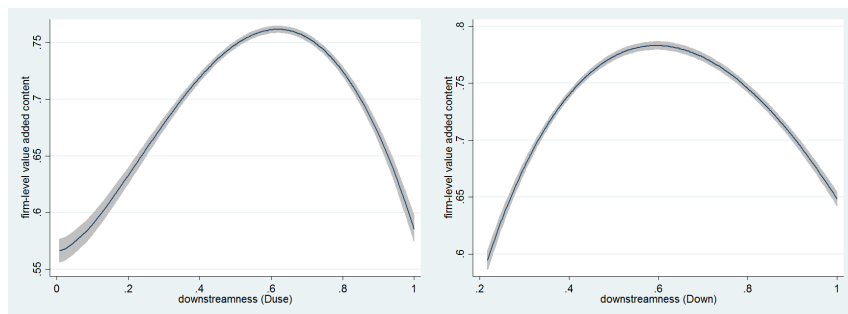
$$\left(\frac{\text{Value added}}{\text{Turnover}} \right)_{ij} = \beta_0 + \beta_1 X_j + \beta_2 Z_i + \varepsilon_{ij} \quad (4.3)$$

where the ratio of value-added on turnover value is the value-added content of firm i active in industry j . The term X_j include alternatively downstreamness metrics and squared terms. The term Z_i collects firm-level controls presented in Table D9. Standard errors are clustered by 4-digit industries.

Thus, after the estimation of the model, in Fig. 22 we report the quadratic fit for firm-level value-added content along supply chains for

Ukraine. We test the model for both downstreamness metrics (*Duse-Tuse* and *Downmeasure*) to provide the robust results. We observe not typical behavior for the curve that we relate to the fact that the number of firms, which belong to the sector of services, is almost five times more than firms of the manufacturing sector. Additionally, we report that more capital-intensive firms correlate with a lower value-added content in production, whereas more productive, smaller and older firms tend to generate more value added.

Figure 22: Quadratic fit of firm-level value added content on downstreamness metrics



Moreover, both plots show that if the firm locates in upstream or downstream, it will create less value-added. Such results lead to the decision of positioning the economic activity on the supply chain in the mid-stream, which will bring comparative advantages and more value-added to a firm in Ukraine. Hence, we confirm our results that the affiliates in Ukraine are positioning as more downstream rather than upstream. In case of Ukraine, when the country is more specialized in the production of raw materials, for companies is better to choose the activities that are more proximate to the intermediate production. Also, the participation of Ukraine in the global value chains depends on its policy and tariff regulations. Although Ukraine has a high potential to become one of the competitive economies in international trade, it still should approve a number of requirements for the simplification of trade procedures and barriers.

4.5 Conclusions

Nowadays, the growth of the national economy is defined not only by its GDP or exports but also with respect to the value-added and country's position in the global value chains. For Ukraine, the positioning at the supply chain has special importance as the deep integration into the GVCs is highly correlated to the economic development. Such integration is possible while implementing and cooperating within the international trade agreements. Note that Ukraine approved the WTO Trade Facilitation Agreement (TFA) in 2015. It is associated with the acceleration of export-import activities and the significant reduction of trade costs. Nonetheless, the implementation of TFA requires more attention and efforts in Ukraine. Such low level of the TFA performance has a negative impact not only on the trade but also it can create additional problems for the country (non-implementation of requirements leads to the fines and sanctions). Thus, the policies improvement with respect to the TFA can help to expand the reach of the markets and variety of goods of international trade. As a result, it will lead to the deepening of the integration in the worldwide supply chain. Furthermore, the new agreements through European Neighbourhood Policy (ENP), in particular, Eastern Partnership, will allow Ukraine to become a highly competitive country with attractive business-climate and reliable platform for investments and innovations in the near future. Also, the DCFTA and its requirements will help to overcome the non-tariff barriers and reach the European standards of production. In general, this agreement opens new possibilities and allows to create the base for active participation in the GVCs.

Moreover, we tested the optimal organizational pattern of parents and affiliates position along the supply chain at the firm-level. We found that in general, affiliates in Ukraine tend to be more downstream, which is associated with a possible fact of the existent export barriers in the country. Our results are robust after different specifications. Furthermore, we introduced the "smile curve", which also confirmed our results and first intuition.

Appendix D

Table D1: Number of affiliates with respect to parents by quartiles of downstreamness

Parents quartile	Number of first investments by quartiles		Parents quartile	Number of successive investments by quartiles	
Pq1	[885]	Fq1	Pq1	[1602]	Sq1
Pq1	[583]	Fq2	Pq1	[1843]	Sq2
Pq1	[122]	Fq3	Pq1	[887]	Sq3
Pq1	[230]	Fq4	Pq1	[791]	Sq4
Pq2	[604]	Fq1	Pq2	[327]	Sq1
Pq2	[2289]	Fq2	Pq2	[800]	Sq2
Pq2	[206]	Fq3	Pq2	[101]	Sq3
Pq2	[632]	Fq4	Pq2	[350]	Sq4
Pq3	[51]	Fq1	Pq3	[26]	Sq1
Pq3	[155]	Fq2	Pq3	[82]	Sq2
Pq3	[180]	Fq3	Pq3	[58]	Sq3
Pq3	[64]	Fq4	Pq3	[33]	Sq4
Pq4	[196]	Fq1	Pq4	[82]	Sq1
Pq4	[563]	Fq2	Pq4	[276]	Sq2
Pq4	[90]	Fq3	Pq4	[53]	Sq3
Pq4	[888]	Fq4	Pq4	[248]	Sq4

Table D2: Firm controls

	Obs	Mean	Std. Dev.	Min	Max
Parents					
(Log of) number of affiliates	7824	0.197291	0.471913	0	8.30499
Affiliates					
(Log of) labor productivity	15495	4.855193	1.458423	-3.06222	14.39832
(Log of) capital intensity	15549	4.812609	1.862413	-2.82583	15.44873
First investment					
(Log of) labor productivity	7777	5.096373	1.516816	-3.062222	14.04332
(Log of) capital intensity	7804	4.821642	1.825979	-2.825833	15.44873
Successive investments					
(Log of) labor productivity	7718	4.612169	1.354446	-2.975529	14.39832
(Log of) capital intensity	7745	4.803508	1.898492	-1.845827	14.18362

Table D3: Baseline estimations, impact of parents on first investment

	(1)	(2)	(3)	(4)	(5)	(6)
	First inv Downmeasure	First inv Downmeasure	First inv Downmeasure	First inv DuseTuse	First inv DuseTuse	First inv DuseTuse
Parent <i>Downmeasure</i>	0.279*** (23.89)	0.276*** (23.55)	0.263*** (22.46)			
Parent <i>DuseTuse</i>				0.309*** (23.62)	0.309*** (23.61)	0.294*** (22.56)
Foreign	-0.0278** (-3.13)	-0.0233* (-2.57)	0.000412 (0.04)	-0.00402 (-0.64)	-0.00637 (-0.98)	0.0143* (2.15)
Offshore	-0.00364 (-0.19)	0.00262 (0.14)	0.0242 (1.25)	0.0328* (2.42)	0.0286* (2.08)	0.0489*** (3.55)
(log) Affiliates number	0.00329 (0.63)	0.00452 (0.85)	0.00532 (1.00)	0.00276 (0.74)	0.00166 (0.44)	0.00168 (0.44)
Constant	0.428*** (57.87)	0.437*** (53.94)	0.527*** (44.63)	0.402*** (49.86)	0.402*** (47.76)	0.484*** (46.18)
Affiliates firm level controls						
Time FE for investment	YES	YES	YES	YES	YES	YES
Size	NO	YES	YES	NO	YES	YES
Other controls	NO	NO	YES	NO	NO	YES
Observations	7733	7733	7681	7703	7703	7651
Adj. R^2	0.073	0.074	0.091	0.068	0.068	0.091

† statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table D4: Baseline estimations, impact of parent on successive investments

	(1) Affiliate Downmeasure	(2) Affiliate Downmeasure	(3) Affiliate Downmeasure	(4) Affiliate DuseTuse	(5) Affiliate DuseTuse	(6) Affiliate DuseTuse
Parent <i>Downmeasure</i>	0.222*** (13.11)	0.220*** (12.99)	0.216*** (12.77)			
Parent <i>DuseTuse</i>				0.330*** (14.00)	0.327*** (13.91)	0.330*** (13.95)
Foreign	-0.0261* (-2.05)	-0.0184 (-1.44)	-0.00366 (-0.28)	0.000565 (0.05)	0.00707 (0.65)	0.00502 (0.44)
Offshore	-0.0480** (-2.66)	-0.0358* (-1.97)	-0.0242 (-1.33)	-0.00403 (-0.26)	0.00595 (0.38)	0.00230 (0.15)
(log) Affiliates number	0.000758 (0.85)	0.00258** (2.81)	0.00358*** (3.67)	0.00453*** (6.45)	0.00585*** (8.05)	0.00561*** (7.18)
Constant	0.460*** (41.01)	0.481*** (41.61)	0.492*** (30.50)	0.382*** (25.96)	0.396*** (26.56)	0.391*** (21.80)
Affiliates firm level controls						
Size	NO	YES	YES	NO	YES	YES
Other controls	NO	NO	YES	NO	NO	YES
Observation	7559	7559	7517	7506	7506	7465
Adj. R^2	0.029	0.037	0.049	0.025	0.032	0.033

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table D5: Baseline estimations, impact of first on successive investments

	(1) Affiliate Downmeasure	(2) Affiliate Downmeasure	(3) Affiliate Downmeasure	(4) Affiliate DuseTuse	(5) Affiliate DuseTuse	(6) Affiliate DuseTuse
FI <i>DownMeasure</i>	0.395*** (25.46)	0.388*** (25.09)	0.385*** (24.73)			
FI <i>DuseTuse</i>				0.289*** (18.27)	0.289*** (18.37)	0.300*** (18.53)
SI labor productivity			0.0152*** (6.85)			0.00142 (0.72)
SI capital intensity			-0.0143*** (-9.58)			0.00422** (3.21)
Constant	0.356*** (31.14)	0.375*** (31.93)	0.368*** (23.64)	0.424*** (38.45)	0.434*** (38.95)	0.404*** (26.59)
First investment firm level controls						
Size	YES	YES	YES	YES	YES	YES
Successive investment firm level controls						
Size	NO	YES	YES	NO	YES	YES
Observations	7568	7568	7527	7510	7510	7470
Adj. R^2	0.083	0.090	0.100	0.044	0.051	0.053

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table D6: Dependence of the Difference between First Affiliates and Parents

	(1)	(2)	(3)	(4)	(5)	(6)
	Dummy	Dummy	Dummy	Dummy	Dummy	Dummy
	DownMeasure	DownMeasure	DownMeasure	DuseTuse	DuseTuse	DuseTuse
	Dummy>0					
Parent <i>Downmeasure</i>	-5.042*** (-25.67)	-5.015*** (-25.45)	-5.003*** (-25.18)			
Parent <i>DuseTuse</i>				-4.427*** (-15.40)	-4.371*** (-15.17)	-4.341*** (-14.85)
Foreign	0.269* (2.23)	0.199 (1.62)	0.392** (3.03)	0.438*** (3.69)	0.324** (2.66)	0.563*** (4.39)
Offshore	0.591* (2.20)	0.491 (1.80)	0.568* (2.07)	1.069*** (4.01)	0.902*** (3.34)	1.019*** (3.73)
(log) Affiliates number	0.0472 (0.68)	0.0274 (0.39)	0.0162 (0.23)	0.141* (2.07)	0.108 (1.56)	0.0866 (1.23)
Constant	3.275*** (29.49)	3.226*** (27.10)	3.767*** (22.44)	2.983*** (17.84)	2.841*** (16.47)	3.534*** (16.59)
Affiliates size	NO	YES	YES	NO	YES	YES
Other controls	NO	NO	YES	NO	NO	YES
	Dummy<0					
Parent <i>Downmeasure</i>	1.351*** (9.35)	1.421*** (9.76)	1.522*** (10.20)			
Parent <i>DuseTuse</i>				5.420*** (19.37)	5.466*** (19.48)	5.728*** (19.98)
Foreign	0.230 (1.81)	0.120 (0.92)	0.230 (1.69)	0.389** (3.09)	0.312* (2.42)	0.320* (2.37)
Offshore	0.326 (1.07)	0.178 (0.58)	0.161 (0.52)	0.246 (0.79)	0.135 (0.43)	0.0241 (0.08)
(log) Affiliates number	0.0676 (0.96)	0.0403 (0.57)	0.00974 (0.13)	0.0751 (1.05)	0.0564 (0.78)	0.0333 (0.45)
Constant	-0.373*** (-3.74)	-0.547*** (-5.02)	-0.368* (-2.30)	-2.813*** (-16.01)	-2.935*** (-16.18)	-3.200*** (-14.27)
Affiliates size	NO	YES	YES	NO	YES	YES
Other controls	NO	NO	YES	NO	NO	YES
Observation	7773	7773	7721	7758	7758	7706
Pseudo R^2	0.117	0.118	0.124	0.109	0.111	0.119

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table D7: Dependence of the Difference between Successive Affiliates and Parents

	(1)	(2)	(3)	(4)	(5)	(6)
	Dummy DownMeasure	Dummy DownMeasure	Dummy DownMeasure	Dummy DuseTuse	Dummy DuseTuse	Dummy DuseTuse
Dummy>0						
FI <i>DownMeasure</i>	0.368 (1.66)	0.454* (2.03)	0.446* (1.97)			
FI <i>DuseTuse</i>				3.201*** (10.94)	3.264*** (11.16)	3.193*** (10.84)
FI medium size	0.128 (1.16)	0.0583 (0.52)	0.0348 (0.31)	0.202 (1.79)	0.117 (1.02)	0.0779 (0.67)
FI large	2.794*** (21.01)	2.646*** (19.08)	2.449*** (17.32)	1.895*** (12.19)	1.731*** (10.85)	1.604*** (10.12)
FI very large	0.751*** (5.12)	0.657*** (4.32)	0.645*** (4.12)	0.698*** (4.71)	0.600*** (3.90)	0.558*** (3.53)
Constant	0.530*** (3.38)	0.328* (2.00)	1.067*** (4.65)	-1.199*** (-6.34)	-1.405*** (-7.26)	-0.775** (-2.98)
Affiliates size	NO	YES	YES	NO	YES	YES
Other controls	NO	NO	YES	NO	NO	YES
Dummy<0						
FI <i>DownMeasure</i>	-0.336 (-1.43)	-0.221 (-0.94)	-0.286 (-1.19)			
FI <i>DuseTuse</i>				1.336*** (4.59)	1.404*** (4.83)	1.241*** (4.23)
FI medium size	0.474*** (4.08)	0.389*** (3.30)	0.367** (3.08)	0.534*** (4.64)	0.442*** (3.78)	0.414*** (3.51)
FI large	2.175*** (15.50)	1.942*** (13.27)	1.739*** (11.63)	1.742*** (10.91)	1.517*** (9.25)	1.420*** (8.69)
FI very large	0.616*** (3.92)	0.451** (2.77)	0.492** (2.93)	0.604*** (3.90)	0.431** (2.68)	0.459** (2.77)
Constant	0.491** (2.98)	0.226 (1.31)	1.270*** (5.27)	-0.401* (-2.14)	-0.633** (-3.28)	0.300 (1.15)
Affiliates size	NO	YES	YES	NO	YES	YES
Other controls	NO	NO	YES	NO	NO	YES
Observations	7675	7675	7633	7669	7669	7627
Pseudo R^2	0.073	0.077	0.082	0.085	0.089	0.094

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table D8: Dependence of the Difference between Successive Affiliates and Parents

	(1) Dummy DownMeasure	(2) Dummy DownMeasure	(3) Dummy DownMeasure	(4) Dummy DuseTuse	(5) Dummy DuseTuse	(6) Dummy DuseTuse
Dummy>0						
Parent <i>Downmeasure</i>	-5.955*** (-18.71)	-5.917*** (-18.52)	-5.958*** (-18.44)			
Parent <i>DuseTuse</i>				-3.265*** (-7.60)	-3.194*** (-7.38)	-3.163*** (-7.24)
Foreign	0.159 (0.86)	0.155 (0.83)	0.211 (1.08)	0.306 (1.72)	0.285 (1.59)	0.328 (1.74)
Offshore	0.894*** (3.34)	0.877** (3.22)	0.879** (3.19)	1.194*** (4.47)	1.158*** (4.26)	1.163*** (4.23)
(log) Affiliates number	0.403*** (17.29)	0.396*** (16.76)	0.375*** (15.36)	0.495*** (22.35)	0.486*** (21.57)	0.465*** (20.06)
Constant	3.249*** (17.71)	3.154*** (16.51)	3.563*** (13.81)	1.847*** (7.34)	1.682*** (6.49)	2.068*** (6.67)
Affiliates size	NO	YES	YES	NO	YES	YES
Other controls	NO	NO	YES	NO	NO	YES
Dummy<0						
Parent <i>Downmeasure</i>	1.077*** (4.87)	1.168*** (5.21)	1.106*** (4.86)			
Parent <i>DuseTuse</i>				5.686*** (12.71)	5.825*** (12.88)	5.804*** (12.71)
Foreign	0.246 (1.35)	0.139 (0.75)	0.283 (1.45)	0.225 (1.20)	0.112 (0.59)	0.172 (0.86)
Offshore	-0.136 (-0.44)	-0.282 (-0.91)	-0.219 (-0.70)	0.166 (0.57)	-0.00416 (-0.01)	0.0491 (0.16)
(log) Affiliates number	0.403*** (16.88)	0.380*** (15.64)	0.351*** (14.03)	0.434*** (18.92)	0.412*** (17.65)	0.391*** (16.28)
Constant	-0.622*** (-3.82)	-0.909*** (-5.26)	-0.199 (-0.80)	-3.361*** (-11.96)	-3.668*** (-12.66)	-3.182*** (-9.35)
Affiliates size	NO	YES	YES	NO	YES	YES
Other controls	NO	NO	YES	NO	NO	YES
Observations	7708	7708	7665	7708	7708	7665
Pseudo R^2	0.173	0.178	0.180	0.148	0.152	0.154

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table D9: Description of Variables

Variable	Description	Source
<i>Value added content</i>	It is the value added (Operating Revenue - material costs) over Turnover	<i>Orbis</i>
<i>Capital intensity</i>	It is the ratio between fixed assets over number of employees in log	<i>Orbis</i>
<i>Age</i>	It is the age of the firm in log	<i>Orbis</i>
<i>Size</i>	It is the number of employees in log	<i>Orbis</i>
<i>Productivity</i>	It is the value added over number of employees in log	<i>Orbis</i>
<i>Price-cost margin</i>	It represents the level of competition, defined as: [operating revenue - (cost of material + costs of employees)]/ operating revenue]	<i>Orbis</i>
<i>Foreign</i>	It is a dummy variable equal to 1 if the firm <i>i</i> is a foreign owned affiliate and 0 otherwise.	<i>Orbis</i>

Table D10: Least squares results

Dependent variable:	(1)	(2)	(3)	(4)
Value added content	OLS	OLS	OLS	OLS
<i>DuseTuse</i>	0.332 (0.345)			-2.753 (5.618)
<i>DuseTuse</i> ²	-0.230 (0.265)			2.445 (5.006)
<i>Downmeasure</i>		0.620 (0.459)	-1.253 (6.950)	
<i>Downmeasure</i> ²		-0.514 (0.340)	1.336 (5.336)	
<i>Capital intensity</i>	-0.0150*** (0.00478)	-0.0159*** (0.00442)		
<i>Size</i>	-0.0335*** (0.00425)	-0.0340*** (0.00437)		
<i>Age</i>	0.0259** (0.0119)	0.0260** (0.0120)		
<i>Productivity</i>	0.0783*** (0.00830)	0.0761*** (0.00799)		
<i>Price-cost margin</i>	0.0338 (0.0322)	0.0339 (0.0322)		
<i>Foreign</i>	-0.0395*** (0.0129)	-0.0390*** (0.0131)		
Constant	0.374*** (0.132)	0.335** (0.166)	0.645 (2.033)	1.128 (1.568)
Observations	13,033	13,099	13,678	13,608
R-squared	0.321	0.324	0.000	0.000
Errors clustered by 4-digit industry	YES	YES	YES	YES

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

References

- Acemoglu, D., Antràs, P. and Helpman, E. (2007), 'Contracts and Technology Adoption', *American Economic Review* pp. 916–943. 80
- Acemoglu, D., Johnson, S. and Mitton, T. (2009), 'Determinants of Vertical Integration: Financial Development and Contracting Costs', *THE JOURNAL OF FINANCE* **LXIV**(3). 80
- Alfaro, L., Antras, P., Chor, D. and Conconi, P. (2017), 'Internalizing Global Value Chains: A Firm-Level Analysis', *CEP Discussion Paper* (1507). 81
- Amerighi, O. and de Feo, G. (2007), 'Competition for FDI in the Presence of a Public Firm and the Effects of Privatization', *Working Paper* . 44
- Amiti, M. and Freund, C. (2010), *China's Growing Role in World Trade*, University of Chicago Press, chapter The Anatomy of China's Export Growth, pp. 35–56. 37
- Amurgo-Pacheco, A. and Pierola, M. D. (2008), 'Patterns of export diversification in developing countries', *Washington, DC: World Bank Policy Research Working Paper* **4473**. 37
- Antràs, P. and Chor, D. (2013), 'Organizing the Global Value Chain', *Econometrica* **81**(6), 2127–2204. 4, 80, 82, 83, 89
- Antràs, P., Chor, D., Fally, T. and Hillberry, R. (2012), 'Measuring the Upstreamness of Production and Trade Flows', *American Economic Review* **102**(3), 412–416. 81
- Armington, P. S. (1969), 'A Theory of Demand for Products Distinguished by Place of Production', *International Monetary Fund Staff Papers* **16**(1), 159–178. 37
- Atalay, E., Hortacsu, A. and Syverson, C. (2014), 'Vertical Integration and Input Flows', *American Economic Review* **104**(4), 1120–1148. 82

- Baldwin, R. (2006), 'Globalisation: the great unbundling(s)', *Globalisation Challenges for Europe and Finland* . 80
- Baldwin, R. (2011), 'Trade and industrialisation after globalisations 2nd-unbundling: how building and joining a supply-chain are different and why it matters', *NBER Working Paper* (17716). 80
- Baldwin, R. (2016), *The Great Convergence*, The Belknap Press of Harvard University Press. 80
- Baldwin, R. and Lopez-Gonzalez, J. (2015), 'Supply-chain Trade: A Portrait of Global Patterns and Several Testable Hypotheses', *The World Economy* **38**(11), 16821721. 80
- Belderbos, R. and Carree, M. (2002), 'The Location of Japanese Investments in China: Agglomeration Effects, Keiretsu, and Firm Heterogeneity', *Journal of the Japanese and International Economies* **16**(2), 194–211. 45, 65
- Bergin, P. R. and Glick, R. (2015), 'Tradability, Productivity, and Understanding International Economic Integration', *Cambridge, MA: National Bureau of Economic Research*. . 37
- Besedes, T. and Prusa, T. J. (2011), 'The role of extensive and intensive margins and export growth', *Journal of Development Economics* **94**(2), 371–379. 37
- Boudier-Bensebaa, F. (2005), 'Agglomeration Economies and Location Choice: Foreign Direct Investment in Hungary', *Economics of Transition*, **13**(4), 605–628. 45
- Brainard, S. L. (1993), 'A Simple Theory of Multinational Corporations and Trade with a Trade-Off between Proximity and Concentration', *National Bureau of Economic Research Working Paper* (4269). 82
- Branyiczki, I., Bakacsi, G. and Pearce, J. L. (1992), 'The Back Door: Spontaneous Privatization in Hungary', *Annals of Public and Cooperative Economics* **63**(2), 303–316. 49
- Brümmer, B., von Cramon-Taubadel, S., Nivievskyi, O. and Schlather, M. (2010), *Agglomeration Economies in Ukrainian Dairy Sector: a Marked Point Process Approach* . 45
- Bureau Van Dijk (2016), 'Company Information Worldwide', <https://orbis.bvdinfo.com/version-2016526/home.serv?product=orbisneo>. [Online]. 51, 69
- Chand, M. and Ghorbani, M. (2011), 'National culture, networks and ethnic entrepreneurship: A comparison of the Indian and Chinese immigrants in the US', *International Business Review* **20**, 593–606. 46

- Chenery, H. B. and Strout, A. M. (1966), 'Foreign assistance and economic development', *The American Economic Review* . 12
- Cieřlik, A. (2005), 'Location of foreign firms and national border effects: the case of Poland', *Tijdschrift voor economische en sociale geografie* **96**(3), 287–297. 46
- Cingolani, I., Panzarasa, P. and Tajoli, L. (2017), 'Countries positions in the international global value networks: Centrality and economic performance', *Applied Network Science* **2**(21). 82
- Costinot, A., Vogel, J. and Wang, S. (2013), 'An Elementary Theory of Global Supply Chains', *Review of Economic Studies* **80**, 109–144. 80
- Coughlin, C. C., Terza, J. V. and Arromdee, V. (1991), 'State Characteristics and the Location of Foreign Direct Investment within the United States', *The Review of Economics and Statistics* **73**(4), 675–683. 45
- Dai, L. (2013), 'The Comparative Advantage of Nations: How Global Supply Chains Change Our Understanding of Comparative Advantage', *M-RCBG Associate Working Paper Series* (15). 82
- de Backer, K. and Yamano, N. (2011), 'International Comparative Evidence on Global Value Chains', *Organization for Economic Co-Operation and Development (OECD)* . 80
- del Prete, D. and Rungi, A. (2017), 'Organizing the Global Value Chain: a firm-level test', *Journal of International Economics* **109**, 16–30. 81, 91
- Dixit, A. and Grossman, G. (1982), 'Trade and Protection with Multistage Production', *Review of Economic Studies* **49**(4), 583–594. 79
- Eichengreen, B. and Hausmann, R. (1999), 'Exchange rates and financial fragility', *The National Bureau of Economic Research* . 12
- Ekonomichna Pravda (2015), 'How was Changing the Price of Russian Gas. Chronicle of Raises and Falls', <http://www.epravda.com.ua/publications/2015/10/26/564676/>. [Online]. 32
- Evenett, S. J. and Venables, A. J. (2002), 'Export growth in developing countries: Market entry and bilateral trade flows', *University of Bern working paper* . 37
- Feenstra, R. (1998), 'Integration of Trade and Disintegration of Production in the Global Economy', *Journal of Economic Perspectives* **12**(4), 31–50. 79
- Feldman, M. P. and Audretsch, D. (1999), 'Innovation in cities: science-based diversity, specialization and localized competition', *European Economic Review* **43**, 409–429. 45, 52

- Flam, H. and Helpman, E. (1987), 'Vertical Product Differentiation and North-South Trade', *American Economic Review* 77(5), 810–822. 37
- Frydman, R., Pistor, K. and Rapaczynski, A. (1996), 'Exit and voice after mass privatization: The case of Russia', *European Economic Review* 40, 581–588. 49, 62
- Grosfeld, I. and Hare, P. G. (1991), 'Privatization in Hungary, Poland and Czechoslovakia', *Centre for Economic Policy Research* . 49
- Grossman, G. M. and Helpman, E. (1991), 'Innovation and growth in the global economy.', *Cambridge, MA: MIT Press* . 37
- Guimaraes, P., Figueiredo, O. and Woodward, D. (2000), 'Agglomeration and the Location of Foreign Direct Investment in Portugal', *Journal of Urban Economics* 47(1), 115–131. 45
- Guriev, S. and Rachinsky, A. (2005), 'The Role of Oligarchs in Russian Capitalism', *JOURNAL OF ECONOMIC PERSPECTIVES* 19(1), 131–150. 63
- Guzhva, I. (2015), 'Integration into the Global Value Chains. Recommendations for Ukraine', *International Journal of Innovative Technologies in Economy* 2(2), 3–7. 81
- Halvorsen, T. (2012), 'Size, Location and Agglomeration of Inward Foreign Direct Investment (FDI) in the United States', *Regional Studies* 46(5), 669–682. 45, 65
- Head, K., Ries, J. and Swenson, D. (1995), 'Agglomeration benefits and location choice: Evidence from Japanese manufacturing investments in the United States', *Journal of International Economics* 38(3–4), 223–247. 45, 58
- Helpman, E. (1984), 'A Simple Theory of International Trade with Multinational Corporations', *Journal of Political Economy* 92(3), 451–471. 82
- Helpman, E. and Krugman, P. (1985), 'Market Structure and Foreign Trade', *Cambridge, MA: MIT Press* . 82
- Hilber, C. A. L. and Voicu, I. (2010), 'Agglomeration Economies and the Location of Foreign Direct Investment: Empirical Evidence from Romania', *Regional Studies* 44(3), 355–371. 45, 65
- Hummels, D., Ishii, J. and Yi, K.-M. (2001), 'The nature and growth of vertical specialization in world trade', *Journal of International Economics* 54, 75–96. 79
- Hummels, D. and Klenow, P. (2005), 'The Variety and Quality of a Nations Exports', *The American Economic Review* 95(3), 704 – 723. 3, 37, 38

- Iurchyshyn, V. (2011), 'Economic Review of Ukraine: Consolidation of Debt Risk', http://razumkov.org.ua/upload/yurchyshyn_borh_Apr-2011.pdf. [Online]. 12
- Jacobs, J. (1970), *The economy of cities.*, New York, NY: Vintage. 45
- Jean, R.-J. B., Tan, D. and Sinkovics, R. R. (2011), 'Ethnic ties, location choice, and firm performance in foreign direct investment: A study of Taiwanese business groups FDI in China', *International Business Review* **20**, 627–635. 45
- Jones, R. W. and Kierzkowski, H. (1990), 'The Role of Services in Production and International Trade: A Theoretical Framework', *The Political Economy of International Trade* . 79
- Klein, T. (1992), 'Managing external debt in developing countries', *World Bank discussion papers* . 12
- KMU (2014), 'Government portal', http://www.kmu.gov.ua/control/uk/publish/article?art_id=247809851&cat_id=244274130. 3
- Korbushko, I. (2012), 'External Debt Analysis and Evaluation of its Economic Impact on Developing Countries', <http://www.essuir.sumdu.edu.ua/bitstream/123456789/28001/1/Korbushko.Zabiiaka.pdf>. [Online]. 12
- Krugman, P. (1979), 'A model of balance-of-payments crises', *Journal of Money, Credit and Banking* . 12
- Krugman, P. (1985), 'International debt strategies in an uncertain world', *International debt and the developing countries* . 12
- Krugman, P. (1991a), *Geography and Trade*, MIT Press, Cambridge. 54
- Londar, L. (2015), 'Analysis of Current Government Debt and Key Trends of Providing the Debt Security of Ukraine', http://www.niss.gov.ua/public/File/2015_analit/derzh_borg.pdf. [Online]. 11
- Markusen, J. R. (1984), 'Multinationals, MultiPlant Economies, and the Gains from Trade', *Journal of International Economics* **16**(3-4), 205–226. 82
- Marshall, A. (1920), *Principles of Economics*, London: MacMillan. 45
- Matolcsy, G. (1991), 'Privatization: Hungary', *Eastern European Economics* **30**(1), 49–56. 49
- Mayer, T., Mejean, I. and Nefussi, B. (2010), 'The Location of Domestic and Foreign Production Affiliates by French Multinational Firms', *Journal of Urban Economics* **68**(2), 115–128. 45

- McFadden, D. (1973), 'Conditional Logit Analysis of Qualitative Choice Behavior', *FRONTIERS IN ECONOMETRICS* pp. 105–142. 58
- Miller, J. (2006), 'Evolution of Mass Privatization in Bulgaria', *William Davidson Institute* (814). Working Paper. 49
- Mission of Ukraine to the EU (2017), 'EU's assistance to Ukraine', <http://ukraine-eu.mfa.gov.ua/ua/ukraine-eu/eu-policy/assistance>. [Online]. 19
- Myers, S. (1977), 'Determinants of corporate borrowing', *Journal of Financial Economics* . 12
- National Bank of Ukraine (2015), 'Balance of Payments and External Debt of Ukraine', http://www.bank.gov.ua/control/en/publish/article?art_id=67604&cat_id=37801. [Online]. 12
- Nowak, J., Cywinski, L., Dzyuma-Zaremba, U. and Harasym, R. (2015), 'Polish fdi in ukraine: Analyzing location factors, investment trends and firm-level activity', *34*, 201–227. 44, 45
- Ostapchuk, D. (2016), 'Anthology of offshore companies: Guide to Ukrainian offshore web', http://voxukraine.org/longreads/panama/index_ua.html. [Online]. 58
- Paci, R. and Usai, S. (1999), 'Externalities, knowledge spillovers and the spatial distribution of innovation', *GeoJournal* *49*(4), 381–390. 45, 52
- Padalka, S. (2012), 'Privatization in Ukraine in the System Of Relations: Government, Civil Society, Individuals', *Living Space of Ukraine: Political and Humanitarian Dimensions (1991-2010 Years)* pp. 101–118. 47
- Pashaver, O. and Verhovodova, L. (2003), *The Final Stage of Privatization in Ukraine*, Milenium. 46, 47, 48
- Puntillo, R. and Ipsen, D. (1996), 'Poland's mass privatization program', *The European Journal of Finance* *2*, 41–45. 49
- RNBO (2018), <http://mediarnbo.org/about/?lang=en>. 7
- Rukh Dobrovoltsiv "Prostir Svobody" (2015), 'Situation of Ukrainian Language in Ukraine during 2014-2015', <http://dobrovol.org/>. [Online]. 50, 55
- Rungi, A. and del Prete, D. (2017), "'Smile Curve': Where Value is Added Along Supply Chains", *IMT Lucca EIC Working Paper Series* . 4, 81, 94
- Sachs, J. and Williamson, J. (1986), 'Managing the LDC debt crisis', *Brookings Papers on Economic Activity* . 12

- SankeyMATIC (2017), <http://sankeymatic.com/build/>. 87
- Schmidt, K. M. (2000), 'The political economy of mass privatization and the risk of expropriation', *European Economic Review* **44**, 393–421. 48
- Schwab, K. (2016a), *The Global Competitiveness Report*, Technical report, World Economic Forum. 78
- Schwab, K. (2016b), *The Global Competitiveness Report 2016/2017*, Technical report, World Economic Forum. 15
- Shafil, N. (1995), 'Making a Market: Mass Privatization in the Czech and Slovak Republics', *World Development* **23**(7), 1143–1156. 49
- Shaver, J. M. (1998), 'Do Foreign-owned and U.S.-owned Establishments Exhibit the Same Location Pattern in U.S. Manufacturing Industries?', *Journal of International Business Studies* **29**(3), 469–492. 45
- State Property Fund of Ukraine (2015), 'Report on the work of the State Property Fund of Ukraine, progress and results of the implementation of the State Privatization Program', <http://www.spfu.gov.ua>. 49
- State Statistics Service of Ukraine (2017), 'Statistical Information', <http://www.ukrstat.gov.ua/>. [Online]. 21, 51, 69
- Taglioni, D. and Winkler, D. (2016), *Making Global Value Chains Work for Development*, Washington, DC: World Bank. 81
- The Law of Ukraine (2014), "about renovation of government", <http://zakon0.rada.gov.ua/laws/show/1682-18>. 16
- The World Bank (2014), 'Trading Up to High Income'. 82
- The World Bank (2016), 'Gross External Debt Position by Sector', http://databank.worldbank.org/data/views/reports/ReportWidgetCustom.aspx?Report_Name=C2-SDDS-new&Id=f75db76d. [Online]. 35
- The World Bank (2017), 'Doing Business 2018', <http://www.doingbusiness.org/~media/WBG/DoingBusiness/Documents/Annual-Reports/English/DB2018-Full-Report.pdf>. 18
- Timothy, J. K. and Ruhl, K. J. (2013), 'How Important Is the New Goods Margin in International Trade?', *Journal of Political Economy* **121**(2), 358–392. 37
- UNCD (2016), 'UN Comtrade Database', <http://comtrade.un.org/>. [Online]. 21

- Vakhitov, V. and Bollinger, C. (2010), 'Effects of Ownership on Agglomeration Economies: Evidence from Ukrainian Firm Level Data', *Journal of Urban Economics* . 45
- Verkhovna Rada of Ukraine (1992), 'Law "On privatization of small state-owned enterprises (small privatization)"', zakon.rada.gov.ua/laws. [06.03.1992 N 2171-XII]. 47
- Yeats, A. (1997), 'Just How Big Is Global Production Sharing?', *World Bank Policy Research Paper* (1871). 79
- Zaheer, S., Lamin, A. and Subramani, M. (2009), 'Cluster Capabilities or Ethnic Ties? Location Choice by Foreign and Domestic Entrants in the Services Offshoring Industry in India', *Journal of International Business Studies* **40**, 944–968. 45
- Zorome, A. (2007), 'Concept of Offshore Financial Centers: In Search of an Operational Definition', <http://www.imf.org/external/pubs/ft/wp/2007/wp0787.pdf>. [Online]. 47, 57
- Zvirgzde, D., Schiller, D. and Diez, J. (2013), Location choices of multinational companies in Ukraine, in 'Regional Integration: Europe, the Mediterranean and the World Economy'. 44, 45



SOME RIGHTS RESERVED



Unless otherwise expressly stated, all original material of whatever nature created by Olena Kulynych and included in this thesis, is licensed under a Creative Commons Attribution Noncommercial Share Alike 2.5 Italy License.

Check creativecommons.org/licenses/by-nc-sa/2.5/it/ for the legal code of the full license.

Ask the author about other uses.