

Cieřlik, Andrzej; Gurshev, Oleg

## Article

# Determinants of inward FDI in Ukraine: Does political stability matter?

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## Empirical Paper

Andrzej Cieřlik\*, Oleg Gurshev

# Determinants of inward FDI in Ukraine: Does political stability matter?

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**Abstract:** The main goal of this article is to study the determinants of foreign direct investment (FDI) in Ukraine from 2013 to 2017 that includes the years of armed conflict. We adopt the Knowledge-Capital model as our analytical framework and extend it to include the effects that account for political stability and political regime. The research hypotheses obtained from this framework are verified using the Pseudo-Poisson Maximum Likelihood estimation technique and the bilateral panel data on direct investment stocks from 140 partner countries. Our empirical findings show that access to Ukraine's cheap labor force is the primary reason for inward FDI. Moreover, we find no direct relationship between the political events in Ukraine and the investment stock dynamics as the estimated parameters on the indices of democracy, autocracy, polity, and political stability show no statistical significance.

**Keywords:** foreign direct investment, political stability, Pseudo-Poisson maximum likelihood, Ukraine

**JEL Classification:** F23, P33

## 1 Introduction

Inward foreign direct investment (FDI) is often seen as an important source of physical capital in the post-conflict economies as it complements foreign aid and may generate positive labor market effects. More importantly, FDI is often associated with the transfer of new skills and technologies, stimulates indigenous firms to improve their productive capacities, and facilitates access to foreign markets. Besides, FDI may bring into the host economy secondary spillovers that can affect the performance of indigenous firms. Such spillovers can arise due to the leakage of foreign knowledge or due to the response of indigenous firms to the arrival of multinational enterprises (MNEs). Such spillovers are likely to affect the productivity of indigenous firms in the same industry but can also have effects on wages and international market access, as well as productivity in upstream and downstream industries [Berger and Diez, 2008; Li and Tanna, 2019]. Thus, FDI can help post-conflict countries to shift from aid-dependent to investment-driven development [Turner et al., 2011].

In the case of Ukraine, despite the 30% drop in the overall FDI stocks, the present values have somewhat converged to their pre-2014 levels, which in part may be attributed to the depreciation of the Hryvnia against the US dollar thus making FDI much more attractive. In 2018, the inward FDI stock in Ukraine accounted for \$32.2 billion [State Statistics Service of Ukraine, 2019]. Most FDI in Ukraine originates from the European Union (EU) member states. The top five FDI source countries are Cyprus (\$8.9 billion), the Netherlands (\$6.39 billion), the United Kingdom (\$1.9 billion), Germany (\$1.6 billion), and Switzerland (\$1.51 billion).

\*Corresponding author: Andrzej Cieřlik, Faculty of Economic Sciences, University of Warsaw, Warsaw, Poland.

E-mail: [cieslik@wne.uw.edu.pl](mailto:cieslik@wne.uw.edu.pl)

Oleg Gurshev, Faculty of Economic Sciences, University of Warsaw, Warsaw, Poland.

E-mail: [oleggurshev@gmail.com](mailto:oleggurshev@gmail.com)

Most FDI stock is concentrated in sectors such as manufacturing (\$8.1 billion), wholesale and retail trade (\$5.3 billion), real estate (\$4.1 billion), finance, and insurance (\$3.5 billion).

The main goal of this article is to study empirically the determinants of inward FDI in Ukraine from 2013 to 2017 that includes the years of political instability and the military conflict in Eastern Ukraine. As regards our analytical framework, we adopt the formal Knowledge-Capital (KC) model and extend it to include the effects that account for political instability and the change of the political regime. The research hypotheses obtained from this framework are verified using the Pseudo-Poisson Maximum Likelihood (PPML) estimation technique and the bilateral data on inward FDI stocks from 140 partner countries. Indeed, the economy of Ukraine may still present substantial economic and political risks as a potential FDI destination and is often ranked on par with other post-conflict countries, such as Chad, Nigeria, Mali, and Sudan [Worldwide Governance Indicators, 2019].

The structure of this article is as follows. The next section offers a review of relevant literature. Subsequently, the empirical methodology is described. Finally, we report and interpret our empirical findings. The article ends with concluding remarks, policy recommendations, and guidelines for future research.

## 2 Literature review

In this section, we offer a selective literature review that focuses mainly on the empirical literature on FDI in Ukraine. The first empirical studies on inward FDI in Ukraine started in the second half of the 1990s. The first study by Ishaq [1997] pointed to a combination of political, institutional, and legislative barriers that failed to generate the necessary conditions for inward FDI when compared to other Central and East European (CEE) countries. Subsequently, Lutz et al. [2003] examined the effect of industry-wide and region-wide spillovers on the level of exports of Ukrainian firms and concluded that large urban firms benefited the most from inward FDI and the inward FDI stocks were concentrated in the production of durable goods. Firm-level studies by Jakubiak and Kudina [2008] and Akulava and Vakhitova [2010] confirmed that problems such as ambiguity of the legal system, unclear property rights, the uncertainty of the economic environment remained in place for inward FDI. Moreover, several authors reported pessimistic implications for technological spillovers on the productivity of local firms. For example, Zvirgzde et al. [2013] used an enterprise survey of 153 foreign-owned firms in Ukraine with a focus on location choices and location patterns of inward FDI in Ukraine and concluded that market seeking motive was present in the capital city region of Kyiv as a result of large market potential, access to resources, and institutional quality of the capital. In a more recent study, Oleksyuk [2015] analyzed a potentially deep and comprehensive economic integration between the European Union and Ukraine using a multiregional general-equilibrium simulation model and reported that a reduction of non-tariff barriers would lead to a large income increase in Ukraine. Besides, the liberalization of the barriers to inward FDI would cause new entries of multinational firms in the business services sector and increase the competition in the domestic market. Finally, Kaczmarek [2017] studied the conditions and structure of Polish-originated FDI to Ukraine among 345 firms and reported motives for investment such as attractive production costs, market absorption, tax exemptions, exports to Ukraine, and geographical proximity.

However, the aforementioned studies suffer from several shortcomings. In particular, the relationship between the theory and the data in previous empirical studies is rather vague as they do not use equations that are directly derived from theoretical models. Moreover, these studies do not try to discriminate between competing theories and various reasons for FDI. Finally, still, there are no empirical studies on inward FDI in Ukraine that would use the multi-country bilateral FDI data. Hence, we conclude from the literature review that there is an important gap in the study of inward FDI determinants in Ukraine that we attempt to fill in. Furthermore, recent events of political transition in Ukraine present an opportunity to study the effects of political instability and conflict on the determinants of inward FDI. Therefore, we argue that it is reasonable to use the theoretical framework of the KC model that combines both horizontal and vertical reasons for FDI. Moreover, we extend the original KC model by including proxy variables for political stability and the type of political regime.

The established discourse follows the idea that political instability is negatively correlated with inward foreign direct investment (FDI) as it generates uncertainty and alters the decision-making process of agents in the economy thus increasing costs and risks of performing any FDI-related activities [Carmignani, 2003]. In particular, Resnick [2001] in the empirical study for 19 developing countries from Asia, Latin America, and the Caribbean found that the transition to democracy deterred inward FDI. Besides, political instability and higher levels of democracy also deterred foreign investors.

Subsequently, Busse and Hefeker [2007] using the sample of 83 developing countries found that the majority of political variables, such as political stability, ethnic conflicts, and democracy seemed to matter for FDI inflows. Also, Li and Vashchilko [2010] found that interstate military conflicts reduce bilateral FDI, whereas security alliances, particularly defense pact ones, increase it. More recently, Li et al. [2017] showed that primary sector FDI flows to developing countries were not significantly affected by civil war, whereas the secondary and tertiary sectors' FDI was more sensitive to such an outbreak, potentially leading to reversals of existing FDI.

### 3 Research methodology

The contemporary FDI literature distinguishes between two key reasons for foreign investment: horizontal and vertical [Markusen, 2013; Davies and Markusen, 2020; Riker and Wickramarachi, 2020]. The former allows multinational firms to overcome distance and trade costs and facilitates foreign market access. The latter is made to obtain production inputs at lower costs and it involves international fragmentation of production. From the theoretical perspective, the first research efforts on modeling FDI were focused on explaining the multinational activity between countries that were similar in terms of their levels of per capita income. First, the theoretical models of horizontally-motivated FDI were proposed by Krugman [1983] and Markusen [1984].<sup>1</sup> At about the same time, Helpman [1984] and Helpman and Krugman [1985] proposed the first models of vertically-motivated FDI arising as a result of differences in factor proportions between the developed and the developing countries.<sup>2</sup> Subsequently, the horizontal and vertical reasons for FDI were integrated into a single analytical framework called the Knowledge Capital model proposed by Markusen [2002]. In this model, firms can choose between exporting, horizontally and vertically-motivated FDI depending on various combinations of source and host country characteristics. The KC model developed by Markusen [2002] has been considered the most general model of FDI currently available. Unfortunately, the KC model cannot be solved analytically and most results are based on numerical simulations. For example, according to this model, the national exporting firms prevail when trade costs are low and countries are similar both in market size and in factor proportions. In contrast, horizontally-motivated FDI occurs when trade costs are high and countries are similar both in market size and factor proportions. Finally, vertically-motivated FDI occurs when trade costs are low and countries are similar in market size but dissimilar in factor proportions. Therefore, we propose the following research hypotheses for our empirical study:

*Hypothesis 1:* The smaller the difference in the market size between the source country and Ukraine the bigger the inward FDI stock in Ukraine (horizontal reason).

*Hypothesis 2:* The larger the difference in per worker human capital endowments between the source country and Ukraine the bigger inward FDI stock in Ukraine (vertical reason).

*Hypothesis 3:* The higher the trade cost between the source country and Ukraine the bigger the horizontal FDI stock and the smaller vertical FDI stock in Ukraine.

*Hypothesis 4:* The lower the investment cost in Ukraine the bigger the inward FDI stock in Ukraine (both horizontal and vertical reasons).

*Hypothesis 5:* The higher the political instability in Ukraine the smaller the inward FDI stock in Ukraine (both horizontal and vertical reasons).

<sup>1</sup> Their seminal models have been extended by, *inter alia*, Horstmann and Markusen [1987], Markusen and Venables [1998, 2000], Helpman et al. [2004], Cieřlik [2013, 2015a,b, 2016, 2018], and Cieřlik and Ryan [2012].

<sup>2</sup> These early models have been extended by, *inter alia*, Zhang and Markusen [1999] and Markusen and Venables [2000].

Inward FDI stock in Ukraine is measured using the annual data collected from the yearly reports of the State Statistics Service of Ukraine. As a measure of FDI, we use only equity stocks by source countries from 2013 to 2017. The FDI equity stocks may better reflect the postulated theoretical relationship rather than the sum of equity and debt instruments that were frequently used in the FDI literature [Cieřlik, 2019]. The explanatory variables cover the period of 2012–2017 to account for the lagged estimation. Although the inward FDI data for Ukraine is available for more recent years, the last available year of our sample is for 2017. This is due to the data available for our explanatory variables obtained from the PennWorldTable 9.1. The final data set covers 140 countries from 2012 to 2017 and contains a total of 700 observations. The list of investment source countries is provided in Table A1 in the Appendix.

The difference in the market size between the source country and Ukraine is measured using the squared difference in output-side real GDPs (GDP-DIFF). To assure international comparability, each country's GDP is given at chained purchasing power parities (PPPs) and expressed in constant 2011 US dollars. The GDP data is sourced from the PennWorldTable (PWT) 9.1.

The difference in factor proportions between the source country and Ukraine is measured using the per worker difference in human capital (HC-DIFF). The difference in per worker human capital is calculated using the human capital index. The human capital data is sourced from the PennWorldTable (PWT) 9.1.

The distance-related trade costs between the source country and Ukraine are expressed as a geographic distance (DISTANCE), which is measured as the distance between the capital city of a source country and the capital of Ukraine (Kyiv). The geographic distance is expressed in kilometers. The distance data is obtained from the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII).

Moreover, to approximate the trade and investment barriers and restrictions, we include the trade and investment freedom indexes for source countries and Ukraine, respectively ( $TF_{parent}$ ,  $TF_{Ukraine}$ ,  $IF_{Ukraine}$ ). These indexes are sourced from the Heritage Foundation. The trade freedom indexes measure freedom based on the burdens of tariffs and non-tariff barriers of a country. The investment freedom index measures freedom from restrictions on the movement and use of investment capital within and across the country's borders. The higher values of these indexes are associated with more open and liberal trade and investment regimes in the country and vice-versa.

We also control for the combined economic size of the investment partners that is measured as the sum of the source country GDP and Ukraine's GDP (GDP-SUM). The GDP-SUM variable is calculated using the real GDP data expressed at constant 2011 national prices in US dollars. The data on the joint economic size is sourced from the PennWorldTable (PWT) 9.1.

Finally, to account for the political regime shift and political stability in Ukraine, we introduce indices for democracy, autocracy, political stability, absence of terrorism/violence, and polity index score. Firstly, the democracy index measures the presence of democratic institutions and procedures, governance constraints, civil liberties, and the degree of political participation. The Democracy Index is an additive eleven-point scale (0–10), where 0 is the least democratic governance system and 10 the most democratic. Secondly, the autocracy index measures the governance properties such as lack of regularized political competition and concern for political and civil freedoms. The autocracy index is measured similarly to the democracy index using a 10 point scoring system. Lastly, the polity index is measured as a difference between democracy and autocracy indices, and it scores the country's political system between +10 (strongly democratic) to –10 (strongly autocratic). The indices that represent a type of political regime are sourced from the Polity IV annual time series, which is maintained by the Center for Systemic Peace. Political stability and absence of terrorism/violence index are sourced from The Worldwide Governance Indicators Project [2019]. It measures perceptions of the likelihood of political instability and/or politically-motivated violence in a given country.

The definitions of our explanatory variables and their summary statistics are reported in Tables A2 and A3 in the Appendix, respectively. The calculated pairwise correlations between the explanatory variables used in our empirical study are shown in Table A4 in the Appendix. To account for collinearity between the variables of political stability, democracy, autocracy, and polity, we separately include each of the variables in estimations.

The estimated empirical model in the most general form is specified as follows:

$$\begin{aligned} FDI_{ijt} = & \beta_0 + \beta_1 \ln(GDP_{it} + GDP_{jt}) + \beta_2 \ln(GDP_{it} - GDP_{jt})^2 + \beta_3 \ln|HC_{it} - HC_{jt}| + \beta_4 \ln DISTANCE_{ij} + \beta_5 IF_{it} \\ & + \beta_6 TF_{it} + \beta_7 TF_{jt} + \beta_8 STAB_{it} + \beta_9 DEMOC_{it} + \beta_{10} AUTOC_{it} + \beta_{11} POLITY_{it} + \varepsilon_{ijt} \end{aligned} \quad (1)$$

where  $FDI_{ijt}$  is the bilateral inward FDI stock from source country  $i$  in host country  $j$  in year  $t$ ,  $GDP_{it}$  and  $GDP_{jt}$  are the GDPs of countries  $i$  and  $j$  in year  $t$ ,  $HC_{it}$  and  $HC_{jt}$  are the human capital indexes for countries  $i$  and  $j$  in year  $t$ ,  $DISTANCE_{ij}$  is the geographical distance between the capitals of countries  $i$  and  $j$ ,  $IF_{it}$  is the investment freedom index for country  $i$  in year  $t$ ,  $TF_{it}$  are  $TF_{jt}$  trade freedom indexes for country  $i$  and in country  $j$  in year  $t$ ,  $STAB_{it}$  is a variable measuring political stability in country  $i$  in year  $t$ ,  $DEMOC_{it}$  is a variable measuring the level of institutionalized democracy in country  $i$  in year  $t$ ,  $AUTOC_{it}$  is a variable measuring the level of institutionalized autocracy in country  $i$  in year  $t$ ,  $POLITY_{it}$  is a variable measuring the overall polity score for country  $i$  in year  $t$ , while  $\varepsilon_{ijt}$  is the error term, for  $i = \text{Ukraine}$ ,  $j = 1, \dots, 140$  investment partners of Ukraine,  $t = 2013, \dots, 2017$ , and  $\beta$ 's are the parameters to be estimated.

Our estimation technique is based on the PPML as it deals with the problems of zero dependent variables and log-transformation as well as overdispersion in the data. When compared to other approaches such as Ordinary Least Squares, Nonlinear Least Squares, Feasible Generalized Least Squares, and Tobit models the PPML performs best [Santos Silva and Tenreyro, 2006]. In particular, it can produce unbiased and consistent estimates, robust to different patterns of heteroskedasticity.

**Table 1.** Benchmark estimation results

Explanatory variable	(1)	(2)	(3)	(4)
GDP-SUM	0.885*** (0.168)	0.885*** (0.168)	0.885*** (0.168)	0.885*** (0.168)
GDP-DIFF	0.055 (0.041)	0.055 (0.041)	0.055 (0.041)	0.055 (0.041)
HC-DIFF	0.411** (0.188)	0.411** (0.187)	0.411** (0.188)	0.411** (0.188)
DISTANCE	-0.895*** (0.083)	-0.893*** (0.083)	-0.893*** (0.083)	-0.895*** (0.083)
TF <sub>source</sub>	0.091*** (0.026)	0.091*** (0.026)	0.091*** (0.026)	0.091*** (0.026)
TF <sub>Ukraine</sub>	1.130 (2.235)	0.511 (1.211)	0.511 (1.211)	0.511 (1.211)
IF <sub>Ukraine</sub>	-0.030 (0.074)	-0.007 (0.055)	-0.007 (0.055)	-0.007 (0.055)
STAB	1.946 (3.020)			
DEMOC		1.293 (1.882)		
AUTOC			-1.293 (1.882)	
POLITY				0.646 (0.941)
Constant	-101.188 (184.833)	-58.723 (112.411)	-50.960 (101.417)	-54.842 (106.907)
Time effects	No	No	No	No
Observations	700	700	700	700
R <sup>2</sup>	0.068	0.068	0.068	0.068

**Note:** Robust standard errors in parentheses; \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

**Source:** Own calculations.



**Table 2.** Benchmark estimation with fixed time effects results

Explanatory variable	(1)	(2)	(3)	(4)
GDP-SUM	0.884*** (0.168)	0.884*** (0.168)	0.884*** (0.168)	0.884*** (0.168)
GDP-DIFF	0.055 (0.041)	0.055 (0.041)	0.055 (0.041)	0.055 (0.041)
HC-DIFF	0.411** (0.187)	0.411** (0.187)	0.411** (0.187)	0.411** (0.188)
DISTANCE	−0.893*** (0.083)	−0.893*** (0.083)	−0.893*** (0.083)	−0.893*** (0.083)
TF <sub>source</sub>	0.091*** (0.026)	0.091*** (0.026)	0.091*** (0.026)	0.091*** (0.026)
TF <sub>Ukraine</sub>	−0.149 (0.368)	−0.149 (0.368)	−0.149 (0.368)	Omitted N/A
IF <sub>Ukraine</sub>	0.021 (0.065)	0.021 (0.065)	0.021 (0.065)	0.014 (0.072)
STAB	Omitted N/A			
DEMOC		Omitted N/A		
AUTOC			Omitted N/A	
POLITY				0.147 (0.363)
Constant	221.094 (369.924)	221.094 (369.624)	221.094 (369.624)	155.140 (483.417)
Time effects	Yes	Yes	Yes	Yes
Observations	700	700	700	700
R <sup>2</sup>	0.068	0.068	0.068	0.068

**Note:** Robust standard errors in parentheses; \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

**Source:** Own calculations.

## 4 Empirical findings

In this section, we report and interpret our empirical findings. The benchmark estimation results obtained without controlling for individual time effects are reported in Table 1. Due to the collinearity between political and stability indices, they are included separately in each regression and reported separately in columns (1), (2), (3), and (4), respectively. The majority of the estimated coefficients display the signs that are in line with the theory, but not all of them are statistically significant. In particular, the reported coefficients in columns (1), (2), (3), and (4) favor the vertical reason for FDI over the horizontal one as the coefficients that are commonly associated with a horizontal reason, such as GDP-DIFF, IF<sub>Ukraine</sub>, and TF<sub>Ukraine</sub> are not statistically significant at all. Notably, the estimated parameter on the differences in human capital between Ukraine and source countries is positive and statistically significant at the 5% level. This supports the notion that Ukraine's cheap labor force is of interest to MNEs and generates inward FDI stock, suggesting a strong vertical motive. Furthermore, trade freedom in the source country, which serves as a proxy for trade cost TF<sub>source</sub>, is significant already at the 1% level and displays a positive sign that further confirms a vertical reason for FDI. Moreover, the estimated parameter on the geographic distance variable is negative and statistically significant already at the 1% level. This is also in line with the expectations. Hence, these results support the vertical reason for FDI in Ukraine.

Furthermore, the estimated parameters on the indices of democracy, autocracy, and polity display expected signs and but are not statistically significant. The estimated parameter on the political stability index displays an expected positive sign as more politically stable countries attract both modes of FDI, but it carries no statistical significance to the model. Moreover, the estimated coefficient on the GDP-SUM

**Table 3.** One-period lagged estimation results

Explanatory variable	(1)	(2)	(3)	(4)
GDP-SUM	0.969*** (0.161)	0.970*** (0.161)	0.970*** (0.161)	0.970*** (0.161)
GDP-DIFF	0.037 (0.041)	0.037 (0.041)	0.037 (0.041)	0.037 (0.041)
HC-DIFF	0.435** (0.181)	0.435** (0.182)	0.435** (0.182)	0.435** (0.182)
DISTANCE	-0.913*** (0.091)	-0.913*** (0.091)	-0.912*** (0.091)	-0.912*** (0.091)
TF <sub>source</sub>	0.075** (0.024)	0.076** (0.024)	0.076** (0.024)	0.076** (0.024)
TF <sub>Ukraine</sub>	-0.143 (0.281)	-0.125 (0.295)	-0.125 (0.295)	-0.125 (0.295)
IF <sub>Ukraine</sub>	0.008 (0.088)	0.004 (0.088)	0.004 (0.088)	0.004 (0.088)
STAB	0.202 (0.455)			
DEMOC		0.365 (0.560)		
AUTOC			-0.365 (0.560)	
POLITY				0.182 (0.280)
Constant	4.998 (24.35)	1.100 (27.488)	3.296 (25.52)	2.198 (26.472)
Time effects	No	No	No	No
Observations	700	700	700	700
R <sup>2</sup>	0.063	0.063	0.063	0.063

**Note:** Robust standard errors in parentheses; \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

**Source:** Own calculations.

variable is significant at the 1% level and displays a positive sign. This suggests that FDI increases with the combined economic size of Ukraine and investment partner countries. Moreover, horizontal motive factors such as trade and investment freedoms are not significant in the model, which implies that the horizontal mode of FDI is of lesser importance in Ukraine.

The robustness of our benchmark estimation results is studied in the subsequent tables. Table 2 reports estimation results obtained from specification (1), having controlled for individual time effects. The results are almost identical in qualitative terms compared to our benchmark results reported in Table 1 and support the vertical motive of FDI in Ukraine. In the case of time effects estimated parameters on the indices of democracy, autocracy, and political stability are omitted during the computation of PPML regression, while the estimated parameter on the polity index displays an expected sign, but it is not statistically significant.

Table 3 reports estimation results obtained from the specification with the one-period lagged independent variables to avoid the potential simultaneity problem. These estimation results are similar in qualitative terms to the results reported in Table 1. The estimated parameters on independent variables point to a stronger vertical motive for FDI in Ukraine than our benchmark results from Table 1. In this type of specification, the estimated parameters on our democracy, autocracy, polity, and political stability variables are in line with our initial benchmark results, although carry less magnitude.

Finally, in Table 4, we show estimation results obtained from the specification with the one-period lagged independent variables while controlling for individual time effects. The estimation results are very similar to the results reported in Table 3. As a result, it can be concluded that obtained estimation results support the vertical mode of FDI in Ukraine. Similarly to Table 2, estimated parameters on the indices of democracy, autocracy, and political stability are omitted during the computation of PPML regression. Lastly, the estimated parameter on the polity index displays an expected sign but it is not statistically significant.



**Table 4.** One-period lagged estimation results with time effects

Explanatory variable	(1)	(2)	(3)	(4)
GDP-SUM	0.971*** (0.163)	0.971*** (0.163)	0.971*** (0.163)	0.971*** (0.163)
GDP-DIFF	0.037 (0.041)	0.037 (0.041)	0.037 (0.041)	0.037 (0.041)
HC-DIFF	0.435** (0.181)	0.435** (0.181)	0.435** (0.181)	0.435** (0.181)
DISTANCE	−0.913*** (0.091)	−0.913*** (0.091)	−0.913*** (0.091)	−0.913*** (0.091)
TF <sub>source</sub>	0.076** (0.024)	0.076** (0.024)	0.076** (0.024)	0.076** (0.024)
TF <sub>Ukraine</sub>	−0.123 (0.302)	−0.313 (0.312)	−0.313 (0.312)	−0.113 (0.310)
IF <sub>Ukraine</sub>	0.015 (0.096)	0.025 (0.097)	0.025 (0.097)	0.009 (0.097)
STAB	0.289 (0.453)			
DEMOC		Omitted N/A		
AUTO			Omitted N/A	
POLITY				0.179 (0.281)
Constant	3.112 (26.290)	18.736 (27.531)	18.736 (27.531)	1.124 (28.722)
Time effects	Yes	Yes	Yes	Yes
Observations	700	700	700	700
R <sup>2</sup>	0.063	0.063	0.063	0.063

**Note:** Robust standard errors in parentheses; \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

**Source:** Own calculations.

## 5 Conclusion

In this article, we investigated empirically various reasons for inward FDI in Ukraine during the most recent period 2013–2017 using the PPML estimation method. Our estimated specification was obtained directly from the theory and extended to account for the political regime shift and political stability in Ukraine. Our benchmark results for the 140-partner country sample period point to the vertical motive as the primary determinant of FDI in Ukraine. The estimation results obtained from the specification with the one-period lagged independent variables, as well as estimation results with additional individual time effects, support our benchmark findings. These results are very different from the results obtained for other countries that typically find the importance of both vertical and horizontal or horizontal reasons only [Cieřlik, 2020a,b,c]. On the other hand, our framework finds no direct relationship between political events in Ukraine and FDI stock dynamics as the estimated parameters on the indices of democracy, autocracy, and polity are either omitted during the estimation of the empirical model or show no statistical significance.

Our findings have multiple policy implications. In the short-term, Ukraine has to focus on the improvement of market access mechanisms as severe high barriers to entry continue to exist. The observed vertical motive for FDI may contribute to increased economic inequality in the economy thus much of the focus must be toward controlling for such effects. Upcoming energy sector and land privatizations may yield positive inward FDI, although newly created markets could use a set of policies that promote and encourage competition rather than collusion. Overall, has put notable efforts in improving its FDI reporting procedures<sup>3</sup> and national economic transparency to the international investor community thus our current

<sup>3</sup> Since June 2020, the Central Bank of Ukraine has begun to report FDI data in complete accordance with the International Monetary Fund's (IMF) manual on the balance of payments and investment position reporting standards [IMF, 2009].

investment outlook is positive and it is likely that Ukraine may experience a period of robust inward FDI growth motivated by its quality labor force and relatively lower national wages compared to other CEE countries.

Lastly, we suggest several possible extensions of this study. The proposed analytical framework should be applied to a longer period, which may yield more accurate results. Although, it is doubtful that the inward FDI motive has experienced a noticeable shift in the past decade. Moreover, including control effects for factors such as the level of corruption, civil rights and the rule of law in the empirical model may provide deeper insights into the nature of FDI motives. The scale of research can be expanded to include the rest of post-Soviet countries to analyze in detail FDI determinants in the post-transition countries. Moreover, it would be insightful to study foreign investment decisions at the firm and sectoral levels in addition to the country level. Finally, it would be useful to study also the determinants of the regional distribution of FDI.

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## Appendix

**Table A1.** Sample of countries used in the estimation

<b>Sample</b>	Albania, Algeria, Angola, Argentina, Armenia, Australia, Austria, Bahrain, Bangladesh, Barbados, Belgium, Belize, Benin, Bolivia, Botswana, Brazil, Brunei Darussalam, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Central African Republic, Chile, China, Colombia, Costa-Rica, Croatia, Cyprus, Czech Republic, Denmark, Dominican Republic, D.R. of the Congo, Ecuador, El Salvador, Estonia, Ethiopia, Finland, Fiji, France, Gabon, Gambia, Germany, Ghana, Greece, Guatemala, Haiti, Honduras, Hungary, Hong Kong, Japan, Jamaica, Jordan, India, Indonesia, Italy, Iran, Iraq, Israel, Kazakhstan, Kenya, Kyrgyzstan, Kuwait, Latvia, Lesotho, Liberia, Lithuania, Luxembourg, Macau, Madagascar, Malaysia, Mali, Malawi, Maldives, Malta, Mauritius, Mauritania, Mexico, Moldova, Mongolia, Morocco, Mozambique, Myanmar, Namibia, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Korea (Rep of), Romania, Rwanda, Saudi Arabia, Senegal, Serbia, Sierra Leone, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Syria, Sudan, Swaziland, Sweden, Switzerland, Tanzania, Taiwan, Tajikistan, Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey, Venezuela, Vietnam, Yemen, Ukraine, Uruguay, Uganda, United Arab Emirates, United Kingdom, United States, Zambia, Zimbabwe
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**Source:** Own summary.

**Table A2.** Variable description

Variable	Description	Data source
FDI	Bilateral direct investment equity stock data from non-resident entities, includes investment by a direct investor in its direct investment enterprise (immediate or not), retail funds, real estate investment (including investment properties and vacation homes), pass-through transactions, transactions that reach or surpass the threshold of 10 percent or more voting power, reverse investment by a direct investment enterprise in its own immediate or indirect investor [IMF, 2009]. Calculated as: Direct investment enterprises to direct investor equity – reverse investment equity + nonresident equity – resident equity	State Statistics Service of Ukraine
GDP-SUM	Log of GDP sum (in \$US million) $\ln(Y_{it} + Y_{jt})^2$	Penn WorldTable 9.1
GDP-DIFF	Log of squared GDP difference (in \$US million) $\ln(Y_{it} - Y_{jt})^2$	
HC-DIFF	Log of human capital difference, adjusted for the number of employed population $\ln  Hit / Lit - Hjt / Ljt $	
DISTANCE	Log of geographical distance between the source and host countries (between capital cities, in km)	CEPII
TF	Trade freedom index	Heritage Foundation
IF	Investment freedom index	
STAB	Political Stability and Absence of Violence/Terrorism index that measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism	Worldwide Governance Indicators
DEMOC	Democracy index that measures the presence of democratic institutions and procedures, governance constraints, civil liberties and degree of political participation	Center for Systemic Peace
AUTOC	Autocracy index that measures the governance properties such as lack of regularized political competition and concern for political and civil freedoms	
POLITY	Polity index is measured as a difference between democracy and autocracy indices, it scores country's political system between +10 (strongly democratic) to -10 (strongly autocratic)	

**Source:** Own summary.

**Table A3.** Summary statistics

Variable	Mean	SD	Min	Max
FDI	245.099	1204.861	0	17725.6
GDP-SUM	13.508	0.740	12.850	16.779
GDP-DIFF	25.500	2.242	12.496	33.407
HC-DIFF	−1.095	1.960	−8.390	3.197
DISTANCE	5712.067	3755.745	399.460	17284.29
TF <sub>source</sub>	76.825	10.596	40.6	90
TF <sub>Ukraine</sub>	85.62	0.627	84.4	86.2
IF <sub>Ukraine</sub>	20	3.164	15	25
STAB	−1.698	0.463	−2.02	−0.78
DEMOC	5.2	0.400	5	6
AUTO	0.8	0.400	0	1
POLITY	4.4	0.800	4	6

**Source:** Own summary.**Table A4.** Correlations between variables

Variable	GDP-DIFF	HC-DIFF	GDP SUM	DISTANCE	TF <sub>source</sub>	TF <sub>Ukraine</sub>	IF <sub>Ukraine</sub>	STAB	DEMOC	AUTO	POLITY
GDP-DIFF	1	−0.058	0.937	0.041	0.029	0.008	0.007	−0.009	−0.010	0.010	−0.010
HC-DIFF		1	−0.133	0.050	0.035	−0.005	−0.003	0.006	0.006	−0.006	0.006
GDP SUM			1	0.011	0.046	0.001	0.009	0.000	−0.001	0.001	−0.001
DISTANCE				1	−0.120	0.000	0.000	0.000	0.000	0.000	0.000
TF <sub>source</sub>					1	0.020	0.014	−0.022	−0.025	0.025	−0.025
TF <sub>Ukraine</sub>						1	0.050	−0.986	−0.972	0.972	−0.972
IF <sub>Ukraine</sub>							1	0.061	0.000	0.000	0.000
STAB								1	0.992	−0.992	0.992
DEMOC									1	−1	1
AUTO										1	−1
POLITY											1

**Source:** Own calculations.