

DETERMINANTS OF FDI IN THE NEW EU MEMBER STATES

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Abstract

The paper analyses the location attractiveness of the new EU member states for foreign investors. Our aim is to identify the main factors shaped by the public policies that underlie the FDI stocks in these countries. Based on the literature, these factors are grouped into four pillars: the quality of institutions, the quality of the labour market, the tax burden and the quality of the infrastructure. Their impact on FDI is tested using a fixed effects panel data approach in the ten new EU member states in Central and Eastern Europe. Each of the four pillars is built on the variables already identified in the literature as FDI determinants. The empirical analysis is applied in two stages: in the first stage, we established the variables that are significant for FDI for each of the four pillars. In the second stage, we built an econometric model based on the variables previously found as significant for FDI.

We conclude that the market dimension, expressed as the volume of GDP, the unit labour cost, the development of the infrastructure and the level of macroeconomic stability given by the dimension of the public debt are the main determinants explaining the distribution of FDI in the new EU member states. Therefore, the main attraction to investors was the dimension of the country, as an exponent of the consumption market, and the cheap labour. The motivation of the investors in this region is market and resources seeking. The shift towards efficiency-seeking FDI can be signalled by the significance among relevant factors, according to the empirical results, of the variable related to the development of the telecommunication infrastructure.

Keywords: FDI, panel data analysis, labour market, institutions' quality,

Rezumat

Lucrarea analizează atractivitatea noilor state membre ale UE pentru investitorii străini din punct de vedere al avantajelor de localizare. Scopul este de a identifica principalii factori determinanți pentru ISD aflați sub influența politicilor publice, care stau la baza distribuției stocurilor de ISD în aceste țări. Pe baza literaturii de specialitate, am divizat acești factori în patru piloni: calitatea instituțiilor, calitatea pieței muncii, povara fiscală și calitatea infrastructurii. Impactul asupra ISD este studiat utilizând analiza prin date panel cu efecte fixe în cele 10 noi state membre ale UE din Europa Centrală și de Est. Fiecare dintre cei patru piloni este construit pe baza variabilelor deja identificate în literatura de specialitate ca fiind determinanți ai ISD. Analiza empirică este aplicată în două etape: în prima etapă am identificat variabilele semnificative pentru fiecare pilon în parte. În a doua etapă am construit modelul econometric final pe baza variabilelor care s-au dovedit semnificative anterior pentru atragerea ISD.

Am ajuns la concluzia că principalii determinanți care explică distribuția ISD în regiune sunt dimensiunea pieței, exprimată prin nivelul PIB, costurile unitare cu forța de muncă, dezvoltarea infrastructurii

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și gradul de stabilitate macroeconomică, exprimat de dimensiunea datoriei publice. Prin urmare, principala atracție pentru investitori a constituit-o dimensiunea pieței, ca exponent al capacității de consum, și forța de muncă ieftină. Motivația investitorilor în această regiune este căutarea de piețe și de resurse ieftine. Trecerea spre ISD în căutare de eficiență poate fi semnalată prin includerea între variabilele semnificative, pe baza analizei empirice, a variabilei care ține de gradul de dezvoltare al infrastructurii de telecomunicații.

Cuvinte-cheie: ISD, date panel, piața muncii, calitatea instituțiilor, infrastructură

Cod JEL: C23, F23, P35, O52

Cod REL: 10G, 10F, 18F

1. Introduction

The influence of public policy on FDI determinants can be placed among the theories of international investment that point to the existence of several advantages in the area where the investors decide to locate. In the literature, the cheap labour, the endowment with natural resources, a wide marketplace or lower taxation are the most frequently mentioned types of such advantages. Botello and Davila (2015) point that, among the investment decision of a company that determine the international investment flow, the role of the government policies is equally important, as governments can create attractive factors for investments in strategic sectors.

Bellak et al. (2008) consider that the public policy instruments already became usual in attracting FDI. Now, the only thing that must become clear is the domain that should be influenced in order to offer the best response in terms of FDI inflows. In this respect, the paper analyses the location attractiveness of the new EU member states for foreign investors. Our aim is to identify the main factors shaped by the public policies that underlie the FDI stocks in these countries.

The paper is structured as follows: section 2 provides some insights in the literature of FDI determinants. In section 3, we offer a thorough presentation of the empirical model and we explain the results. The last section summarizes the conclusions.

2. Literature review

The role of public policies in attracting FDI is especially interesting for the ex-transition countries in Central and Eastern Europe. For Mateev and Tsekov (2012), one of the major differences between the Eastern European region and the Western EU countries in attracting FDI is due to the quality of institutions. The argument is available if we consider that, after the fall of the communism, these countries needed to shape their institutions according to the market economy. Such an extensive process included, inevitably, profound transformations on the labour market, on the efficiency of the public institutions and on improving the business environment. Later, this process was improved by the obligations accepted in order to obtain the EU membership. In this respect, Goodspeed et al. (2009) suggested that public policy makers in developing countries should take into consideration the improvement of the governance institutions and the public infrastructure. These measures would increase their countries' efficiency in attracting FDI.

For Berkoz and Turk (2005), there are traditional and environmental factors that determine the choice of the investment's location. In the category of traditional factors are included the market potential, the labour costs or economic growth and also the government policies. The environmental category includes the political, legal and infrastructure factors. In describing the policy variables, Bellak et al. (2008) relate to the corporate taxes, the public research and development expenditure, the information and communication infrastructure, the institutional environment related to FDI and the labour market, as regards the skill level of workers and the labour costs.

A brief literature review on the factors shaped by public policies that are able to intervene in the choice of the foreign investment' location is presented in Paul et al. (2014). The paper covers, broadly, the results for the studies focused on the transition and developing economies and emphasize four pillars that are influenced by public policies: the quality of institutions, the development of infrastructure, the labour market and the tax burden.

These factors proved to be determinants of FDI, according to the literature, but their impact is frequently depending on the investigated period or group of countries. For example, Popovici (2015a) uses a fixed effects panel data for establishing the difference between FDI determinants in the field of the labour market, the telecommunications infrastructure and the quality of institutions during 1994 until 2003 (the transition period) and during 2004 until 2013 (the years that were characterized by the EU adhesion process and the economic crisis). While the quality of institutions and the commercial openness represented the main interest of investors in the first period, the mobile infrastructure and cheap labour force are the FDI determinants in the last period. The analysis is provided for the 11 newest EU member states. In an earlier research on investigating the labour market determinants for FDI, Popovici (2015b) establishes that the unqualified labour force is the main interest for investors in the Eastern European countries, as compared to the Western ones, where the cheap labour force is desired, because it is already endowed with a certain degree of education.

An older approach on the subject of the impact of public policies on FDI was described in Paul et al (2014) and Popovici and Calin (2012). The first paper employs the TOPSIS method in order to establish the attractiveness degree for FDI in CEE countries in two years - 2007 and 2010 and establishes that, under the assumed hypotheses, Estonia is the most attractive country for FDI. The second one computes a public policy index for assessing the relation in the public policies attractiveness and the inward FDI in some countries in Eastern and Central Europe. The conclusion points that economies with better public policies in infrastructure, institutions' quality, labour market and taxation are more attractive for FDI. In contrast to the present research, the mentioned studies already consider that the selected variables are public policy determinants for FDI.

3. Methodology

Due to a low number of observations for each country, we employed the panel data methodology for identifying the FDI determinants. Panel data is seen in the literature as more suitable than the analysis of time series or cross-section data series, as it offers a larger source of information and provides more complex observations on the behaviour's patterns of economic agents (Baltagi, 2005; Hsiao, 2006; Bruderl, 2005).

Hsiao (2006) certifies the widespread use of panel data model where the effects of explanatory variables are invariant both in time and at cross level, but the effects of omitted variables can be decomposed into individual, period or cross-section and period effects. The general equation for panel data is presented below:

$$Y_{it} = \alpha + \beta_{it}' X_{it}' + \delta_{it} + \gamma_{it} + \varepsilon_{it}$$

where Y_{it} is the dependent variable, X_{it}' is the k -dimensional vector of regressors, ε_{it} is the error term with an average of 0 and constant variance for N cross-sections ($i=1, 2, \dots, N$) for each period t , where $t = 1, 2, \dots, T$. The free term is the parameter α , constant for either specification, while δ_{it} and γ_{it} are the specific effects, fixed or random, corresponding to the cross-sections or to the time period. In our analysis, we will employ the fixed-effects panel model, as a consequence of some lack in the data.

The empirical analysis is carried out using ten countries ($N=10$), during nine years ($T=9$). The stocks of FDI are the dependent variable, while the independent variables are grouped in the X_{it} vector according to the four pillars already mentioned.

We apply the panel data methodology in two phases: in the first phase, the equations are estimated for each of the four pillars in order to identify the significant factors for FDI in each domain. In the second phase, the final equation is estimated, taking into account the significant variables identified in the first step, to which we add the control variables. We employed a similar two-steps procedure in Popovici (2015a) due to methodological constraints as regards the number of the dependent variables. Still, as compared to the already mentioned paper, in the present one we focus on a shorter period and we better develop the pillars taken into account (for example, the infrastructure pillar also contains variables describing the road, rail and electricity infrastructure, the tax burden pillar is added).

3.1 Data

The explanatory variables were chosen as proxies of the four public policy pillars identified in the literature, based on the FDI theories that distinguish between horizontal and vertical FDI and for explaining the motivations of investors in choosing the location of the investment. The dependent variable is expressed by the FDI stocks in each country in the CEE region during 2003-2011. Data are provided by UNCTAD and were transformed for being expressed in Euros. The independent variables are grouped into the four pillars expressing a domain of intervention for public policies, as follows: the quality of institutions, the labour market, the fiscal burden and the infrastructure. We also used the GDP and the GDP per capita as control variables. The variables are presented in Table 1.

TABLE 1. THE DEFINITION AND SOURCES OF VARIABLES

Name	The variable and the unit of measurement	Data source
Independent variables		
<i>I. Quality of institutions</i>		
DAT	Public debt, % of GDP	Eurostat
BUG	Budgetary deficit, % of GDP	Eurostat
COR	Control of corruption, standard normal units ranging from -2.5 to 2.5	World Bank

GVF	Government effectiveness, standard normal units ranging from -2.5 to 2.5	World Bank
RLW	Rule of law, standard normal units ranging from -2.5 to 2.5	World Bank
RGQ	Regulatory quality, standard normal units ranging from -2.5 to 2.5	World Bank
POL	Political stability and absence of violence, standard normal units ranging from -2.5 to 2.5	World Bank
II. Labour market		
RULC	Real unit labour cost (euro), expressed as annual growth	Ameco
LAB	Nominal compensation per employee, euro	Ameco
ITR	Implicit tax rate on labour, %	Eurostat
PR	Labour productivity, euro per hour worked	Eurostat
SCH	The percentage of persons who completed the secondary stage of education, %	World Bank
RS	Unemployment rate, %	Eurostat
III. Tax burden		
EATR	Effective average tax rate, %	European Commission
STAT	Statutory tax rate, %	KPMG, European Commission
TVA	Value added tax%	KPMG, European Commission
IV. Infrastructure		
MOB	Number of people who have subscriptions to mobile phone services per 100 inhabitants	World Bank
NET	Number of people with access to the internet network of 100 inhabitants	World Bank
RR	The length of motorways, other roads and railways, compound as the average number of kilometres of motorways, other roads and railways that are found per thousand km sq.	Eurostat
ROADF	The annual road freight transport, millions of tonnes/km	Eurostat
RWG	The annual rail freight transport, millions of tonnes/km	
AIR	Air traffic, the number of commercial and passengers flights	Eurostat
ELC	Electrical capacity, MW	Eurostat

Source: author's computations

3.2 The first phase

In the first step, we identified the FDI determinants for each of the four public policy pillars. For stationarity reasons, we employed logarithm or first level series. The equations were estimated using cross-section fixed-effects (CS), period fixed effects (PE) and cross-section and period fixed-effect (CS-PE). In the first specification (CS), the intercept is varying across the countries; we found that the power of explanation for this model is quite low compared to the other two specifications, where the group of countries became increasingly less homogeneous, allowing the variation of the coefficients and of the intercept. The results obtained in this step are presented in Annex 1.

3.3 The second phase

For this phase, we employed only the significant variables provided by the results of the first phase. The CS specification proved to be, each time, less efficient in explaining the dependent variable, therefore we will drop it from our analysis. The significant variables for the PE specification are presented in Table 2 below:

Table 2. The significant variables for each pillar

	PE	CS-PE
Quality of institutions	DAT	DAT, GVF
Labour market	RULC, ITR, RS	RULC
Tax burden	EATR/STAT	
Infrastructure	MOB, ROADF, ELC	MOB, ROADF, ELC

Source: author's computations

The equation built in this phase will be estimated starting with these variables, to which we add the control variables.

3.4 Results

For the PE specification, we estimated six equations: in the first one (model 1), we included the GDP level (GDP), the public debt (DAT), the real unit labour costs, the mobile telecommunications infrastructure (MOB), the statutory rate of taxation (STAT), the GDP per capita (GDP); in the second model (model 2) we changed the statutory tax rate with the effective average taxation rate (EATR), and then we successively added the other variables for computing the rest of the models: the annual road freight transport (ROADF - model 3), the unemployment rate (RS - model 4), the electricity infrastructure (ELC - model 5) and the implicit tax rate on labour (ITR - model 6).

The first model is the most suitable for explaining the FDI stocks in the new EU member states, according to the value of adjusted R^2 . Any other variable added (in the models from 3 to 6) brings no improvement to the initial model and penalizes it, according to the values of $\bar{R}^2$. The Durbin Watson value, close to 2, confirms the lack of correlation among variables and the quality of the models.

The significant variables are GDP, DAT, RULC and MOB, each of them having the expected signs. The dimension of the market, expressed by the GDP, is among the main factors that attract investors in this region. The macroeconomic stability also influences the location decision, proving that investors prefer a safe and financially stable environment, whose

indebtedness should not raise problems. The level of public debt is significant and has a negative impact on FDI. The labour costs (RULC) continues to be an essential determinant for investors in the CEE region, with the highest impact on FDI, according to the coefficients. The investors are following countries with low labour costs compared to the productivity.

TABLE 3. THE RESULTS OF THE PE SPECIFICATION

		(1)	(2)	(3)	(4)	(5)	(6)
GDP	Coefficient	0,592**	0,597**	0,293	0,588**	0,594**	0,520**
	t-Statistic	2,595	2,602	1,205	2,557	2,592	2,173
DAT	Coefficient	-0,210**	-0,198**	-0,044	-0,207**	-0,204**	-0,209**
	t-Statistic	-2,468	-2,315	-0,473	-2,405	-2,365	-2,396
RULC	Coefficient	-0,595***	-0,524	-0,198	-0,602***	-0,616***	-0,699***
	t-Statistic	-1,839	-1,622	-0,573	-1,843	-1,885	-1,870
MOB	Coefficient	0,276**	0,313**	0,146	0,271***	0,271**	0,238
	t-Statistic	2,036	2,419	0,946	1,969	1,989	1,658
GDPC	Coefficient	-0,536	-0,473	0,149	-0,601	-0,562	-0,640
	t-Statistic	-1,376	-1,217	0,351	-1,340	-1,427	-1,523
STAT	Coefficient	-0,003		-0,002	-0,003	-0,003	-0,003
	t-Statistic	-1,103		-0,874	-1,130	-1,072	-1,093
EATR	Coefficient		-0,078				
	t-Statistic		-0,771				
ROADF	Coefficient			0,084			
	t-Statistic			0,869			
RS	Coefficient				-0,024		
	t-Statistic				-0,298		
ELC	Coefficient					-0,089	
	t-Statistic					-0,606	
ITR	Coefficient						-0,376
	t-Statistic						-1,414
C	Coefficient	0,132*	0,064*	0,097	0,137**	0,132**	0,140*
	t-Statistic	2,038	2,749	1,511	2,026	2,033	2,093
$\overline{R^2}$		68,5%	68,3%	64,5%	68,14%	68,26%	67,42%
Akaike criterion		-1,854	-1,846	-1,963	-1,833	-1,837	-1,829
Log Likelihood		98,427	98,059	91,576	98,481	98,650	95,571
SE of regression		0,089	0,089	0,083	0,089	0,089	0,089
Durbin Watson		1,927	1,961	1,965	1,931	1,913	1,925

Note: * indicates statistical significance at 1%, ** at 5% and *** at 10%

Source: author's computations

The more developed the mobile telecommunications infrastructure (MOB), the more attractive for foreign investors. This result is interesting for our analysis as the variable for infrastructure continues to be significant for FDI when the variables for the fiscal burden are introduced (the models 1 and 2), which are not significant. This outcome suggests that the investors are willing to pay taxes as long as the infrastructure enables to conduct their activities. The introduction of the STAT variable instead of EATR in our equation seems to provide a better model for explaining FDI, according to adjusted R^2 and the Akaike information criterion. Still, in both cases, the variables expressing the tax burden are not significant for explaining FDI, although they have the expected sign. Also, GDPC is not a significant variable, but this result is explicable due to the fact that GDPC is a broad variable, that captures issues starting with the quality of institutions to the level of wages. As DAT and RULC are already significant, the insignificant impact of GDPC is understandable.

In the third model we include ROADF; the model has the lowest power in explaining the stock of FDI in the CEE region. Although we obtain the expected sign for ROADF, its impact is not significant. Also, for the rest of the models, as the remaining significant variables are introduced, we do not find any change in the variables already set as significant for FDI, but none of the new introduced variables are significant for FDI. The negative sign obtained for the unemployment rate (RS) confirms that FDI are market-seeking markets and investors are interested in customers with high possibility to purchase. For ITR, we obtain the expected sign, but the variable has no impact on FDI. For ELC we keep to have a negative sign, contrary to the one expected, but this divergence may result from a missing variable which encompasses the qualitative side of the electricity infrastructure.

We proceeded in the same manner for the CS-PE specification. We estimated four regressions, starting with the model with the model that explains the best the dependent variable. The first model (1) includes GDP, DAT, RULC, MOB and GVF and we added ROADF (model 2), ELC (model 3) and GDPC (model 4).

The first model is the most suitable for explaining the distribution of FDI in the CEE countries (see Table 4). This time, only GDP and RULC are significant; none of the two variables used for the quality of institutions are determinants for FDI. The quality of institutions and the development of infrastructure are not significant for FDI once both the coefficients and the intercept vary by country. As the rest of the variables are introduced, the explanatory power of the model decreases and the variables are insignificant. We consider that the interpretation of the results in this case is similar with the one for the PE case.

TABLE 4. THE RESULTS OF THE CS-PE SPECIFICATION

		(1)	(2)	(3)	(4)
GDP	Coefficient	0,505**	0,202	0,503**	0,532**
	t-Statistic	2,049	0,761	2,020	2,132
DAT	Coefficient	-0,111	-0,079	-0,110	-0,160
	t-Statistic	-1,319	-0,912	-1,295	-1,527
RULC	Coefficient	-0,580***	-0,163	-0,585***	-0,553
	t-Statistic	-1,721	-0,424	-1,710	-1,625

MOB	Coefficient	0,200	0,186	0,199	0,212
	t-Statistic	1,335	1,170	1,318	1,403
GVF	Coefficient	0,143	0,191	0,142	0,155
	t-Statistic	1,166	1,345	1,150	1,251
ROADF	Coefficient		0,116		
	t-Statistic		1,031		
ELC	Coefficient			-0,017	
	t-Statistic			-0,112	
GDPG	Coefficient				-0,342
	t-Statistic				-0,789
C	Coefficient	0,064*	0,059*	0,064*	0,075*
	t-Statistic	2,530	2,305	2,509	5,583
$\overline{R^2}$		69,7%	63,32%	69,3%	69,57%
Akaike criterion		-1,828	-1,863	-1,806	-1,815
Log Likelihood		105,273	95,711	105,282	105,696
SE of regression		0,087	0,084	0,088	0,087
Durbin Watson		2,028	2,137	2,023	2,097

Note: * indicates statistical significance at 1%, ** at 5% and *** at 10%

Source: author's computations

4. Conclusions

The present research contributes to the literature by enriching the results so far with the impact of public policies on FDI in the CEE countries in a period with important political and economical events for the development of these economies. Our methodological approach is appropriate, meaning that we first establish the soundness of each pillar, by identifying the significant variables, and then we test these variables within the broad framework, where the control variables are also included.

For the 10 new EU member states, the dimension of the market, expressed by the GDP level, the low labour costs, the development of mobile telecommunications infrastructure and the macroeconomic stability given by the size of the public debt are the main FDI determinants during 2003-2011. Therefore, in this period, the investors were mainly motivated by the advantage of these countries as consumer markets and providers of cheap labour force. The motivation of investors remained that of market and resource seeking. The shift towards efficiency-seeking FDI can be signalled by the significance of the variable expressing the development of mobile infrastructure in explaining FDI flows.

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