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## GOVERNANCE QUALITY AND FOREIGN DIRECT INVESTMENTS IN CENTRAL AND EASTERN EUROPE: MACRO-LEVEL ANALYSIS USING PANEL DATA APPROACH

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**Summary:** In this paper we investigate the role of governance quality in attracting foreign direct investments (FDIs) in the selected CEE states. Using panel data the fixed and random effects models are employed to assess the importance within and between country differences in governance quality. The obtained results indicate that the quality governance improvement over the last years has significantly affected the FDIs inflows to the CEE region, while the governance differences between the selected countries do not explain the intercountry differences in FDIs.

**Keywords:** foreign direct investments, governance, fixed and random effects models.

### 1. Introduction

The role of foreign direct investments (FDIs) in the economies of Central and Eastern European (CEE) states has attracted a lot of interest and numerous empirical studies<sup>1</sup> have confirmed the positive relationship between the FDIs inflows and economic growth. The theoretical explanations of this phenomenon can be divided into two wide groups. The first type of explanations underlines the fact that FDIs are the source of additional capital which increases the marginal product of labour and decreases marginal product of capital<sup>2</sup>. The second group of reasons focuses the attention on the productivity improvements in the host countries that are made due to the FDIs presence. Carkovic and Levine<sup>3</sup> point out that FDIs produce externalities

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<sup>1</sup> A. Riess, K. Uppenberg, *Determinants and Growth Effects of Foreign Direct Investment*, European Investment Bank, Economic and Financial Studies, EIB Papers, No. 3, 2004, p. 77; L. Kornecki, S. Raghawan, *The Impact of Inward FDI Stock on GDP Growth: An Empirical Evidence from Central and Eastern Europe*, "American Journal of Business Research" 2008, Vol. 1, No. 1, p. 8.

<sup>2</sup> G.D.A. MacDougall, *The Benefits and Costs of Private Investment from Abroad: A Theoretical Approach*, Economic Record, Vol. 36, 1960, p.13-35.

<sup>3</sup> M. Carkovic, R. Levine, *Does Foreign Direct Investment Accelerate Economic Growth?*, University of Minnesota, Working Paper, 2002, p. 195.

in the form of technology transfers and spillovers. Romer<sup>4</sup> also notes that important “idea gaps” between rich and poor countries still exists and FDI’s influence may be significant in catching-up process. Both groups of factors expand the host country’s production possibility frontier and taking into account the transition characteristic of the CEE economies, FDI’s seem to be there an extremely important determinant in promoting economic growth.

In this context the question of what attracts FDI’s inflows is natural and vital for the CEE states. To answer this issue the research has been done both at the micro (firm) and macro (country) levels. At the firm level the identified significant factors have been: labour cost and quality, infrastructure development, environmental regulations<sup>5</sup> and distance between source and host countries, firm size, technological sophistication<sup>6</sup>. The macro level analysis on the other hand indicates tax rates, and macroeconomic stability as other important factors<sup>7</sup>. However, the common conclusion for all the studies mentioned in this paragraph is the key role of a host country’s governance.

According to the definition provided by the World Bank: *governance consists of the traditions and institutions by which authority in a country is exercised. This includes the process by which governments are selected, monitored and replaced; the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them*<sup>8</sup>. Governance therefore touches the characteristics of the institutional environment (e.g. execution of the law of property, anti-corruption efforts) that seems to be crucial for business activity.

The development of FDI’s inflows and the governance level in some CEE states is presented on the following graphs.

Looking at Figures 1 and 2 the increasing trend in FDI’s inflows is easily identified. On the other hand when comparing the data on governance we see that three of the analyzed countries (Bulgaria, Romania and Slovakia) improved their level of governance significantly, in one case (Hungary) the governance level remained almost unchanged and in two countries (Czech and Poland) the governance variable values declined. It is, however, worth underlining, that in the case of Poland and the Czech Republic the last values of the governance indicator were still higher than at the same moment in Bulgaria and Romania.

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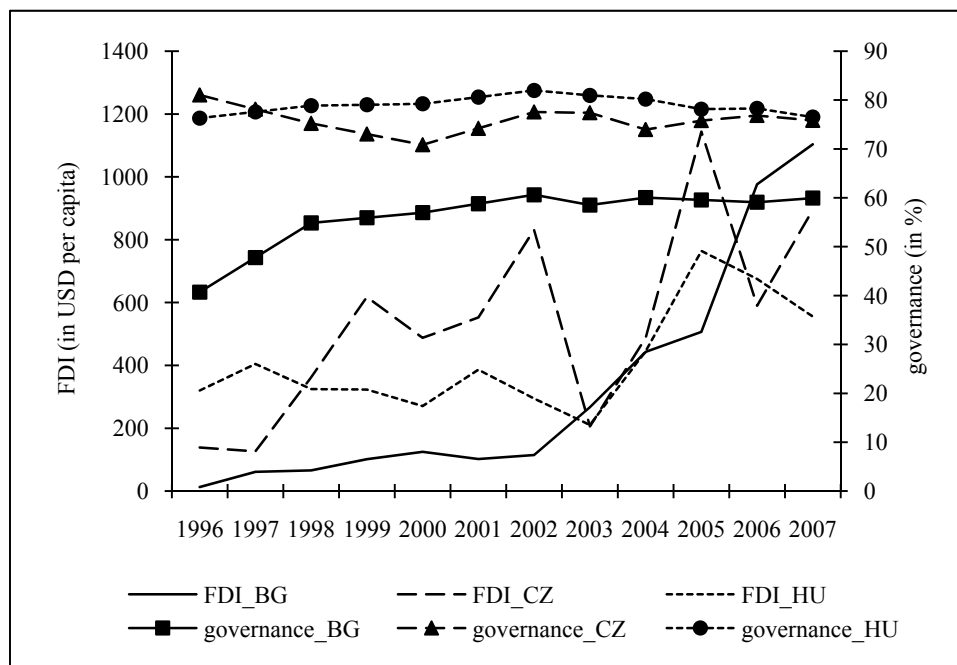
<sup>4</sup> P. Romer, *Idea Gaps and Object Gaps in Economic Development*, “Journal of Monetary Economics” 1993, Vol. 32, No. 3, p. 543-573.

<sup>5</sup> M. Cole, R. Elliot, Zhang, *Corruption, Governance and FDI Location in China: A Province-Level Analysis*, Department of Economics, University of Birmingham Discussion Papers, No. 06, 2008, p. 4.

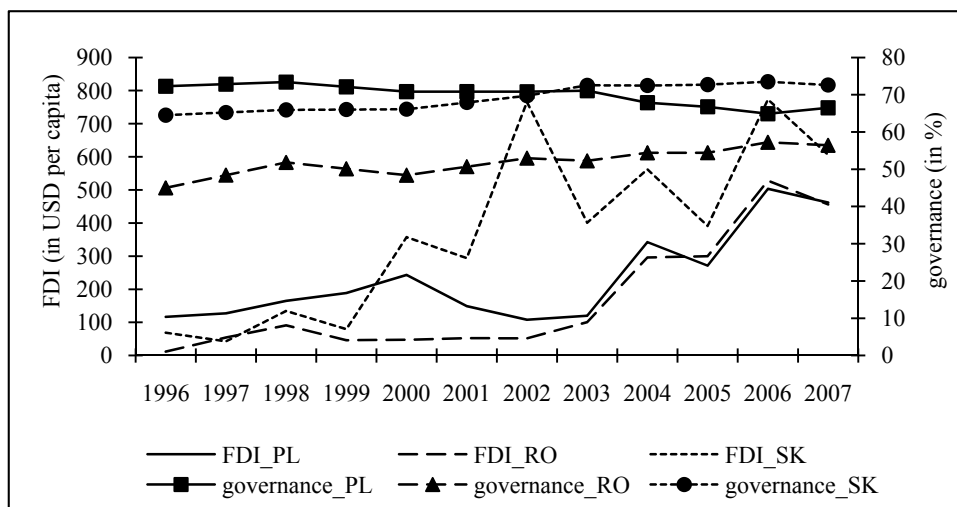
<sup>6</sup> B.S. Javorcik, S. Wei, *Corruption and Cross-Border Investment in Emerging Markets: Firm-Level Evidence*, Hong Kong Institute for Monetary Research, Working Papers, No. 06, 2009, p. 16.

<sup>7</sup> B.A. Blonigen, *A Review of the Empirical Literature on FDI Determinants*, National Bureau of Economic Research, NBER Working Papers, No. 11299, 2005, p. 9.

<sup>8</sup> <http://info.worldbank.org/governance/wgi/index.asp> (as on 1st Feb 2010).



**Figure 1.** FDI and governance level in Bulgaria, Czech Republic and Hungary



**Figure 2.** FDI and governance level in Poland, Romania and Slovak Republic

Remarks: The detailed description of the "FDI" and "governance" variables can be found in the "Data and Methodology" part.

Source: own calculations.

## 2. Hypotheses, methodology and data

In this paper we do not want to confirm once again the general finding that higher quality of governance attracts more FDIs. Instead, we would rather focus our attention on the sample of CEE states and draw some more precise conclusions about the significance of the differences in the governance level among these countries and about the importance of institutional changes that took place in CEE in the last years. Therefore we formulate two hypotheses:

### *Hypothesis 1:*

The improvement in the governance quality over the last years in the CEE states was a significant factor affecting new FDIs inflows.

### *Hypothesis 2:*

The differences in the governance quality among the CEE states are significant for foreign investors and may influence the decisions on FDIs location.

In order to assess the importance of the investigated factor (governance) on the FDIs inflows and to test both of the hypotheses we employ the panel data approach. The panel data methodology is used in the situations when we utilize data for multiply  $N$ -objects (in our case countries) observed in two or more  $T$ -periods (in our case years). The baseline form of our model would be then:

$$FDI_{it} = \alpha + \beta_1 Gov_{it-2} + \beta x_{it-2} + \varepsilon_{it} \quad (1)$$

For  $i = 1, \dots, N$  ( $N = 6$ ) and  $t = 1, \dots, T$  ( $T = 11$ ) and where  $FDI_{it}$  is the  $FDIs$  inflow value in country  $i$  at time  $t$ ,  $\alpha$  is the common intercept,  $GOV_{it}$  is the value of the governance level,  $x_{it}$  is a  $1 \times K$  vector of control variables and  $\varepsilon_{it}$  is the error term. To control possible endogeneity we lag all independent variables by two years. Moreover, the decision on FDI location in year  $t$  is backed by the careful analysis of the data, which investors do with some advance to the final decision. Hence this lag is also justified again. All variables enter the equation in logs.

Estimating the model in this form, however, may encounter a serious problem. Even if we add  $x_{it}$  vector it is possible that some of the independent variables are still omitted and such a situation leads us to the biased estimation of the model. To overcome this limitation we use two types of models: fixed (FE) and random (RE) effects model.<sup>9</sup>

The FE model may be defined by the following formula:

$$FDI_{it} = \alpha_i + \beta_1 Gov_{it-2} + \beta x_{it-2} + \varepsilon_{it} \quad (2)$$

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<sup>9</sup> For technical discussion on FEM, REM and Hausman test that we only interpreted in the next two paragraphs see: J.M. Wooldridge, *Econometric Analysis of Cross Section and Panel Data*, The MIT Press, 2001, p. 247-283.

There is a specific  $\alpha_i$  constant term (fixed effect, group dummy) that controls the average differences across countries in any observable or unobservable predictors. To test whether the countries have different intercepts, we employ the  $F$ -test. Under the null hypothesis the estimated constant terms are equal. The rejection of the null (low  $p$ -value) indicates the validity of the different country dummies estimates.

However, prevailing the omitted bias problem leads to another limitation in the FE model. Due to subtracting the observations from the intra-country mean, it explains only the within-country variation and we cannot draw any conclusions about the significance of between-countries differences.

To describe the RE model we use the equation:

$$FDI_{it} = \beta_1 Gov_{it-2} + \beta x_{it-2} + \mu_{it} \quad (3)$$

where  $\mu_{it} = \alpha_i + \varepsilon_{it}$ . The individual heterogeneity  $\alpha_i$  is assumed to be normally distributed  $\alpha_i \sim N(0, \sigma_\alpha)$  and what also differs the FE and RE specification is  $\alpha_i$  which is uncorrelated with  $\varepsilon_{it}$  and independent variables. Employing these strong assumptions RE model preserves both between-country and within country variation, hence, we say that the independent variables that are significant in RE model explain inter-country and intra-country variation.

To decide whether the FE or RE model would be more appropriate the Hausman test is provided. Under the null hypothesis both models are consistent when their estimates do not differ significantly. When this difference is statistically significant (low  $p$ -value) we should reject RE model as inconsistent.

The empirical verification strategy would be therefore as follows. First, we estimate the FE with the full set of control variables. The estimation of the same RE model is at this stage impossible as the RE estimation requires a number of cross-section coefficients. The next step would be then to estimate the FE and RE models using only the variables that we found to be significant at the beginning. The final point of the testing procedure is checking the correctness of the obtained models using the Hausman test.

In this research we used the annual data for the years 1996-2007 and the investigated sample consisted of six CEE states: Bulgaria, Czech Republic, Hungary, Poland, Romania and Slovak Republic. The choice of this sample was motivated by two reasons. First of all we wanted to collect the data on the heterogeneous group of countries. Hence we have 4 countries that entered the European Union (EU) in the first group (Czech, Hungary, Poland, Slovakia) and two countries that joined the EU later (Bulgaria, Romania). The second criterion on the other hand had a strict econometric motivation. Our target was to collect the data for all the variables that started in 1996<sup>10</sup> to constructed balanced panel, which would produce more robust results compared to unbalanced dataset. This criterion finally limited our sample to the group of six countries.

<sup>10</sup> That year the Worldbank started to publish data on governance.

The dependent variable – FDI inflows (FDI) – was found in the *United Nations Conference on Trade and Development (UNCTAD) Foreign Direct Investment* database.<sup>11</sup> To create a meaningful basis for comparison we utilized the variable: “Direct investment in reporting economy” measured in US dollars at current prices per capita.

The investigated independent variable – governance (GOVER) – was created using the data collected by the Worldbank in its *Worldwide Governance Indicators (WGI) project*<sup>12</sup>. The WGI reports the values of the governance indicators for 212 countries and territories from the year 1996<sup>13</sup> for six dimensions of governance: Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law, Control of Corruption. For each country at moment  $t$  we simply averaged the values for each dimension creating this way the new aggregated measure. The correlations between all the dimension are relatively high ranges from 0.83 to 0.94, hence such an approach seems to reasonable. The values of governance indicators are measured in percentage points and indicate a rank of a country among all countries in the world. 0 corresponds to the lowest rank and 100 is the highest rank.

The description of the other independent (control) variables is presented in Table 1.

**Table 1.** Control variables description

Coefficient's symbol	Name	Description	Source
$\beta_2$	GDP per capita (GDP)	GDP per capita in US dollars at current prices	Data on GDP volume, population and exchange rates were obtained from the International Financial Statistics (IFS) database
$\beta_3$	Unemployment rate (UNEMP)	Average unemployment rate, yearly	IFS database
$\beta_4$	Household Consumption Expenditures (CONS)	Consumption per capita US dollars at current prices	Data on consumption., population, exchange rates were obtained from the IFS database
$\beta_5$	CIT tax rate (CIT)	Where a progressive (as opposed to flat) rate structure applies, the top marginal rate is shown	CZ, HU, PL, SK – OECD tax database BG, RO – Deloitte International Tax Source
$\beta_6$	CPI rate (CPI)	Yearly average CPI % change y/y	IFS database

Source: own study.

<sup>11</sup> <http://stats.unctad.org/fdi> (as on 1st Feb 2010).

<sup>12</sup> <http://info.worldbank.org/governance/wgi/index.asp> (as on 1st Feb 2010).

<sup>13</sup> As a matter of a fact in the years 1996-2002 the Worldbank collected the data every two years, for the odd years we estimated the values using the “before” and “after” observations.

The reasons for using the chosen set of control variables are listed below:

- *GDP* – it is a measure of a country's market size. A. Adeoye<sup>14</sup> points out high value of this variable may attract foreign investors looking for attractive markets to sell their products. There is also a positive correlation between *GDP per capita* and the presence of clusters or agglomeration economies with large pools of specialists or skilled workers in a particular branch.
- *UNEMP* – higher unemployment rate means better position of the employer on the labour market and better position of foreign investors in settling down their business.
- *CONS* – as the level of wages is highly correlated with the consumption, this variable is treated as the proxy of wages in a host country. Higher *CONS* therefore means higher costs of doing business.
- *TAX* – similarly to *CONS*, higher taxes decrease the business profitability.
- *CPI* – many empirical studies<sup>15</sup> stress the fact that foreign investors put a lot of attention to the general macroeconomic stability. In this case the CPI inflation rate may be a good proxy of this feature and we expect that countries with the lowest rate<sup>16</sup> will be preferred by the foreign investors.

To summarize, we expect the following coefficients signs:

**Table 2.** Expected coefficients signs

$\beta_1$	$\beta_2$	$\beta_3$	$\beta_4$	$\beta_5$	$\beta_6$
+	+	+	-	-	-

Source: own study.

We did not decide to include to our set of control variables the infrastructural and educational proxies. We think that these variables can be better implemented into the micro-level framework. At the macro-level they are highly aggregated and the available data in the case of chosen sample do not vary substantially the investigated states. However, as we mentioned before, the employed methodology should minimize the problem of omitted variables estimation bias.

<sup>14</sup> A. Adeoye, *Macro-Economic Level Corporate Governance and FDI in Emerging Markets: Is There a Close Relationship?*, A dissertation thesis presented to the Management Department, School of Social Science and Public Policy, King's College London, London, 2007, p. 30, available at SSRN: <http://ssrn.com/abstract=1120816> (as on 1<sup>st</sup> Feb 2010).

<sup>15</sup> H. Singh, K. Jun, *Some New Evidence on Determinants of Foreign Direct Investment in Developing Countries*, World Bank, Policy Research Working Paper, No. 1531, 1995, p. 4; M.B. Nonnemberg, M.J.C. de Mendonça, *The Determinants of Foreign Direct Investment in Developing Countries*, Brazilian Association of Graduate Programs in Economics, Proceedings of the 32nd Brazilian Economics Meeting, No. 061, 2004, p. 16.

<sup>16</sup> We are aware that deflation is a damaging phenomenon too, but none of the six countries in the selected period had the yearly average rate CPI rate below 0%.

### 3. Empirical results

The estimation of the FE model with the full set of control variables indicated three significant variables: GOVER, GDP and TAX. These variables were also significant in the FE model, with the reduced set of determinants. It is also worth underlining that in both regressions the coefficients' signs were in line with the presented theoretical explanations, which confirms the robustness of the obtained estimates.

**Table 3.** FE model with the full set of control variables

Independent variable	GOVER	GDP	UNEMP	CONS	TAX	CPI
Coefficient's value	<b>2.6289</b> [0.0000]	<b>1.7491</b> [0.0471]	0.0913 [0.2742]	-0.8267 [0.2487]	<b>-1.0767</b> [0.0000]	0.0233 [0.2189]

Remarks: p-values in brackets. Coefficients significant at 0.05 level are bolded.

Source: own estimates.

**Table 4.** FE model with the selected set of control variables

Independent variable	GOVER	GDP	TAX
Coefficient's value	<b>2.6448</b> [0.0000]	<b>0.6853</b> [0.0000]	<b>-1.3659</b> [0.0000]

Remarks: p-values in brackets. Coefficients significant at 0.05 level are bolded.

Source: own estimates.

The results of F-test reject the hypothesis that the estimated constant terms are equal, hence using the model with individual heterogeneity is justified.

**Table 5.** F-test test results

F-test statistic	<i>p-value</i>
29.940219	0.000

Source: own estimates.

In the last step of our verification procedure we estimated the RE model which delivered the following results.



**Table 6.** RE model with the selected set of control variables

Independent variable	GOVER	GDP	TAX
Coefficient's value	1.1696 [0.2045]	<b>0.6615</b> [0.0179]	<b>-1.3350</b> [0.0001]

Remarks: p-values in brackets. Coefficients significant at 0,05 level are bolded.

Source: own estimates.

Surprisingly, the governance indicator in this case was found to be insignificant and the Hausman test results did not reject the null hypothesis that both models were consistent.

**Table 7.** Hausman test results

Chi-Sq. Statistic	<i>p-value</i>
5.315135	0.1501

Source: own estimates.

## 4. Conclusion

The interpretation of the obtained quantitative results is following:

- the first hypothesis is not rejected (quantitative proof: the significance of the government variable in the FE model), hence the improvement of governance quality in the last years was a significant factor in a process of attracting new FDI inflows;
- the second hypothesis is rejected (quantitative proof: the insignificant governance variable in the RE model while at the same time the Hausman test indicates that both models, i.e. FE and RE are consistent), therefore we state that the differences in the governance quality between the investigated countries did not significantly explain the differences in the level of FDI inflows.

We do not want to formulate so sharp policy recommendations, hence the model risk in econometric activity is always present. Finally, we prefer to conclude that the differences in the governance quality between the countries are not perceived by investors to be very significant as we expected at the beginning. These results should be verified by further studies, preferably using different methodology e.g. survey study.

Besides assessing the importance of the governance factor the other interesting results emerged.

Firstly, the CIT level turned out to be one of the key-determinants both in FE and RE specifications. Therefore it is highly possible that this factor explains the intra- and intercountry FDI variance.

Secondly, the CPI index does not seem to be in the case of CEE states an important indicator of macroeconomic stability as it was in the past. As macro-stability is a multidimensional phenomenon<sup>17</sup>, we propose to focus the attention on some other macro-stability proxies in future research. In this context the level of budget deficit, which is very often viewed as the measure of politicians' attitude to the market reforms, seems to be a reasonable proposition.

## Literature

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<sup>17</sup> J.A. Ocampo, *A Broad View of Macroeconomic Stability*, United Nations DESA Working Paper series, No. 1, 2005, p. 2.

## **JAKOŚĆ RZĄDZENIA (*GOVERNANCE*) I BEZPOŚREDNIE INWESTYCJE ZAGRANICZNE W KRAJACH EUROPY ŚRODKOWO-WSCHODNIEJ: ANALIZA MAKROEKONOMICZNA Z WYKORZYSTANIEM DANYCH PANELOWYCH**

**Streszczenie:** W artykule podjęto próbę oszacowania wagi czynnika – jakości rządu (*governance*) w procesie napływu bezpośrednich inwestycji zagranicznych (BIZ) w wybranych krajach Europy Środkowo-Wschodniej. Wykorzystując dane panelowe zastosowano modele z efektami ustalonymi oraz modele z efektami losowymi w celu pomiaru znaczenia różnic w poziomie *governance* w przekroju międzyokresowym oraz międzynarodowym. Uzyskane rezultaty wskazują, że poprawa jakości rządu na przestrzeni ostatnich lat była czynnikiem istotnie oddziałującym na napływ BIZ do krajów regionu Europy Środkowo-Wschodniej, podczas gdy różnice w poziomie *governance* w przekroju międzynarodowym nie wyjaśniają różnic w poziomie BIZ pomiędzy badanymi krajami.