

## EMPIRICAL STUDY ON THE DETERMINANTS OF FDI INFLOWS TO ROMANIA

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**Abstract:** *The strong increase in foreign direct investment (FDI) since the 90s is one of the most outstanding aspects of the globalization of economies. Economic and technological changes, globalization and trade liberalization have boosted FDI flows worldwide, which has contributed to economic growth process. In Romania, the value of FDI inflows rose from 40 million dollars in 1991 and reached a peak in 2008, when the highest value of FDI inflows was registered (13 491.5 million dollars according to UNCTAD statistics). The economic and financial crisis strongly affected FDI inflows to Romania which dropped dramatically until 2012. Later than in other countries, the recovery in FDI flows to Romania since 2013 still remains slight. The objective of this empirical investigation is to analyze the influence of several economic factors on FDI inflows to Romania, during 1991-2014. Using simple regression models, the research reveals that economic factors such as gross fixed capital formation, gross domestic product (GDP), exchange rate and the inflation rate have an important role in explaining FDI inflows to Romania, while trade openness and labour cost have a moderate influence on FDI inflows. Between FDI inflows to Romania and gross fixed capital formation, GDP, exchange rate, respectively trade openness, there is a direct and linear correlation and between FDI inflows and inflation rate, respectively labour cost, there is an inverse linear correlation. The results obtained from our empirical research highlight the idea that the evolution of economic factors in Romania, as a host country, represents an important guide for foreign investors that seek to obtain competitive advantages.*

**Keywords:** FDI inflows; determinants; Romania.

**JEL classification:** F21.

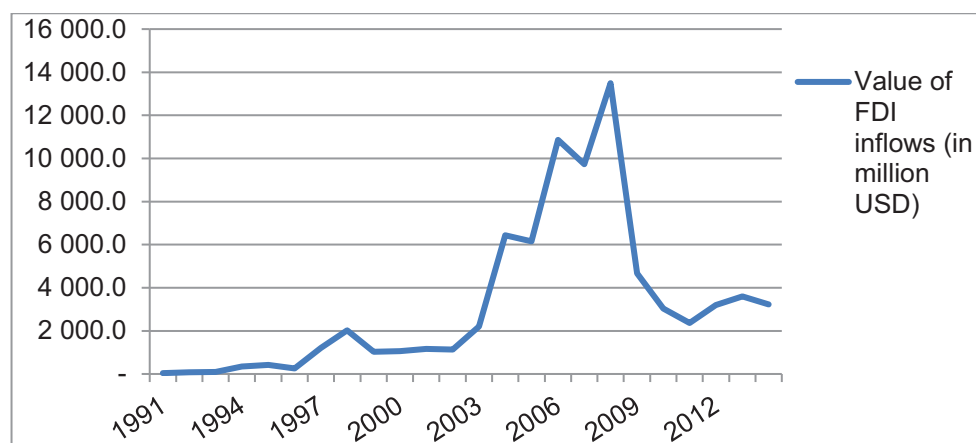
### 1. Introduction

The strong increase in foreign direct investment (FDI) since the 90s is one of the most outstanding aspects of the globalization of economies. Economic and technological changes, globalization and trade liberalization have boosted FDI flows worldwide, which has contributed to economic growth process. The last decades have been characterized by a substantial increase in FDI inflows, from 207 billion dollars in 1990 to 1,23 trillion dollars in 2014 (UNCTAD, 2015: 2), historical peak occurring in 2007 with a value of 1,87 trillion dollars, according to UNCTAD statistics. Although GDP, trade, gross fixed capital formation and employment recorded an increase, global FDI inflows fell by 16% in 2014, down from 1,47 trillion dollars in 2013. Factors like the fragility of the global economy, policy uncertainty for investors and elevated geopolitical risks have contributed to the decline in FDI flows globally (UNCTAD, 2015: 2).

In Romania, the value of FDI inflows rose from 40 million dollars in 1991 and reached a peak in 2008, when total FDI inflows was 13 491.5 million dollars. The period of good economic results that Romania's economy experienced after 2000 represented a

determinant factor for increased confidence and optimism of the foreign investors towards the opportunities that Romania offers. As a result of this increased confidence, FDI inflows to Romania registered a significant increase, putting into value the competitive potential of the Romanian economy.

Economic and financial crisis that began in the second half of 2007 in the USA, has spread rapidly around the world, reflecting thus the interdependencies between economies. FDI flows globally were also affected, and Romania has not been an exception. Since 2009, due to the declining capital markets, the blocked access to credit, restricted liquidity in international markets and rising risk aversion of investors (National Bank of Romania, Annual Report 2008: 11) global FDI flows and, of course, FDI inflows to Romania have entered on a downward trend, which has deepened in the years that followed. According to UNCTAD statistics, 2012 was the year in which smallest amount of FDI inflows was recorded after the outbreak of the economic and financial crisis, i.e. 2 362.9 million dollars. However, 2013 marked a recovery in FDI inflows to Romania, but still slight and oscilating. Figure 1 shows the evolution of the value of FDI inflows to Romania, during 1991-2014, as shown by UNCTAD statistics.



**Figure 1:** The evolution of FDI inflows to Romania during 1991-2014

Source: realized by the author based on data from UNCTAD statistics on FDI inflows, by region and economy, 1990-2014, [Online], Available:

<http://unctad.org/en/Pages/DIAE/World%20Investment%20Report/Annex-Tables.aspx>.

The objective of this empirical investigation is to analyze the influence of several economic factors on FDI inflows to Romania, during 1991-2014. Based on previous research in the literature, the following factors of influence were selected: market size, measured by gross domestic product (GDP) nominal value, trade openness, gross fixed capital formation, labour cost, exchange rate and inflation rate. The next section of the paper includes a literature review on the determinants of FDI inflows, section 3 presents the data and the methodology used, section 4 presents the results of the empirical research and the last section of the paper provides the conclusions of the research.

## 2. Literature review

The field literature revealed a vast range of studies that analyze the determinants of FDI inflows. There are several studies that analyse the FDI flows between the members of the European Union and Central and South Eastern European countries, especially in the context of EU accession. Thus, using a panel data set for 25 transition economies between 1990 and 1998, Kinoshita and Campos (2003) find that the main determinants are institutions, agglomeration and trade openness and emphasized the differences between the Eastern European and Baltic countries, on the one hand, and the former Soviet Union countries on the other. According to Janicki and Wunnava (2004) the size of the host economy, host country risk, labour costs in host country, and openness to trade represent key determinants of FDI inflows in CEECs (transition economies at that time). Bevan and Estrin (2004) analyse the determinants of FDI from Western countries, mainly in the European Union (EU), to Central and Eastern European ones and revealed determinants like unit labour costs, gravity factors, market size, and proximity and less the host country risk. Botric´ and Škuflic´ (2006) estimated a panel GLS on seven South Eastern European countries (including Romania) and eight different CEEC and concluded that market-seeking determinants of the FDI (GDP level, GDP per capita, GDP growth, population) give mixed signals in different specifications, variables such as privatization, openness and the density of infrastructure appear to be robust under different specifications. They also mentioned the positive influence of the agglomeration factor. Based on a panel data sample of nine SEECs (including Romania), during the period 2000-2005, Dauti (2009) showed that market seeking determinants (GDP growth, GDP per capita, GDP level) give negative significant results under random effect specification. Variables like openness, domestic credit to private sector, as a percentage of GDP, or government expenditures proved to be insignificant regarding FDI attractiveness for the analysed period of time. However, the variable regarding the infrastructure, introduced as a number of internet users per 1000 inhabitants was identified as having a positive influence on FDI inflows.

Many studies in the literature have focused on analyzing the determinants of FDI inflows to developing countries in all regions of the world. Thus, Noorbakhsh et al. (2001) emphasized the importance of human capital, the skills and capabilities, as a determinant of FDI inflows to developing countries. Asiedu (2002) revealed the differences between developing countries in attracting FDI. He showed that a higher return on investment and better infrastructure positively influences FDI inflows to non-sub Saharan Africa countries (SSA) but it doesn't have a significant impact on FDI inflows to SSA, openness to trade is a common determinant. Addison and Heshmati (2003) conducted a research with regard to developing countries and found that economic growth, trade openness, democratization and information and communication technology have a positive effect on FDI flows while the level of risk has a negative influence on FDI inflows to those countries.

Erdal and Tatoglu (2002) analyzed the locational determinants of FDI inflows to Turkey, over the period 1980-1998, and concluded that Turkey offers several location advantages in terms of market size, infrastructure, openness of the economy and market attractiveness but unfortunately the exchange rate instability and economic stability have slowed FDI inflows. Analyzing US FDI into the Western European and Asian regions over the period 1981–2000, Sethi et al. (2003) showed that they were driven by the advantage of the low wage levels. Chowdhury and Mavrotas (2006) examined the causal relationship between FDI and economic growth and found that GDP causes FDI in the case of Chile and not vice versa, while for Malaysia and Thailand, there is a strong evidence of a bi-directional causality between the two variables. The research conducted by Ang (2008) regarding Malaysia, over the period 1960-2005, supports the idea that real GDP have a significant

positive impact on FDI inflows, as well as increases in the level of financial development, infrastructure development, and trade openness. On the other hand, he found that growth rate of GDP exerts a small positive impact on inward FDI and that higher statutory corporate tax rate and appreciation of the real exchange rate discourages FDI inflows. Contrary to the general beliefs, the results seem to suggest that higher macroeconomic uncertainty attracts more FDI inflows. Based on a panel data analysis, covering the period 1975-2009, regarding BRIC countries, Ranjan and Agrawal (2011) found that market size, macroeconomic stability and growth prospects, trade openness, labour cost and infrastructure facilities are potential determinants of FDI inflows whereas total labour force and gross capital formation have insignificant influence.

Wadhwa and Reddy (2011) studied the impact of some market seeking, efficiency seeking and resource seeking factors of host countries on FDI inflows to host countries based on a sample of ten Asian countries, during 1991-2008. Researchers have identified several factors that positively influenced FDI inflows to host countries such as GDP, imports, mobile subscribers while inflation and internet users negatively influenced FDI inflows. A recent study realized by Boateng et al. (2015), over the period 1986-2009, revealed that real GDP, sector GDP, exchange rate and trade openness positively and significantly influences FDI inflows to Norway, while money supply, inflation, unemployment and interest rate produced significantly negative results.

Regarding our country, Bîrsan and Buiga (2009) revealed that the main factors determining the evolution in the FDI/GDP (%) as proxy for the FDI evolution are market size and potential, reform progress, business liberalization, and labour cost. Kyrkilis and Pantelidis (2009) emphasized the role of wage differentials between Romania and Bulgaria and the EU-15 average, of the privatization process and of the domestic demand in attracting FDI inflows to both countries. Other studies (Bîrsan and Buiga, 2008) reveal that low labour cost and labour force quality are important elements that foreign investors (them being efficiency seekers and market seekers type) in the Romanian manufacturing sector rely on. There are some researches that focused on revealing the determinants of FDI inflows to Romania at a regional level. Thus, Goschin et al. (2013) took into consideration eight development regions, during the period 2001-2008, and revealed that the GDP/capita, the agglomeration (population density), the technological level of production, the level of R&D expenditure of business enterprise sector and the labour cost represented determinants of FDI inflows at a regional level during the analysed period. Dornean and Oanea (2015) also focused on studying the impact of major macroeconomic factors on territorial distribution of FDI in Romania, across eight regions, during the period 2006 – 2012. Researchers have identified the human capital and economic stability as determinants that have the highest impact on FDI level within one region, as well as the total number of graduated persons, unemployment rate, net salary increase and Km of modernized road.

Taking into consideration previous studies in the specialized literature, we will further analyse the influence that the main economic determinants, identified by other researchers, have on FDI inflows to Romania.

### **3. Variables, data and research methodology**

The aim of this empirical investigation is to study the correlation between the value of FDI inflows and several determinant factors, selected in accordance with the previous relevant studies from the field literature.

We have collected annual data with respect to Romania, over the period 1991 – 2014, regarding the following variables considered determinants of FDI inflows:

- Market size, measured by nominal GDP value expressed in millions of lei, current prices;
- Labour cost, expressed as the percentage change of average annual net wage;
- Trade openness, expressed as the sum of exports and imports of goods and services measured as a share of GDP;
- Gross fixed capital formation, expressed in millions of lei;
- Average exchange rate, RON/ USD;
- Inflation rate.

The size of the economy, measured by GDP, is expected to be a positive and significant determinant of FDI inflows because a larger market reflects a greater potential of consumption, profitability and opportunities for trade. Trade openness reflects new business opportunities for foreign investors and is expected to positively influence FDI inflows. Lower labour costs reduce the cost of production and, therefore, it represents an attraction factor of FDI inflows. Gross fixed capital formation shows the domestic investments, the potential of the country for spending so it should attract higher FDI. The depreciation of domestic currency is associated with higher FDI inflows because foreign investors from countries with a strong currency will have a higher wealth position and, therefore the cost of capital will be reduced. A low rate of inflation attracts foreign direct investment, whereas a high rate of inflation will direct foreign investors to other countries where lower inflation makes investments less expensive.

Data regarding the endogenous variable, FDI inflows, was collected from UNCTAD statistics. The GDP annual value and the gross fixed capital formation values were collected from Eurostat. Data regarding trade openness was collected from the website of World Bank, the World Development Indicators. Data regarding the average annual net wage and inflation rate were collected from the website of Romanian National Institute of Statistics, TEMPO Online Database. The percentage change of average net wage was calculated separately for each year. Data regarding average exchange rate RON/ USD was collected from the website of the National Bank of Romania, the Interactive Database. In order to verify the correlation between the endogenous variable and the exogenous ones, presented above, we will investigate and test the following hypotheses:

H1: Market size, reflected by Gross Domestic Product, has a positive influence on FDI inflows.

H2: Lower labour cost has a positive influence on FDI inflows.

H3: Higher openness to trade has a positive influence on FDI inflows.

H4: Higher gross fixed capital formation has a positive influence on FDI inflows.

H5: The depreciation of domestic currency has a positive influence on FDI inflows.

H6: The decrease of the inflation rate has a positive influence on FDI inflows.

The validation of these hypotheses will be based on the results of simple regression models elaborated using the Eviews software. These models will help us identify the strength of the correlation between the two categories of variables and its statistical significance.

#### **4. Results**

This empirical research is based on simple regression models which will help us to identify the correlation between the chosen variables, to determine the intensity of the correlation, to analyse its shape, to determine the model parameters and to test the hypotheses in order to establish their validity.

Given the exponential evolution of the variables considered, the numerical values were transformed by logarithm. Some of the data were deseasonalized using Tramo-Seats

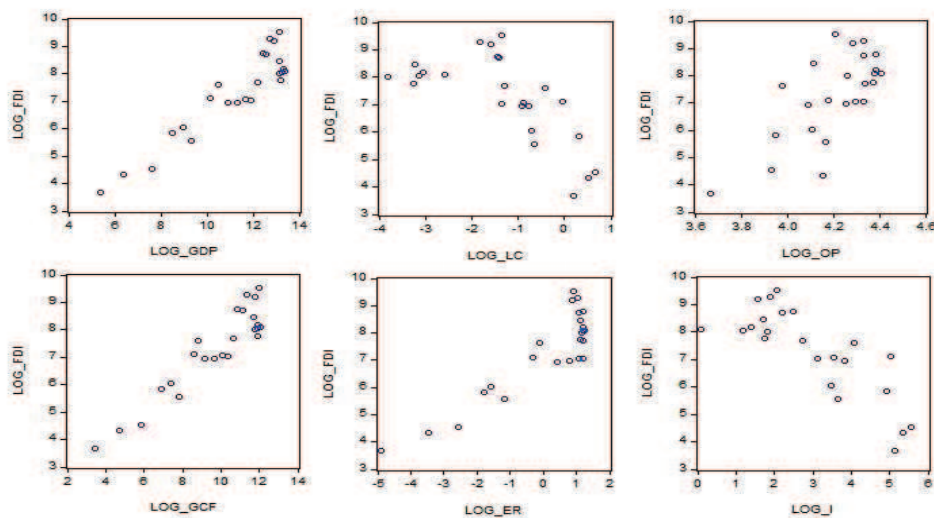
method. Table 1 shows the variables used in the modelling and their symbol.

**Table 1:** Variables used in the modelling and their symbol

Name of the initial variable	Symbol for the initial data series	Symbol for the transformed variable
FDI inflows	FDI	LOG_FDI
GDP	GDP	LOG_GDP
Labour cost	LC	LOG_LC
Trade openness	OP	LOG_OP
Gross capital formation	GCF	LOG_GCF
Exchange rate RON/USD	ER	LOG_ER
Inflation rate	I	LOG_I

Source: realized by the author

The scatter plot between LOG\_FDI and the exogenous variables is used with the purpose of describing the correlation between the variables mentioned above and the endogenous variable, foreign direct investment inflows.



**Figure 2:** The scatter plot between FDI inflows and the exogenous variables

Source: author calculus using Eviews

Analysing the above graphical representations, we can conclude that between FDI inflows and GDP, trade openness, gross fixed capital formation, respectively the exchange rate, there is a direct and linear correlation and between FDI inflows and labour cost, respectively the inflation, there is an inverse linear correlation.

The above mentioned hypothesis will be further confirmed using econometric modelling. We will develop simple linear regression models between the variable FDI inflows, which is considered in the logarithmic form, and the selected exogenous variables, some of the estimation results being presented in table 2:



**Table 2:** Estimation results of linear simple regression model between FDI inflows and exogenous variables

Exogenous variable	R-squared $\hat{R}^2$	Fisher statistic $F_{calc}$	P	Coefficient of exogenous variable	t Statistic	P
LOG_GDP	0.865	141.95	0	0.6255	11.9144	0
LOG_LC	0.463	19.02	0.00025	-0.8352	-4.3614	0.0002
LOG_OP	0.493	21.46	0.000129	6.0881	4.6330	0.0001
LOG_GCF	0.873	152.43	0	0.5928	12.3466	0
LOG_ER	0.798	87.08	0	0.8200	9.3321	0
LOG_I	0.649	40.84	0.000002	-0.8475	-6.3910	0

Source: author calculus using Eviews

The correlation coefficient (R-squared) expresses the intensity of the influence that each exogenous variable has on the variable LOG\_FDI. The closer the value is to 1, the stronger the correlation between variables. It can be observed that the correlation reports are statistically significant.

As shown in Table 2, the intensity of the correlation regarding the sample of 24 observations is strong and statistically significant between LOG\_FDI and the variables LOG\_GCF, LOG\_GDP, LOG\_ER and LOG\_I. The intensity of the correlation between LOG\_FDI and the variables LOG\_OP and LOG\_LC is medium the sample level but is statistically significant at population level. It is a direct correlation from the LOG\_GCF, LOG\_GDP, LOG\_ER, LOG\_OP and reverse from LOG\_LC and LOG\_I.

By analyzing the significance of the coefficients, we can observe that all of them are significantly different from 0, the probability that they are null featuring in the last column of the table 2 (it can be seen that it is zero in most cases). The coefficients of labour cost and inflation rate are negative, so we can state that a raise of their value has a negative impact on FDI inflows to Romania.

The tests relating to residual variable  $\varepsilon_t$  confirm the validity of the models: White test confirmed the homoscedasticity of the errors, Durbin Watson - the independence and Jarque Berra - the normality of errors.

All the hypotheses are verified, the models are valid, so we can take the following decisions regarding the research hypotheses:

**Table 3:** Research propositions and related decisions using linear models

Research propositions	Decision
H1: Market size, reflected by Gross Domestic Product, has a positive influence on FDI inflows.	Validated
H2: Lower labour cost has a positive influence on FDI inflows.	Validated
H3: Higher openness to trade has a positive influence on FDI inflows.	Validated
H4: Higher gross fixed capital formation has a positive influence on FDI inflows.	Validated
H5: The depreciation of domestic currency has a positive influence on FDI inflows.	Validated
H6: The decrease in the inflation rate has a positive influence on FDI inflows.	Validated

Source: author results using Eviews

## 5. Conclusion

The results obtained in our empirical research support many of the findings of previous research in this area. The study reveals that economic factors such as gross fixed capital formation, gross domestic product (GDP), exchange rate and inflation rate have an important role in explaining FDI inflows to Romania, while trade openness and labour cost have a moderate influence. Between FDI inflows to Romania and gross fixed capital formation, GDP, exchange rate, respectively trade openness, there is a direct and linear correlation and between FDI inflows and labour cost, respectively the inflation, there is an inverse linear correlation.

The results obtained from our empirical research highlight the idea that the evolution of economic factors in Romania, as a host country, represents an important guide for foreign investors regarding their investment policy, subordinated to the objective of obtaining competitive advantages. **Thus, we revealed the important role played by macroeconomic factors** in attracting FDI to Romania, as a host country. In order to improve **the level of FDI inflows to Romania**, the directions of action of government forces and policy makers should be directed towards improving the economic indicators that influence the most the FDI inflows.

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