The Impact of Foreign Direct Investments on Economic Growth in Romania

Adrian Petre [1]

One of the current priority objectives for Romania is the integration into euro zone. To achieve this objective, Romania must record progress on economic growth. Various empirical studies have analyzed the influence of foreign direct investment (FDI) on economic growth to see whether investment flows positively influence the economic development. The results revealed that positive connection depends on certain features of the economy at a time. The purpose of this research is to highlight the impact of the FDIs on the Romanian economic development because the debates on capital flows, both in the political and academic environment, associate these flows with a number of benefits for beneficiary states. In order to fulfill the objective of this research is analyzed, mainly, the relationship between foreign direct investment (FDI) and gross domestic product (GDP).

Keywords: E22, O40
JEL Classifications: economic growth, foreign direct investment impact, GDP

Introduction

Foreign direct investment is an important factor in real convergence process because they influence the structural convergence, the convergence of income and the productivity convergence. FDI flows

[1] **Adrian Petre,** PhD Candidate, Faculty of Theoretical and Applied Economics, Bucharest University of Economic Studies, Bucharest, Romania, adrian.petre21@gmail.com

contribute to economic growth through increasing productivity by providing new investment, better technology and managerial skills for the countries that receive these investments. FDI are financial flows that do not generate foreign debt, and because of that FDI are preferred to other sources of capital. The new theory of economic growth mentions that the indirect effects of FDI (access to foreign markets, technological externalities), are all factors that lead to long-term economic growth.

Between FDI and other variables of economic growth such as domestic investment, research and development expenditures, exports, human capital, there are strong interactions and relationships.

Specifically, FDI flows can play a vital role in the host countries, because they increase the supply of funds for domestic investments. The main goal of this scientific paper is to highlight the role of FDI on economic growth and the need for Romania to attract a larger volume of FDI as a source of achieving economic convergence.

Literature review

Many empirical studies that makes the connection between FDI and economic growth have identified a positive relationship between these variables, but only for certain regions.

Apergis, N., Lyroudi, K., Vamvakidis, A., in 2004, investigated the causal relationship between FDI and economic growth for several economies in transition and concluded that there is bidirectional causality between the two variables. Alfaro, L., S. Kalemli-Ozcan and S. Sayek, in 2009, showed that the developed financial markets can enhance the positive effect of FDI on economic growth.

Countries with efficient financial markets can benefit more from FDI in order to stimulate economic growth through technology transfer. A. Omri and B. Kahouli, in 2014, emphasizes that the effect of FDI stock on growth in MENA countries is positive and statistically

significant, similar results were obtained by R. Bhandari, D. Dhakal, G. Pradhan, K. Upadhyaya, in 2007, for the Eastern European states.
According Neto, D. G. and F. J. Veiga, in 2013, foreign direct investment can promote technology transfer and catch-up process, and can contribute to economic growth more than domestic investment.
S. Anwar and L.P. Nguyen, in 2011, analyzed the influence of FDI on economic growth for 61 provinces in Vietnam and concluded that there is a positive link between the two variables. Lensink, R. and O. Morrissey, in 2006, have shown that FDI volatility has a significant negative effect on economic growth. Alguacil, M., A. Cuadros, and V. Orts, in 2011, showed that the strongest positive effects of FDI on economic growth occurring in states with similar macroeconomic and institutional framework. On the other hand, Aizenman, J., and D. Y. Jinjarak Park, in 2013, showed that FDI inflows have not a significant impact on economic growth.

Methodology

To determine the potential for attracting foreign direct investment by Romania, we will use the state performance index in attracting investments (IPI). We'll use in this regard data series for 2003-2014. This index is the ratio between the share of FDI flows in global flow and the share of domestic GDP in global GDP. The index captures the influence of the business environment, infrastructure, technologies and presence of natural resources.
A value greater than 1 of this index demonstrates superior flow of foreign direct investment relative to the size of the economy.

$$IPI=(FDI_i/FDI_m)/(GDP_i/GDP_m) \qquad (1)$$

It is also analyzed the influence of FDI on GDP, based on a simple linear regression:

$$\log(GDP) = a+b\log(FDI) \qquad (2)$$

By estimating Equation (2), we will examine the impact of FDI on economic growth in Romania, with a series of data covering the period 2003-2014 and we will investigate whether FDI is a statistically significant determinant of economic growth. Explanatory variable is the volume of FDI inflows and the dependent variable is the rate of growth of GDP.

To determine the long-term link between the two variables, the first step is to test the stationarity of the two variables using Augmented Dickey-Fuller test (ADF).

The test consists in estimating the following regression model:

$$\Delta y_t = \beta_1+\beta_2 t+\delta y_{t-1}+\sum_{i=1}^{p} \alpha_i \Delta y_{t-1}+\varepsilon_i \qquad (3)$$

y_t is the variable tested for stationarity, δ are lags for identifying higher order autocorrelation, and ε_i is standard error. When the value of ADF statistical test is negative, the null hypothesis rejected.

H_0: the serie has unit root

H_1: the serie is stationary

After testing the stationarity of FDI inflows and economic growth, is investigated the long-term correlation between the two variables, using the Johansen co-integration test. Johansen test takes into account a number *k* of independent linear combinations for a number *m* of time series variables, leading to a stationary process.

$$X_{1,t} = \alpha+\beta_2 Xk+\beta_3 X_{3,k}+\ldots+\beta_k X_{k,t}+ \varepsilon_t \qquad (4)$$

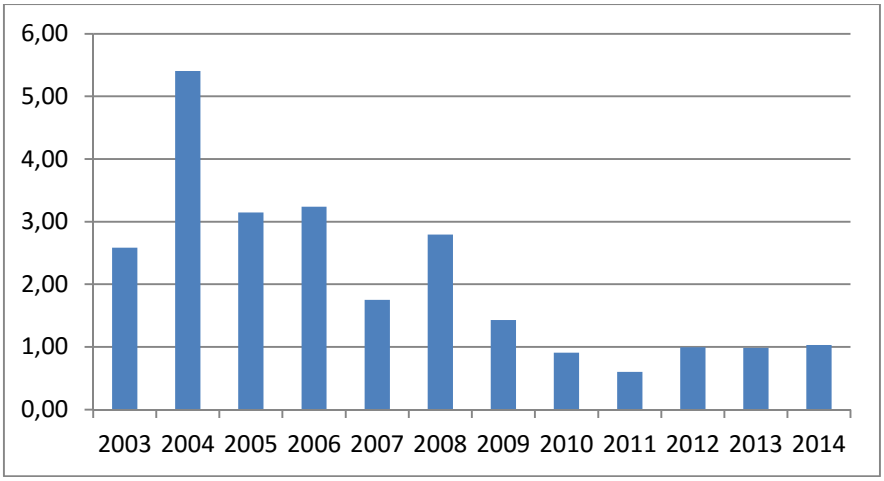
The last step is to use Equation 2 to test the relationship between the two variables. The results of the analysis will demonstrate whether there is a causal connection between the volume of FDI inflows and the growth rates of GDP and the connection strength.

Empirical results

Figure 1 shows the evolution of Romania's potential for attracting foreign direct investments, in the period 2003-2014.

Figure 1

Romania's performance index in attracting investments



Source of data: WorldBank, UNCTAD. Author's calculations

The potential for attracting FDI, as measured by the performance of a state in attracting investment, had a downward trend since 2004.

In 2010, 2011 and 2013, the index value is less than 1, which demonstrates a lower flow of foreign direct investment relative to the size of the economy. For a more accurate analysis of the impact of FDI on GDP, is analyzed the causal relationships between the two indicators. In this regard, the data sets are checked to see if they are stationary and is verified the existence of co-integration relationships at the level of the indicators.

Augmented Dickey-Fuller test results, shown in Table 1, show that, for a significance level of 5%, the growth rates of GDP and FDI inflows are stationary at first difference

Table 1

The results of Augmented Dickey-Fuller test

FDI		t-Statistic	Prob.
Augmented Dickey-Fuller test statistic		-3.458399	0.0321
Test critical values:	1% level	-4.200056	
	5% level	-3.175352	
	10% level	-2.728985	
Variable	Coefficient	t-Statistic	Prob.
FDI(-1)	-1.154214	-3.458399	0.0072
GDP		t-Statistic	Prob.
Augmented Dickey-Fuller test statistic		-3.59673	0.0282
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	
Variable	Coefficient	t-Statistic	Prob.
GDP(-1)	-1.703138	-3.59673	0.0088

Source: Author's calculations

Based on the relationship between ADF test and critical values ($t_{ADF\_FDI\ test}$ =-3.358399 < $t_{critical(5\%,\ 10\%)}$; $t_{ADF\_GDP\ test}$ = -3.458399 < $t_{critical(5\%,\ 10\%)}$), the null hypothesis is rejected and the alternative hypothesis is accepted, resulting in the two series are stationary at first difference.

The two series have the same degree of stationarity and this enables testing the long-term correlation between them. Johansen Co-integration test results are shown in Table 2.

Table 2

Johansen Co-Integration test results

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.873359	25.74966	15.49471	0.001
At most 1 *	0.398641	5.085634	3.841466	0.0241
Trace test indicates 2 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: Author's calculations

Trace test indicates two cointegration relationships, and this shows that the relationship between the two stationary sets of data can be described by two linear relationships. Based on this result, we can say that the various components of GDP may be influenced by FDI.

To test whether foreign direct investments have a long-term effect on economic growth is tested the link between FDI and GDP growth rates, using the Equation 2.

The regression test results are shown in Table 3.

Table 3

Least Square Method Results

Dependent variable: GDP				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	-0.042886	0.078304	-0.547692	0.5959
FDI	0.00003	0.00001	2.422983	0.0359
R-squared	0.369914	Mean dependent var		0.118333
Adjusted R-squared	0.306905	S.D. dependent var		0.171773
S.E. of regression	0.143005	Akaike info criterion		-0.900859
Sum squared resid	0.204505	Schwarz criterion		-0.820041
Log likelihood	7.405155	F-statistic		5.870844
Durbin-Watson stat	1.776203	Prob(F-statistic)		0.035878

Source: Author's calculations

According to data gathered from the regression test, we can say that FDI has a positive impact on the GDP growth rate. Adjusted R-squared value indicates that 30.69% of GDP is influenced by FDI.

Conclusions

The economic analysis conducted has shown through Johansen test and OLS test, a long-term connection between FDI inflows and economic growth rates. The rate of growth of the Romanian economy is influenced in a consistent rate by FDI inflows. One of the Romania's objectives is to join the euro area, and for this goal it is necessary to increase growth rates and achieve real convergence with the euro area. The study showed that FDI has a positive impact on economic growth in Romania, increasing resources utilization efficiency, resulting in the fact that FDI is a source of accomplishment of Romania's economic convergence with the euro area.

Romanian authorities should implement some mechanisms for attracting FDI, to increase the attractiveness of the country for investors because the Romania's performance index in attracting foreign direct investment is on a downward trend since 2004. In the period 2004-2006 the Romania's performance index in attracting FDI was high due to favorable conjuncture related to accession to the European Union.

Acknowledgement

This work was cofinanced from the European Social Fund through Sectoral Operational Programme Human Resources Development 2007-2013, project number POSDRU/187/1.5/S/155656 „Help for doctoral researchers in economic sciences in Romania".

References

Aizenman, J., Jinjarak, Y., and Park, D. 2013. Capital Flows and Economic Growth in the Era of Financial Integration and Crisis. *Open Economies Review*.

Alfaro, L., Kalemli-Ozcan, S., and Sayek, S. 2009. FDI, Productivity, and Financial Developmen. *World Economy*.

Alguacil, M., Cuadros, A., and Orts, V. 2011. Inward FDI and Growth: The Role of Macroeconomic and Institutional Environment. *Journal of Policy Modeling* 33(3): 481-496.

Anwar, S., Nguyen, L. P. 2011. Foreign direct investment and export spillovers: Evidence from Vietnam. *Business Review*, 20.

Apergis, N., Lyroudi, K., Vamvakidis, A. 2004. The Relationships between Foreign Direct Investment and Economic Growth: Evidence from Panel Data in Transition Economies. *International Atlantic Economic Conference*, Lisbon, Portugal.

Basu, P., Chakraborty, C., and Reagle, D. 2003. Liberalization, FDI, and Growth in Developing Countries: A Panel Cointegration Approaches. *Economic Inquiry*.
Bhandari, R., Dhakal, D., Pradhan, G., Upadhyaya, K. 2007. Foreign Aid, FDI and economic growth in East European countries. *Economics Bulletin*.
Lensink, R. and Morrissey, O. 2006. Foreign Direct Investment: Flows, Volatility, and the Impact on Growth. *Review of International Economics* 14(3): 478-493.
Neto, D. G. and Veiga, F. J. 2013. Financial Globalization, Convergence and Growth: The Role of Foreign Direct Investment. Journal of International Money and Finance.
Omri, A., Kahouli, B. 2014. The nexus among foreign investment, domestic capital and economic growth: Empirical evidence from the MENA region. *Research in Economics*.