KNOWLEDGE – International Journal
Vol. 28.1
December, 2018

EMPIRICAL ANALYSIS OF THE EFFECTS OF FDI ON THE ECONOMIC GROWTH: CASE OF THE REPUBLIC OF MACEDONIA

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Abstract: the importance of FDI on the economic growth of a country is widely accepted fact among the scholars and policymakers, beside of the existing debate regarding the strength of its impact and the level of the development of a country.
In this regard, the main objective of this paper is to empirically determine the effects of FDI on the Macedonian economy, through the co-integration and VECM methodology. In addition, this study analyzes the impact of FDI in the short-run and long-run period in the Republic of Macedonia, utilizing quarterly time series data for the period 1998 – 2017. Moreover, time series are tested for unit root by employing the Augmented Dickey Fuller test, demonstrating that variables contain unit root in their level, while are stationary in their first difference.
Secondly, Granger causality test is used in order to investigate the causal relationship among FDI and real GDP growth rate in Republic of Macedonia for 1998q1-2017q2, by suggesting unidirectional causal relationship among these variables.
Last but not least, this study investigates the existence of significant relationship between FDI and economic growth in the context of the Macedonian economy, in both long – run and short – run time period.
Keywords: FDI, growth, VECM, co-integration.

1. INTRODUCTION

The evidence regarding the positive effects of FDI on the growth of the hos country has attracted the attention of many policy makers and scholars so far. In this direction, developing countries have offered incentives in order to encourage foreign direct investments in their economies and Republic of Macedonia is not an exception.
However, recently there exist an ambiguous debate regarding the empirical results of the positive effects of FDI on host countries in macro and micro level. This is mainly to the mixed empirical findings represented so far while analyzing such nexus.
Further, various studies have examined the impact of FDI on developing economies, but FDI is mainly received by developed countries (Lucas, 1990; Gourinchas and Jeanne, 2013). If we review the macroeconomic analyses that account for groups of developed countries, we can see that there is often reported either a negative impact on growth (Carkovic and Levine 2005; Johnson 2006; Herzer 2012). However, By contrast, there exist papers that claim that in developing countries there exist a positive effect of FDI inflows (Olofsdotter 1998; Reisen and Soto 2001; Alfaro et al. 2004, Li and Liu 2005; Batten and Vo 2009). Yet, many scholars seem to agree that any positive effect of FDI on growth is largest among developed countries, since they have the absorptive capacity to benefit from the foreign investment.
The main aim of this paper is to empirically analyze the effects of FDI inflows in the economic growth of Republic of Macedonia for the time period 2000 – 2017, utilizing quarterly time series.
If we take a look at the economic reforms in Republic of Macedonia, we can see that even though they have been moving steadily forward, still there have existed several phenomena which affected negatively the economic growth of the country, such as corruption, lack of finance, political instability and an unclear regulatory environment, affecting also negatively the inflow of FDI and helping in the maintenance of high unemployment level. In addition, many reforms taken by the Macedonian government towards an open economy, with the focus on the privatization process, have considerably improved the economic performance of the country, resulting in considerably improved indicators and increasing trends, demonstrating periods of high economic growth.
However, several external shocks affecting the socio-economic activity while the transition period of the Republic of Macedonia. Although was evident the need for foreign direct investments, Republic of Macedonia is counted to be as one of the transition countries with lower levels of FDI compared to other transition economies. In addition, liberalization process of foreign trade noticed some important progress during 2001 with the signing of the Stabilization and Association Agreement with EU, second step was noticed during 2003 when the country accessed to the WTO, while the other important step was seen during 2006, when Republic of Macedonia joined the regional CEFTA.

After the independence of Republic of Macedonia, the inflows of foreign direct investments were in modest level. In addition, foreign investments were mainly noticed in the manufacturing and construction sectors, while the most recent inflows have been invested in the service sector.

In order to analyze the impact of the FDI inflows on the economic growth of Republic of Macedonia, this study is structured as follows: the second part reviews the relevant empirical literature dealing with the nexus of FDI and economic growth, third section covers the data and specification of the methodology, fourth section discusses the empirical findings while the last part employs the conclusions and recommendation of this nexus in Republic of Macedonia.

2. LITERATURE REVIEW

Although there is a plenty of empirical research made on the investigation of the link between FDI and economic growth both in developed and developing countries, yet due to the ambiguous debate and unreached consensus, the relationship between economic growth and FDI has attracted the attention of many scholars and policymakers recently. Moreover, evidence suggests that FDI can stimulate economic growth through different channels, discussed by authors such as Solow (1956), MacDougall (1960), Kemp (1961) and Diamond (1965). As Shehaj (2009) stated on her paper, empirical evidence was sought with regard to the effect of FDI on the economic growth of developing countries through its effect on the productivity levels (Stoneman, 1975), through the impact on the technological progress (Findlay, 1978) or via international trade, imports and exports (Balasubramanyam et al., 1996).

The main debate regarding the nexus of FDI and economic growth is basically to the two main views: studies which identify positive relationship among FDI and economic growth [De Mello, 1999; Chong, Baharumshah, 2010] and on the other side studies that demonstrate negative effects of FDI on economic growth [Moran, 1998] or no significant nexus among them [Ericson, 2001].

The impact analysis of foreign capital flows on the development of the beneficiary country underlines the role of the channels through which FDI exert a positive impact: exports, the extend of financial markets, development of human capital skills, technological and know-how transfer, raise in local enterprises productivity by incitement produced by foreign competition, ensuring a fair distribution of incomes (through tax payments, lower production prices, increased use of labor force) [Zait, 2003].

A positive connection between the two variables is obtained through the strong and worldwide extended financial markets channel [Alfaro, 2010; Durham, 2004; Hermes & Lensink, 2003; Chee &Nair, 2010], as an insufficient level of development of the markets and financial institutions prevent getting of a high level of economic growth [Abzari, Zarei, Esfahani, 2011].

The studies that identified a negative correlation as a result of the research are greatly reduced as number, but the most important are: Durham [2004], Lyroudi [2004], Carkovic & Levine [2005] and Lipsey [2006]. The unfavorable approach of the relation between FDI and the economic growth is surprised by Durham [2004] after researching a panel formed by 80 countries, member and non-member OECD in the period 1970 – 1980, but sustain the important role played by financial and institutional absorptive capacity. In the same view Kholdy [1995] applies Granger causality test on 10 economies from Eastern Asia. The negative relationship is also suggested by Lyroudi and Papanastosiou [2004] through the Bayesian analysis and Carkovic and Levine [2005] who got negative effects through taking into account a certain level of education, economic and commercial development in the beneficiary country, as "the exogenous part of FDI do not exert a positive and robust influence on economic growth" and "does not exist any empirical, trans-national and confident evidence to support the claim that FDI accelerates economic development", while Lipsey and Sjoholm [2005] noted that "there is no universal relation between the ratio of FDI inflows in GDP and the national growth rate".

There are a significant number of studies which identified a positive correlation between FDI and economic growth, both in developed and developing countries. The neoclassic theory situates the local market size at the basis of foreign capital entering and the microanalysis implemented by specialists [Alfaro, 2003; Vu, Noy, 2009; Marwah, Tavakoli, 2004] points out a strong connection in the manufacturing, primary and services sector. The positive correlation between FDI and the effects generated in the economy requires the insurance of a minimum level of human capital, economic and financial stability and a degree of markets liberalization [Blomstrom, 1996; UNCTAD, 1999; Sarkar, 2007]. Salman, Feng [2009] and Misztal [2010] mentioned the role of the foreign capitals in gaining an increased GDP rate through contribution to: human resources development, capital formation, raising the level of competitiveness on the local market.

3. RESEARCH METHODOLOGY

The effects of FDI on the economic growth of Republic of Macedonia are first analyzed by specification of the model estimated with the OLS method, given the static properties of the time series. It is further explored for the long-term relationship between the variables that use the Johansen co-integration test, as well as by performing an unlimited VECM model. In addition, a Granger causality test is carried out to determine the direction of causality between FDI and economic growth.

Quarterly data are used in empirical analysis, covering the period 1999Q1-2016Q3. The main sources of data are the National Bank (NBRM) and the State Statistical Office (SSO).

A summary statistical description of the variables used in the analysis are shown below in (Table 2).

Table 1. A summary of descriptive statistics of the used variables.

Variable	Obs	Mean	Std. Dev.	Min	Max
ln rGDP	71	11.34094	.1692452	11.01653	11.61263
ln FDI	71	3.771048	.8760208	1.145823	5.994669
ln Rexp	71	10.339	.3667483	9.643239	11.11963
ln Rimp	71	10.70128	.3453725	9.762604	11.30924

Source: author's calculations.

- **Specification of the econometric model**

In order to analyze the effects on the economic growth of Republic of Macedonia, the following model has been determined:

$$\ln rGDP = \beta 1 \ln FDI + \beta 2 \ln Rexp + \beta 3 \ln Rimp + \varepsilon_1$$

Real GDP at constant prices is taken as a dependent variable, representing economic growth, while FDI, real exports and real imports are considered as independent variables in this model. Finally, this model allows us to examine the relative effects of FDI on economic growth in the Republic of Macedonia.

4. EMPIRICAL RESULTS

The analysis begins with the properties of the time series by applying ADF test for unit root The results show that all series appear to have unit root at their level, thus they are not stationary at their level, but they become stationary in their first difference. The test results are summarized in the following table.

Table 2. Results of the Augmented Dickey Fuller test.

	Variable	Augmented Dickey Fuller	Comment
Level	**lnrGDP**	0.145 (-2.917)	**H_0**
	lnFDI	-2.338 (-2.917)	**H_0**
	lnRexp	-0.334 (-2.917)	**H_0**
	lnRimp	-0.129 (-2.917)	**H_0**
First difference	**lnrGDP**	-4.662 (-2.918)	**H_1**
	lnFDI	-4.919 (-2.918)	**H_1**
	lnRexp	-3.184 (-2.918)	**H_1**
	lnRimp	-5.009 (-2.918)	**H_1**
Notes: † numbers in brackets represent lag length in ADF test			

Source: author's calculations

RESULTS OF VECM MODEL

Before applying the co-integration technique, it is necessary to find the length of the delay of the data from the time series. The length of the lag is found through the VECM technique using the the following three criteria: AIC, HQIC and SBIC. These criteria propose 4 lengths of delay in VECM as presented in the following table:

Table 3. The length of lags

Lag	**AIC**	**HQIC**	**SBIC**
0	-3.62307	-3.55796	-3.45854
1	-12.368	-5.82631	-5.22976*
2	-6.25211	-5.53596	-4.44228
3	-6.66024	-5.61857	-4.02777
4	-7.50129*	-6.1341*	-4.04618

Source: author's calculations.

The co-integration method is used to test the variables for a long-term relationship. The following table provides empirical support for a long-term relationship between the above variables, since the zero hypothesis for co-integration is not rejected. The λ trace test suggests that there is at least one co-integrating vector, which means that the variables are moving together in the long run and there is a long-term relationship between FDI and economic growth in the Republic of Macedonia.

Table 4. Johansen's co-integration test

Null hypothesis	Alternative hypothesis	λ- trace	95 % critical value
r = 0	r > 0	76.5436	68.52
r ≤ 1	r > 1	**43.8410***	**47.21**
r ≤ 2	r > 2	20.7619	29.68

Source: author's calculations.

In the following table, the results of VECM are presented, in order to see the long-term relationship between FDI, and economic growth in the Republic of Macedonia for the last 17 years.

Table 5. VECM model results

Variables (co-integration vector 1)	**β**	**α**
ln Rgdp	1.000	0
ln FDI	-0.0044 (-0.375)	-10.282 (0.000)
ln Rexp	-0.0522 (-0.397)	0.4088 (0.024)
ln Rimp	0.0703 (0.265)	1.527 (0.000)

Source: author's calculations.

From the VECM results, it can be seen that since the sign of the coefficient is negative and statistically significant, it indicates that there is a long-term relationship between FDI and economic growth in the Republic of Macedonia for the time spin 2000q1 – 2016q4. Furthermore, FDIs do not have a statistically significant impact on the economic growth in the Republic of Macedonia. On the other hand, real exports have a positive and statistically significant impact on economic growth, while real imports have no statistically significant impact on economic growth.

THE GRANGER CAUSALITY TEST

The Granger causality test is used to test the direction of causality between the variables included in this model. We regress GDP by its own lagging values and FDI by creating zero-hypothesis tests, while the results are shown in the following table (Table 6).

Table 6: The results of Granger Causality test

		Dependent variables (equation)		
		ln rGDP	**ln open**	**ln FDI**
Independent variables (lags)	**ln rGDP**		23.87 **(0.000)**	4.613 (0.329)
	ln FDI	14.509 **(0.006)**	15.605 **(0.004)**	

Source: author's calculations.

According to the results of the Granger causality test, FDI causes GDP in the Republic of Macedonia, thus there exist a unidirectional causality between FDI and economic growth.

5. CONCLUSION

The purpose of this study is to empirically analyze the effects of FDI on the economic growth of the Republic of Macedonia. This study uses quarterly data for the time period 2000Q1-2016Q4, using the VECM methodology and Granger causality test.

The results of the stationarity test or Unit root test, relying on the Augmented Dickey Fuller test, indicate that the time series are not stationary at their level, that is, they contain unit root, but become stationary in the first difference. The result of Johansen's co-integration test indicates that there is one co-integrated vector indicating the existence of a long-term relationship between the variables in this model. From the results of VECM, it can be seen that since the sign of the coefficient is negative and statistically significant, it indicates that there is a long-term relationship between FDI and economic growth of the Republic of Macedonia for the time spin 2000q1 – 2016q4. Furthermore, FDIs do not have a statistically significant impact on the economic growth in the Republic of Macedonia. On the other hand, real exports have a positive and statistically significant impact on economic growth, while real imports have no statistically significant impact on economic growth.

In addition, the results of the VECM model analysis does not support the hypothesis that there is a positive and significant relationship between FDI and economic growth in Macedonia. In addition, there is a significant link between exports and economic growth, while there is no significant link between imports and economic growth in the Republic of Macedonia.

According to the results of the Granger's causality test, there exist unidirectional causality between FDI and economic growth, running from FDI to economic growth, thus FDI triggers economic growth in the case of the Republic of Macedonia.

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