An Empirical Study in Albania of Foreign Direct Investments and Economic Growth Relationship

Lorena Cakerri[1], Oltiana Muharremi[2]*, Filloreta Madani[1]

[1]Faculty of Economy, University of Vlora, Albania, [2]Meehan School of Business, Stonehill College, North Easton, MA, USA.
*Email: omuharremi@stonehill.edu

ABSTRACT

Albania has managed to attract increasing foreign direct investments (FDI) inflows as a result of achieving political and macroeconomic stability, improving the business climate and legislation. FDI is an essential source of sustained economic growth for Albania, bringing in capital investment, advanced technology, and highly qualified management. FDIs have helped the country finance existing account deficits, further develop the financial sector, and increase employment possibilities. This paper aims to study the empirical relationship between FDI and economic growth in Albania from 2002 to 2017 using time series data. This research will assess whether the inflow from foreign direct investors into Albania has created a positive cointegration relationship on economic growth.

Keywords: Foreign Direct Investment, Economic Growth, Development, Cointegration, Vector Error Correction Model
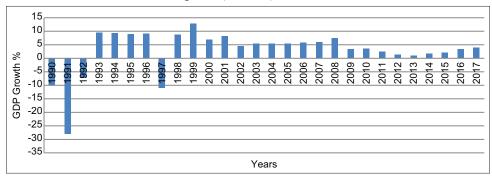**JEL Classifications:** F21, F43, C23, 010

1. INTRODUCTION

Developing countries, especially transitional countries, are unable to finance total domestic investments with national savings. Local household savings are a lot less than the capital required to finance big investments. Therefore, developing countries consider foreign direct investments (FDI) as an opportunity to help alleviate the shortage of capital needed (UNCTAD, 2015).[1] In the early 2000s, Albania was an emerging country with many carryover problems from 45 years of communist rule. It was experiencing negative economic growth and a difficult macroeconomic situation (Chart 1). An indication of this situation was the continuous high inflation rates since the early 1990s, at one point reaching as high as 226% in 1992. In order to change this situation, it was necessary to undertake numerous reforms politically, economically, legally, institutionally, land reform, financial system reform, and

privatization. With help from international financial institutions, such as the IMF, the European Bank for Reconstruction and Development, and the World Bank, in 1992 Albania launched a stabilization program aimed at boosting gross domestic product, reducing inflation, reducing the budget deficit, and pulling foreign investors into the country (Luci and Kripa, 2008). It was precisely the early structural reforms undertaken that brought rapid results reflected in the year to year growth of the gross domestic product, with an average economic growth rate of 9.3% from 1993 to 1996.[2] In 1997, civil unrest ensued due to the collapse of Ponzi Scheme investment firms, which marks a negative moment in the Albanian economy, damaging the positive performance achieved up to that point. Soon after, the economy experiences favorable rates of economic growth. From 1998 to 2008 Albania's economic growth

---

1   https://unctad.org/en/PublicationsLibrary/webdiaeia2015d3_en.pdf

2   Albania was the first of the current Western Balkan countries to launch structural reforms, World Bank 2009, Albania; Building Competitiveness in Albania.

Chart 1: GDP growth (% annual) in Albania, 1990-2017

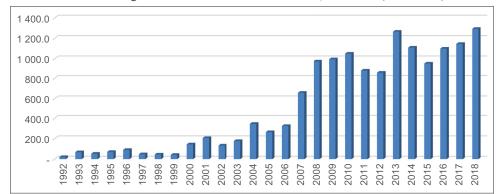Source: International monetary fund; Authors' work

Chart 2: Foreign direct investment inflows in Albania, 1992-2018 (in $ million)

Source: UNCTAD, FDI/MNE database

reaches approximately 6%, very similar to that of other countries in the Western Balkans region.[3] It was the global financial crisis of 2007-2008 that slowed economic growth to 3.4% in 2009. Beyond the direct impact of the global financial crisis, Albania was also affected by the imminent recession facing its two major trading partners, Italy, and Greece. This economic downturn is marked by a steep reduction in remittances and a decline in export.[4] Since 2013 Albania's economic growth tripled, from 1% in 2013 to 3.9% in 2017. This recovery is also due to mega-projects financed by foreign investors in the energy sector, which brought significant growth in FDI. Another essential factor with a positive impact is the improvement of the economic situation in the European Union, Albania's leading trading partner.[5]

In the past 2 decades, as indicated in Chart 2 below, inflows from FDIs have generally been upward trending, until 1996. Their positive performance was adversely affected by the civil unrest throughout the country in 1997[6] Furthermore, the regional crisis sweeping through the Balkans in 1999.[7] The privatization of formerly state-owned companies undertaken by the Albanian government provided an excellent opportunity to absorb massive

FDI inflows. During the global financial crisis (2007-2008), FDI in Albania continues to grow, not immediately reflecting the expected negative impact of the crisis.[8] Even though 2009 and 2010, FDIs were primarily driven by privatization and continued to maintain an upward trend of the previous year.[9] In 2009, the Albanian government agreed to sell 76% of the state-owned electrical provider shares to the Czech company CEZ, helping maintain the upward trend in FDI. From 2008 to 2011 while many countries were experiencing the effects of the economic and financial crisis, FDI in Albania continued to grow. This incremental growth rate (2008-2011), as is indicated in the chart below, slows down when compared with the 2006-2008 economic period.[10] From 2014 to 2017, foreign investment significantly increases due to significant investments in the energy sector. A vital element of this value is the investment for the Trans Adriatic Pipeline (about 40%). FDI inflows averaged close to $1 billion annually from 2008 to 2017. Foreign investments have also increased in January 2018-March of 2018 compared to the first quarter of 2017.[11]

---

3 Albania became one of the poorest countries in the region in the early 2000s, with a high median income in 2008 (World Bank)

4 Investment Climate Statement, 2015 Albania.

5 IMF Country Report No. 17/373. Albania.

6 In 1997, FDI inflows were halved compared to 1995 & 1996.

7 Kosovo crisis in 1999, though a regional factor, had a more profound impact on Albania due to its proximity and ethnic ties.

8 The fact that Albania is not very integrated into the global financial value chain provided some protection against the impact of the international financial and economic crisis. It also limited the impact of the international financial crisis in the country due to Albania's relatively modest entanglement with the world markets.

9 Boubakri et al. (2011) suggest that privatization could create opportunities to improve the investment climate.

10 This impact is due to the Greek and European countries' financial crises, which are Albania's main trading partners.

11 https://www.indexmundi.com/facts/albania/foreign-direct-investment.

2. LITERATURE REVIEW

The inflow of foreign investments to Albania, as in other Western Balkan countries, is driven mainly by the desire to invest in new markets and efficiency. FDI plays a significant role in the economic development of all Western Balkan countries, including Albania. These countries provide opportunities in developing a new service sector market, highly driven by major privatization initiatives and a relatively low-cost labor force (Jirasavetakul and Rahman, 2018).

Currently, several studies have tested the relationship between FDI and economic growth, and some have found out a cointegration between the two variables. These conclusions or findings vary based on the methods used in the research, variable choices, etc.

Sometimes the findings are contradictory, but extensive research shows that FDI has a positive effect on economic growth. Kukeli et al. (2006), on their research, find a positive relationship between FDI and output in ten Central Asian and Eastern European countries. Pradhan (2009) investigates the cointegration relationship between FDI and economic growth in ASEAN countries, namely Indonesia, Malaysia, Thailand, Singapore, and the Philippines, between 1970 and 2007. The study finds bidirectional cointegration between FDI and economic growth except for Malaysia. Malikane and Chitambara, 2017 study the impact of FDI on total factor productivity and conditional or relative backwardness for 45 African countries over 22 years (1980–2012). In this research, they apply the fixed–effect and two-step system Generalized Method of Moment (GMM), and they find a generally positive but weak effect of FDI on productivity growth.

Foreign investment in Albania appears to contribute positively to economic growth, supporting the theory that FDI is an essential factor of economic growth (Zoto, 2012; Lleshaj, 2016; Demeti and Rebi, 2014). Foreign investments in Albania generally provide positive effects, such as value-added to the economy, employment, and productivity growth (Merollari and Koti, 2015). However, empirical studies show that in Albania, it is the increase in productivity that explains FDI inflows. Multinational companies that invest in Albania are often oriented towards activities that do not require the use of advanced technology. Benefiting from the transfer of advanced technologies, Albania needs to focus its policies on foreign investments towards greener, more efficient technology. FDIs help boost domestic funding but retain superiority over them since "for the same amount of capital investments, Albania's economic growth has a higher degree of elasticity from FDI, than from local capital" (Lleshaj, 2016). FDIs are also more efficient than domestic investors, due to their ability to diversify the capital structure, which enables them to be more competitive in the market.

Some studies show an insignificant positive impact of FDI on economic growth in Albania, at times, even a negative impact (Zisi, 2014). These results may be due to the size of the Albanian market, and the short duration of foreign investment, which dictates the small amount of foreign investment and the lack of time needed to materialize the positive effects in the host country. Also, the effect of the global financial crisis negatively affected the absorption of FDI. Another reason that may explain these results is the fact that foreign investors are directly encouraged to invest in Albania by taking advantage of natural resources, low labor costs, and facilities provided by the Albanian government.

3. RESEARCH HYPOTHESIS AND METHODOLOGY

3.1. Objective of the Study

An essential purpose of the empirical analysis in this paper is to identify whether foreign investment establishes a cointegration relationship with economic growth in Albania. The analysis seeks to find if there is a positive or negative impact of FDI on economic growth.

The research approach in this paper is deductive, which, based on some existing theories, aims to explain the expected behavior of the main variables by testing the inquired hypotheses. The focus of the study will be the empirical examination of the quantitative relationship between FDI inflows and economic growth in Albania, estimating it through the gross domestic product for the period 2002-2017. Quantitative data will be analyzed through multiple regression. The econometric analysis will be performed through econometric methods, such as the Vector Autoregression Model (VAR) and Vector Error Correction Model (VECM).

H_1: There is a cointegration relationship between FDI and economic growth in Albania which goes from FDIs towards economic growth.

3.2. Data and Variables

The data used in the model are secondary data of variables with a quarterly observation frequency for the years 2002-2017. The data is retrieved from the Bank of Albania, The Albanian National Statistics Institute, the World Bank, UNDP. The econometric model will identify and measure variables that represent essential elements for economic growth and that have a cointegration relationship with FDI inflows. The effect of the theoretical on the economic growth of FDI is expected to be meaningful and positive. In order to measure the effect of FDI on economic growth in Albania, the endogenous growth model is extended by including the effect of FDI and other variables, based on theoretical and empirical support, as a source for long-term growth in Albania. The basic model is the model presented by Borensztein et al. (1998). Through this model the impact of FDI inflows will be tested as the primary independent variable on economic growth estimated through the gross domestic product, the dependent variable, even in the presence of other independent variables referred to as absorption capacity variables: human capital, technological development, trade openness, financial development, as well as other variables of economic growth like inflation and government spending.

The empirical model of the study includes:

y – Gross Domestic Growth, GDP, Albania's economic growth indicator.

α - (constant identifier).

X_1-FDI, Source Bank of Albania, measured as the inflow of FDI.

X_2- Development of human capital, HC_I, the level of human capital is measured through the human capital development index, Source UNDP.

X_3- Technological Difference, TEC_I, is the technological difference of Albania comparing it with technologically advanced countries, measured by the difference between United States GDP per capita and Albania's GDP per capita, as a ratio of Albania's GDP per capita.[12] Data is collected from Bank of Albania journal publications and the Federal Reserve Bank of St. Luis, USA.

X_4- Financial sector development, FINDEV, measured through monetary aggregate M3/GDP, source Bank of Albania. A higher liquidity ratio will mean more intensification of operations in the banking system, the main part of the financial system in Albania. What is reasonably expected is that the larger the financial sector, the more financial services it can provide (King and Levine, 1993).

X_5- Commercial opening, TO, is calculated as the sum of overall trade volume, imports, and exports, comparing it to GDP and reflects the host country's trade policies to facilitate trade opportunities. This indicator shows how favorable the conditions are for foreign trade and helps to spread the positive effects of FDI in the country.

X_6- Public Expenses, PubExp, data collected from Bank of Albania publications.

X_7- Inflation, INF. This index is used as the official inflation measure in Albania and is calculated by the variation in the general price level of goods and services intended for consumption.

3.3. Research Methodology

Analyzing the cointegration relationship between GDP and FDI, the multivariate VAR model and the VECM model are used. Both models provide the error correction mechanism in estimating the coefficients of the VAR model and make it possible to determine the existence or not of cointegration relationships, in the short and long term, between the dependent variable and the independent variable. The study begins by investigating the quality of the time series, continuing with understanding the short-term and long-term relationships between variables. The data are expressed by the logarithm of their real values, in order to incorporate the reproductive effects of the time series created with the data obtained in the study. Transform the lag data into a logarithmic form so that the variances of the data over time are more consistent and allow the residuals to satisfy the conditions of homoscedasticity and their normal distribution (Lütkepohl and Xu 2009).

3.3.1. Correlation analysis

An essential indicator of the statistical relationships exhibiting the variables considered in the study is the bivariate correlational relation between these variables. These correlations determine the nature of the relationships between variables in pairs, as well

as the robustness of this relationship. The sign of the correlation coefficient determines the nature of the statistical relationship between the variables. The strength of the relationship is determined by comparing the absolute value of the coefficient with the value 1. Through the correlation analysis is measured the degree of linear static relationship between the variables.

3.3.2. Stationarity testing

Since the data used in the empirical analysis are time-series data, it is necessary to test them for stationarity before testing them for integration. The stationarity of the data in time series form requires that the time variable does not influence the mean, variance, and autocovariance values of the data (Gujarati, 2011). "Unit root testing" is used to determine stationary data. Testing unitary roots help avoid false regressions, which produce invalid results. The stationarity of the variables is verified by the Augmented Dicky-Fuller (ADF) test, which determines whether or not the unit root exists at the level of direct values or in the first difference for each variable. The multivariate linear equation can express the ADF regression test:

$$\Delta X_t = \delta_0 + \delta_1 t + \delta_2 X_{t-1} + \sum_{i=1}^{k} \alpha_i \Delta X_{t-1} + u_t \quad (1)$$

Where:

X_t expresses the natural logarithm of the variable over time "t";

ΔX_{t-1} expresses the first differences with k-lags;

u_t is the variable that expresses autocorrelation errors.

The coefficients are estimated from the processed data. The null hypothesis and the alternative hypothesis for the existence of roots per unit for each variable have the below formula:

$$H_0 : \delta_2 = 0 \quad \text{v.s.} \quad H_a : \delta_2 < 0$$

In the ADF model for testing the null hypothesis, its acceptance or rejection is realized by comparing the value of the ADF (t-statistic) with the critical value of the test at the predetermined level of statistical significance (1%, 5%, or 10%). In this study, the 5% level of statistical significance is used. When the value of the ADF t-statistic is higher than the critical value of the test at the 5% level, the null hypothesis cannot be rejected, so it remains that the relevant variable has a unit root, which means that this variable is non-stationary. The ADF test is performed for each of the variables involved in modeling, both at the right level of their values but also at the first difference.

Phillips and Perron (PP), 1988, developed the PP test used in this study, similar to the ADF tests. The PP test is more complete than ADF-test because the test involves an automatic correction of the Dickey-Fuller procedure. Also, unlike the ADF test, the PP test appears more straightforward in applying as it does not necessarily require the specification of the delay length (p). Like the ADF tests, the conclusions and hypotheses for the PP tests are the same. The null hypothesis of non-stationary series is rejected in favor of the stationary alternative for each test when the test statistic of PP is more than the critical values, and the corresponding probability value is <5%.

---

12 Borensztein et al. 1998, Li and Liu 2005; Elboiashi 2015, Malikane and Chitambara 2017, to measure the technological gap, use the difference between US GDP per capita and Albania's GDP per capita as a measure of Albania's GDP per capita, since the US is considered a technologically advanced country.

3.3.3. Optimal lag length

An important step when analyzing data connections with VAR models is to determine the lag length of the data used accurately. Determining the appropriate lag length increases the reliability of the VAR model conclusions (Lütkepohl, 1993). To determine how to select the lag length, one can use the lowest values achieved by some of the most usable criteria in specifying the appropriate lag time.

3.3.4. Johansen integration test

Non-stationary time series data often make the analysis difficult. It is necessary to see if the variables are co-integrated with each other. The existence of co-integration, as a necessary condition in the analysis of data with econometric models, yields better results than if obtained by running continuous differences of each dataset until they reach stationarity. When dealing with more than two variables in a time series, the order of integration of these variables must first be found. The procedure used in the paper to find out whether the variables are cointegrated or not is Johansen Integrations Test (Johansen, 1988; 1991).

3.3.5. The autoregressive vector (VAR)

The VAR autoregressive vector model is widely used to analyze time-series data, especially for multi-variable time series analysis. Generally, the VAR (p) model for time series differential m-variables is formulated as follows:

$$y_{t,i} = c_i + \sum^{p} \sum_{j=1} \Phi_j y_{t-j,i} \tag{2}$$

$$y_t = c + \sum_{i=1}^{p} \varnothing_i y_{t-1} + \varepsilon_t \tag{3}$$

Where y_t is the element vector iy in time t, $\varnothing_i$ is the order matrix $n \times n$, whose elements are the coefficients of the vector y_{t-1} for i=1, 2., p, p is the lag length, c is the vector of the ordinate in origin, and ε_t is the random shock vector (Usman et al., 2017).

3.3.6. VECM

In the VAR model, the autoregressive vector can be applied when all the variables that will be part of the model are stationary. When the variables do not meet the stationarity condition, and co-integration relationships occur between the variables, the VECM model can be used. Through VECM, both short-term and long-term effects can be estimated in time series data analysis. The VECM model of order p, with range cointegration $r < k$, is presented as follows:

$$y_t = c + \prod Y_{t-1} \sum_{i=1}^{p-1} \Gamma_i \Delta Y_{t-1} + \varepsilon_t \tag{4}$$

Where Δ is the operator of differentiation, $\Delta y_t = y_t - y_{t-1}$, y_{t-1}, is the endogenous vector variable with the first lag, ε_t is the excess vector, c is the vector of the ordinate in the origin, $\prod = \alpha\beta'$ is the matrix of integration coefficients, α is the correction vector, the order matrix $k \times r$ and β is the cointegration vector (long-term parametric), a matrix of order $k \times r$, Γ_i is the order matrix $k \times k$ of endogenous coefficients for the variable i (Usman et al., 2017).

3.3.7. Granger causality analysis

Granger, 1969, defines the causality between the two variables in the form of time series as follows: a variable y_t may have been caused by another variable x_t, both in the form of time series, if the first variable can be predicted using the past values of the variable x_t Granger to judge the casual links between time series variables constructed a system with a general form as follows:

Table 1: Descriptive statistics

Variable	Obs.	Mean	Std. dev.	Min.	Max.
Quarterly	64	32.5	18.61899	1	64
lnGDP	61	1.50509	0.3018598	11.77467	12.92871
lnINF	64	0.8640636	0.4430633	−0.4054651	1.973892
lnPubExp	56	11.28492	0.355928	10.50706	11.89857
lnFDI	64	9.517097	0.7312928	7.994931	10.50447
lnTO	64	4.301842	0.1065015	4.059528	4.566749
lnFinDev	64	5.707607	0.1181133	5.424026	5.923415
LnTEC_I	64	2.60176	0.3434797	2.289874	3.466045
LnHC_I	64	−0.3241096	0.0440015	−0.3945252	−0.2691875
Time	64	199.5	18.61899	168	231
lnGDP_D1	63	0.0179899	0.117022	−0.1658335	0.2669582
lnINF_D1	63	−0.0213114	4127958	−1.51262	1.154404
lnPubExp_D1	63	0.0211711	0.3021699	−0.7789917	0.6278496
lnFDI_D1	63	0.0318312	0.4386591	0.9484329	1.652722
lnTO_D1	63	0.0035412	0.1231345	0.2201228	0.277028
lnFinDev_D1	60	0.0036023	0.1146191	−0.2413764	0.1738944
lnTEC_I_D1	63	−0.0181638	0.0465373	−0.106704	0.1179104
lnHC_I_D1	55	0.0022789	0.0049709	0	0.0187925
Inter1	56	−3.025227	0.244434	−3.650059	−2.591353
Inter2	61	54.67125	4.762987	45.23756	61.59866
Inter3	64	24.55833	1.845699	22.03105	29.53739
Inter4	64	40.97385	3.670298	33.6566	46.88203
Inter1_D1	55	0.011302	0.160237	−0.6252849	0.3588266
Inter2_D1	60	0.179582	2.372018	−4.86301	7.091572
Inter3_D1	63	−0.074699	1.273562	−3.24188	4.779831
Inter4_D1	63	0.1671193	2.37388	−4.961327	6.012089

Source: Authors' work

$$\begin{pmatrix} y_{1t} \\ y_{2t} \end{pmatrix} = CD_t + \sum_{t=1}^{p} \begin{pmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{pmatrix} \begin{pmatrix} y_{1t-1} \\ y_{2t-1} \end{pmatrix} + \begin{pmatrix} u_{1t} \\ u_{2t} \end{pmatrix} \tag{5}$$

The model built by him, y_{1t} does not cause y_{2t}, only if $\alpha_{2i}=0$, $i= 1, 2, , p$.

According to the Granger causality test, y_t causes x_t if y_t helps predict x_t. If y_t does not cause x_t and x_t does not cause y_t, then:

$$\begin{pmatrix} \Delta X_t \\ \Delta Y_t \end{pmatrix} = \begin{pmatrix} \beta_1 \\ \beta_2 \end{pmatrix} + \sum_{t=1}^{p} \begin{pmatrix} \alpha_{11} & \alpha_{12} \\ \alpha_{21} & \alpha_{22} \end{pmatrix} \begin{pmatrix} \Delta X_{t-1} \\ \Delta Y_{t-1} \end{pmatrix} + \prod \begin{pmatrix} X_{t-1} \\ Y_{t-1} \end{pmatrix} \begin{pmatrix} u_{1t} \\ u_{2t} \end{pmatrix} \tag{6}$$

Where $\begin{pmatrix} X_{t-1} \\ Y_{t-1} \end{pmatrix}$ is the term error, which comes from a long-term cointegration relation, u_{1t} and u_{2t} are following independent errors with expected zero value and finite covariance matrix

$\sum$x. Deciding Granger's analysis of causality, a hypothesis needs to be built:

H_0 (there is no causal relationship between the variables)
H_1 (there is a causal relationship between the variables)

If the P (P-value) is higher than the significance level α, then the alternative hypothesis H_0 will be accepted, concluding that there is no causal relationship between the variables. Otherwise, hypothesis H_0 will be rejected, and hypothesis H_1 will be accepted (Faruku et al., 2011).

4. EMPIRICAL DATA ANALYSIS

4.1. Empirical Results of the VECM Model, the Impact of FDI on Economic Growth

Table 1 shows the results of the descriptive statistics in order to obtain more precise information about the normality and

Table 2: Correlation matrix

lnGDP	lnINF	lnPubExp	lnFDI	lnTo	lnFinDev	lnTEC_I	lnHC_I
0.0000							
0.1194	1.0000						
0.8759	−0.0631	1.0000					
0.8872	−0.1328	0.7678	1.0000				
0.3357	0.0365	0.2281	0.3430	1.0000			
0.6295	−0.2971	0.4623	0.5802	0.3649	1.0000		
0.8898	0.0036	−0.7538	−0.8167	−0.4548	−0.7027	1.0000	
0.9410	−0.2326	0.7591	0.7379	0.3244	0.8320	−0.8636	1.0000

Source: Authors' work

Table 3: Findings of the unit root tests for the variables at different levels

Unit root tests	Variables							
	lnGDP	lnINF	lnPubExp	lnFDI	lnTO	lnFinDev	lnTEC_I	lnHC_I
Augmented dickey-fuller (ADF) With constant and trend	−1.235	−4.618	−1.574	−1.231	−2.234	−0.922	−2.339	−1.408
Phillips perron (PP) With constant and trend	−6.733	−5.236	−8.811	−5.876	−6.199	−8.796	−1.778	−1.780

Source: Authors' work

Table 4: Results of unit root tests for variables' first differences

Unit root tests	Variables							
	lnGDP_D1	lnINF_D1	lnPubExp_D1	lnFDI_D1	lnTO_D1	lnFinDev_D1	lnTEC_I_D1	lnHC_I_D1
Augmented dickey-fuller (ADF) With constant and trend	−4.161	−5.354	−4.417	−5.098	−4.025	−4.136	−4.160	−2.191
Phillips perron (PP) With constant and trend	−31.51	−11.54	−26.44	−19.99	−13.20	−26.88	−4.838	−9.856

Source: Authors' work

Table 5: Determination of lag length

Selection-order criteria								
Sample: 2003q4-2015q4						Number of obs=49		
Lag	LL	LR	df	P	FPE	AIC	HQIC	SBIC
0	351.255				1.9e-15	−14.0512	−13.9487	−13.781
1	615.079	527.65	49	0.000	3.0e-19	−22.8196	−21.9993	−20.6575*
2	696.805	163.45	49	0.000	8.8e-20	−24.1553	−22.6173	−20.1014
3	788.964	184.32	49	0.000	2.1e-20	−25.9169	−23.6611	−19.9712
4	862.391	146.86*	49	0.000	1.7e-20*	−26.9139*	−23.9404*	−19.0764

Endogenous: lnGDP lnPubExp LnFDI lnTO lnFinDev lnTEC_I lnHC_I
Exogenous: _cons

Source: Authors' work

symmetry of the distribution of the variable estimators in the model.

The results are calculated over a period from the first quarter of 2002 to the fourth quarter of 2017. To avoid possible errors and to approach the normal distribution, the logarithmic form of the variables in the model is taken. We calculate the correlation matrix to find the relationship between the variables in the model. The results are shown in Table 2 below.

The results show that there is a positive static relationship between lnDGP and lnPubExp, lnFDI, lnTO, lnFinDev, lnHC_I, and there is a negative static relationship between lnGDP and lnINF, lnTEC_I. These results are consistent with the theoretical expectations regarding the association of these variables.

The central bivariate relationship between GDP and FDI, which is also the objective of this study, from the correlation matrix shows that these variables correlate positively and at a stable level between them (corr. = 0.88). The existence of the correlation does not mean cointegration, so we used the VECM model to assess whether there is a cointegration relationship between the variables in the study. Before developing the model, it is essential to determine whether the variables are stationary, and then the order of their stationarity. The procedure used to determine stationary variables is unit root testing. Whether the time series has a unit root or not, the ADF stationarity test is utilized for all variables at different levels. Phillips and Perron test are applied to support the stationarity results. The findings of the unit root tests are given in Table 3 below.

The results of unit root tests show that all variables are non-stationary at different levels except for the inflation rate logarithmic series (lnINF). This variable is stationary, and it is integrated at level zero (0). Finding the order of integration for the variables in the model requires the creation of new variables from their first differences, as follows:

$lnGDP\_D1 = lnGDP_t - lnGDP_{t-1}$
$lnPubExp\_D1 = lnPubExp_t - lnPubExp_{t-1}$
$lnFDI\_D1 = lnFDI_t - lnFDI_{t-1}$
$lnTO\_D1 = lnTO_t - lnTO_{t-1}$
$lnFinDev\_D = lnFinDev_t - lnFinDev_{t-1}$
$lnTEC\_I\_D1 = lnTEC\_I_t - lnTEC\_I_{t-1}$
$lnHC\_I\_D1 = lnHC\_I_t - lnHC\_I_{t-1}$

The ADF and PP tests are applied to the new series of first differences from the variables evaluated above and tested if they meet the stationarity condition. The results of unit root tests on the first differences are given in Table 4.

The results show that the variables in the first difference are stationary, and they are integrated at a level first, I (1). After defining stationarity, the next step is to identify the existence of a short-term or long-term relationship between lnGDP and lnINF, lnPubExp, lnFDI, lnTO, lnFinDev, lnTEC_I, lnHC_I. Since the model is multivariate, to determine if there is a cointegration relationship, the Johansen cointegration test is used, which only applies to variables having the same order of integration, and to avoid possible errors the lnINF time series is excluded since it is stationary at the level and has an order I (0). In order to avoid erroneous results, first, it was determined the appropriate length of each lag over these variables: lnGDP, lnPubExp, lnFDI, lnTO, lnFinDev, lnTEC_I and lnHC_I. The results of the testing are shown in Table 5.

Table 5 shows that almost all the information criteria tests applied, reach the minimum value for lag = 4. Since four of the criteria used have determined the optimal level of a lag number to be a level 4, in the other two steps of constructing the VECM model (co-integration test and coefficient evaluation), the level of lag will also be 4. Applying Johansen's test for lag = 4, the model gives the following results:

The Johansen co-integration test, as it reflects in Table 6 shows that there are at least three long-term relationships among the variables in the model, such as: lnGDP, lnPubExp, lnFDI, lnTO, lnFinDev, lnTEC_I, and lnHC_I. (Also, on the results in Table 6 for maximum rank "n = 3," Trace Statistic (TS) = 47.1106 < Critical Value (CV) = 47.21). Thus, the variables utilized in the study provide at least three co-integrated models, according to the Johansen test, using the Trace criterion. VECM model can be applied to determine the long-run economic relationship between the variables. The results of the VECM model are given in the Table 7.

The VECM output contains information on the short- and long-term relationship between the variables included in the model. The last part of the output provides information about the long-term relationship between the variables. From the output of the VECM method an integration equation can be derived for the long-term between lnGDP and lnPubExp, lnFDI, lnTO, lnFinDev, lnTEC_I, lnHC_I.

Table 6: Johansen co-integration test

Johansen tests for cointegration					
Trend: Constant				Number of obs.=49	
Sample: 2003q4-2015q4				Lags=4	
Maximum rank	Parms	LL	Eigenvalue	Trace statistic	5% critical value
0	154	756.9989		210.7843	124.24
1	167	800.0575	0.82752	124.667	94.15
2	178	826.3942	0.65869	71.9938	68.52
3	187	838.8358	0.39819	47.1106*	47.21
4	194	850.5314	0.37959	23.7193	29.68
5	199	858.347	0.27313	8.0882	15.41
6	202	861.377	0.11633	2.0281	3.76
7	203	862.3911	0.04054		

Source: Authors' work

Table 7: VECM model

Vector error-correction model					
Sample: 2003q4-2015q4				No. of obs=49	
				AIC=−25.83908	
Log likelihood=800.0575				HQIC=−23.39286	
Det (Sigma_ml)=1.55e-23				SBIC=−19.39145	
Equation	**Parms**	**RMSE**	**R-sq**	**Chi-square**	**P>Chi-square**
D_lnGDP	23	0.024091	0.9765	1080.522	0.0000
D_lnPubExp	23	0.114131	0.927	330.0181	0.0000
D_lnFDI	23	0.38559	0.6572	49.84497	0.0000
D_lnTO	23	0.061604	0.8719	177.0441	0.0000
D_lnFinDev	23	0.028638	0.9654	725.1245	0.0000
D_lnTEC_I	23	0.035396	0.741	74.4013	0.0000
D_lnHC_I	23	0.002583	0.8853	200.741	0.0000
Identification: beta is precisely identified					
Johansen normalization restriction imposed					
Beta	**Coef.**	**Std. err.**	**z**	**P>|z|**	**5% Conf. interval**
_ce1					
lnGDP	1				
lnPubExp	10.37832	1.625221	6.39	0	7.192942	13.56369
lnFDI	−4.355466	0.5475636	−7.95	0	−5.428671	−3.282261
lnTO	4.338212	2.199908	1.97	0.049	0.0264723	8.649952
lnFinDev	−23.46449	3.774926	−6.22	0	−30.86321	−16.06577
lnTEC_I	−0.2644457	0.9286934	−0.28	0.776	−2.084651	1.55576
lnHC_I	57.62829	10.44113	5.52	0	37.16406	78.09253
_cons	45.68787				

Source: Authors' work

Table 8: VECM sustainability test

Eigenvalue stability condition	
Eigenvalue	**Modulus**
1	1
1	1
1	1
1	1
1	1
1	1
−0.9903604	0.99036
0.0051688+0.9780239i	0.978038
0.0051688−0.9780239i	0.978038
0.9360712	0.936071
0.154131+0.8531885i	0.866999
0.154131−0.8531885i	0.866999
−0.1837006+0.8255278i	0.84572
−0.1837006−0.8255278i	0.84572
0.03662818+0.8444077i	0.845202
0.03662818−0.8444077i	0.845202
−0.7918631+0.03488788i	0.792631
−0.7918631−0.03488788i	0.792631
0.4175506+0.6601886i	0.781151
0.4175506−0.6601886i	0.781151
−0.5280312+0.4450538i	0.690572
−0.5280312−0.4450538i	0.690572
0.4185053+0.3552199i	0.548933
0.4185053−0.3552199i	0.548933
−0.5235108	0.523511
0.2063578	0.206358
−0.1194935	0.119494
0.06524865	0.065249

Source: Authors' work. The VECM specification imposes 6-unit moduli

Co-integration equation = lnGDP + 10.37 lnPubExp − 4.35 lnFDI + 4.33 lnTO − 23.46 lnFinDev 0.26 lnTEC_I + 57.62 lnHC_I

This implies that in the long run equilibrium, when the cointegration equation is equal to 0, the calculation will be:

lnGDP = −10.37 lnPubExp + 4.35 lnFDI − 4.33 lnTO + 23.46 lnFinDev + 0.26 lnTEC_I − 57.62 lnHC_I

One of the important research questions that this study raises is: "Do FDI flows positively or negatively affect gross domestic product?" To answer this question a statistical hypothesis is built:

H_0: FDI does not have a positive impact on Albania's GDP.
H_a: FDI has a positive impact on Albania's GDP.

The answer to this question comes through estimating the coefficients of the cointegration model presented by the equation. Since the coefficient in front of the logarithmic treatment of the FDI variable differs from zero and positive (b = 4.35), then the null hypothesis (H_0) will be rejected; thus, the alternative hypothesis H_a will be accepted. Referring to the linear model and the alternative hypothesis, the consensus is that FDI flows have a positive impact on gross domestic product. Following the same logic, the impact of other variables included in the equation on the gross domestic product is tested.

This means that the values of lnGDP are positively dependent on the values of lnFDI, lnFinDev, and lnTEC_I, in the long run, as well as lnGDP values are negatively dependent on the values of lnPubExp, lnTO, and lnHC_I. Interpreting the cointegration equation, a 1% increase in FDI lag (lnFDI) will lead to an increase of GDP lag by 4.35%.

The co-integration equation resulting from applying the VECM method, concludes that there is a Granger causality relationship

Table 9: VECM's lagrange multiplier test

Lagrange - multiplier test			
Lag	Chi-square	df	Prob.>Chi-square
1	56.667	49	0.21070
2	42.6505	49	0.72683
3	64.2029	49	0.07126
4	65.9787	49	0.05315

Source: Authors' work. H_0: No autocorrelation at lag order

in the long-term derived from FDIs towards economic growth. This confirms the first hypothesis on the existence of a positive and long-term relationship deriving from FDI towards economic growth. Also, several results are drawn in connection to the relationships created between the variables included in this equation:

- There is a significant and positive long-term relationship between financial development (lnFinDev) and economic growth (lnGDP), and there is a cointegration Granger relationship that moves from lnFinDev to lnGDP
- There is a significant long-term negative relationship between public spending (lnPubExp), trade openness (lnTO), human capital index (lnHC_I), and economic growth (GDP). This Granger cointegration relationship is derived from lnPubExp, lnTO, lnHC_I towards GDP.
- As for the technological difference index (lnTEC_I) this variable is statistically insignificant (P) = 0.76 > 0.05; however, the coefficient sign is positive. This means that technological development has not been enough to influence long-term economic growth.

In order to achieve long-run equilibrium, one should normally rely on the short-run equilibrium that exists between the variables in the model. Analysis of the model allows the evaluation of the information about the short r un. First, we determine the short-run equations and evaluate the significance of each, then each of the variables in their first difference is evaluated. Each of the equations has as a dependent variable the first difference, such as: lnGDP_D1, lnINF_D1, lnPubExp_D1, lnFDI_D1, lnTO_D1, lnFinDev_D1, lnTEC_I_D1, and lnHC_I_D1. The paper seeks to understand the relationship between FDI and economic growth, so the focus is primarily on equations that have a dependent variable lnGDP_D1 and lnFDI_D1. What is noticeable is that the time series of the first difference D_lnGDP depends significantly on the series of first differences from $lnGDP_{t-1}$, $lnGDP_{t-2}$, $lnPubExp_{t-1}$, $lnPubExp_{t-2}$, $lnPubExp_{t-1}$, $lnFDI_{t-1}$, $lnFDI_{t-2}$, $lnFDI_{t-3}$, $lnHC\_I_{t-2}$, and $lnHC\_I_{t-3}$. Also, from the output, it is noted that there is an error correction term for the equation where the variable (D_lnGDP) appears as a dependent variable. This error correction vector (ce_1) is statistically significant and has a negative value, which means that lnGDP is an endogenous variable. It also indicates that the dynamic model is stable, as long-run equilibrium deviations are adjusted by decreasing lnGDP. The statistical error correction for $lnGDP_t$ represents the negative quarterly adjustment of $lnGD_{t-1}$, which will be 2.68% of its integral value $lnGDP_t$. It also can be used to measure the adjustment speed to reach a steady-state for variable lnGDP.

Whereas, for the second equation, where D_lnFDI is the dependent variable, the error correction is $ce_1 = 0.188$, but is not statistically significant. This indicates that it is neither caused by the values of

its previous periods nor by those of other variables. The coefficients ahead of the variables are all significant, so the conclusion is that economic growth does not cause changes in FDI for Albania. There is also a short-term Granger cointegration stemming from FDI towards economic growth, and this relationship is negative.

4.2. Diagnosing the VECM Model, the Impact of FDI on Economic Growth

It is crucial to prove that the model produces reliable results and does not carry errors, so a series of diagnostic tests are applied. Initially, the sustainability test is applied to see that the model has no errors and is specified. If the values of the remaining modules are more than one, then the model is not stable, and the results are inaccurate and carry errors, but if the values are ≤1, then the model is stable, and its results can be used for predictions and analysis. The results of the VECM sustainability test are given in the Table 8.

The second assessment applied is the Lagrange Multiplier (LM) autocorrelation test between residuals. This tests whether the residue is autocorrelated to the lag specified in the corresponding VECM model. The test results are given in Table 9 below.

Table 9 shows that the probability values are higher than 5% (P > 0.05) for each lag value, indicating that the H_0 hypothesis "there is no autocorrelation in the residuals for any of the lags tested," cannot be dismissed.

5. CONCLUSIONS

Through econometric analysis, the relationship that exists between FDI is evaluated, measured as inflows and economic growth, calculated based on gross domestic product. Concerning the relationship between the two main variables, attention is focused on two moments. First, to determine if they have a cointegration relationship between them, and second, to determine if FDIs have a positive impact on economic growth. The VECM and the Granger cointegration test are applied to investigate the cointegration relationships among the variables.

The results of the VECM model, which is used to test the hypothesis, establish a conclusion that there is a long-term Granger cointegration relationship derived from FDI to economic growth and that FDI flows have a positive impact on gross domestic product. Specifically, a 1% increase in FDI lag (lnFDI) will lead to a 4.35% Gross Domestic Product lag increase. This conclusion is relevant and is consistent with much of the theoretical and empirical literature addressing the relationship between these two variables. It is a conclusion that should further encourage the Albanian government to develop better policies that help increase the inflow of foreign direct investors.

Another important conclusion of this model that requires reflection is the fact that in the long run, the gross domestic product does not have a cointegration relationship with FDI, to move from domestic product towards FDI. Thus, economic growth does not cause changes at FDIs in Albania. A large part of FDI is destined for exports, and they are attracted primarily because of the relatively cheap resources in the country.

REFERENCES

Borensztein, E., De Gregorio, J., Lee, J.W. (1998), "How does foreign direct investment affect economic growth?" Journal of International Economics, 45(1), 115-135.

Demeti, A., Rebi, E. (2014), Foreign direct investments (FDI) and productivity in Albania. Interdisciplinary Journal of Research and Development, 1(1), 7-14.

Elboiashi, H.A. (2011), Dissertation Thesis. The Effect of FDI and Other Foreign Capital Inflows on Growth and Investment in Developing Economies.

Faruku, A.Z., Asare, B.K., Musa, Y., Shehu, L. (2011), Causality analysis of the impact of foreign direct investment on GDP in Nigeria. Nigerian Journal of Basic and Applied Sciences, 19(1), 9-20.

Granger, C.W.J. (1969), Investing causal relations by econometric models and cross- spectral methods. Econometrica, 37, 424-438.

Gujarati, D. (2011), Econometrics by Example. Hampshire: Palgrave Macmillan.

Jirasavetakul, L.F., Rahman, J. (2018), Foreign Direct Investment in New Member State of the EU and Western Balkans: Taking Stock and Assessing Prospects. Washington, DC: International Monetary Fund.

Johansen, S. (1991), Estimation and hypothesis testing of the cointegrating vector in Gaussian vector autoregression models. Econometrica, 59, 1551-1580.

King, R., Levine, R. (1993), Finance and growth: Schumpeter might be right. The Quarterly Journal of Economics, 108(3), 717-737.

Kukeli, A., Chuen-Mei, F., Liang-Shing, F. (2006), "FDI and growth in transition economies: Does the mode of transition make a difference?" RISEC, 53(3), 302-322.

Li, X., Liu, X. (2005), "Foreign direct investment and economic growth: An increasingly endogenous relationship." World Development, 33, 393-407.

Lleshaj, LL. (2016), Evaluation of Foreign Direct Investment and Cost of their Capital, the Case of Albania. Albania: Foreign Direct Investment.

Luci, E., Kripa, D. (2008), Investments role in Albania's Economic Growth in the Course of the Transition. Albania: International Conference on Balkan Studies.

Lütkepohl, H. (1993), Introduction to Multiple Time Series Analysis. 2nd ed., Ch. 4. Berlin: Springer-Verlag.

Lütkepohl, H., Xu, F. (2009), The Role of the Log Transformation in Forecasting Economic Variables, Working Paper No. MWP2009/06, European University Institute.

Malikane, C., Chitambara, P. (2017), Foreign direct investment, productivity and the technology gap in African economies. Journal of African Trade, 4(1-2), 61-74.

Merollari, K., Koti, S. (2015), Foreign direct investments in Albania, structure and dynamics. European Journal of Economics and Business Studies, 1(2), 22-32.

Phillips, P.C.B., Perron, P. (1988), Testing for a unit root in time series regression. Biometrika, 75, 335-346.

Pradhan, R.P. (2009), "The FDI-led-growth hypothesis in ASEAN-5 countries: Evidence from cointegrated panel analysis." International Journal Business and Management, 4(12), 153-164.

UNCTAD. (2015), Global Investment Trend Monitor, Financing for Development FDI can be an Important Source of External Development Financing for LDCS, LLDCS and SIDS. Switzerland: UNCTAD.

Usman, M., Fatin, F.D., Barusman, Y.S., Elfaki, A.M., Widiarti, W. (2017), Application of Vector Error Correction Model (VECM) and Impulse Response Function for Analysis Data Index of Farmers' Terms of Trade. Indian Journal of Science and Technology, 10(19), 1-14. DOI: 10.17485/ijst/2017/v10i19/112258.

Zisi, A. (2014), Impact of Foreign Direct Investment on Economic Growth and the Drivers of their Absorption: The case of Albania. Albania: Foreign Direct Investment.

Zoto, O. (2012), Dissertation Thesis; FDI in Albania: Analysis of Effects, Policies, and Link to Economic Growth.