Foreign Direct Investment and Economic Growth in Low-Income and Lower-Middle-Income Economies of West Africa

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Abstract

This paper examines the contribution of foreign direct investment to economic growth through the main sector of economy in 5 Low-Income economies (Burkina Faso, Guinea Bissau, Liberia, Niger and Sierra Leone) and 4 Lower-middle-income economies (Cote d'Ivoire, Ghana, Nigeria and Senegal) of West Africa. Using regression model and the Granger causality test with a panel data for the period 2000-2016, we discovered that on all West Africa's region the FDI's contribution is positive but not significant with an autocorrelation positive. Therefore, by studying the case of each country we note that the majority has positive FDI and few are negative, also le majority of those countries have a negative autocorrelation. Our result show that only primary sector is negative and the secondary and tertiary sector are positive but all are not significant for the whole region but in individual result of the country, it is the tertiary sector which influences more the growth before the primary and secondary sectors.

Keywords: FDI, Growth, Regression Analysis, Granger causality test, West African Countries

1. Introduction

Foreign Direct Investment is an international movement of capital made to create, develop or maintain a subsidiary abroad or to exercise control or significant influence over the management of a foreign company. The economic sector is a grouping of activities that appear to be similar. There are three main economic sectors: The first sector is the primary sector and all activities whose purpose is the exploitation of natural resources which includes: agriculture, fisheries, forests, mines and deposits. The second is the secondary sector which includes activities consisting of a more or less sophisticated transformation of raw materials (manufacturing industries, construction). Lastly, the tertiary sector which constitutes of activities that are complementary to agricultural and industrial activities such as trade, transport, financial activities, services provided to businesses, services rendered to private individuals, accommodation-catering, real estate, information-communication for the tertiary merchant and for the tertiary non-market are public administration, teaching, human health, social action according to English economist Colin Clark: "The conditions for economic progress" (1947). Economic growth is an increase in the capacity of an economy to produce goods and services, compared from one period of time to another. West Africa region is all countries settled in the west part of Africa, characterized by a wide range of ecosystems and production systems. Estimated at 372 million people in 2017, this region is among the region of Africa which benefits from foreign direct investment. According to the African Development Bank, services are the dominant sector in West Africa, since in the key countries, services contribute most to GDP as 37% (in Liberia and Sierra Leone, however, agriculture remains dominant). Across all countries in the region, manufacturing's share in GDP is the lowest of any sector. Manufacturing's highest share in the region is in Cote d'Ivoire, about 18 percent of GDP in 2017. In most West African countries, manufacturing is confined to light industry processing primary products and producing consumer goods. The agricultural sector is also a neglected sector in Africa and especially in the West Africa region. However, the majority of the labor force is in the agricultural sector, it has 65% of employment and gross domestic product (GDP) of 35% according to West Africa Agricultural Productivity Program (WAAPP).

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Foreign direct investment (FDI) flows to Africa has slumped to $42 billion in 2017, a 21% decline from 2016, according to UNCTAD's World Investment Report 2018. The purpose of this study is to examine the contribution of foreign direct investment to economic growth using a data panel approach over the period 2000-2016 to observe the impact of foreign direct investment on economic growth in the three main sectors of economic activity. This survey allows us to take stock and find out more about what is preventing West Africa from progressing despite the many foreign direct investments it receives and the strengths it has in all its economic sectors. The West African countries we are studying in this investigation are: Burkina Faso, Côte d'Ivoire, Ghana, Guinea Bissau, Liberia, Niger, Nigeria, Senegal and Sierra Leone. Several scientific studies have focused their research on FDI and economic growth in developing countries, in Africa, in sub-Saharan Africa or in one country only, but rarely in the West Africa region, based on major economic sectors and examining the case of each country as well as the region in general. For this reason, our research is moving towards West Africa, seeking the contribution of FDI to growth through the economic sector. This research is important for this region because these countries have many assets and could also have a self-financing capacity; we want to examine the state of economic growth in this region and what contributes to it. For this study, we deal with the data panel method using two models: the regression model and the Granger causality test. The rest of the paper is organized as follows: Section 2 reviews the literature on the growth of FDI. Section 3 describes the model, the data, the econometric methodology and the empirical results. Finally, Section 4 summarizes the main findings of the study and provides policy recommendations.

2. Literature review

Pelinescu, E., & Radulescu, M. (2009) found that most specialists think that FDI had a positive impact upon the economic growth in the receiving countries. They showed that it was a direct relation between the FDI flows (as percent of the GDP) and the growth of GDP per capita not just for the developed countries, but also for most of the developing countries. In this way, the countries that had attracted an important FDI volume had the highest economic growth rates. Since the early '60s of the 20th century, the times with the most intense foreign investment activities had coincided with a sudden increase in the macroeconomic indicators (especially the GDP). They concluded that only direct foreign investments would allow the re-specialization of the economy to surpass the situation of maintaining on the world markets only with food products and raw materials. Their experience shows that FDI substantially enhanced the national economies' re-specialization processes all over the world. They share the opinion of those specialists who affirm that FDI plays a determinant role in re-specializing the transition economies and in increasing the export potential. Also, FDI growth leads to increase in the manufactured production quantity, examining some structural changes which occurred under the influence of FDI in the economies of new European Union member states (The Czech Republic, Estonia, Hungary, Lithuania, Latvia, Poland, Slovakia, and Slovenia) and in South-East Europe, they draw also the attention upon the changes in the export potential of those countries.

In their study, Dritsaki, & Stiakakis (2014) featured on the relationship between foreign direct investments, exports, and economic growth in Croatia using annual time series data for the period 1994-2012. Several econometric models, including the bounds testing (ARDL) approach and the ECM-ARDL model were employed. The results confirm a bidirectional long run and short run causal relationship between exports and growth in order to offer new perspectives and insight for a new policy in Croatia for a sustainable economic growth.

Iamsiraroj & Ulubaşoğlu (2015) show several theories have been advanced on the beneficial effect of foreign direct investment (FDI) on economic growth. However, mixed empirical findings have resulted in a long-standing debate. They explore the global FDI–growth relationship through an 'informed' econometric analysis predicated on substantial guidance obtained from a detailed investigation of 880 estimates reported in 108 published studies. With model uncertainties alleviated and the core specification benchmarked against the aforementioned assessment, our econometric analysis, utilizing a global sample of 140 countries in the period 1970 to 2009, conclusively documents that FDI positively affects economic growth. Moreover, they find that this association holds globally as strongly as in the developing world as well as it is regional variation rather than within-country variation, and contemporaneous FDI rather than past FDI, which matters for growth. Finally, appropriate absorptive capacity indicators for positive growth are identified to be trade openness and financial development rather than schooling.

Seyoum, & Lin (2015) use annual balanced panel data to examine the Granger causal link between foreign direct investment (FDI) and economic growth (measured by real GDP growth) for 23 African countries covering the period from 1970 to 2011. Using recently developed panel econometric techniques, the present paper takes into account non-stationery and cross-section dependency in the dataset when analyzing the growth-FDI nexus.

Their findings indicate two-way Granger causality link between FDI and economic growth. They showed that this causal link is not homogeneous among individual countries in the sample. More specifically, they observed unidirectional causality from FDI to GDP growth in Egypt, Gabon, and Mauritania, and from GDP growth to FDI in Côte d'Ivoire, Kenya, South Africa and Zambia. Their main finding remains robust to estimation between FDI as a fraction of gross capital formation and real GDP growth. Anyanwu, & Yameogo (2015) analyze drivers of foreign direct investments (FDI) to West Africa using a panel dataset from 1970 to 2010. OLS and GMM techniques are used for the estimations. The main results indicate that there is a U-shaped relationship between economic development and FDI inflows to West Africa. In summary: (i) The quadratic element of real per capita GDP, domestic investment, trade openness, first year lag of FDI, natural resources (oil and metals) endowment and exports, and monetary integration have positive and significant effect on FDI inflows to West Africa; and (ii) there is a negative relationship between FDI inflows to the sub-region and loan component of ODA, economic growth, level of economic development (real GDP per capita), life expectancy, and domestic credit to the private sector.

Alvarado & Ponce (2017) examine the effect of foreign direct investment (FDI) on economic growth in 19 Latin American countries. Using panel data econometrics, they found robust empirical evidence that suggests that the effect of FDI on economic growth is not statistically significant in aggregated form. This result varies when they incorporate the levels of development reached by the countries in the region. FDI has a positive and significant effect on product in high-income countries, while in upper-middle-income countries the effect is uneven and non-significant. Finally, the effect in lower-middle-income countries is negative and statistically significant. Their findings show that FDI is not an adequate mechanism to accelerate economic growth in Latin America, with the exception of high-income countries.

Sunde (2017) examines economic growth as a function of foreign direct investment and exports in South Africa, applying the autoregressive distributed lag model, known as the ARDL bounds testing approach to co-integration for the long run relationship between economic growth, foreign direct investment and exports. The error correction model was used to examine the short run dynamics; and the VECM Granger causality approach was used to investigate the direction of causality. It confirmed co-integration between economic growth, foreign direct investment and exports; it also indicates that both foreign direct investment and exports spur economic growth contrary to some studies, which found that FDI does not cause economic growth. The VECM Granger causality analysis found unidirectional causality between economic growth and foreign direct investment running from foreign direct investment to economic growth, unidirectional causality between foreign direct investment and exports running from foreign direct investment to exports and bidirectional causality between economic growth and exports. The results thereof confirm the FDI-led growth hypothesis for South Africa. On the policy front, the government could stimulate foreign direct investment through incentives to investors, creation of a good macroeconomic environment and a careful utilization of loose monetary policy to grow the economy.

Lin & Benjamin (2018) examine the interactions between economic growth, energy consumption and foreign direct investment among other factors using a panel dynamic ordinary least squares model for Mexico, Indonesia, Nigeria and Turkey (MINT), because they are emerging economies, have large population and favorable demography with high expectation for strong economic growth. To make the analysis more homogenous, these interactions were examined for individual country and as a group from 1990 to 2014 and coefficients of their long run economic growth function estimated. They found that there exist a bi-directional causal relationship between economic growth, energy consumption and FDI inflows for Mexico, a bi-directional causal relationship between economic growth and energy consumption, between economic growth and FDI inflows, and an unidirectional causal relationship from FDI to energy consumption for Indonesia as well as exist a bi-directional causal relationship between economic growth and energy consumption, between economic growth and FDI inflows, and an unidirectional causal relationship from FDI to energy consumption for Nigeria while Turkey had a bi-directional causal relationships between economic growth, energy consumption and FDI inflows. They conclude that diversification of economy to improve labor productivity is encouraged and over reliance on fossil fuel should be minimized. Another study by Bermejo & Werner (2018) went to show that, it is often asserted with confidence that foreign direct investment (FDI) is beneficial for economic growth in the host economy. Empirical evidence has been mixed, and there remain gaps in the literature. The majority of FDI has been directed at developed countries. Single-country studies are needed, due to the heterogeneous relationship between FDI and growth, and because the impact of FDI on growth is said to be largest in open, advanced developed countries with an educated workforce and developed financial markets (although research has focused on developing countries).

They fill these gaps with an improved empirical methodology to check whether FDI has enhanced growth in Spain, one of the largest receivers of FDI, whose gross domestic product growth was above average but has escaped scrutiny. During the observation period 1984–2010, FDI rose significantly, and Spain offered ideal conditions for FDI to unfold its hypothesized positive effects on growth. The results are robust and clear: The favorable Spanish circumstances yield no evidence for FDI to stimulate economic growth. The Spanish EU and euro entry are also found to have had no positive effect on growth. The findings call for a fundamental rethinking of methodology in economics.

Makiela, & Ouattara (2018), in their study, went to show that, the impact of foreign direct investment (FDI) on growth remains a thorny question for researchers and policy makers. At the theoretical level, it has been argued that, FDI is growth enhancing. However, existing empirical studies have left researchers and policy makers perplexed as these studies do not appear to find a strong relationship between the two variables. The findings, based on a sample of developed and developing countries over the period 1970–2007, conclusively reveal that FDI affects growth via inputs accumulation but not the total factor productivity growth channel. In addition, they suggest that factors other than FDI may have contributed to the increase in productivity witnessed in developing countries in recent decades.

K Sokang (2018), investigates the impact of FDI on the economic growth of Cambodia by utilizing the time series data throughout 2006-2016. The correlation matrix and multiple regression analysis techniques were used to analyze the collected data. The findings reveal that FDI has a positive impact on the economic growth of Cambodia and recommends that government should bring reforms in the domestic market to attract more FDI in Cambodia. The foreign direct investment (FDI) inflows are often seen as an important catalyst for economic growth in developing countries.

Velonjara, & Gondje-Dacka (2019), investigate the effect of foreign direct investment (FDI) on economic growth in 9 West African countries namely; Burkina Faso, Cote d'Ivoire, Ghana, Guinea Bissau, Liberia, Niger, Nigeria, Senegal and Sierra Leone. Using panel data econometrics for the period 2000-2016, they found empirical evidence that suggests that the effect of FDI on economic growth is negative and statistically significant. The findings show that neither is foreign direct investment nor the primary sector of economy (PSE) of this region is not an adequate mechanism to accelerate economic growth in West African countries. However, the secondary and tertiary sector of economy for this region has a positive effect and is statistically significant to explain the growth.

3. Data Base and Model

The data from this study are taken from the World Bank website. The dataset used consists of 144 observations for West African countries from 2000 to 2016. The countries studied are 5 Low-Income economies (Burkina Faso, Guinea Bissau, Liberia, Niger and Sierra Leone) and 4 Lower-middle-income economies (Cote d'Ivoire, Ghana, Nigeria and Senegal) of West Africa. The low-income economies are those with GNI per capita, calculated using the World Bank Atlas method, of $1,045 or less in 2014. However, Lower-middle-income economies are those with a GNI per capita calculated using the World Bank Atlas method, of more than $1045 but less than $4,125. A number of countries that could have been included in the sample were omitted for lack of sufficient data on some of the selected variables. This choice was not arbitrary because data from a single international source can overcome the challenges of convincing database methods and approaches. The methodology used for the empirical findings on this thesis involves regression analysis. The variables used are: Dependent variable: Gross domestic product growth rate (GDP). Independent variables: Foreign Direct Investment (FDI), Gross Fixed Capital formation (GFC), Primary Sector (PES), Secondary Sector (SSE) and Tertiary Sector (TSE).

3.1. Regression Analysis

The regression equation is formulated as below.

$Y_t = a + \beta_1 FDI_{t-1} + \beta_2 GFC_{t-1} + \beta_3 PSE_{t-1} + \beta_4 SSE_{t-1} + \beta_5 TSE_{t-1} + \varepsilon_t$ (1)
Where $Y_t = (GDP_t - GDP_{t-1}) / GDP_{t-1}$,
$FDI = FDI/GDP$
$GFC = GFC/GDP$
$PSE = PSE/GDP$
$SSE = SSE/GDP$
$TSE = TSE/GDP$

GDP is the gross domestic product growth rate, FDI is the inflow of foreign investment in the countries, the GCF is the gross capital formation and the PSE, SSE and TSE respectively represent the three economic sectors such as the primary, secondary and tertiary sectors of the selected countries. β_1, β_2, β_3, β_4 and β_5 are the constants of the equation. A one-year lag is used for all the independent variables means FDI, GCF, PSE, SSE and TSE. This is to see the effect of these variables from the previous period on economic growth. The impact of FDI inflows in particular should not be felt on economic growth in the same year. This model places each of the independent variables as a fraction of GDP.

The main hypothesis of empirical work is that the contribution of FDI inflows to economic growth in the region West Africa is positive. This can be confirmed or denied based on the estimated value of β_1 in the regression analyzes. The null hypothesis for Ho: $\beta_1 = 0$ means FDI inflows do not contribute to growth, while the alternative hypothesis is $\beta_1 \neq 0$. The result of the regression analysis for the region over the period is presented in Table 1, while the results for countries are shown in Table 2. The Durbin Watson (DW) statistic included in the result is used to test autocorrelation in the error term. It should be noted if the DW value is from 0 to less than 2 it indicates that the autocorrelation is positive, whether the value is 2.0 indicates that there is no autocorrelation and when the value goes from 2 at 4 is the negative autocorrelation. The value t is presented to test the significance of the coefficient estimates. There are 16 observations in each analysis.

Table 1. Regression result for West Africa

Variables	β	t-value	R^2	DW
Constant	1.1121	0.4155	0.0001	1.1301
FDI_{t-1}	0.0181	0.9460		
GFC_{t-1}	-0.0056	0.9831		
PSE_{t-1}	-0.0057	0.9678		
SSE_{t-1}	0.0016	0.9961		
TSE_{t-1}	0.0019	0.9895		

Source: *Author's computation*

Our results show in global the coefficient estimates for FDI_{t-1} is positive for the West Africa countries but not significant at the 5% level of significance according to t-test. They also show a positive autocorrelation of the residual. Based on the regression analysis, a unit increase in FDI leads to an increase in GDP growth of about 0.0181 percentage points. GDP growth also is estimated to decrease by 0.0057 percentage points if the PSE_{t-1} increases by one unit. The secondary and tertiary sector influence positively the growth of GDP but has a very low percentage, for an increase of one unit the secondary sector causes an increase of 0.0016 percentage points and 0.0019 for the tertiary. The increase of one unit of GFC_{t-1} implies a decrease of GDP growth by 0.0056 percentage points.

Table 2. Regression result for the countries

Burkina Faso

Variable	β	t-value	R^2	DW
Constant	1.5119	0.0732	0.3809	1.7434
FDI_{t-1}	0.3450	0.8082		
GFC_{t-1}	-0.4670	0.3297		
PSE_{t-1}	-0.5020	0.8747		
SSE_{t-1}	0.2176	0.7103		
TSE_{t-1}	0.0208	0.9050		

Cote d'Ivoire

Variable	β	t-value	R^2	DW
Constant	-5.9231	0.0039	0.6012	2.5431
FDI_{t-1}	0.8897	0.7393		
GFC_{t-1}	4.3231	0.0136		
PSE_{t-1}	-1.2137	0.1215		
SSE_{t-1}	-0.3890	0.7898		
TSE_{t-1}	0.0157	0.9787		

Ghana

Variable	β	t-value	R^2	DW
Constant	0.8383	0.0643	0.3369	1.9512
FDI_{t-1}	0.1467	0.7508		
GFC_{t-1}	0.2263	0.2632		
PSE_{t-1}	-0.0712	0.5550		
SSE_{t-1}	-0.2285	0.2676		
TSE_{t-1}	-0.0489	0.6854		

Guinea Bissau

Variable	β	t-value	R^2	DW
Constant	0.1830	0.8570	0.1605	2.1558
FDI_{t-1}	-1.0835	0.4703		
GFC_{t-1}	0.0742	0.9501		
PSE_{t-1}	0.3441	0.3086		
SSE_{t-1}	-0.6502	0.3564		
TSE_{t-1}	-0.0908	0.8119		

Liberia

Variable	β	t-value	R^2	DW
Constant	-37.0631	0.0945	0.4015	1.3009
FDI_{t-1}	2.4233	0.0799		
GFC_{t-1}	-0.1529	0.9958		
PSE_{t-1}	2.4381	0.7712		
SSE_{t-1}	-9.5058	0.1550		
TSE_{t-1}	0.2092	0.9715		

Niger

Variable	β	t-value	R^2	DW
Constant	5.8229	0.2524	0.2135	2.1265
FDI_{t-1}	-1.2891	0.8066		
GFC_{t-1}	2.4171	0.4381		
PSE_{t-1}	-0.2473	0.8577		
SSE_{t-1}	-9.8240	0.1604		
TSE_{t-1}	2.2737	0.2109		

Nigeria

Variable	β	t-value	R^2	DW
Constant	-0.1271	0.7921	0.3281	2.2084
FDI_{t-1}	-0.4944	0.7344		
GFC_{t-1}	-0.1815	0.6810		
PSE_{t-1}	0.3601	0.4239		
SSE_{t-1}	-0.2156	0.5169		
TSE_{t-1}	0.0217	0.8685		

Senegal				
Variable	β	t-value	R²	DW
Constant	2.6505	0.0558	0.3118	2.3202
FDI_{t-1}	-7.3186	0.1231		
GFC_{t-1}	-0.2729	0.7124		
PSE_{t-1}	-1.1563	0.5419		
SSE_{t-1}	-1.8845	0.4666		
TSE_{t-1}	1.4201	0.3528		
Sierra Leone				
Variable	β	t-value	R²	DW
Constant	-2.2191	0.0221	0.3241	1.8274
FDI_{t-1}	0.1106	0.9014		
GFC_{t-1}	0.2421	0.7287		
PSE_{t-1}	0.1986	0.7090		
SSE_{t-1}	0.6120	0.5383		
TSE_{t-1}	-0.3024	0.7048		

Source: *Author's computation*

The result for Burkina Faso shows that an increase of one unit of FDI contributes to increase 0.3450 percentage points of GDP growth as well as for the secondary and tertiary sectors, for an increase of one unit causes an augmentation of 0.2176 percentage points for the secondary sector and 0.0208 for the other. The primary sector and the government's spending are negatively influence to GDP growth when one unit increase of primary sector leads to decrease 0.5020 percentage points and similarly for GFC for one more unit leads to the reduction of 0.4670 percentage points GDP's growth. It is estimated that Liberia has an FDI coefficient that most influences GDP growth in the West Africa region among the selected countries, when it increases by one unit its FDI implies an increase of 2.4233 percentage points compared to Senegal, if one unit of FDI is increased this leads to a decrease in GDP growth to 7.3186. For Sierra Leone, FDI, primary, secondary sector and GFC influence positively GDP growth but only the tertiary sector has a negative influence on GDP growth. The tertiary sector has a positive impact on the GDP growth of 6 countries compared with 4 countries that are impacted by the primary sector and only 2 by the secondary sector. If we refer to the results, we can admit that the tertiary sector is the most sought after than the other two sectors yet the majority of countries in the region are agricultural. Of the nine countries selected in the region, five have an estimated positive coefficient for FDI such as Burkina Faso, Ivory Coast, Ghana, Liberia and Sierra Leonne, and four have a negative coefficient such as Senegal, Nigeria, and Guinea Bissau and Niger. By studying each country individually, we find that 5 countries have a negative autocorrelation and 4 have a positive autocorrelation.

3.2. Granger causality test

This subsection represents a regression that aims to test whether the Granger FDI is driving GDP growth. The test equation is formed using 1 and 2-year offsets for FDI and Y as explanatory variables, and Y_t is always the dependent variable described above. The mathematical presentation of the equation is as follows.

$$Y_t = a + a_1 Y_{t-1} + a_2 Y_{t-2} + \beta_1 FDI_{t-1} + \beta_2 FDI_{t-2} + \varepsilon_t \quad (2)$$

The regression is utilized to determine if the FDI-Granger-causes GDP growth. Y and FDI in the equation represent the same variables as in the first regression, except that the variables are shifted by one or two years and the shifted values of Y are included as independent variables. There are 126 observations in the test. The result is shown in Table 3. An F statistic is also employed to test whether the coefficients for FDI_{t-1} and FDI_{t-2} are simultaneously equal to zero. The null hypothesis is $H_0: \beta_1 = \beta_2 = 0$. This will be rejected or accepted based on the calculated F value that will be tested at a significant level of 5%.

Table 3. Granger causality regression with all the variables

Variable	β	t- value
Constant	-0.1406	0.6996
Yt-1	-0.2238	0.0000
Yt-2	-0.0553	0.0000
FDIt – 1	0.0969	0.1582
FDIt – 2	-0.0077	0.1975
Regression Sum of square (RSS)	4.0376	
Residual Sum of square (ESS)	1972.533	

Source: *Author's calculation*

The result of the coefficient estimates shows that for FDI_{t-1} is positive by 0.0969 and for FDI_{t-2} it is negative by 0.077 percentage points but both are not significant at the significance test of 5%. For Y_{t-1}, it negatively influences the growth of GDP but being statistically significant, it will lead the current GDP growth to decrease of 0.2238 percentage point compared to the previous year. To test whether the FDI coefficients are zero, the above regression is repeated this time without the FDI variables.

Table 4. The regression without FDI

Variable	β	t- value
Constant	-0.1288	0.7230
Yt-1	-0.2175	0.0000
Yt-2	-0.0558	0.0000
Regression Sum of square (RSS)	4.0411	
Residual Sum of square (ESS)	2008.642	

Source: *Author's computation*

The value of F can be calculated using the formula below.

$$F = \frac{(RSS_2 - RSS_1)/(K-L)}{ESS/(n-(K+1))} \quad (3)$$

Where RSS_2 and RSS_1 are the regression sum of square for the table 4 and 3 respectively, K is the number of independent variables in the regression presented in table 3 and L is the number of independent variables presented in table 4, ESS is the residual sum of square for the regression in table 3 and n is the number of observations in the series data used. The calculated F value is about 0.00010, which is less than the critical value of F, that is, 3.00; therefore, H_0 will not be rejected. This means that β_1 and β_2 are not simultaneously significant in the equation. This implies that the assumption that FDI_{t-1} and FDI_{t-2} are not statistically significant for economic growth cannot be rejected.

4. Conclusion

The study aimed to examine the contribution of foreign direct investment to economic growth using panel data approach over the period 2000-2016 to observe the impact of foreign direct investment to economic growth through the three main sectors of economic activity in 5 Low-Income economies (Faso, Guinea Bissau, Liberia, Niger and Sierra Leone) and 4 Lower-middle-income economies (Cote d'Ivoire, Ghana, Nigeria and Senegal) of West Africa, using the data panel method measured by GDP as dependent variable, and a number of independent variables, such as Foreign Direct Investment (FDI), Gross Fixed Capital Training (GFC), Primary Sector (PES), Secondary Sector (SSE) and Tertiary Sector (TSE) in nine (9) countries in West Africa countries. We found on all West Africa's region that the FDI's contribution is positive but not significant at 5% level of significance according to t-test, and the autocorrelation of the residual is also positive. Therefore, by studying the case of each country we note that only 5 countries have the FDI positive while for the other four, it is negative. Also, it is noted that the majority of those countries have a negative autocorrelation.

The tertiary sector influences the GDP's growth in several West African countries more than the others sectors. This is due to the fact that the majority of FDI invested in these countries are FDI intended to develop the tertiary sector. Since the majority of the population works in agriculture and primary sector activities, the result confirms that this sector has a small influence on GDP growth because of several factors such as climate change, insecurity, lack of adequate modern technology and infrastructure to improve production. The secondary sector also faces a low yield and has the least influence on growth because the materials and technologies used are still archaic and produce low result which is not enough to be meaningful in GDP growth. We find that the presence of FDI can be very profitable for West Africa if the government introduces a diversification of the economy by investing a little more on the two sectors which weakly influence the growth of the GDP in order to attract manufacturers in the agricultural, textile and pharmaceutical sectors whose value-added products will be for export. By enacting a law on relieving the formalities of the procedures for obtaining industrial licenses, while looking at the advantage of the countries and verifying the possibility on its application. Adopting a beneficial investment for both contracting countries; always favor a win-win partnership.

References

Alvarado, R., Iñiguez, M., & Ponce, P. (2017). Foreign direct investment and economic growth in Latin America. Economic Analysis and Policy, 56, 176-187. DOI: org/10.1016/j.eap.2017.09.006

Anyanwu, J. C., & Yameogo, N. D. (2015). What drives foreign direct investments into West Africa? An empirical investigation. African Development Review, 27(3), 199-215. DOI: org/10.1111/1467-8268.12141

Bermejo Carbonell, J., & Werner, R. A. (2018). Does foreign direct investment generate economic growth? A new empirical approach applied to Spain. *Economic Geography*, *94*(4), 425-456. DOI: 10.1080/00130095.2017.1393312

Dritsaki, C., & Stiakakis, E. (2014). Foreign direct investments, exports, and economic growth in Croatia: A time series analysis. *Procedia Economics and Finance*, *14*, 181-190. DOI:10.1016/S2212-5671(14)00701-1

Hausman, J. (1978) Specification Tests in Econometrics. *Econometrica, 46,* 1251-1271. DOI:10.2307/1913827

Iamsiraroj, S., & Ulubaşoğlu, M. A. (2015). Foreign direct investment and economic growth: A real relationship or wishful thinking? Economic Modelling, 51, 200-213. DOI: org/10.1016/j.econmod.2015.08.009

Lin, B., & Benjamin, I. N. (2018). Causal relationships between energy consumption, foreign direct investment and economic growth for MINT: Evidence from panel dynamic ordinary least square models. Journal of cleaner production, 197, 708-720.DOI: 10.1016/j.jclepro.2018.06.152

Makiela, K., & Ouattara, B. (2018). Foreign direct investment and economic growth: Exploring the transmission channels. *Economic Modelling*, *72*, 296-305. DOI: 10.1016/j.econmod.2018.02.007

Pelinescu, E., & Radulescu, M. (2009). The impact of foreign direct investment on the economic growth and countries' export potential. *Romanian Journal of Economic Forecasting*, *4*(1).

Seyoum, M., Wu, R., & Lin, J. (2015). Foreign direct investment and economic growth: The case of developing African economies. *Social Indicators Research*, *122*(1), 45-64. DOI:10.1007/s11205-014-0679-6

Sokang, K. (2018). The Impact of Foreign Direct Investment on the Economic Growth in Cambodia: Empirical Evidence. DOI: 10.18775/ijied.1849-7551-7020.2015.45.2003

Sunde, T. (2017). Foreign direct investment, exports and economic growth: ADRL and causality analysis for South Africa. *Research in International Business and Finance*, *41*, 434-444. DOI: 10.1016/j.ribaf.2017.04.035

Velonjara, H. M., & Gondje-Dacka, I. M. (2019). Foreign direct investment, three main sectors of the economy and economic growth: Evidence from West African Countries. Journal of Economic and Social Thought, 6(3), 156-167. DOI: 10.1453/jest.v6i3.1921