Assessing the Impact of Foreign Direct Investment on Economic Growth: Empirical Study in Algeria for the Period (2000-2017)

تقييم أثر الاستثمار الأجنبي المباشر على النمو الاقتصادي: دراسة تطبيقية في الجزائر للفترة (2000–2017)

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Received: 18/03/2019 *Accepted*: 17/03/2020

Résumé : L'étude vise à examiner l'impact de l'investissement direct étranger (IDE) sur le développement économique en Algérie, en utilisant des données annuelles sur la période allant de 2000 à 2017. Cette étude utilise cinq variables macroéconomiques, notamment le PIB par habitant, pour mesurer le développement économique en tant que dépendant. variable, investissements directs étrangers (IDE), volume d'exportation (EX), volume d'importation (IM) et formation brute de capital (GCF) en tant que variables indépendantes. Enfin, les quatre variables par rapport au PIB par habitant ont été testées à l'aide d'un modèle de régression groupée. Les résultats indiquent que les investissements directs étrangers, les importations et les exportations ont, statistiquement, des effets négatifs sur le développement économique. Pourtant, la formation brute de capital influe positivement sur le développement économique.

Mots-clés: étranger, investissement, développement, exportation, importation.

Abstract: The study aims at investigating the impact of Foreign Direct Investment (FDI) on economic development in Algeria, by employing yearly data during the period between 2000 and 2017. This study uses five macroeconomic variables, particularly per capita GDP to measure economic development as a dependent variable, Foreign Direct Investments (FDI), Export Volume (EX), Import Volume (IM) and Gross Capital Formation (GCF) as independent variables. At last, the four variables against per capita GDP have been tested using pooled regression model. The findings dictate that Foreign Direct Investment, import, and export, statistically, have negative effects on economic development. Yet, gross capital formation positively affects the economic development.
Keywords: Foreign, Investment, Development, Export, Import.

JEL Codes : F21, O11, P33.

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Introduction:

Foreign Direct Investment (FDI) has been known as one of the most effective methods of drawing flows from external sources. Hence, the use of this technique becomes a significant aspect of building capital in developing countries around the world. However, the share of investment from these countries and in other states has been declining over the past years. For developing countries, the positive impact of foreign direct investment is widely spreading as a tool for economic growth and power. The most powerful impact of implementing FDI is the increase in aggregate productivity, in opportunities of employment, and in the outflow of exports and exchange of technological advancement between the investor and country. Besides, having foreign direct investment in a developing country enables the employment and exploitation of natural and human resources implement innovative businesses practices in terms of management and marketing. It also facilitates the reduction of budget deficit. Another benefit of FDI is that it involves the risks and regulations of external debt and adds value to the human capital through provision of the job training. Therefore, countries facing a scarcity of capital and technological expertise usually experience slower growth than those that do not. According to a number of studies, foreign direct investment can serve as a means of transfer of technology and knowledge. Conversely, other studies suggest that FDI can have negative impact on domestic economies. In fact, Repatriation of profit and "Market Stealing Effect", discussed in this study, serves as a significant example of such an assumption.

In this study, the focus of research is on the role of foreign direct investment in achieving economic development in Algeria,. One may question the choice of such countries over others. The answer lies in the fact that significant research on the FDI has been conducted across the world, and it has been proved to be fruitful in achieving economic development especially in developed countries. Thus, there was a need to conduct empirical studies to investigate the impact of FDI on economic development in developing countries mainly in the Arab World. Accordingly, this shortage has motivated the researcher to investigate the effect of FDI on economic development in Algeria.

Objectives of the Study:

The main objective of this study is to investigate the effect of Foreign Direct Investment on economic development in Algeria.

Importance of the Study:

The importance of this study stems from the lack of empirical studies that have previously examined the influence of FDI on economic development in the Arab World, particularly in Maghreb Countries. In fact, the majority of studies have been conducted on the developed countries rather than developing countries. Consequently, this study may help regulators improve the investment climate to attract more foreign investors and direct the financial resources to beneficial sectors.

Question of the Study:

To find out the effect of FDI on the economic development, the study considers one main question, which is formed as follows:

What is the role of FDI in achieving economic development in Algeria for the period of 2000-2017?

Structure of the Study:

In addition to the current section, two other sections are included. The second section discuss the theoretical background, surveys, relevant literature, and presents studies associated with the study's subject. Also, section three is dedicated to the adopted methodology. It describes the sample of data and variables of the study, test hypotheses and assesses the obtained results.

1.Theoretical Background:

According to Grazia Ietto-Gillies (2012), and Stephen Hymer's theory concerning direct investment in the 1960s, the motive behind Foreign Direct Investment and Multinational Corporations was interpreted by neoclassical economics relying on macroeconomic principles. These assumptions were based on the classical theory of trade in which the reason behind trade was a result of the dissimilarity in the costs of production of goods among two countries, focusing on the low cost of production as a drive for a firm's foreign activity Grazia Ietto-Gillies (2012). Presently, a question is raised as follows: What is Foreign Direct Investment (FDI)?

Generally, Foreign Direct Investment contains "mergers and acquisitions, building new facilities, reinvesting profits earned from overseas operations and intra company loans". In a narrow sense, FDI only refers to building a new facility, a lasting management interest in an enterprise operating in an economy other than that of the investor.

According to the International Monetary Fund, Foreign Direct Investment, commonly known as FDI, "refers to an investment made to acquire lasting or long-term interest in enterprises operating outside of the economy of the investor." The investment is direct because the investor, which can be a foreign person, company, or group of entities, is seeking to control, manage, or have significant influence over the foreign enterprise.

In addition to this, the WTO (World Trade Organization) and the Organization for Economic Cooperation and Development defined FDI as "any investment activity is stable in a particular country (country of origin), which owns assets in another country (the host country), in order to conduct these investments."

Furthermore, another question, that of the existence of a relationship between economic growth and development, is raised. According to Ranis et al., economic growth and development is a two-way affiliation. They suggest that the first chain consists of economic growth benefiting human development, since economic

growth is likely to lead families and individuals to utilize their heightened incomes to raise expenditures. This, in turn, will promote human development. At the same time, with the increased consumption and spending, health, education, and infrastructure systems grow; hence, they contribute to the economic growth.

2.Literature Review:

This part presents past and recent studies which are based on the foreign direct investment FDI and its effect on economic development. Various studies have investigated the role of FDI in achieving economic development in both, developed and developing countries. Yet, much literature on Arabic countries seems to be limited.

Makki and Somwaru (2004): Impact of Foreign Direct Investment and Trade on Economic Growth: Evidence from Developing Countries

The study aims to examine the impact of foreign direct investment and trade on economic growth. Also, it investigates the relationship between the FDI, human capital, and domestic investment in achieving economic development in twenty-six developing countries, in the period from 1971 to 2000. The study concluded that FDI and Trade have a positive effect on economic growth. It also dictates a positive influence of FDI on domestic investment.

Katerina et al., (2004): Foreign Direct Investment and Economic Growth in Transition Economies

The majority of studies investigate the relationship between FDI and the economic growth in US and European countries. Yet, the main objective of this study is to examine and discover the relationship between the foreign direct economic and growth in transition economic. The study employs Bayesian analysis. The results indicate that foreign direct investment does not show any significant relationship with economic growth for all these countries.

Al-Muhtaseb (2006): The Impact of Foreign Direct Investment on the Economic Growth of Jordan (1990 - 2006)

The study investigates the effect of foreign direct investment on the economic growth in Jordan for the period from 1990 to 2006. Using ordinary least square OLS, the study concludes that FDI flow increasing form one year to another, particularly in the last few years. The study also dictates a positive impact of FDI on the capital formation, as well as technology deployment. Finally, the study detects a positive influence of FDI on the economic growth in Jordan for the aforementioned period.

Abdulkhaliq (2007): Foreign Direct Investment and Economic Growth: Empirical Evidence from Sectoral Data in Indonesia

The purpose of this study is to uncover the impact of foreign direct investment (FDI) on economic growth using detailed sectoral data for FDI inflows to Indonesia over the period 1997-2006. In whole, FDI seems to have a positive impact on economic growth. Conversely, the results show no effect on accounting for the different average growth performance across sectors.

Gudaro et al., (2012): Impact of Foreign Direct Investment on Economic Growth:A Case Study of Pakistan

The paper aims to analyze the effect of FDI in Pakistan for the period from 1981 to 2010. The study tries to link between Gross Domestic Product (GDP) on one part and foreign direct investment FDI and Inflation on the other part. While GDP is considered as a dependent variable, FDI and Inflation are considered independent variables. Consequently, the results show that the model has a positive and significant association of GDP and FDI. Yet, a negative and significant relationship is attested between GDP and inflation.

Tshepo (2014): The Impact of Foreign Direct Investment on Economic Growth and Employment in South Africa: A Time Series Analysis

The paper attempts to find the impact of FDI on economic growth and employment in South Africa within a period of 24 years, from 1990 to 2013. The study uses the Unit Root Test to examine the stationary of time series. Moreover, the Johansen Co-integration test is employed to test the existence of long-run relationship between variables. The results of the analysis show that employment and FDI were found to be stationary at first order difference. However, FDI is found stationary at level form. All in all, the results detect strong evidence that from 1990 to 2013 there was a positive long-run relationship between FDI, GDP, and employment in South Africa.

Petre (2015): The Impact of Foreign Direct Investments on Economic Growth in Romania

The main purpose of the study is to examine the effect of FDI on the Romanian economic development. To achieve the core objective of the study, the relationship between FDI and Gross Domestic Product (GDP) is analyzed. The study employs data series from 2003 to 2014 representing the share of FDI flows in global flow and the share of GDP in global GDP. Based on linear regression, the study concludes a positive influence of FDI on economic growth in Romania. The study recommends encouraging FDI flows to achieve real convergence with euro area.

Maitah et. al (2015): The Impact of Foreign Direct Investment, Domestic Investment and Imports on Palestinian Economic Growth

The study seeks to analyze and measure the effect of FDI, Domestic investment, and imports on Palestinian economic growth during the period 1995-2014. Least square method has been employed to achieve the objective of the study. The findings indicate that FDI positively affects the economic growth in Palestine.

3.Data and Methodology:

3.1.Data of the Study:

In order to collect data, the study relies on various sources. Data are mainly obtained from secondary sources such as: World Bank website and United Nations Conference on Trade and Development (UNCTAD) publications. Besides, the flow of FDI is collected from UNCTAD reports, per cap GDP, imports, exports, and gross capital formation, which are obtained from the World Bank reports. The sample of the current study consists of one Maghreb country (Algeria).

3.2.The Model:

Following the study of Hamdan (2016), the five variables are added together in a linear regression model to reach the study objectives. The model is presented as follows:

$$\boldsymbol{per\ capita\ GDP}=\beta_0+\beta_1\,\mathbf{FDI}_t+\beta_2\mathbf{IM}_t+\beta_3\mathbf{EX}_t+\beta_4\boldsymbol{GCF}_t+\varepsilon_t \ldots (1)$$

Where:

$\boldsymbol{per\ capita\ GDPt}$: is a measure of the sum output of a country that takes the gross domestic product (GDP) and divides it by the number of people in the country. In this model it is expressing the economic development at year t.

β_0: constant.

$\mathbf{FDI_t}$: the flows of foreign direct investment in dollars.

$\mathbf{IM_t}$: imports of goods and services in dollars at year t.

$\mathbf{EX_t}$: exports of goods and services in dollars at year t.

$\mathbf{GCF_t}$ **:** Gross capital formation in dollars at year t**.**

$\boldsymbol{\varepsilon_t}$**:** the error term**.**

The model is taken in Log form as follows:

$$\boldsymbol{LOG\ per\ capita\ GDP_t}=\beta_0+\beta_1\log\mathbf{FDI}_t+\beta_2\log\mathbf{Im}_t+\beta_3 log\ EX_t+\beta_4\log\mathbf{GCF}_t+\varepsilon_t \ldots (2)$$

3.3.Methodology of the Study

In order to attain the study objectives, the study employed Panel Data Analysis Method. It applies three analysis models: Pooled Regression Model, Fixed Effects Model (FEM), and Random Effects Model. To select the appropriate model, the study utilizes two tests: Lagrange Multiplier (LM) for a preference between Pooled Regression Model and Fixed Effect Model (FEM). In addition, Hausman test is utilized to choose between Fixed Effects Model (FEM) and Random Effects Model (REM).

3.3.1.Statistical Analysis:

The motive behind the use of this analysis models is to select the most appropriate one that best provides datasets. In the pooled model, all observations are set together and the regression coefficient explains the global effect regardless of the time or any individual aspects (Gujarati, 2004). The ordinary least square is usually used to estimate the model.

3.3.2.Descriptive Statistics

The results presented in Table (5.1) shows a deviation in LogEx observations which has the highest Mean value with 10.66%. Another deviation is observed in LogGCF which has the highest value of standard deviation with 0.30%, and 10.99% as Max value. Additionally, the observations of Logper cap GDP show a deviation too; it has the lowest standard deviation value 0.017%. Moreover, LogIM dictates a deviation in the observations where it has the highest min value with 10.15%. However, the LogFDI did not show any deviation in their observations.

Table 1 : « Descriptive Statistics of the Variables of the Study »

Variables	Mean	Std. Deviation	Min	Max
Per cap GDP	4.47	0.017	4.64	4.69
FDI	3.16	0.28	2.45	3.48
IM	10.49	0.27	10.15	10.83
EX	10.66	0.22	10.03	10.91
GCF	10.61	0.30	10.14	10.99

Source: released by the researcher based on Stata output

3.3.3.Multicoliniarity Test

The variance inflation factors (VIF) and Tolerance (1/VIF) are usually employed to examine and assess the Multicoliniarity problems. The VIF provides the degree to which each independent variable is explained by other independent variables (Gujarati, 2004). The results of the test in the following Table (5-2) show that the VIF for all variables is less than 10, whereas 1/VIF for all variables is more than 0.1. The findings indicate that the model does not suffer from Multicoliniarity problem.

Table 2 : « Variance Inflation Factor (VIF) and Tolerance (1/VIF) for the Independent Variables »

Variables	VIF	1/VIF
FDI	4.54	0.22
IM	4.83	0.20
EX	7.46	0.13
GCF	3.34	0.29
Mean VIF	5.04	

Source: released by the researcher based on Stata output

3.3.4.Pearson Correlation between Independent Variables

The following Table (5-3) describes in details the correlation between all the explanatory variables that are employed in this study. Commonly, the independent variables should not be correlated between each other, or at least the correlation

between the independent variables should be low. Hence, the correlation coefficient between all factors is low. The results show that all the explanatory variables are positively and significantly correlated between each other. Furthermore, it is noticed that the correlation between all the independent variables is low as it should be.

Table 3 : « Pearson Correlation between the explanatory variables »

Variables	LogFDI	LogIM	LogEX	LogGCF
LogFDI	1			
LogIM	0.8334***	1		
LogEX	0.7999***	0.9229***	1	
LogGCF	0.8331***	0.9988***	0.9271***	1

Source: released by the researcher based on Stata output

***** Correlation is significant from zero at the 1% level. ** Correlation is significant from zero at the 5% * Correlation is significant from zero at the 10% level.**

3.3.5.Pooled Model (Estimated by Ordinary Least Square OLS)

According to the findings reported in Table (5-4), imports and exports have a negative effect on the economic development but it's not significant at (α=10%). Moreover, gross capital formation has a positive impact on the economic development and it is not significant also at (α=10%) in Algeria for the period 2000-2017. However, foreign direct investment has a statistically significant negative influence on the economic development at (α=10%) in Algeria for the period 2000-2017**.**

Table 4 : « The Pooled Estimation Results »

$$LOG\ per\ capita\ GDP_t = \beta_0 + \beta_1 \log FDI_t + \beta_2 \log Im_t + \beta_3 log\ EX_t + \beta_4 \log GCF_t + \varepsilon_t$$

variables	Coefficients	Std.Error	t-Statistic	Probability
LogFDI	-.0291619	.0140746	-2.07	0.065
LogIM	-.0224421	.1639975	-0.14	0.894
LogEX	-.0337329	.0268695	-1.26	0.238
LogGCF	.0183235	.1552755	0.12	0.908
Constant	5.157813	.1976076	26.10	0.000
R-square= 0.8362/ Adjusted R-square= 0.7707				

Source: released by the researcher based on Stata output

3.3.5.1.Breuch-Pagan Test for Heteroskedasticity

According to Table (5-5) below, Breuch-Pagen test has been employed to uncover heteroskedasticity problem. This test relies on the employment of Ordinary Least square (OLS) residuals regression under the null hypothesis. Unlike the

alternative hypothesis, the null hypothesis indicates that the variance of the residuals is not homogeneous or constant. At last, the test's results indicate that heteroskedasticity problem does not exist for the chosen sample as the Chi-square distributed amounted to 0.33, with 0.56 P-value. In view of that, it is not significant and the null hypothesis is rejected. Thus, the variance of residuals is homogeneous.

Table 5 : « Breuch-Pagan Test »

Ho: Constant variance

chi2(1)	0.33
Prob > chi2	0.56

Source: released by the researcher based on Stata output

4.Results and discussion :

The main objective of this study is to investigate the impact of foreign direct investment FDI on the economic development in Algeria for the period 2000 - 2017, using pooled OLS method. According to the Table (5-4) which represents the pooled estimation results, the findings indicate that all the independent variables don't have statistically significant effect on the economic development at (α=10%) except the foreign direct investment, which has statistically significant influence at (α=10%). Furthermore, the R-square is amounted to 0.8362%, that is, 83.62% of the variation in the dependent variable (economic development) can be explained by the variation in the independent variables in Algeria for the period 2000-2017. Unexpectedly, the coefficient of the FDI was -0.029, that is, each increase in the FDI by 100% leads to a decrease in economic development by 2.9% in Algeria for the period 2000-2017. The result contradicts the economic theory, and it can be interpreted by the lack of experience among this country in dealing with FDI and the directing of FDI to construction and services rather than productive sectors.

Furthermore, the export coefficient was -0.033; it means that each increase in exports by 100% lead to a decrease in economic development by 3.3%. This result is contradicts the economic theory, since the increase and expansion in the volume of exports will increase the specialization in the production of goods, research, development, and the pursuit of obtaining permanent technology. In the case of Algeria this negative relationship can interpreted by the proportion of oil exports to the total volume of exports which is 97%, This leads to a disproportionate productivity and it is reflected negatively on economic development. Also, the imports coefficient was -0.022, which means that each increase in imports by 100% leads to a decrease in economic development by 2.2% , and this is also consistent with the economic theory, since the greater the volume of imports the lowest of economic growth. At last, the gross capital formation GCF coefficient was 0.018, that is, each increase in GCF by 100% leads to an increase in economic development by 1.8%. This result is consistent with the economic theory, because

the increase in GCF leads to an increase in the sense of investment which automatically and positively affects the economic development.

Conclusion:

The core purpose of this study is to assess the impact of foreign direct investment in on economic development in Algreia for the period 2000-2017. The findings of the study can be summarized as follows:

The R-square was 83.62%, that is, 83.62% of the variation in the economic development can be explained by the variation in the independent variables. Thus, the model fits well. The foreign direct investment FDI, Exports and imports negatively affects the economic development in Algeria for the period 2000-2017.

The Gross Capital Formation positively influences the economic growth in Algeria for the period 2000-2017. All the independent variables don't have statistically significant effect on the economic development at (α=10%) except the foreign direct investment, which has statistically significant influence at (α=10%)**.**

According to the results, the study encourages domestic investment and directs the investors to productive sectors. It recommends the following: The foreign direct investment should be redirected to reflect a positive impact on economic development in Algeria. Support the establishment of free industrial zones to improve the investment climate and attract investors. Since export negatively affects the economic development in Algeria, the study recommends the encouragement of investment in sectors that have high export capacity, such as the manufacturing sector.Attract the capital of Arab immigrant to restore their investments, by improving the investment climate, reducing the political risk and amelioration of the banking sector.The focus of this study is developing countries; therefore, a comparative study between two or more countries should be applied in future research to gain relevant insights.To further improve findings, this study recommends employing longer periods of data with more frequent (monthly data).

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