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The effect of foreign direct investment (FDI) on economic growth: The case of AMU

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Abstract

This study analyses the impact of foreign direct investment (FDI) on economic growth (GDP) in the Arab Maghreb Union (AMU). For this purpose, it uses Angel Granger cointegration method for the period from 1980-2021. The estimation results show that these two variables are cointegrated. We found that FDI has a significant positive impact on economic growth, which confirms that FDI is an important factor in promoting Maghreb economic growth. The causality test show that there exists a directional causality from GDP to FDI in AMU.

1. Introduction

The international movement of capital is one of the most important factors for the development of the world economy, especially in the case of developing and less developed countries. The importance of FDI, as a form of international capital movement, is in the existence of positive externalities created by multinational corporations (MNCs).

The contribution of foreign direct investment (FDI) to economic growth in host countries has long been the subject of intense debate. It is widely observed that FDI mitigates the saving-investment imbalance and provides technology which is used for the production of goods and services. Additionally, FDI enhances tax revenue as well as human capital (Buckley, 2002).

Foreign direct investment (FDI) has grown significantly in the past 20 years. Its growth has outpaced world production and the growth of international trade. Although most foreign direct investment is concentrated in developed countries, its flows have become increasingly important in developing countries. This large influx has led economic policy makers in developing countries to focus their efforts on attracting more foreign capital after realizing their impact on the economic performance of the host country, This paper tries to describe and analyze broad literature to detect the proper variables in explaining the impact of FDI on growth in the Maghreb countries (Algeria, Tunisia, Morocco, Libya and Mauritania) during the period 1980-2021 by applying the methodology of cointegration of Angel Granger.

The structure of the paper is as follows. Following this Instruction section, Section 2 Foreign direct investment in the countries of the Arab Maghreb region, Section3 Discusses the literature review. Section 4 Methodology. Section 5 presents empirical results, followed by the Conclusions and policy implications provided in Section 6.

2. Foreign direct investment in the countries of the Arab Maghreb region

Foreign direct investment (FDI) is defined as a project established or owned by a foreign investor outside the borders of their home country. This ownership can be either complete or partial, allowing the investor to manage and monitor the project in conjunction with the local investor. Through FDI, the necessary funding for projects can be provided, job opportunities can be generated, and advanced technologies and expertise can be created. According to the International Monetary Fund (IMF), foreign investments are considered direct when the foreign investor owns 10 percent or more of the company's capital shares and has the ability to influence its management.

Developing countries work to encourage foreign direct investment as a driving factor for economic growth and development, aiming to achieve a set of objectives in reality. The flow of FDI from one country to another results in various effects that can be summarized as follows:

- Utilizing technological knowledge and high managerial skills transferred from the investing country to the host country, benefiting both in terms of production methods and techniques.
- Providing employment opportunities and mitigating unemployment issues, as foreign companies in host countries contribute to increased employment for their citizens and raise wages.
- Contributing to improving the balance of payments and developing exports while reducing imports.
- Contributing to capital formation.
- Influencing the local market structure and promoting competition in favor of consumer interests regarding price, quality, and service.
- Increasing economic growth rates in the host country by enhancing product quality, which opens global markets for these products, ultimately increasing average individual income and improving their living standards.

The countries of the Arab Maghreb region possess vast potentials and resources that enable them to attract foreign direct investments. However, their performance remains limited and is characterized by a lack of diversity, as they focus on specific sectors.

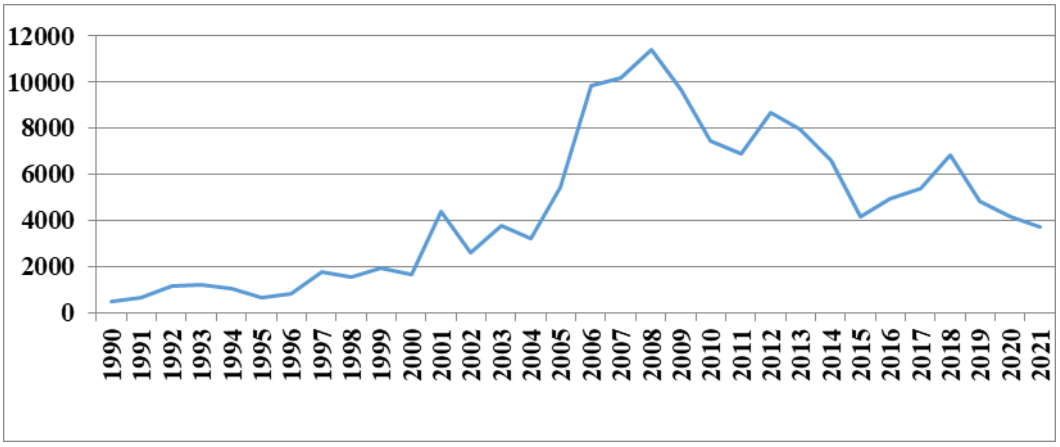

Figure 1: FDI inflows to Arab Maghreb Countries during the period 1990-2018 (Millions of U.S)

Source : ((https://unctadstat.unctad.org))

Through the above figure, it can be observed that the inflow of foreign direct investment (FDI) into the Arab Maghreb countries is irregular, fluctuating between periods of increase and decrease. For instance, FDI increased modestly from $293.7 million in 1990 to approximately $1481.52 million in 2000. Then, from 2003 to 2008, FDI experienced significant jumps, reaching a value of $7877.41 million. However, in the subsequent two years, FDI declined due to the global financial crisis and the absence of security and political stability in Tunisia, negatively affecting its performance.

In 2015, foreign direct investments saw a decline in inflows due to the petroleum crisis caused by a decrease in global petroleum prices, particularly affecting Algeria, which experienced a negative value of -$584.46 million, as foreign investors became hesitant to invest in the fuel sector. Subsequent years saw increases in FDI values, albeit with modest percentages, attributed to improved investment conditions in the region. However, FDI declined again in 2019 due to the COVID-19 pandemic.

3. Literature review

The relationship between foreign direct investment (FDI) and economic growth has motivated a voluminous empirical literature focusing on both industrial and developing countries. For instance, (Argiro, 2003) indicated that FDI has a direct, and indirect positive effect on the growth rate of European Union economies through trade reinforcement. According to the author, FDI may raise the productivity in the receiving country and exports. This increase in productivity, in turn, may indirectly affect exports.

(Alege , 2014) investigate the relationship between foreign direct investment and economic growth in the ECOWAS sub-region for the period 1970-2011 by employing the Generalized Methods of Moment technique of estimation (GMM). The report suggested a negative and insignificant relationship between foreign direct investment and economic growth in the ECOWAS sub-region despite enhanced human capital, trade openness and sound governance in the Sub-region.

(Anochie et al, 2015) in a study of foreign direct investment flows in Nigeria: Pro or Economic Growth Averse concluded that there is a positive relationship between economic growth (GDP) and FDI as well as the fact that domestic investment was responsible for the growth witnessed in Nigeria's economy over the period under review. Although, the result was positive but statistically insignificant which could be a result of insufficient FDI funds invested into the Nigerian economy which has not been able to significantly impact the economic growth.

(Panagiotis Pegkas, 2015) The study was conducted during the period 2002-2012, using panel data, FMOLS and DOLS. The results revealed a long-term and positive correlation between the stock of foreign direct investment and economic growth in the European Union. Opposite results were found by (Sonja & Tanja , 2016)after investigating the effect that FDI had on economic growth in the European Union. Their result indicated a negative interdependence between FDI and GDP and no positive impact of FDI on the value of GDP in the EU from 2005 to 2015. The global economic crisis in the reporting period can be one of the causes of the given negative coefficients.

(Galaye & Helian , 2016) The estimation results show that FDI has a positive impact on economic growth. We found that FDI in WAEMU is going to facilitate trade, FDI liberalization, economic cooperation, improve the business environment and increase the labour cost. FDI will allow WAEMU countries to attract more foreign

capital for the creation of jobs and wealth. (Seiko. M. Z, 2016), has examined the influence of FDI on Economic growth using panel data from fourteen countries in East Africa for the period 1980 to 2013. He uses the dynamic generalized method of moments (GMM) estimators after testing for autocorrelation and model specification tests. He decided that FDI is a main guide of economic growth and a promoter of economic conditional gathering in Eastern Africa; therefore, the sub-region requisite to attract more FDI by refining investment conditions, strengthening regional integration, developing human capital and basic infrastructure, and promoting export-oriented investment, (Habibi, Karimi , 2017)The empirical results show that the FDI is one of the major drivers of economic growth in Iran and GCC countries, (Stanisic, N, 2015) analyzed the FDI inflow and economic growth of Southeastern European economies and found that there is no significant association between these two variables, which was due to methodological imperfections.

This complexity may be because the effect of FDI on growth differs significantly from one group of countries to another as indicated by (Nlandu Mamingi &Kareem Martin, 2018). (Selma , 2013) indicated that FDI has both direct and indirect effects on employment. However, he did not show how those indirect effects increase GDP. Besides (2012), indicated that in addition to externalities, technology spillovers, human capital training, efficiency, and productivity are among the factors that indirectly increase GDP in the economic growth of the receiving country.

A study conducted by (Dinh et al, 2019)assessed the relationship for both short-run and long-run periods among FDI and 30 lower-middle-income countries' economic growth for a period ranging from 2000 to 2014. the authors concluded that a negative impact of lagged FDI for one and two periods on economic growth exists in the short run. On the other hand, in the long run, a positive impact occurs. The authors recommended that policies should be made to encourage FDI in order to improve economic growth in the long run. These results could be supported by (Koojaroenprasit, 2012); (Shahbaz &Rahman, 2010).

Quite recently, In order to address the question of whether FDI impacts economic growth, (Bibhuti & Farid , 2020) analyzed the causal nexus between FDI and GDP in Bangladesh. They used augmented Dickey-Fuller, augmented Dickey-Fuller generalized least square, Kwiatkowski-Phillips-Schmidt-Shin, and Lee-Strazicich unit root tests to check stationarity, augmented autoregressive distributed lag (augmented ARDL) bounds to test cointegration, and Granger causality to analyze the direction of causality. A long-run relationship between FDI and GDP was revealed. An unidirectional causality running from GDP to FDI was also detected.

(Huong et al, 2021) employs a VAR model based on unit root tests, Granger causality, impulse responses, and variance decompositions. In his conclusion, FDI has a positive impact on short-term economic growth, but negative impacts on long-term growth. While a study by Qureshi et al. (2021) (Qureshi et al, 2021) claims that economic growth is positively associated with corruption in developing countries while it is negatively associated with corruption in developed countries.

4. Methodology

The concept of cointegration in 1980 entered into the analysis of time series. Cointegration analysis is a method of attempting to determine whether a long-term relationship of two or more non-stationary time series. To be examined closely associated with economic variables in the long run equilibrium.

The presence of a cointegration relationship between the variables indicates that these variables move together in the long term. In this study, the long-term macroeconomic relationship between the two variables is examined.

Engel Granger's cointegration method has been employed to analyze the impact of foreign direct investment on economic growth in Arab Maghreb countries.

To make an empirical assessment of the link between foreign direct investment and economic growth a three-step procedure is adopted to investigate the relationship between two variables. In step one (Engel & Granger, 1987), the unit root test to determine the order of integration of the series. Step two tests for cointegration of the series identified as first deference I(1) using the Engel and Granger residual based approach. In step three, the Granger causality test to examine causality between the variables.

To assess empirically the impact of FDI on economic growth in AMU, we specify the following model:

$$LGDP = \alpha_0 + \alpha_1 LFDI + \varepsilon_t$$

Where:

$LGDP$: is the log of the gross domestic product

$LFDI$: is the log of foreign direct investment inflows

ε_t: is the error term

Engel and Granger have shown that if the two variables are stationary in the first difference and the error term is integrated in I(0), if a long-run relationship exists between the GDP and FDI this means that the two variables are cointegrated.

We hypothesise that the FDI inflows have a positive effect on economic growth in AMU.

The data for our analysis are obtained from the United Nations Conference on Trade and Development (UNCTAD) which covered 21 years from 1980 to 2021. The data cover five AMU countries (Algeria, Tunisia, Morocco, Libya and Mauritania).

5. Empirical results

5.1.Unit root test

As with the nature of time series data, the first step is to test the unit root for examining whether the time series data are stationary or non-stationary before identifying if a long relationship between the variables exists or not. The augmented Dickey-Fuller and Phillips- Perron tests were used to test the stationary of the variables. The results of the unit root test are reported in Table 1:

Table 1. Unit root test results

Variable	**ADF**		**PP**	
	Level	**First difference**	**Level**	**First difference**
GDP	-2.2529 (0.9173)	-5.5495* (0.0000)	-0.3332 (0.9109)	-5.5442* (0.0000)
FDI	-2.6979 (0.2435)	-6.2520* (0.0000)	-2.7184 (0.2385)	-6.6798* (0.0000)

Note: * indicate the significance at the 1% levels

Source: Author's calculation (Eviews 9)

The results of Table 1 show that the null hypothesis of the presence of unit root test or non-stationary has been rejected for the two variables. This shows that all variables integrated in the first difference I(1). This also means that the series are non-stationary in level but stationary in first difference.As the results indicate that FDI and GDP have the same order of integration, the next step is to use Engel Granger cointegration test.

5.2. Cointegration test

Angel and Granger cointegration test is used to reveal the long-run relationship between the two variables. According to the test, variables are assumed to be stationary at the same level. Both variables should have first-order stationarity. After creating a new regression with the variables whose stationarity is obtained, the stationarity of the residuals of this regression at the level value is tested. If it shows stationarity in level value, it concludes that there is cointegration between variables (Yakup & Granger , 2021)**.**

We estimate our equation using the ordinary least squares (OLS) method in order to test the presence of a long-term relationship between the variables, the results are represented in Table 2:

Table 2. OLS Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	0.292488	0.034657	8.439437	0.0000
C	4.371244	0.116347	37.57070	0.0000
R-squared	0.664255	Mean dependent var		5.335146
Adjusted R-squared	0.654928	S.D. dependent var		0.232722
S.E. of regression	0.136707	Akaike info criterion		-1.090751
Sum squared resid	0.672801	Schwarz criterion		-1.004563
Log likelihood	22.72428	Hannan-Quinn criter.		-1.060086
F-statistic	71.22410	Durbin-Watson stat		0.185512
Prob(F-statistic)	0.000000			

Source: Author's calculation (Eviews9)

According to the results of Table 2, The coefficient of FDI inflows is positive and statistically significant, this suggests that FDI has a positive effect on economic growth in the Arab Maghreb Union (AMU). It also reveals that the 1% rise in FDI tends to increase 0.29% in GDP that confirms the importance of FDI and its role in promoting economic growth in the Maghreb countries. This can be explained by the potential to benefit from the spread of technologies and available competencies through establishing advanced investments, which positively impact productivity, as well as the deficiency of local investments. On the other hand, the governments of the Maghreb countries resort to tapping into foreign expertise in this field due to the weakness of domestic experience. For instance, in the case of Algeria, particularly concerning the hydrocarbons sector. Therefore, it can be said that foreign direct investment is linked to long-term economic growth, as confirmed by the study's findings.)The R^2 is 0.66. It indicates that 66% of the variance in GDP can be explained by FDI. The

F-statistic value of the cointegration regression model is (71.22), which shows that the model is statistically significant. The long-run equilibrium model is as follows:

GDP= 4.371244 + 0.292488 FDI+ ε_t

The ADF and the PP unit tests were applied on the residual from this long-run regression in order to examine whether or not the residual series are stationary in level. The results obtained are presented in table 3:

Table 3. Results of residual stationery

ADF		**t-statistic**	**Prob**
		-3.6256	**0.0419**
Test critical values	**1%** **5%** **10%**	**-4.2436** **-3.5442** **-3.2046**	
PP		**t-statistic**	**0.0299**
Test critical values	**1%** **5%** **10%**	**-4.2436** **-3.5442** **-3.2046**	

Source: Author's calculation (Eviews9)

The results from ADF and PP tests suggest that the residuals are stationary at level I(0) which means a long-run relationship between FDI and GDP, These results indicate that the two variables are integrated and thus there is a cointegration between them.

5.3.Granger Causality Test

Since a long relationship is found between FDI and GDP, the last test carried out is Ganger Causality to determine the direction of the causality among the variables. The results are presented in Table 4:

Table 4. Causality test of Granger

Null Hypothesis:	Obs	F-Statistic	Prob.
FDI does not Granger Cause GDP	35	1.84372	0.1769
GDP does not Granger Cause FDI		2.50680	0.0297

Source: Author's calculation (Eviews9)

The Granger causality test for the relationship between FDI and GDP indicates that there is a directional causality from GDP to FDI in AMU i.e. economic growth causes foreign direct investment, and there is also no significant Granger causality from FDI to GDP.

6. Conclusion

The foreign direct investments in the countries of the Arab Maghreb region remain limited and are concentrated in specific sectors compared to the potential of these countries and other economic blocs. Therefore, through our study, we attempted to understand the impact of foreign direct investment on economic growth in the Arab Maghreb Union during the period from 1980 to 2021, using the cointegration methodology of Angel Granger to study the long-term relationship between foreign direct investment (FDI) and gross domestic product (GDP). We arrived at the following results:

- The results of the unit root test indicated that the study variables had a unit root at the level but were stationary at the first difference.
- The results of the cointegration tests by Angel Granger showed a significant and positive relationship between foreign direct investment and gross domestic product in the Arab Maghreb Union, confirming that foreign direct investment is an important factor in promoting economic growth in the Maghreb region.
- The results of the residual stability test indicated that they were stationary at the level, confirming the existence of a long-term equilibrium relationship between the study variables.

- There is a one-way causal relationship, meaning that economic growth causes foreign direct investment, not the other way around. Therefore, it can be stated that there is a unidirectional relationship between the two variables.

Based on these findings, this study reveals a significant and positive relationship between foreign direct investment (FDI) and economic growth in the Maghreb region in the long term. However, this impact falls short of its potential when considering the region's capabilities and in comparison to global investment flows. Additionally, investments in the region are concentrated in specific sectors. In recent years, there has been a disturbance in the volume of FDI due to the unfavorable investment climate, economic and political instability in the region. This has raised concerns among foreign investors, deterring them from investing or expanding their existing investments in these countries, along with the various restrictions imposed on such investments across different sectors.

Based on the obtained results, we propose the following recommendations:

1. Ensure political, economic, and social stability in the Maghreb region as a necessity for providing a conducive investment climate and achieving economic growth.
2. Emphasize the development of the human capital as a fundamental factor for attracting foreign direct investment.
3. Increase expenditure in research and development to diversify and enhance the production base.
4. Work on improving and simplifying laws and regulations to instill greater confidence in investors.
5. Encourage and support developmental projects that contribute to accelerating the pace of growth and economic development in Maghreb countries.
6. Establish a Maghreb Free Trade Area to leverage significant advantages that can help attract foreign direct investment, transfer modern technology, and create job opportunities.
7. Promote collaborative efforts among Maghreb countries to enhance intra-regional investment climate and sign bilateral agreements to encourage the movement of individuals, goods, and capital between surplus and deficit countries.

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