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The Impact of Foreign Direct Investment on Economic Growth in North Africa (Algeria, Tunisia, and Egypt): An Econometric Analysis, 1990–2023

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Abstract:

Foreign direct investment has assumed great importance for host countries because of its positive effects; numerous studies have confirmed the effect of foreign investment on economic growth. The three North African countries, Algeria, Egypt, and Tunisia, have experienced similar investment climate conditions and are considered among the least attractive regions for foreign investment. Foreign investment inflows to them have remained modest, except in Egypt. The econometric study confirmed the existence of a positive direct relationship between inflows of foreign direct investment to North African countries and their rates of economic growth.

Keywords: Foreign direct investment, economic growth, investment climate, Maghreb countries.

1. Introduction

The importance of foreign direct investment and multinational corporations in international economic relations has increased globally, and perceptions of their activities have evolved,

particularly since the end of the Second World War and the establishment of the new world economic order with the entry into force of the Bretton Woods Agreement. Their importance increased worldwide, particularly after the collapse of the socialist bloc and the acceleration of economic globalisation.

Despite the tendency of foreign direct investment to locate in the advanced countries of North, owing to their considerable attractiveness stemming from a favourable investment climate, many developing countries, especially those that are economically open, have relied heavily on foreign direct investment in their development process since its early stages. Foreign direct investment thus became one of the most important determinants of economic growth in these countries. This applies to countries in South and Southeast Asia, such as Taiwan, South Korea, Malaysia, Hong Kong, Indonesia, the Philippines, India, and China, during the phase of economic openness.

In fact, states and governments, particularly those in developing countries, make significant efforts to ensure an optimal investment climate that aligns with the requirements of economic globalisation and is capable of attracting the most significant possible amount of foreign direct investment, given its considerable importance in supporting their economic growth. The countries of North Africa have made substantial strides in economic development; however, like other developing countries worldwide, they seek to attract more foreign direct investment to support their economic growth.

Research Problem:

The research problem is framed in the following question: What is the effect of FDI on economic growth in North African countries (Algeria, Tunisia, and Egypt)?

Research Hypothesis:

The study is based on the hypothesis that foreign direct investment has a positive effect on the growth rate of gross domestic product in North African countries.

Aim of the Study:

This paper aims to examine the actual effect of foreign direct investment on economic growth in Algeria, Tunisia, and Egypt, addressing both the inflows of foreign investment into these countries and the prevailing investment climate within them.

Methodology:

To achieve the objectives of this research, the following methods were used:

– A descriptive–analytical method is used to grasp the theoretical framework of FDI and to study its relationship with economic growth and development in Maghreb countries during the study period.

– The quantitative analytical method, which incorporates econometric techniques to measure the effect of foreign direct investment on economic growth in North African countries, involves constructing an econometric model consisting of the dependent variable, gross domestic product, and the independent variable, foreign direct investment.

Temporal and Spatial Limits:

The study focuses on the North African countries of Algeria, Tunisia, and Egypt during the period from 1990--2023.

Data collection method:

The study data were obtained from the United Nations Conference on Trade and Development (UNCTAD) database.

Content of the study

This paper is divided into three main sections: the first addresses the theoretical framework of foreign direct investment, the second examines the reality of foreign investment in North African countries, and the third measures the effect of foreign investment on economic growth in these countries.

2. Theoretical Framework of Foreign Direct Investment:

2.1 Definition of Foreign Direct Investment:

The concept of foreign direct investment has evolved, as it is among the primary sources of international finance, especially for developing countries. Some view it as investments coming from abroad, either in kind or in cash, with the aim of establishing projects of a productive, marketing, or administrative nature over the long term (Al-Hamid, 2017, p. 960). Others view foreign direct investment as investment flows by foreign investors that represent approximately 10 per cent or more of a company's capital or 10 per cent of voting power (Muhammad Ismail, 2022, p. 5).

Various international institutions, such as the World Bank, the International Monetary Fund, and the United Nations Conference on Trade and Development (UNCTAD), agree that ownership or acquisition by the foreign investor of a fixed, permanent, or long-term share of not less than 10 per cent of the capital (or share capital) of an enterprise or project, which grants the foreign investor voting power to express an opinion in the management of the project.

2.2 Importance of Foreign Direct Investment for Host Countries

Foreign direct investment enables host countries, especially developing ones, to bridge resource gaps, particularly between savings and investment, and thus constitutes an international source of finance that differs from other sources of international financing, such as loans, owing to their burdensome borrowing costs and conditions; it also differs from foreign aid and grants, as the latter depend primarily on political relations between donor and recipient states (Ali, 2007, p. 9). Foreign investment also plays a crucial role in providing employment opportunities and alleviating unemployment, one of the most pressing economic challenges in developing countries, including the three North African countries under study: Algeria, Tunisia, and Egypt. It contributes to the transfer of technology and positively affects the balance of payments through capital inflows; it is a source of foreign currency, increases physical capital, and supports the development of the export sector, which is urgently needed by developing countries, including Algeria, Tunisia, and Egypt.

2.3 The Relationship between Foreign Direct Investment and Economic Growth

The credit for explaining the relationship between foreign direct investment and economic growth goes to the pioneers of the neoclassical school and the modern theory of economic growth, which encourages foreign direct investment through a set of models. The Solow–Swan model clarified that the effect of foreign investment on economic growth is limited in the short term and confined to the level of income, leaving the long-run growth rate unchanged. Despite the limited short-term effect under diminishing returns to physical capital, the model highlighted the role of foreign direct investment in maximising returns to output, in addition to the positive externalities that enhance productivity owing to the modern technology accompanying it (Al-Hamid, 2017, p. 692).

The Harrod–Domar model likewise posits the existence of a set of gaps between locally available resources and targeted resources, whether financial, human, organisational, or technological. For example, foreign investment is expected to contribute to closing the gap between savings and investment, which represents economic development through growth in gross domestic product and is directly linked to the volume of available savings, assuming that the productivity of capital remains constant in the short term. Accordingly, growth in gross domestic product will be a function of the availability of domestic and foreign savings.

Thus, the effect of foreign investment on the savings gap is positive, even though it is viewed as monetary capital, an assumption that conflicts with the fact that foreign investment may consist of a set of productive assets.

Foreign investment also helps to cover the foreign exchange revenue gap faced by many developing countries because of their chronic balance of payment deficits (Muhammad, 2003, p. 118). Although there is agreement on the effect of net foreign investment inflows on the balance of payments, there is disagreement regarding the effect of foreign investment on the balance of payments in developing countries. This calls for the latter to issue laws and regulations governing the access of foreign investments to credit from the local banking and financial system to ensure that local firms are not crowded out in obtaining finance from the domestic financial market, as well as the repatriation of profits abroad. Foreign investment may also be viewed as a tool to bridge the deficit in government revenues by creating new opportunities for horizontal tax-base expansion (Muhammad, 2003, p. 118).

Although some economists believe that foreign investments can be a burden on host countries, if the benefits of these investments exceed the gains expected to be obtained from them, especially in cases where they substitute for or crowd out domestic investment.

Nevertheless, many researchers have concluded that foreign investment contributes to strengthening long-term economic growth, depending on the volume of foreign investment as well as the externalities it generates in the host country through knowledge and the diffusion of technology as an internal factor for improving productivity; it may also have indirect effects such as competition, emulation, and imitation (Nazari & Harun, 2016, p. 505).

For empirical studies on the effect of foreign investment on economic growth, approximately 42 studies (approximately 36%) reported that the effect of foreign investment on economic growth is positive and depends on the absorptive capacity of the host country, such as human capital, the level of financial development, and technological capabilities, a further 20% of these studies reported that foreign direct investment has a direct positive effect on economic growth, and 12% suggested that the effect of foreign direct investment on economic growth depends on the sector, with a larger expected effect in manufacturing. In addition, 20% of the studies indicated that different types of foreign direct investment have varying impacts on economic growth; for example, greenfield investments tend to have a greater effect than joint ventures do. Finally, 10% of the studies found that foreign investment hurts economic growth, as it replaces domestic investment (Hussain, 1435, p. 117).

In general, foreign investment has two types of positive effects: the first is quantitative, represented by an increase in the stock of physical capital and the creation of new production capacities; the second is qualitative, represented by improving the technological level and increasing workers' skills, as well as managerial skills, etc.

The Reality of Foreign Direct Investment and Economic Growth in North Africa:

3.2 Investment climate

The World Bank considers the investment climate to consist of a large set of specific indicators that interact with one another to create an attractive environment for investment, encouraging

firms to undertake profitable economic activities within the national economy (World Bank, 2005, p. 2).

The Arab Investment and Export Credit Guarantee Corporation in Arab countries prepares an index called the Dhaman Index to evaluate the investment climate. This index monitors the performance of 158 countries, including 21 Arab countries, across 190 primary and secondary indicators in fields related to the investment climate, as issued by 33 international bodies.

Table 1:

The status of Algeria, Egypt, and Tunisia in the composite investment climate index for 2023.

(Average global rank)

	Global rank	Composite index for evaluating the investment climate	Indicators for evaluating the regulatory and legislative environment	Indicators for evaluating factors of production	Indicators for evaluating the political situation and country risk	Indicators for evaluating economic performance
Algeria	95	95.2	107	100	94	80
Egypt	103	100.3	94	85	107	116
Tunisia	114	106.4	85	86	122	132

Source: (Arab Investment and Export Credit Guarantee Corporation, 2024, p. 10).

The three North African countries, Algeria, Tunisia, and Egypt, exhibited convergence in their evaluations according to the 2024 report of the Arab Investment and Export Credit Guarantee Corporation; however, they occupied late positions in the global ranking and came after many developing and Arab countries, such as the United Arab Emirates, which achieved an advanced

global ranking. While Algeria ranks 95th globally, Egypt ranks 103rd, and Tunisia ranks 114th. Among the indicators for evaluating the regulatory and legislative environment at the global level, Tunisia ranked 85th, Egypt 94th, and Algeria 107th. Among the indicators for evaluating factors of production, Algeria ranked 100th, Egypt 85th, and Tunisia 86th. Among the indicators for evaluating the political situation and country risk, Algeria ranked 94th, Egypt 107th, and Tunisia 122nd. Among the indicators for evaluating economic performance, Algeria ranked 80th, Egypt 116th, and Tunisia 132nd.

The preceding statistics indicate that the governments of the three countries must continue economic reforms to improve the investment and business climate in their territories, making them destinations for attracting foreign investments of all kinds.

3.2—Foreign direct investment inflows to North African countries (1990–2023):

The data indicate a modest volume of foreign direct investment attracted by the North African countries of Algeria and Tunisia compared with other geographical regions of the world, except Egypt, which recorded significant levels of inwards foreign investment.

Table 2:

Foreign direct investment inflows to the Maghreb countries (1990–2023)

Unit: million US dollars

Year	Algeria	Egypt	Tunisia
1990	40	734	89
1991	80	253	173
1992	30	459	584
1993	0	1207	656
1994	0	1133	566

1995	0	595	378
1996	270	636	531
1997	260	887	365
1998	607	1076	668
1999	292	1065	368
2000	280	1235	779
2001	1113	510	487
2002	1065	647	821
2003	638	237	584
2004	885	2157	639
2005	1146	5376	783
2006	1888	10043	398
2007	1744	11573	1616
2008	2632	9495	2759
2009	2754	6712	1688
2010	2301	6386	1513
2011	2581	-483	1148
2012	1499	6031	1603
2013	1697	4256	1117
2014	1507	4612	1064

2015	585	6925	1003
2016	1636	8107	855
2017	1232	7409	882
2018	1475	8141	1036
2019	1382	90910	845
2020	1140	5852	652
2021	870	5122	660
2022	255	11400	714
2023	1216	9841	768

Source: (United Nations Conference on Trade and Development, 2024).

The data in Table 2 indicate that the volume of foreign investment inflows to Algeria increased from $40 million in 1999 to $280 million in 2000 and then to $2,754 million in 2009 before trending downwards to settle at approximately $1,216 million in 2023. For Tunisia, the volume of inwards foreign investment rose from approximately $ 89 million in 1999 to $ 779 million in 2000 and then to approximately $ 2,759 million in 2008, after which it declined to approximately $ 768 million in 2023. In contrast, Egypt is among the most attractive destinations for foreign direct investment in the Arab world and North Africa region: inwards foreign direct investment increased from approximately 734 million US dollars in 1990 to 1,235 million US dollars in 2000 and then to approximately 4,612 million US dollars in 2014, reaching its highest level in 2022 at approximately 11,400 million US dollars, before declining to approximately 9,841 million US dollars in 2023. The best explanation for the decline in investment inflows to Tunisia and Algeria, compared with Egypt, is that these countries ranked lower in the global investment climate index referred to earlier.

UNCTAD data indicate that the relative importance of inwards foreign direct investment flows to the three North African countries ranged between 0.1% and 0.2% of total global foreign

investment flows and between 0.6% and 0.3% of total foreign investment flows to developing countries in 2000 and 2023.

4- Measuring the Effect of Foreign Investment on Economic Growth in North African Countries

Descriptive Study of the Study Variables

Initial statistical tests of the variables included in the model are an essential step preceding any analytical study, as they aim to deepen the understanding of the nature of these variables. The descriptive study is a crucial tool in this context, as it enables the analysis of distributional characteristics, the calculation of measures of central tendency and dispersion, and the identification of outliers that may cause bias in the study results.

In our attempt to estimate a model that measures the effect of investment on economic growth, using panel models for a sample of 3 countries (Algeria, Tunisia, and Egypt), we take the rate of foreign direct investment (FDI) as the explanatory variable in this study. In contrast, the dependent variable is gross domestic product (GDP).

The study variables and previous studies that used them can be summarised in the following table:

Table 3:

Description of the Study Variables

Variable name	Variable symbol	Variable type	Source	Studies that used the variables
Foreign direct investment	FDI	Explanatory	.....	.....
Gross domestic product	GDP	Dependent	.....	.....

Source: Prepared by the researcher.

Before commencing the estimation and construction of the study models, it is necessary to perform some statistical tests to understand the structure and nature of the data that will be used in the estimation process, as clarified in the following Table:

Table 4:

Descriptive data for the two series under study during the period 1990–2023

	GDP	FDI
Mean	2099.108	186.4750
Median	1050.000	60.84000
Maximum	11578.00	7348.000
Minimum	-585.0000	12.29000
Std. Dev.	2789.495	723.8977
Skewness	1.912787	9.630801
Kurtosis	5.672070	95.78066
Jarque–Bera	92.54363	38161.86
Probability	0.000000	0.000000
Sum	214109.0	19020.45
Sum Sq. Dev.	7.86E+08	52926813
Observations	02	102

Source: Outputs of the Eviews 13 program.

As an initial step to gain a quick idea about the time series under study and through the statistical tests shown in the Table above, we note that the value of the arithmetic mean is greater than the value of the median in both series, in addition to the fact that the skewness of both series is positive, which indicates that the distribution curve of both series has a right tail longer than the left tail (skewed to the right).

2. Examination of the Stationarity of the Panel Time Series

Before any model is built, it is necessary to conduct a stationarity test for the panel time series, which relies on various relevant tests, especially the LLC, IPS, and ADF tests, to reveal the properties of the time series of the variables under study. Accordingly, we applied these tests to all the model variables individually, and the results are shown in the following table:

Table 5:

Results of panel time series stationarity tests via the Im, Pesaran and Shin W statistic tests

Variable	Test type	At level I(0)	At first difference I(1)
FDI	IPS	0.35816 (0.6399)	−4.73201 (0.0000)
GDP	IPS	−1.08632 (0.1472)	−4.2378 (0.0000)

Source: Prepared by the researcher.

The first values in the table represent the statistics, whereas the values in parentheses express the corresponding probability for each statistic. From the table, we observe concordance in the results obtained via the IPS stationarity tests, which indicate that the two variables are stationary at the first difference, indicating rejection of the null hypothesis that posits the existence of a unit root.

3. Estimation of Panel Time-Series Models

To measure the effect of foreign direct investment on economic growth in the selected Arab countries through some of their indicators, panel data were used for the period from 1990--2023 through three basic models: the pooled regression model (PRM), the fixed effects model (FEM), and the random effects model (REM), which rely on the Eviews.9 program.

This study contains three models, as mentioned earlier, which can be summarised as follows:

The first model measures "the effect of foreign direct investment (FDI) on gross domestic product (GDP)," and is written according to the following basic relationship:

$$\mathrm{GDP}_{it} = \beta_0 + \beta_1 \mathrm{FDI}_{it} + \varepsilon_{it}.$$

3.1. Test of Cross-Sectional Dependence

In the model, we aim to measure the impact of foreign direct investment on gross domestic product (GDP), utilising panel data spanning the period from 1990--2023. However, there is enormous variance in the values of the two variables across countries, as the data for the GDP series differ among the three countries. Therefore, the generalised least squares (GLS) method was used, with the assumption that the error variance differs across units (heteroskedasticity across cross-sections). Accordingly, the results were as follows:

Table 6:

Results of the cross-sectional dependence test

Test	Statistic	d.f.	Prob.
Breusch–Pagan LM	26.75486	3	0.0000
Pesaran scaled LM	9.697882	—	0.0000
Pesaran CD	2.892350	—	0.0038

We note that the Pesaran CD test has a probability of less than 5%; therefore, we reject the null hypothesis and accept the alternative hypothesis, which stipulates the presence of differences between cross-sectional weights; hence, it is necessary to use the generalised least squares (GLS) method.

2.3. Estimation of the model parameters via the fixed effects model

After the results of the previous test indicated that the fixed effects model (FEM) is the most appropriate, we use the generalised least squares (GLS) method to estimate the model parameters via the fixed effects model after weighting according to the two methods (Panel GLS with Cross-

section SUR or Weights) because the number of time observations (T) exceeds the number of sections (N). Relying on the Eviews 13 program, we find the following:

Table 7:

Estimation of the model parameters via the fixed effects model

The dependent variable in this model is gross domestic product (GDP).

Study period: 1990–2023, T = 34, N = 3; number of observations: 102

	Panel GLS with Cross-section SUR	Panel GLS with Cross-section Weights
C	46.48871 (0.0281)	45.03378 (0.0061)
FDI	0.028345 (0.0000)	0.026933 (0.0000)
Number of Observations	102	102
R-squared	0.424713	0.372514
F-Statistic	73.826413	59.36614
Prob (F-Statistic)	0.000000	0.000000

Source: Prepared by the researcher via Eviews. 13 outputs.

The choice of the appropriate model between the two rests on the Fisher criterion and the coefficient of determination. We note that the fixed effects model estimated by GLS SUR is superior, as the Fisher value is larger and the coefficient of determination improves.

Accordingly, we can interpret the relationship between the dependent and explanatory variables by comparing the obtained statistical results with those of economic theory to determine whether they are consistent or contradictory. On the basis of the results in Table 7, the model can be examined according to the following criteria:

• From a statistical standpoint:

– The constant term is significant at 5%, meaning that we reject the null hypothesis that the constant equals zero.

– The coefficient of foreign direct investment is significant because the probability (Prob) is less than 5%; thus, we accept the alternative hypothesis that the foreign investment coefficient does not equal zero.

– When conducting the overall significance test for the model (Fisher test), we find that the probability of rejecting the model is zero (Prob(F statistic) = 0.000); therefore, the model is acceptable as a whole.

– The coefficient of determination reached 0.424713, indicating that the independent variable accounts for 42.47% of the variation in gross domestic product. In comparison, the remaining 57.52% are explained by other factors not included in the model.

– The p value of the F statistic equals 0.000, which is less than the 0.05 significance level, indicating that the chosen model is significant overall. Accordingly, the study results can be expressed as follows:

• The parameter sign is positive and significant at the 5% level, indicating a powerful direct relationship between the dependent variable (GDP) and the explanatory variable (FDI). In other words, whenever foreign direct investment in the North African countries under study—Algeria, Tunisia, and Egypt—increases by $ 1, gross domestic product increases by approximately $ 0.028345 annually. This is consistent with economic theory, which posits a relationship between increases in foreign direct investment inflows and economic growth, as noted earlier.

5. Conclusion

Foreign direct investment has assumed great importance for host countries, as it contributes to providing employment opportunities, reducing unemployment rates, and transferring technology, in addition to its positive effects on the balance of payments through capital inflows, being a source of foreign currency, increasing the state's stock of physical capital, and developing exports, especially for developing countries.

Many studies have confirmed that foreign direct investment affects economic growth, as addressed by the Solow–Swan model, which shows that despite the limited short-run effect of foreign investment on economic growth, it contributes to maximising returns to output, in addition to positive externalities that lead to increased productivity owing to the modern technology accompanying it. The Harrod–Domar model also suggests that foreign direct investment plays a crucial role in bridging the gap between savings and investment and that growth in gross domestic product is a function of the availability of both domestic and foreign savings.

The three North African countries, Algeria, Tunisia, and Egypt, exhibited convergence in their evaluation according to the 2024 report of the Arab Investment and Export Credit Guarantee Corporation; however, they occupied late positions in the global ranking and came after many developing and Arab countries, such as the United Arab Emirates, which achieved an advanced global ranking.

Although the trend of inwards foreign direct investment flows to North African countries increased during the study period, they remained modest, except in the case of Egypt.

The study showed a positive and significant coefficient at the 5% significance level, indicating a powerful direct relationship between the dependent variable (GDP), representing gross domestic product, and the explanatory variable (FDI), representing the foreign direct investment indicator. That is, whenever foreign direct investment in the North African countries under study—Algeria, Tunisia, and Egypt—increases by $ 1, gross domestic product increases by approximately $ 0.028345 annually. This is consistent with economic theory, which posits a relationship between increases in foreign direct investment inflows and economic growth, as noted earlier.

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