

**ALGERIA'S ATTRACTIVENESS FOR FOREIGN DIRECT INVESTMENTS
(AN ECONOMETRIC ANALYSIS STUDY)****MENNAD Merwa Fatima ^{1♦}, DOUDI Mohammed ²**¹ LEPPES, University Centre of Maghnia (Algeria), m.mennad@cu-maghnia.dz² LEPPES, University Centre of Maghnia (Algeria), m.daoudi@cu-maghnia.dz**Received:** 29/08/2025**Accepted:** 28/10/2025**Published:** 25/11/2025**Abstract:**

This study attempts to show the attractiveness of Algeria to Foreign direct investments (FDI), through the application of the ARDL model and the Toda-Yamamoto Causality test for the period 1990-2022. Through the results, we found that with regard to the situation in Algeria, There are more repulsive factors to foreign direct investments than attractiveness. Among the attractive variables, we found the market size on the short term (+1.13%;+ 0.82%) and long term (+6.85%), However, this pull factor is offset by two very repellent disincentives, namely corruption and tax pressure. Public investments also contribute negatively in the short term, but they can contribute positively in the long term.

Keywords: Foreign direct investments, attractiveness, ARDL model, market size, Toda-Yamamoto Causality.

JEL Classification: F210, E270, F32, C1.

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1. Introduction:

The current global economy is undergoing a significant and profound revolution, which is primarily marked by the growth of scientific and technological innovation as well as the increasing significance of initiative, organization, and management. In today's worldwide system, these factors—along with professionalism and the ability to draw in foreign investment—have taken center stage as productive inputs. The manufacture of conventional commodities, on the other hand, no longer heavily relies on natural services, intermediate materials, energy resources, mechanization, cheap and unskilled labor, or even self-sustaining financial resources. This change demonstrates how an economy that relies heavily on labor and resources is giving way to one where competitiveness and sustainable growth are determined by knowledge, innovation, and investment mobility.

Algeria has had to adjust to the realities of economic and financial globalization in this global setting as a member of the international system. Acknowledging its critical role in modernization and growth, the nation has worked to improve its ability to draw in foreign direct investment (FDI) in addition to integrating into international trade and financial flows. In order to increase the country's attractiveness to international investors, Algerian authorities have created the institutional and legal frameworks and implemented incentives. These initiatives show that the advantages of international investment flows—such as technological transfer, managerial know-how, employment creation, and integration into global value chains—are recognized.

However, expert international surveys continue to show that foreign direct investment inflows are still modest despite these attempts and Algeria's open investment policy. Even while there has been an improving trend, the actual amounts of foreign direct investment (FDI) documented still fall well short of the goals and expectations that underpin the national investment policy.

Therefore, the primary research question that emerges is: What are the primary drivers of foreign direct investment in Algeria, and what are the primary barriers that restrict or deter these inflows and keep them from having the intended developmental impact?

2. Literatures review:

The first theoretical analyses of the phenomenon of multinational companies were conducted in the late 1950s. These analyses focused on explaining the imperfect competition and monopoly that characterised these companies. Perhaps the most important of these were Vernon's theory of the 'product life cycle', Hymer and Caves' theory of the 'large multinational corporation' and Caves' theory of 'product diversity'. It is evident that the content of these aforementioned theories is characterised by two primary observations. Firstly, there is a meticulous effort to elucidate and analyse the underlying factors that contribute to a company's status as an international or multinational entity. This aspect constitutes the crux of the analysis. The second point pertained to the adoption of American corporations as a paradigm for state-owned enterprises pursuing international investment opportunities. (Vernon, R, 1966) (Hymer, 1968) (Caves R, 1974)

Beginning in the seventies, more serious and more effective attempts appeared in order

to explain the phenomenon of foreign direct investment, and in this regard we find the theoretical theory or the selective "eclectic theory" (paradigm of OLI: O « Ownership », L « Localization», I «Internalization»). And that allowed us to better understand the phenomenon of the location and migration of multinational companies, whether in developing countries or in developed countries. The fundamental idea that stems from this theory is that the multinational company possesses a qualitative advantage of Ownership. It will choose to invest in a location or geographical area that is stimulating and attractive, so that it can take advantage of this advantage to raise awareness of the lowest possible production costs globally. (Dunning,J, 1980)

As a general rule, the prevailing studies in this field have focused on the cost and quality of labour, the quality of infrastructure and public institutions, and the role played by national economic policies (trade policy, exchange rate policy, tax policy, etc.). The following set of variables has been identified as a contributing factor to the attraction of foreign direct investment in a given country: the size of the market, the quality of the infrastructure, trade openness, the level of economic integration and the stability of the political environment. (Root F, Ahmed A, 1979)

Wheeler and Mody's study sought to explain the phenomenon through the analysis of a set of variables, including market size, labour costs, industrial fabric (i.e. the presence of industrial areas) and advanced infrastructure. The latter is hypothesised to be contingent on the availability of such infrastructure and the rapid development of industry. It is further posited that these variables are closely related to the level of economic development of the host country for foreign direct investment, as well as to the productive sector chosen by the multinational company. In the context of developing countries, foreign direct investment in the electronic industry is found to be significantly associated with the quality of infrastructure and labour costs. Conversely, for developed countries, this investment is found to be closely related to the size of the market and the extent of industrial preparation. It is noteworthy that the quality of infrastructure is not perceived as a hindrance to foreign direct investment in developed countries, which is a matter of concern. The presence of multinational companies in these countries will result in an improvement in the quality of services available, as compared to those found in developing countries. (Wheeler D, Mody, A, 1992) The attractiveness of a particular country to foreign direct investment is closely related to labor productivity, as well as real expenditures devoted to higher education and social stability. (Axaroglou, k, 2005)

With the expansion of globalization, economic activities have tended to be more specialized and fragmented into the global market sectors. Fragmentation, as well as the theories of the productive market sectors strategy that Kierzowski came up with was in order to further clarify the phenomenon of the positioning of multinational companies and their choices of areas of their activities in the world, especially in Developing countries. The theories show the existence of models for foreign direct investment of the vertical type, which is based on minimizing factor costs. And what is known is that foreign direct investment was more necessary when there were customs restrictions between countries, so that the multinational companies would avoid those customs obstacles and overrun the

market of a certain region that they choose to locate and carry out their activities at its level, and this is what is known as tariff-jumping. Protected and closed economies were more attractive and attractive to foreign direct investment compared to those economies open to the world, in other words, the degree of protectionism of a particular economy and the size of its internal market are among the most important determinants of attracting foreign direct investment, and the choice between it and export. Here, a substitution or substitution relationship is created between foreign direct investment and export, and this is what generates another model for foreign direct investment, which is of the horizontal type. (Sven W, Kierzowski H, 2001)

In addition to the aforementioned points, foreign direct investments of the vertical type are also referred to as north-south investments. These investments are directed from developed and technologically advanced countries in the Global North to developing countries in the Global South. These countries in the Global South have access to material and human resources at low costs. In other words, there is a discrepancy between the source and host countries with regard to natural resources. In addition to owning the factors of production, labour costs and the extent of their qualification, these elements remain among the most important determining and influencing factors in FDI flows of a vertical type. (Helpman E, Krugman P, 1985).

There are standard studies that tried to analyze and explain the attractiveness of countries to foreign direct investment, using in general data specific to the host countries (macroeconomic data) or data related to the institutions active in the host countries (microeconomic data). All these studies attempted to measure the effects of foreign direct investment on the host countries and to determine its determinants. In order to analyze the factors explaining foreign direct investment, analysts use the FDI index as a percentage of GDP in order to determine the market size. (Asiedu, E, 2006)

Following the multinational company's decision to invest in a foreign country, the subsequent stage is the selection of the host country for its investments. The question that arises in this regard is the basis for choosing the host country. In other words, what factors contribute to a particular country's attractiveness for foreign direct investment? The identification of the geographical location of foreign direct investment flows within a specific country or geographical area is challenging due to the absence of a unified theoretical framework that encompasses all the applied results. (Blonige A, 2005)

The foundation of the aforementioned concepts necessitates the establishment of a definition for an attractive location or geographical area that stimulates foreign direct investment. The attractiveness of a particular region for foreign direct investment is contingent on a multi-faceted set of variables, and thus cannot be attributed to a single factor or variable.

3. Foreign direct investments in Algeria:

Algeria has yet to achieve the level of competitiveness that would enable it to attract significant foreign direct investment and foreign investors, particularly in sectors other than hydrocarbons. This lucrative sector is currently experiencing a surge in interest from international companies, a development that has been precipitated by the recent escalation in global black gold prices. The degree of privatisation in the primary public sectors of Algeria remains minimal. One of the most contentious issues in Algeria pertains to the predominance of a 100% public Algerian banking system, which is entirely subject to the state's authority and lacks the presence of private Algerian banks. It is imperative that Algeria revitalises its banking system. To this end, the creation of a spirit of competition between banks through privatisation and the encouragement of the establishment of private banks is essential. In order to be in line with global developments and changes in the field of business and investment, especially foreign direct investments, the Algerian banking system must be reformed. (Laza K, 2011)

Algeria is persevering with its economic reform programme in an effort to mitigate the severity of unemployment, which is particularly pronounced among the youth demographic. The issue of youth unemployment in Algeria remains a significant social and economic concern that demands urgent attention. The implementation of a comprehensive policy to stimulate economic recovery and accelerate growth in the country is imperative to address this issue effectively.

Algeria continues to encourage foreign direct investment, particularly in sectors that would enhance and develop Algerian infrastructure and facilitate movement across the country's extensive geographical regions. This investment would undoubtedly contribute to the revitalisation of the economic climate between the different regions in the country. However, it is evident in Algeria that the hydrocarbon sector continues to be a highly attractive domain for foreign direct investments, in contrast to other sectors. Moreover, the hydrocarbon sector within the country continues to represent the primary catalyst for GDP growth. Consequently, the Algerian economy remains susceptible to the volatility of oil prices within global markets. (World investment prospects to 2011, pp:18-67)

An examination of statistical data pertaining to the influx of foreign direct investment into Algeria reveals a conspicuous weakness in investment flows, a trend that persisted until 1996. This phenomenon persisted despite Algeria's adherence to the aforementioned Laws 90-10 and 93-12. The observed policy of Algeria, which is somewhat closed to foreign direct investment, is a contributing factor to this trend. In the period following 1986, Algeria embarked on a series of reforms and structural changes in response to the challenges posed by the oil crisis of that year. These reforms, advocated by the International Monetary Fund (IMF), entailed the transition from a planned economy to a free market system. The stabilization and structural adjustment programs implemented by the Algerian government aimed to address the imbalances that had become evident in the wake of the oil crisis. The available institutional and governance indicators suggest that Algeria's institutions continue to demonstrate a degree of fragility. The implementation of institutional reforms has been identified as a potential catalyst for the creation of an investment climate that is more

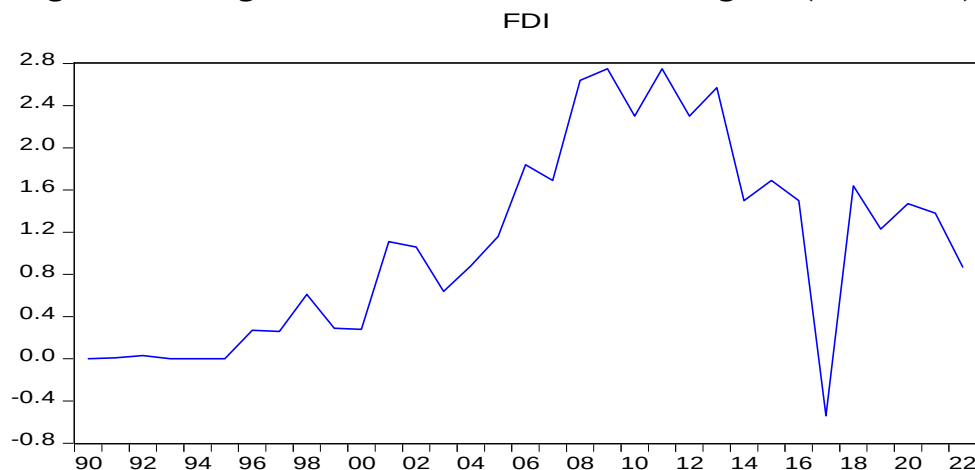
conducive to innovation and competition. It is imperative that the reforms encompass the adoption of a contemporary legal and regulatory framework encompassing property rights, bankruptcy mechanisms, foreign direct investment, financial transactions and the establishment of a competent and independent judiciary. (IMF, 2006)

This period is characterised by economic, political and security instability, which has had a detrimental effect on the attraction of foreign direct investment. The influx of foreign direct investment into Algeria increased rapidly in the late 1990s, as a result of a stabilisation of domestic conditions, particularly the security situation in the country, which had been adversely affected by a period of terrorism, sabotage and political instability. Following a period of relative tranquillity, Algeria has become more outward-looking and has initiated a process of opening its doors to foreign investment, particularly in the hydrocarbon sector. This shift has coincided with the adoption of an expanded programme for development, particularly in terms of infrastructure and basic structural development. As a result, foreign direct investment flows in Algeria have increased qualitatively and significantly.

Foreign direct investments (FDI) declined from 2.8 billion USD in 2012 (1.5% of GDP) to around 1.5 billion in 2016 (0.9% of GDP). Various FDI restrictions introduced in 2009, including a 49% foreign equity cap for any new FDI project, have not helped to contain the downward trend in net FDI inflows. In fact, the foreign exchange regulations put in place by Algeria are among the most stringent of the Arab countries. Potential foreign investors indicate that these restrictions constitute a major obstacle to their activities in Algeria. (World bank, 2017)

Despite the advantages and inducements proclaimed by the Algerian government with the aim of increasing foreign direct investment, the proposed changes involve the modernisation of the investment legislation and the elimination of certain restrictive measures and controls, including the 49/51 investment regulation, in addition to the streamlining of administrative procedures for operators. Nevertheless, foreign investment inflows into the country remain weak, falling short of expectations. In consideration of the necessity to consolidate the industrial infrastructure, cultivate strategic collaborations and augment foreign exchange, it is imperative to explore the potential for enhanced trade partnerships and investments.

According to data from the United Nations Conference on Trade and Development (UNCTAD), Algeria was positioned at the nadir among Arab countries in terms of foreign direct investment (FDI) inflows in 2022. The country in question ranked 16th out of a total of 19 countries that received varying investments during the same period. According to data provided by the United Nations Conference on Trade and Development (UNCTAD), there was a significant decrease in foreign direct investment flows to Algeria. The annual decline was recorded as over 90% in 2022, with the figure standing at just 0.09 billion USD.

Figure 1: Foreign direct investments flows to Algeria (1990-2022)

Source: Prepared by the researcher based on World Bank statistics.

4. Empirical investigation:

4.1ARDL models Auto Regressive Distributed Lag/ARDL:

Dynamic models are distinguished by their consideration of temporal dynamics (adjustment period, expectations, etc.) in the explanation of a variable (chronological series). This characteristic enhances the efficacy of forecasts and policies (decisions, actions, etc.). In contrast, simple (non-dynamic) models offer instantaneous explanations (immediate effects or effects that are not distributed over time), which only restore part of the variation in the variable being explained. Within the family of dynamic models, three distinct types can be identified.

In a dynamic model, the dependent variable (Y_t) can be explained by multiple factors, including:

The values in question are characterised by their staggered arrangement. This dynamic model is referred to as an "autoregressive model" (AR), and can be expressed as follows:

$$Y_t = a_0 + a_1 Y_{t-1} + \dots + a_p Y_{t-p} + \varepsilon_t$$

$$Y_t = a_0 + \sum_{i=1}^p a_i Y_{t-i} + \varepsilon_t \dots \dots \dots 1$$

- The present values of the independent variables (X_t) and their time-shifted values (X_{t-i}). These are "staggered delay models" (DL) which have the form:

$$Y_t = \beta + b_0 X_t + \dots + b_q X_{t-q} + z_t$$

$$Y_t = \beta + \sum_{j=0}^q b_j X_{t-j} + z_t \dots \dots \dots 2$$

- Its own shifted values, present values of independent variables (X_t) and their time shifted values (X_{t-i}). These types of models combine the characteristics of two previous models and are called "autoregressive models with staggered or distributed delays", in English "ARDL model". Below are their shapes:

$$Y_t = \varphi + a_1 Y_{t-1} + \dots + a_p Y_{t-p} + b_0 X_t + \dots + b_q X_{t-q} + e_t$$

$$Y_t = \varphi + \sum_{i=1}^p a_i Y_{t-i} + \sum_{j=0}^q b_j X_{t-j} + e_t \dots \dots 3$$

Note that " b_0 " reflects the short term effect of X_t on Y_t . To calculate the long-term effect of X_t on Y_t (ie " λ "), starting from the following long-term or equilibrium relationship:

$$Y_t = k + \lambda X_t + u, \text{ we will do:}$$

$$\lambda = \frac{\sum b_j}{1 - \sum a_i}$$

The ARDL models, which inherit the characteristics of the AR and DL models, suffer from certain econometric problems which complicate their estimation by Ordinary Least Squares (OLS). These problems include collinearity between explanatory variables (DL model), autocorrelation of errors (AR model), and so on. Robust estimation techniques are typically employed in such contexts. (Persaran et al, 2001)

4.2 Toda-Yamamoto causality:

Toda and Yamamoto (1995) proposed non-sequential procedures to test the causality between series. For these authors, preliminary tests of stationarity and co-integration (Granger's sequential procedures) are of little importance to the economist who must instead focus on testing theoretical restrictions (which ensure level information). The two authors will propose an estimate of a corrected level vector autoregression (over-parameterised), which should serve as a basis for the causality test, under the hypothesis of a probable potential co-integration between series that are integrated into the model without the study as such (explicitly). The Granger causality test, as proposed by Toda and Yamamoto, is a procedure which follows a specific set of steps. (Toda H, Yamamoto T, 1995):

- Find the order of maximum integration of the series under study (dmax) by resorting to stationarity tests.
- Determine the optimal lag or shift of the VAR in the level under study (k) or autoregressive polynomial (AR) using the information criteria (AIC, SIC and HQ).(
- Estimate a VAR in increased level of order " $p=k+dmax$ ".

4.3 The model application:

The selection of model variables was informed by four key considerations, drawing upon the extant literature in economic studies. It is evident that the most significant determining factors in the attractiveness of foreign direct investments are the size of the market, the nature of the institutions, the size of the state in the economy, and finally, the tax pressure.

The data under scrutiny in this study are sourced from annual reports and databases maintained by the World Bank (WDI) and Transparency International. The annual data set under consideration herein encompasses the period from 1990 to 2022. The following variables were utilised in the study:

Variables	Descriptions and data
FDI	Foreign direct investments World Bank (WDI)
GDP	Gross domestic product (Market size) World Bank (WDI)
EG	Equipment spending(The size of the state in the economy) World Bank (WDI)
CORRUP	Corruption(Quality of administrative procedures) Transparency international
OFISC	ordinary taxation(Tax pressure) World Bank (WDI)

$$FDI = f(GDP, EG, CORRUP, OFISC)$$

If we intend to capture the short-term and long-term effects of the above explanatory variables on FDI, the ARDL representation of the function:

$$\begin{aligned} \Delta FDI_t = & a_0 + \sum_{i=1}^p a_{1i} \Delta FDI_{t-i} + \sum_{i=0}^q a_{2i} \Delta GDP_{t-i} + \sum_{i=0}^q a_{3i} \Delta EG_{t-i} + \sum_{i=0}^q a_{4i} \Delta CORRUP_{t-i} \\ & + \sum_{i=0}^q a_{5i} \Delta OFISC_{t-i} + b_1 FDI_{t-1} + b_2 GDP_{t-1} + b_3 EG_{t-1} + b_4 CORRUP_{t-1} \\ & + b_5 OFISC_{t-1} + e_t \end{aligned}$$

4.3.1. Stationarity of series:

In this study, we used ADF test, the results are given as follows.

Table 1: Unit root test ADF (Test of Stationary):

Vs	Level			1st difference			decision	lags
	Intercept	Trend and intercept	None	Intercept	Trend and intercept	None		
FDI	-1.40111 (0.5667)	-0.75502 (0.9578)	-0.58527 (0.4544)	-3.98147* (0.0053)	-4.19681 * (0.0142)	-4.03917* (0.0003)	I(1)	1
GDP	0.56351 (0.9858)	-2.05752 (0.5450)	2.19687 (0.9914)	-3.48965* (0.0166)	-3.65733** (0.0441)	-1.96640 ** (0.0488)	I(1)	1
EG	2.32483 (0.9999)	-1.15678 (0.8987)	4.36484 (1.0000)	-3.3736** (0.0224)	-3.2315 (0.1021)	-3.4465* (0.0014)	I(1)	2
CORRUP	-3.67092* (0.0107)	-2.35800 (0.3913)	-2.23387* (0.0270)	-3.85630* (0.0071)	-5.06266* (0.0020)	-3.73314* (0.0006)	I(0)	1
OFISC	3.19153 (1.0000)	0.45812 (0.9985)	3.79735 (0.9998)	-1.38885 (0.5720)	-3.80066** (0.0329)	-0.19691 (0.6056)	I(1)	1

(.): Probabilities; *: stationary at 1%; **: stationary at 5%

Source: Eviews program outputs

Through the results of the stability obtained, it is clear that the time series of the model variables are not integrated with the same degree, which makes the co-integration test of Engle and Granger (multivariate case) and that of Johansen ineffective, and makes the test of ARDL appropriate (Pesaran et al, 2001).

4.3.2. Co-integration test from Pesaran et al. (2001)

It was reported that the co-integration test developed by Pesaran et al. (2001) had been adapted for the series in question. It is also imperative to recognise that the application of the Pesaran co-integration test necessitates the adherence to two distinct steps.

The primary objective is to ascertain the optimal offset (AIC, SIC).

The Fisher test is a valuable tool for analysing the co-integration of series data.

Optimal offset and estimation of the ARDL model:

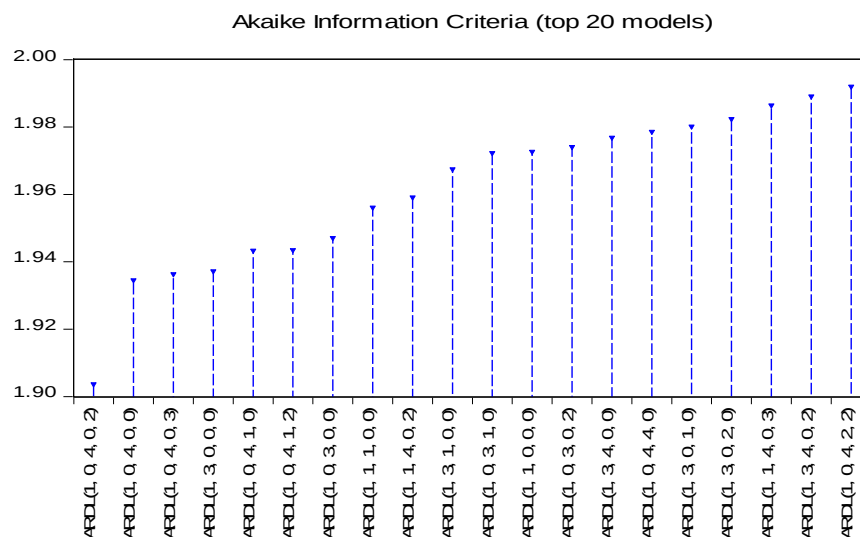
The Schwarz Information Criterion (SIC) will be utilised to select the optimal ARDL model, which is expected to offer statistically significant results with the least number of parameters. The estimation results of the optimal ARDL model selected are presented below in Table 2 and Figure 2.

Table 2: ARDL model (1,0,4,0,2)

Dependent variable : FDI				
Variables	Coefficient	Std. Error	t-Statistic	Prob.*
FDI(-1)	0.122120	0.202742	0.602340	0.5545
EG	7.343241	4.097109	1.792298	0.0899
GDP	0.000194	0.000110	1.765523	0.0944
GDP(-1)	9.32E-07	0.000164	0.005679	0.9955
GDP(-2)	0.000209	0.000193	1.083677	0.2928
GDP(-3)	-0.000142	0.000219	-0.647518	0.5255
GDP(-4)	-0.000307	0.000187	-1.640634	0.1182
OFISC	4.840798	6.368518	0.760114	0.4570
CORRUP	-0.640911	1.518423	-0.422090	0.6780
CORRUP(-1)	2.103227	2.009323	1.046734	0.3091
CORRUP(-2)	-2.607022	1.434850	-1.816930	0.0859
R^2 0.765122 Durbin-Watson stat 2.434211 F-statistic 18.21221				
Adjusted R^2 0.634634 Prob (F-statistic) 0.006080				

Source: Eviews program outputs

Figure 2: SIC graph values



Source: Eviews program outputs

As is evident, the ARDL model (1,0,4,0,2) is the most optimal among the 19 others presented, because it offers the smallest value of SIC. In addition, with regard to the diagnostic tests for the estimated ARDL model, it is evident that there is no autocorrelation of the errors, no heteroskedasticity, normality of the errors, and the model has been well specified (see Table 3).

Table 3: Results of diagnostic tests of the estimated ARDL model.

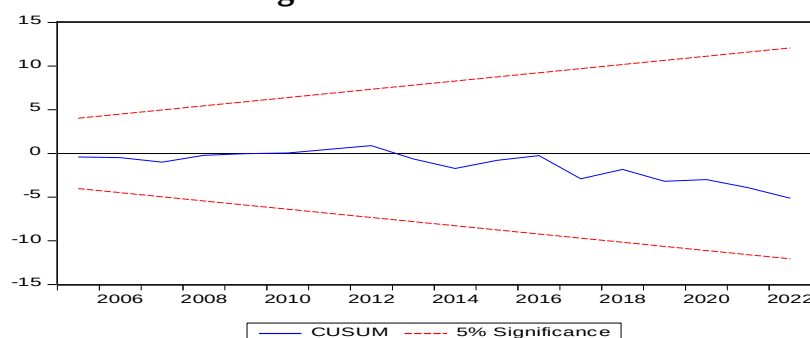
Test hypothesis	tests	Values	(probability)
Autocorrelation	Breusch-Godfrey	1.1892	prob(0.4568)
Heteroskedasticity	Breusch-Pagan- Godfrey	0.3868	prob(0.9317)
Normality	Jarque-Bera	2.9323	prob(0.2308)
Specification	Ramsey (Fisher)	1.2915	prob(0.3383)

Source: Eviews program outputs

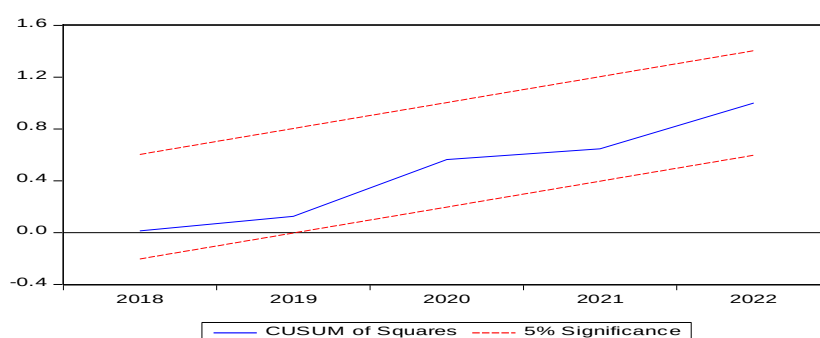
The null hypothesis is accepted for all of these tests. The model has thus been statistically validated. The estimated ARDL model (1,0,4,0,2) is generally considered to be satisfactory and explains 76% of the variance.

The following investigation is concerned with the stability of the model.

The two tests employed for the detection of structural changes in the system under investigation are the cumulative sum of returned residues (CUSUM) and the cumulative sum of the squares of recurrent residues (CUSUM of Squares). These tests are incorporated within the ARDL model. The structural stability of the estimated coefficients of the error correction formula of the self-regression model of distributed time gaps is achieved if the graph of the CUSUM and CUSUM of Squares tests falls within the critical limits at the 5% level. The results are presented in the following figures:

Figure 3: CUSUM test

Source: Eviews program outputs

Figure 4: CUSUM of Squares test

Source: Eviews program outputs

4.3.3 Co-integration test at Bounds:

Table 4: Results of the co-integration test of Pesaran et al. (2001)

variables	FDI GDP EG CORRUP OFISC	
F-stat calculated	7.378186	
Critical threshold	Bound <	Bound >
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Source: EvIEWS program outputs

The findings of the terminal co-integration test substantiate the presence of a co-integration relationship between the series under scrutiny. As demonstrated in Table No. 4, the value of F-stat is greater than that of the upper bound, thereby conferring the capacity to estimate the impact of long-term GDP, EG CORRUP OFISC on FDI. Firstly, an attempt is made to examine the correlation and causality between variables.

Table 5: Simple correlation matrix between variables

	FDI	GDP	EG	CORRUP	OFISC
FDI	1.000000	0.621989	0.553786	-0.664887	0.455198
GDP	0.621989	1.000000	0.960246	-0.512575	0.970126
EG	0.553786	0.960246	1.000000	-0.431962	0.962818
CORRUP	-0.664887	-0.512575	-0.431962	1.000000	-0.388015
OFISC	0.455198	0.970126	0.962818	-0.388015	1.000000

Source: EvIEWS program outputs.

The simple correlation matrix below (Table N°5) indicates a positive correlation between the dependent variable (FDI) and the explanatory variables of GDP and EG, and a negative correlation for the variable CORRUP. The OFISC variable demonstrates no correlation, with the degree of correlation falling at 0.50 (see the first column).

4.3.4 Causality between variables:

In instances where non-stationary variables are not co-integrated or are integrated in different orders, the traditional Granger causality test becomes inefficient. In this instance, the causality test is employed in accordance with the Toda-Yamamoto methodology, which is predicated on Wald's "W" statistic, which is distributed according to a chi-square distribution. The null hypothesis is predicated on the absence of causality between variables (probability Chi-sq > 5%).

Table 6: Toda-Yamamoto Causality Test Results

k	dmax	Dependent (VD)	Explanatory or causal variables / VC (probability)				
			FDI	GDP	EG	CORRUP	OFISC
4	1	FDI	-	3.478092 (0.1757)	3.170327 (0.2049)	4.173102 (0.1241)	3.206504 (0.2012)
		GDP	0.728908 (0.6946)	-	0.750925 (0.6870)	0.453001 (0.7973)	4.531650 (0.1037)
		EG →	7.273528** (0.0263)	0.644614 (0.7245)	-	6.082655** (0.0478)	0.122460 (0.9406)
		CORRUP →	9.325936* (0.0094)	3.374760 (0.1850)	2.425243 (0.2974)	-	3.206504 (0.7099)
		OFISC	0.397035 (0.8199)	0.124858 (0.9395)	1.349893 (0.5092)	2.080120 (0.3534)	-

(.): Probabilities (p-value); *: significant at 1%; **: significant at 5%; and values = statistics of Chi-sq
k: optimal lag of the level VAR (SIC); dmax: maximum order of integration of variables

Source: Eviews program outputs

From the Table 6, we deduce the following causalities in the sense of Toda-Yamamoto:

One-way causalities: the dynamics of FDI are caused by EG and CORRUP.

4. Analysis of the results:

5.1. Short-term coefficients (ST):

As demonstrated in Table N°7 below, the adjustment coefficient, otherwise known as the restoring force, is statistically significant, is negative and has an absolute value between zero and one. This guarantees an error correction mechanism, and therefore the existence of a long-term relationship, otherwise known as co-integration, between variables. It is also important to note the following:

The present study finds that Gross Domestic Product (GDP) has a positive effect on Foreign Direct Investment (FDI) flows in the short term. An increase in GDP of 1% has been shown to accelerate the growth of flows by 1.28% at Short Term (ST). However, this increase began to decline after the subsequent year, reaching a nadir in the third year (1.13%, 0.82%).

It is evident that an increase in equipment spending has a detrimental effect on foreign direct investment flows. A 1% rise in spending is predicted to result in a 2.49% decrease in foreign direct investment flows to Algeria, with this decline projected to persist throughout the subsequent year. This finding lends further credence to the existence of the crowding-out phenomenon in Algeria, whereby government expenditure fails to stimulate aggregate demand due to a reciprocal decline in private sector spending and investment. The augmentation of the state's economic size through an increase in public investments would act as a disincentive for private investments, including those from foreign entities, in the short term. Despite the prevalence of these public forms in infrastructure, their impact on the attractiveness of the region and the state's increasing economic dominance have led to a sense of alienation among multinational companies.

It is evident that CORRUP (Corruption, Quality of administrative procedures) exerts a negligible influence in the short term.

- OFISC (Ordinary taxation, Tax pressure) has a great negative impact on foreign direct investment flows, as the increase in taxation pressure in Algeria by 1% will lead to a decrease in flows by 11.43%. There is high fiscal pressure in Algeria, which works negatively to stimulate domestic and foreign investment alike, and thus it is a factor that drives foreign direct investment. Despite all the tax incentives provided by Algeria in this regard, it did not reflect positively on its attractiveness, and the forms of the effectiveness of these incentives are presented, as the budget costs tax expenses on the one hand, and on the other hand raises indirect taxes to finance it, this paradox clearly affects the size Foreign direct investment flows into Algeria outside the hydrocarbon sector.

Table 7: Estimation results of ST coefficients

Dependent variable : FDI				
Variables	Coefficient	Std. Error	t-Statistic	Prob.*
C	5966.009	648.2377	9.203427	0.0008
D(GDP)	-0.239935	0.089248	-2.688393	0.0547
D(GDP(-1))	1.283724	0.175656	7.308167	0.0019
D(GDP(-2))	1.138306	0.206035	5.524813	0.0052
D(GDP(-3))	0.824543	0.139599	5.906496	0.0041
D(EG)	-0.342882	0.240771	-1.424103	0.2275
D(EG(-1))	-2.495574	0.596639	-4.182717	0.0139
D(EG(-2))	-4.110661	0.579334	-7.095495	0.0021
D(CORRUP)	218.2377	362.0141	0.602843	0.5791
D(CORRUP(-1))	1589.171	830.8601	1.912682	0.1283
D(CORRUP(-2))	662.6174	408.9290	1.620373	0.1805
D(CORRUP(-3))	918.5969	581.3092	1.580221	0.1892
D(OFISC)	0.443102	0.980574	0.451880	0.6748
D(OFISC(-1))	-11.43668	1.571344	-7.278280	0.0019
D(OFISC(-2))	-1.011023	1.197781	-0.844080	0.4461
D(OFISC(-3))	-6.538992	0.992823	-6.586262	0.0028
CointEq(-1)*	-0.855063	0.099546	-8.589636	0.0010

Source: Eviews program outputs

5.2 Long-term coefficients and short-term dynamics:

Ultimately, two variables have been identified as having a significant impact on the inflow of foreign direct investment (FDI). Firstly, an increase in capital expenditure by 1% will result in a substantial positive effect on FDI, with a very significant percentage increase of 6.85% in the short term. This phenomenon can be attributed to the fact that public expenditure on infrastructure development in Algeria is expected to enhance the country's attractiveness over time. It is widely acknowledged that the development of infrastructure is a crucial factor in attracting foreign direct investment to a nation.

Conversely, corruption exerts a substantial deleterious effect on foreign direct investment (FDI) flows. A one-point increase in Algeria's corruption index results in a 1876.289 million dollar reduction in FDI flows, signifying a considerable negative impact.

Algeria is significantly lagging behind other countries in the region, including Burkina Faso (85th), Morocco (80th), Tunisia (74th), South Africa (70th), and Senegal (66th). A considerable number of foreign direct investments have been observed to deviate from their initial trajectory towards Algeria, a phenomenon that can be attributed to the widespread prevalence of corruption. This deviation has the potential to act as a deterrent, thereby diminishing the overall attractiveness of the investment environment.

Table 8: Estimation results of LT coefficients

Dependent variable : FDI				
Variables	Coefficient	Std. Error	t-Statistic	Prob.*
GDP	-1.445131	0.627872	-2.301635	0.0828
EG	6.853675	1.617716	4.236635	0.0133
CORRUP	-1876.289	500.8794	-3.745988	0.0200
OFISC	3.065020	2.675180	1.145725	0.3158

Source: Eviews program outputs

6. Conclusion :

The findings of this study indicate that, in the context of Algeria, foreign direct investment is influenced by a greater number of dissuasive factors compared to pull factors. A number of appealing variables were identified, including the size of the market. Algeria has been identified as a significant investment interface in a variety of economic sectors, and there is a substantial number of multinational companies that are eager to invest in Algeria. Nevertheless, this pull factor is counterbalanced by two significant disincentives: namely, corruption and tax pressure. It is evident that public investments can exert a detrimental effect in the short term; however, it is equally important to acknowledge that they have the capacity to yield favourable outcomes in the long term.

Corruption has been shown to have a detrimental effect on the flow of direct investment (Smith, 2020). Indeed, it has been demonstrated that it can act as an obstacle to both foreign investors and the establishment of a healthy free market based on applicable laws, regulations and laws (Brown et al., 2019). The result of this is a reduction in the levels of profit, as well as uncertainty and real knowledge, and an increase in risk. It is therefore unsurprising that it is considered to be a very effective deterrent (Jones, 2021).

The Algerian tax system is characterised by its complexity, and despite the implementation of reforms, the level of tax pressure remains high. This has the effect of discouraging foreign direct investment in sectors other than hydrocarbons, when compared to the tax environment of neighbouring countries such as Tunisia and Morocco.

The quality of infrastructure is a key factor in attracting foreign direct investment. Algeria has witnessed a significant increase in public investment in recent years, with the majority of this investment allocated to improving infrastructure by constructing roads, particularly the east-west highway. This has the potential to facilitate movement between the outskirts of the extensive Algerian territory, thereby enabling the operations of foreign companies and attracting the highest number of investments.

In order to enhance its appeal for foreign direct investments and enhance its competitiveness in this domain, Algeria must address the following issues:

Firstly, the struggle against corruption in all its forms must be initiated, with a particular emphasis on the administrative and financial aspects.

In the second instance, the objective is to reduce tax pressure, to seek non-fiscal financial resources and to work to reduce the complexities of the Algerian tax system.

In conclusion, it is imperative to reduce the size of the state in the Algerian economy and further stimulate the private sector in the area of investment, whether it is a local or foreign private sector.

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