Economic Determinants of Foreign Direct Investment in Algeria During the, Period (1990-2024)

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Abstract

This research paper aimed to study the impact of some economic determinants on foreign direct investment inflows to Algeria using the Autoregressive Distributed Lag Periods (ARDL) method during the period from 1990-2024 and relying on the Eviews program. The study concluded that there is a long-term equilibrium relationship between the study variables, which included the exchange rate, GDP, inflation, and imports. Based on the results of the study, which proved that there is a significant positive impact of imports on foreign direct investment inflows, while the inflation, exchange rate, and GDP rate variables had a significant negative impact on foreign direct investment in Algeria.

Keywords: *Foreign direct investment, ARDL model, Algeria.*

JEL Classification: F21, C22.

Introduction

Foreign Direct Investment (FDI) is one of the most important drivers of economic growth, structural transformation, and integration into the global economy. It not only provides additional financial inflows but also facilitates the transfer of managerial expertise and advanced technologies, This contributes to increased productivity, diversification of economic activities, and the creation of new job opportunities.

For developing countries, Attracting foreign direct investment (FDI) is considered a way to compensate for weak domestic savings and a strategic tool for promoting sustainable development and increasing competitiveness. However, the ability of these countries to attract foreign investment is deeply affected by the macro and institutional environment, or what is known as the determinants of foreign direct investment.

Many developing and developed countries seek to attract foreign capital in the form of direct and indirect foreign investments to support the growth and development of their economies in various economic sectors, After failing to achieve its development goals through external borrowing, and the resulting negative repercussions on its economy and its inability to service and repay its debts.

Facing the persistent savings–investment gap, these countries began to seek alternative financing sources including foreign direct investment as one of the most important sources of external financing that is compatible with the nature of its economies and development orientations, accelerates economic growth, increases the productive capacities of countries, increasing domestic fixed capital and GDP, and improving the balance of payments. This type of financing is mainly linked to the existence of a set of factors that help attract it, or what is known as the investment climate. This requires developing countries to provide these factors, establish strategic plans, and follow economic policies, incentives, and privileges that would

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contribute to attracting this type of investment and improving and developing the investment climate environment.

Like other developing countries, Algeria has worked to attract foreign direct investment by abandoning a planned economy and moving towards a market economy. Since the early 1990s, the country has implemented comprehensive structural and financial reforms to open its economy to foreign investment, particularly in the hydrocarbon sector, In addition to providing many incentives and guarantees to foreign investors and companies, it worked to improve its investment climate by issuing laws and legislative decrees that regulate the investment process, the most important of which are the Monetary and Credit Law of 1990, Law 93/12, Law 16/09, and Law 08/22 relating to the promotion of investment.

Research Problem

Based on the above, the central research problem can be formulated as follows:

What are the main factors determining foreign direct investment flows in Algeria?

Sub-questions

To answer the main problem, the study poses the following sub-questions:

1. Is there a statistically significant relationship between exchange rates and foreign direct investment in Algeria?

2. Is there a statistically significant relationship between GDP growth rate and foreign direct investment in Algeria?

3. Is there a statistically significant relationship between imports and foreign direct investment in Algeria?

4. Is there a statistically significant relationship between inflation rate and foreign direct investment in Algeria?

Research Hypotheses

To answer the above sub-questions, the following preliminary hypotheses are formulated:

1. The exchange rates have a positive impact on FDI inflows in Algeria ;

2. The GDP ratio has a positive impact on attracting FDI in Algeria ;

3. Imports have a positive impact on FDI inflows ;

4. The inflation rate has a negative impact on attracting FDI in Algeria.

Research Methodology

The study relied on the descriptive analytical method to identify and analyze the performance of certain economic variables as determinants of FDI in Algeria. In addition, the econometric approach was applied to construct a quantitative model to determine the relationships among the study variables, using the Eviews statistical program.

Literature Review

Study (Jadhav, 2012, pp. 6–14)

This study aimed to examine the role of economic, institutional, and political factors in attracting FDI in the BRICS countries (Brazil, Russia, India, China, and South Africa) during the period 2000–2009. The econometric model was estimated using the multiple linear regression model. The study concluded that traditional economic determinants are more important than institutional and political determinants of foreign direct investment. It has been shown that market size variables, expressed as GDP, trade openness, as well as the availability of natural resources, the rule of law and accountability, are key determinants of foreign direct investment in the BRICS economies.

Study (Ali & Guo, 2005, pp. 21–33)

This study aimed to investigate the determinants of foreign direct investment in China, through a survey of a dataset of 22 foreign companies in China to research and identify the factors and motives for making foreign direct investments in this country. The questionnaire was divided into two parts. The first part included a study of the factors that influence and encourage foreign direct investment, while the second part included a study of the factors that motivate reinvestment and increase it.

The study concluded that the key determinants of FDI in China include: market size (GDP, particularly for American companies), economic growth, low labor costs, geographical location and distance, population density, government incentives and policies, infrastructure, membership in the World Trade Organization (WTO), and high investment returns.

Study (Nasrat, 2020, pp. 57–73)

This study aimed to identify the determining factors of foreign direct investment flows to emerging countries during the period from 1992 to 2016, in which Panel data were analyzed for a dataset covering 24 emerging countries. The study concluded that the main determinants of foreign direct investment flows were: market size, trade openness, availability of natural and economic resources, political instability, financial development, and inflation, while the results showed that the labor force is one of the unimportant determinants of foreign direct investment inflows to these emerging countries.

Study (Gharaibeh, 2015, pp. 94–106)

This study examined the determinants of FDI inflows to Bahrain using a multiple linear regression (OLS) model to analyze the relationship between FDI inflows and a set of explanatory variables over the period 1980–2013. The results showed that the key determinants of FDI in Bahrain included government consumption expenditure, inflation, infrastructure, public education, population, labor force, trade openness, market size, and exchange rate.

Study (Castro, Aparecida Fernandes, & Carvalho Campos, 2013, pp. 231–240)

This paper examined the determinants of FDI in Brazil and Mexico during the period 1990–2010, in order to identify the common and different factors and characteristics of the two countries in terms of their impact on the attractiveness of foreign direct investment. A standard model was built using the Vector Error Correction Model (VCM).The results revealed several common determinants for both countries, namely: market size (GDP), economic stability, exchange rate, trade liberalization (through participation in the North American Free Trade Agreement—NAFTA), low labor costs, and proximity to the U.S. market.

Study (Lee, Sung, & Sun, 2024, pp. 2–8)

This paper aimed to investigate the determinants of foreign direct investment flows by classifying them into economic, social and institutional categories in advanced and developing economies, using principal

component analysis (PCA) of annual data from 1996-2019. The study concluded that developing economies rely on economic indicators to attract foreign direct investment, while social determinants are a determinant of foreign investment flows in developed countries. The correlation between institutional indicators and foreign investment flows is weak and not statistically significant in either developing or developed economies.

Study (Manglani & Divya Nandini Sharma, 2023, pp. 11–17)

This study provided a critical review of the existing literature on FDI determinants, aiming to synthesize insights from major theoretical frameworks and empirical evidence. It concluded that the most influential FDI determinants include market size, trade openness, labor costs, infrastructure, and political risks, all of which can affect FDI inflows positively or negatively depending on the host country's conditions.

Study (Faruq, 2023, pp. 35–43)

This paper investigated the economic, institutional, and political determinants of FDI inflows to 24 emerging Asian economies using panel data (2002–2028) and the multiple linear regression model. The study included variables such as market size, trade openness, inflation, natural resources, lending rate, and capital formation (economic factors), as well as business regulatory environment and disclosure index (institutional factors), and political stability, government effectiveness, and rule of law (political factors). The study concluded that most economic factors significantly influence foreign direct investment flows, while political stability had a positive impact on attracting foreign investment.

Study (Azam & Haseeb, 2021, pp. 2–10)

This paper aimed to study the factors affecting foreign direct investment flows in the BRICS countries and the impact of energy on the latter in the period 1990-2018, using the fully modified ordinary least squares (F.M.OLS) and dynamic ordinary least squares (D.OLS) methods. The results indicated that all variables were statistically significant and positively related to FDI except inflation, which showed a negative relationship. Moreover, in the long run, both renewable and non-renewable energy usage positively contributed to attracting FDI. Other significant determinants included market size, trade, and tourism, while economic instability was found to moderate FDI inflows into BRICS economies.

Study (Saleem, Shahzad Shabbir et al., 2020)

This paper aimed to study the determinants of inward foreign direct investment in Pakistan using the ARDL model test for the period 1980-2016. The results of the study showed that there is a long-term relationship between the variables of GDP, trade openness, and institutional quality towards foreign direct investment. It also showed that political instability, inflation, and the real exchange rate have an inverse relationship with foreign direct investment flows in Pakistan.

Study (Paul & Jadhav, 2019, pp. 245–261)

This study aims to explore the role of foreign direct investment determinants using data from 24 emerging markets, including China, India, Indonesia, Turkey, Thailand, Malaysia, and Pakistan. The study's findings indicate that infrastructure quality, trade openness, regulatory quality, and anti-corruption measures are important determinants of foreign direct investment flows in emerging markets.

1- The Evolution of Foreign Direct Investment (FDI) Inflows to Algeria During the Period (1990-2024):

The overall curve of FDI development in Algeria during the period (1990-2024) shows a cyclical trend related to fluctuations in oil prices and the economic policies followed. Studies such as (Khoualed, 2024, pp. 55-71) confirm that improving the business climate and enhancing economic transparency are essential pillars for increasing Algeria's attractiveness to foreign investment in the coming period, especially as the country moves towards a diversified and sustainable economy.
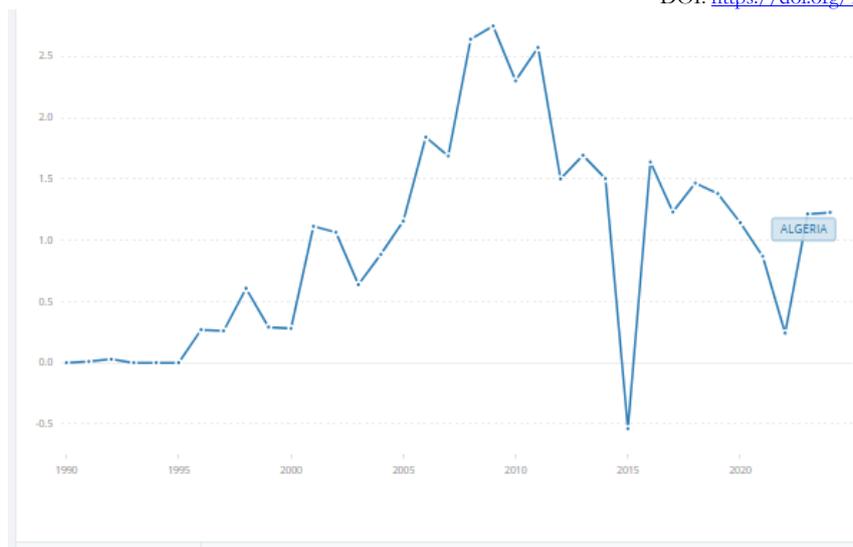
Figure No. (01): The evolution of foreign direct investment flows in Algeria during the period (1990-2024)

Source: World Bank, United Nations Conference on Trade and Development, Statistics and Data Files Handbook, and International Monetary Fund - International Financial Statistics.

To reflect the most important changes in inward foreign direct investment flows to Algeria, we divided the graph into four main stages as follows:

Phase One (1990-1999) - A period of relative isolation and the beginning of structural reforms:

During this phase, the Algerian economy experienced a significant decline in foreign direct investment (FDI) inflows, averaging only $150 million annually (World Bank, 2024) .This was due to the effects of the internal security crisis and the slowdown in economic reforms, The investment environment remained characterized by legislative rigidity and public sector dominance. Despite the adoption of the first financial liberalization reforms in 1994 in cooperation with the International Monetary Fund, the results were limited due to fragile infrastructure and a weak institutional framework.A study by (Khelifa, 2021, pp. 12-20) indicated that the limited trade liberalization during the 1990s reduced Algeria's attractiveness to foreign capital compared to other North African countries such as Morocco and Tunisia during the same period.

Phase Two (2000–2009): A Period of Relative Prosperity a reason to the Oil Boom

The Algerian economy experienced a recovery due to rising oil prices, which contributed to attracting foreign direct investment in large-scale projects in strategic sectors such as energy and infrastructure, with the hydrocarbon sector accounted for more than 80% of total FDI (Trade, Algeria: Foreign Investment Overview., 2023).FDI inflows jumped from $0.4 billion in 2001 to more than $2.7 billion in 2009 (UNCTAD, World Investment Report 2023: Investing in Sustainable Energy for All, 2023). Macroeconomic policies such as external debt repayment have also contributed to improving the credit rating and attracting multinational companies. A study by (Kadari, 2021, pp. 76-89) indicated that the financial stability achieved during this period contributed to attracting FDI.

Phase Three: 2010–2019 — A phase of decline and fluctuation in investment attractiveness

This period attest a gradual decline in FDI flows due to legislative restrictions, particularly the 51/49 rule which limited foreign ownership in local projects. Flows fell from approximately $2.3 billion in 2010 to less than $1 billion in 2019 (World Bank, 2024). This coincided with a decline in oil prices after 2014, which led to weaker external financing and slower growth. A study by (Dib, 2024, pp. 34-45) demonstrated a long-term positive relationship between FDI and economic growth, but weak institutional reforms prevented

the optimal utilization of these flows. Furthermore, Algeria's performance during this period was below the Maghreb average in the easy of Doing Business Index.

Phase Four: (2020-2024) — Phase of relative recovery and economic repositioning

Despite the repercussions of the COVID-19 pandemic, Algeria has begun to see signs of a gradual recovery in foreign direct investment (FDI) inflows. After falling to $255 million in 2022, it rebounded to $1.21 billion in 2023, ranking first in the Maghreb region (Algeria Invest, 2024). In 2022 the Investment Law reforms helped restore investor confidence by simplifying procedures and granting incentive tax breaks. Data from (Portal Mauritius Trade, 2024) indicates that the total stock of foreign investments reached $36.8 billion by the end of 2023, with a growing focus on the manufacturing and renewable energy sectors. These figures reflect a gradual shift towards diversifying the production base and reducing dependence on hydrocarbons.

2- Standard Study of the Determinants of Foreign Direct Investment in Algeria for the Period (1990-2018)

This study is based on annual data for the Algerian economy during the period 1990-2024 derived from the World Bank database, and the study focuses on identifying the most important economic determinants for attracting foreign direct investment in Algeria during the study period.

Study Methodology

This part of the study will identify the most important economic determinants that stimulate the attraction of foreign direct investment in Algeria during the period from 1990 to 2024, based on the distributed lag interval autoregression (ARDL) methodology, which is based on the boundary test (Bunt test) to determine the existence of a long-term relationship between the study variables.

Defining the study variables

To determine the impact of exchange rate fluctuations on foreign direct investment flows in Algeria, the following explanatory variables were used: (GDP, EX, IM, INF) and a dependent variable (FDI) during the period 1990-2024, as follows:

Dependent Variable

Foreign Direct Investment (FDI): (Incoming flows as a percentage of GDP)

Explanatory Variables

Gross local Product Growth Rate (GDP): This variable represents the total annual value of goods and services produced in the economy.

Exchange Rates (EXC) as a percentage of GDP: This variable reflects the value at which one country's currency is exchanged for another country's currency.

Imports (IMP) as a percentage of GDP: These are the goods or services that a country imports from abroad to satisfy market needs and meet consumer demands. This indicator usually reflects the degree of openness of the local economy to the outside world.

Annual Inflation Rate (INF) as a percentage of GDP: This variable reflects a state of instability resulting from a sustained increase in prices over a specific period, indicating the extent of the decline in the purchasing power of the local currency.

Table No. (01): Study Variables and Data Sources

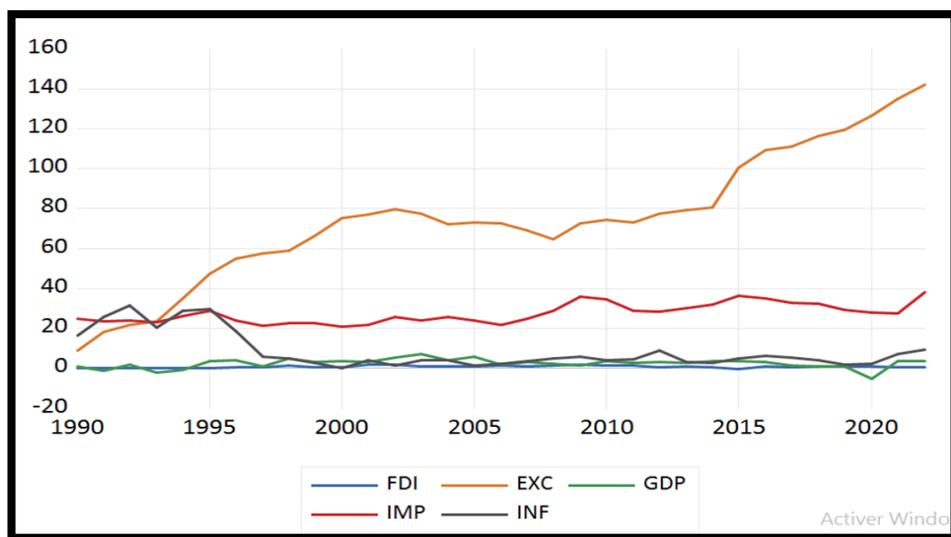| Variable Type	Variable Name	Variable Code	Data Source
Dependent	Foreign Direct Investment	FDI	
Independent	GDP Growth Rate	GDP	
Independent	Exchange Rates	EXC	world bank
Independent	Imports	IMP	
Independent	Annual Inflation	INF	

Source: Prepared by researchers.

Figure (02): Evolution of Model Variables in Algeria During the Period 1990-2024

Source: Prepared by researchers based on outputs from the Eviews.12 program.

Study Model and Stability Test:

The model was formulated as follows:

)GDP ;EX ;IM ;INF**(F=Fdi**

The mathematical formulation of the equation can be written as follows:

$$FDI_t = \hat{\beta}_0 + \hat{\beta}_1 GDP_t + \hat{\beta}_2 EXC + \hat{\beta}_3 IM_t + \hat{\beta}_4 INF_t + \varepsilon_t$$

$\hat{\beta}_1 \cdot \hat{\beta}_2 \cdot \hat{\beta}_3 \cdot \hat{\beta}_4$: These are the estimation parameters for the independent variables;

$\hat{\beta}_0$: represents the constant term;

ε: Random error.

Model Stability Test:

Studying the Independence of Time Series:

Table No. (02): Unit Rot Test by Augmented Dickey-Fuller Test

ADF			ADF				Variables
At First Différence			At Level				
Non	**Trend et intercept**	Intercept	Non	Trend and intercept	Intercept		
-7.576 (0.000) ***	-7.504 (0.000) ***	-7.455)0.000(***	-1.498)0.123(no	-2.737)0.229(no	-2.888)0.057(***	t-statistic prob	FDI
-3.000)0.004(*	-3.884)0.02(**	-3.949)0.004(*	1.954)0.985(no	-1.428)0.832(no	-0.403)0.896(no	t-statistic prob	EXC
-9.203 (0.000) *	-8.954 (0.000) *	-9.087 (0.000) *	-1.248)0.190(no	-3.898)0.023(**	-3.965) 0.004(*	t-statistic prob	GDP
-3.918 (0.000) *	-3.842)0.027(**	-3.910)0.005(*	0.454)0.807(no	3.709-)0.036(**	1.435-)0.552(no	t-statistic prob	IM
5.645- (0.000) *	-5.749)0.000(*	-5.613)0.000(*	1.408-)0.145(no	-1.679)0.737(no	-1.679)0.437(No	t-statistic prob	INF

Note: Significant at 10% level (*******), Significant at 5% level (******), Significant at 1% level (*****), Not significant (no).

Source: Prepared by researchers based on outputs from the Eviews.12 program.

The results of the table for the Unit Root Test of the study model variables using the Augmented Dickey-Fulle test at different significance levels (1%, 5%, 10%) showed that there are variables that are stationary at the At Level and other variables that are stationary when taking the at First Difference. This confirms that the time series are stationary and non-integrated of the same order I(0), I(1), and there are no integral variables of the second order I(2).

Methodology for Cointegration and Boundaries Testing

To ascertain the existence of a long-term equilibrium relationship between the study variables, we begin by testing the null hypothesis (H0), which asserts the absence of a long-term relationship between the study variables. The alternative hypothesis (H1) assumes the existence of a long-term relationship between the variables, where:

- **the null hypothesis (H0)**

$$H_0: \theta_1 = \theta_2 = \theta_3 = \theta_4 = \theta_5 = \theta_6 = 0$$

- **The alternative hypothesis (H1)**

$$H_1: \theta_1 \neq \theta_2 \neq \theta_3 \neq \theta_4 \neq \theta_5 \neq \theta_6 \neq 0$$

This is done according to the following steps:

Determining the number of lag gaps in the ARDL model:

Table (03) shows that the best model to be estimated according to the Schwarz (SC) criterion is ARDL (4.4.4.4.4) as it gives the lowest value for the criterion used; therefore, the Model Unrestricted Error Correction (UECM) can be estimated, the formula of which is given according to the following equation:

$$\Delta \text{FDI}_t = a0 + \sum_{i=1}^{n} \beta_{1i} \, \Delta \, \text{FDI} + \sum_{i=1}^{n} \beta_{2i} \, \Delta \, \text{EXC} + \sum_{i=1}^{n} \beta_{3i} \, \Delta \, \text{GDP} + \sum_{i=1}^{n} \beta_{4i} \, \Delta \, \text{IM} + \sum_{i=1}^{n} \beta_{5i} \, \Delta \, \text{INF}$$
$$+ \sigma_1 \text{FDI} + \sigma_2 \, \text{EXCt} - 1 + \sigma_3 \, \text{GDPt} - 1 + \sigma_4 \, \text{IMt} - 1 + \sigma_5 \, \text{INFt} - 1$$
$$+ \varepsilon t$$

Where:

$a0$: Constant limit.

β_i : Short-term coefficients

σ_i : Long-term coefficients

ε: Random error.

Δ : First difference factor

To estimate the (ARDL) model, the optimal lag periods for the study variables presented in the previous equation must first be determined. This is done through the Unrestricted Vector Autoregressive Model. After applying these criteria to the model variables, it was shown that the optimal lag periods for the model are (1), as shown in the following table:

Table No. (03): Determining the Optimal Slowdown Period for the Model.

HQ	SC	AIC	FPE	LR	LogL	slowdown period
28.02560	28.17605	27.64931	946019.6	NA	-456.1636	**0**
23.58598*	23.11530*	23.12823*	1885.167*	171.0783*	-351.6158	**1**
24.30592	25.96089	23.46671	12206.52	25.88675	-332.2007	**2**

Source: Prepared by researchers based on outputs from the Eviews.12 program.
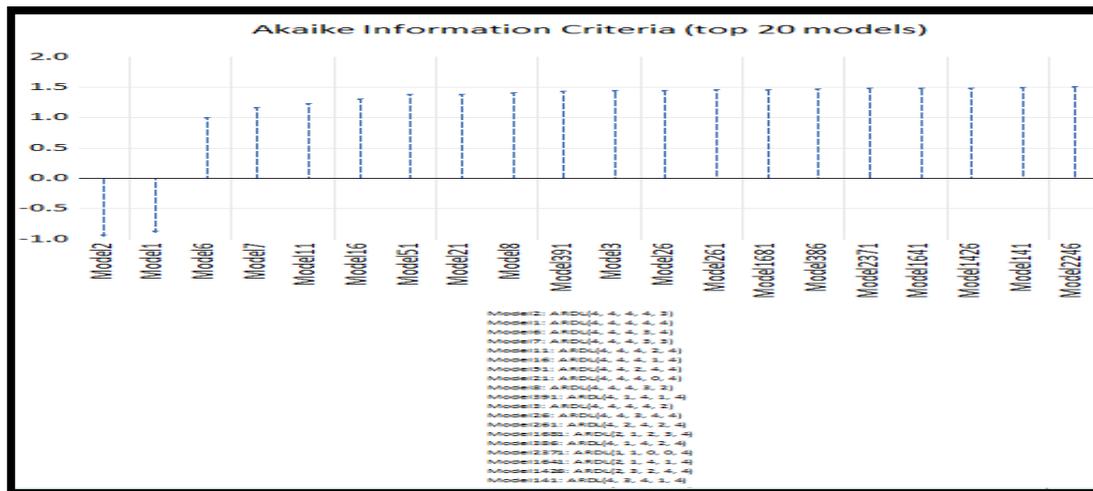
Figure No. (04): The Optimal Model for Slowdown Periods Using the Schwarz (SC) Criterion

Source: Prepared by researchers based on outputs from the Eviews.12 program.

After identifying the distributed lag periods in the model under study, the cointegration test (Bound test) stage comes next to prove the existence of a long-term equilibrium relationship between the study variables, as follows:

Cointegration test using the bounds method (Bound test)

This test is based on testing the validity of the null hypothesis H(0) and the alternative hypothesis H1 (1) where:

H0: There is no cointegration relationship between the model variables

$$H_0: \theta_1 = \theta_2 = \theta_3 = \theta_4 = \theta_5 = \theta_6 = 0$$

H1: There is a cointegration relationship between the model variables.

$$H_1: \theta_1 \neq \theta_2 \neq \theta_3 \neq \theta_4 \neq \theta_5 \neq \theta_6 \neq 0$$

Table No. (04): Results of the Cointegration Test (Bounds Test).

Significance Levels	%1	%2.5	%5	%10
Upper Bound I(1)	4.37	3.87	3.49	3.09
Lower Bound I(0)	3.29	2.88	2.56	2.2
F-statistic	5.436812			
K	4			

Source: Prepared by researchers based on outputs from the Eviews.12 program.

The table indicates that the calculated $F_{cal} = 14.51852$ is greater than the tabulated value at a significance level of 5%. On this basis, we reject the null hypothesis H0 and accept the alternative hypothesis H1. And from it, there is a long-term equilibrium relationship for the model variables, meaning there is cointegration between the study model variables.

Results of long-term and short-term relationship estimation

Long-term relationship:

Table No. (05): Results of Estimation the Long-Term Relationship.

Long-Run Coefficient Estimation Results for the Model				
Variables	**Coefficients**	**standard error**	**T Calculate (t-statistic)**	**Probability (Prob)**
EXC	-0.008604	0.003144	-2.736356	0.0161
GDP	-0.151950	0.049803	-3.051037	0.0086
IMP	0.031281	0.021749	-1.438318	0.0172
INF	-0.070918	0.012355	-5.739933	0.0001
C	3.497965	0.622536	5.618896	0.0001

Source: Prepared by researchers based on outputs from the Eviews.12 program.

Table No (05) shows that all independent variables are statistically significant (exchange rates, GDP, inflation, imports at the significance level of 1%). It also shows that the long-term relationship of the exchange rate has a significant and negative sign, as an increase in the exchange rate by 1% leads to a decrease in foreign direct investment flows by 0.009%. The economic growth rate also showed a significant and negative sign, as an increase in the growth rate by 1% leads to a decrease in foreign investment flows by 0.15%. Imports also had a significant and positive effect, as an increase in the latter by 1% leads to an increase in foreign investment by 0.03%. Inflation, on the other hand, had a significant and negative effect, as an increase in inflation by 1% leads to a decrease in foreign investment flows by 0.07%.

Short-Term Relationships:

Short-term coefficients are shown in the following table:

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ARDL Error Correction Regression
Dependent Variable: D(FDI)
Selected Model: ARDL(2, 1, 2, 4, 3)
Case 2: Restricted Constant and No Trend
Date: 10/18/25  Time: 21:57
Sample: 1990 2024
Included observations: 31
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ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDI(-1))	0.353211	0.163366	2.162083	0.0484
D(EXC)	-0.062636	0.013479	-4.646797	0.0004
D(GDP)	-0.060301	0.029632	-2.035010	0.0612
D(GDP(-1))	0.105031	0.037091	2.831694	0.0133
D(IMP)	0.023266	0.021518	1.081232	0.2979
D(IMP(-1))	0.074473	0.022476	3.313417	0.0051
D(IMP(-2))	0.054399	0.024119	2.255423	0.0406
D(IMP(-3))	0.093635	0.028469	3.289046	0.0054
D(INF)	-0.061418	0.018560	-3.309187	0.0052
D(INF(-1))	0.036672	0.017689	2.073092	0.0571
D(INF(-2))	0.024943	0.016342	1.526277	0.1492
CointEq(-1)*	-1.558179	0.234184	-6.653659	0.0000

R-squared	0.750144	Mean dependent var		0.019355
Adjusted R-squared	0.605491	S.D. dependent var		0.553425
S.E. of regression	0.347606	Akaike info criterion		1.009153
Sum squared resid	2.295774	Schwarz criterion		1.564245
Log likelihood	-3.641875	Hannan-Quinn criter.		1.190099
Durbin-Watson stat	2.735881			

Table No. (06): Results of Estimation the Error Correction Model (ECM)

Source: Prepared by researchers based on outputs from the Eviews.12 program.

The results of the Error Correction Coefficient (ECM) show a negative and significant value of (cointEq(-1)= -1.558179) in the short-term model. This indicates a long-term equilibrium relationship, meaning the correction from short-term to long-term occurs within 0.65 years ($\gamma = 1/-1.55$), or six and a half months. This is interpreted as the short-term error being corrected to return to long-term equilibrium at an adjustment rate of approximately 0.65 years, thus determining the timeframe required to return to equilibrium.

The value of the coefficient of determination R-Squared = 0.75, which is 75%, indicates that the model has a high explanatory power. The incoming foreign direct investment flows are explained by the independent variables included in the model, meaning that they explain 75% of the changes in incoming investment flows to Algeria, and the remaining percentage is explained by other variables not included in the model.

It is also clear to us that the error correction limit parameter ($\delta = 1.558179$) is statistically significant with a value of -1.55 and a negative sign, which indicates the correction of the equivalent of 65% of the deviations and imbalance of the foreign direct investment variable in the short term from its equilibrium value in the long term for less than a year due to the deviation of the independent variables in the long term. That is, 65% of the short-term errors are corrected in one time unit (one year) in order to return to the equilibrium position in the long term, and the difference in equilibrium is corrected in less than a year by an amount of 65%. That is, the difference in equilibrium in the short term in period (t-1) from its equilibrium value in the long term, then the equivalent of (65%) of this deviation is corrected in t period.

Diagnostic Tests for the Model

Table No. (07): Results of the Diagnostic Tests.

Tests	Value		Prob-value	
Serial corrélation LM test	f-statistique:	9.227332	Pro	.F(2.12)
	18.78512	:obc*R-squared	0.0037	
			Prob.chi-Square(2)	
			0.4374	
Normality test	1.6537456		0.437476	
Heteroskedasticity Test	f-statistic	0.397589	Prob.f(23.3)	
	obc*R-		0.9165	
	squared	20.33034 scald	Prob.Chi-Square(23)	0.6216
	explained SS	0.408415	Prob.Chi-Square(23)	1.0000

Source: Prepared by researchers based on outputs from the Eviews.12 program.

Self-Correlation Test:

The following table shows the results of the self-correlation test as follows:

Table No. (08): Self-Correlation Test

Test	Value		Prob-value	
Serial corrélation LM test	f-statistique:	9.227332	Pro .F(2.12)	0.0037
	18.7851	:obc*R-squared	Prob.chi-Square(2)	0.4374

Source: Prepared by researchers based on outputs from the Eviews.12 program.

The table shows that LM = 26.790, where its probability value is 0.5389, which is greater than 0.05. This leads us to accept the null hypothesis, which states that the error boundary is independent at a significance level of 5%; that is, there is no autocorrelation of the errors, and therefore the model is free from the problem of the autocorrelation of errors.

Normality Test:

The following table shows the results of the normality test as follows:

Table No. (09): Normality Test for Residues

Test	Value	Prob-value
Normality test	1.6537456	0.437476

Source: Prepared by researchers based on outputs from the Eviews.12 program.

2879

Based on the results of Table No. (09) and according to the results of the Jarque-Bera statistic, whose probability value is 0.4115, which is greater than 0.05, this leads us to accept the null hypothesis, which states that the residuals of the model follow a normal distribution at a significance level of 5%.

Error Reliability Test:

The following table shows the results of the error reliability test as follows:

Table No. (10): Error Reliability Test

Test	Value		Prob-value	
Heteroskedasticity Test	f-statistic	1.041881	Prob.f(23.3)	0.4736
	obc*R-squared	16.84941	Prob.Chi-Square(23)	0.3954
	scald explained SS	3.770888	Prob.Chi-Square(23)	0.9992

Source: Prepared by researchers based on outputs from the Eviews.12 program.

The test results show that the probability (Prob=0.6261 >0.05) is greater than the significance of 5%, indicating the absence of a variance problem. Therefore, the variance of the errors is consistent and homogeneous.

Functional Shape Fit Test for the Model (Ramsey RESET):

The table below summarizes the outputs of the Eviews.12 program related to the Ramsey RESET test as follows:

Table No. (11): Ramsey RESET Test Results

```
Ramsey RESET Test
Equation: UNTITLED
Omitted Variables: Squares of fitted values
Specification: FDI FDI(-1) FDI(-2) EXC EXC(-1) GDP GDP(-1) GDP(-2) IMP
    IMP(-1) IMP(-2) IMP(-3) IMP(-4) INF INF(-1) INF(-2) INF(-3) C

                     Value        df      Probability
t-statistic        1.087990       13        0.2964
F-statistic        1.183723     (1, 13)     0.2964
Likelihood ratio   2.701516        1        0.1003
```

Source: Prepared by researchers based on outputs from the Eviews.12 program.

Table No. (11) indicates the adoption of the null hypothesis at a significance level of 5%, meaning that the model does not suffer from the problem of indeterminacy; and the reason for this is explained by the value of Prob=0.9024, which is greater than the probability level of 0.05.

Structural Stability Test of the Estimated Model

The following two figures illustrate the results of the structural stability test of the estimated model.

Cumulative sum of returned remainders (CUSUM) and sum of squares of returned remainders (CUSUM OF Squares):
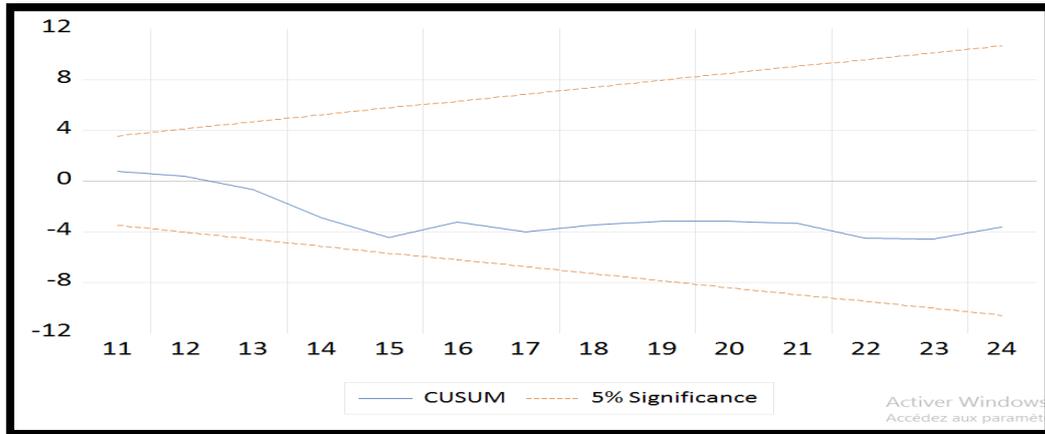
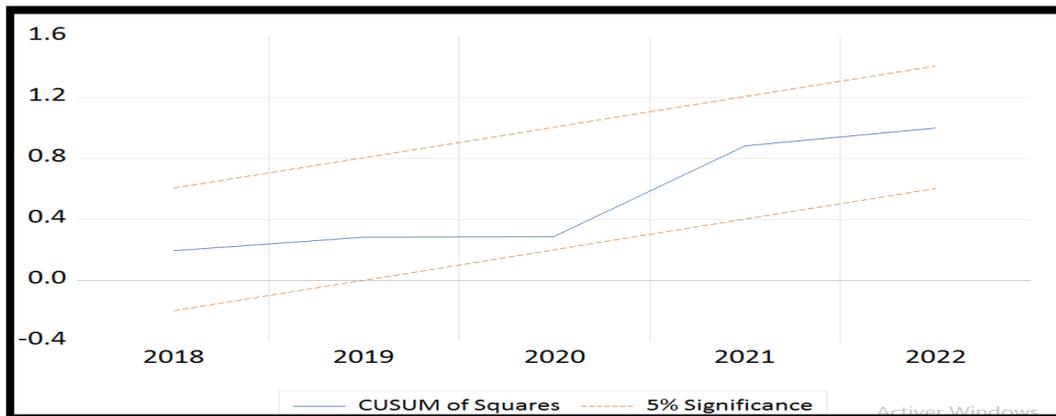

Figure (05): Graph of the CUSUM test.

Figure (06): Graph of the CUSUM of squares test

Source: Prepared by researchers based on outputs from the Eviews.12 program.

From the results of the CUSUM and CUSUM of square tests listed in Figure (05) and (06), it is clear that they are a middle line within the limits of the confidence domain and stable at the 5% significance level; so there is a stability between the variables of the model under study in the short and long term.

Conclusion

This research paper studied the impact of some economic factors on foreign direct investment flows through an econometric model using the Autoregression of distributed lag periods (ARDL) methodology during the period 1990-2024. The study showed that the determinants of foreign direct investment, namely (GDP, exchange rate, imports, inflation rate), have an impact on the flows of this foreign direct investment in Algeria.This is consistent with economic theory and some previous studies.

The study in its theoretical aspect has examined the reality of the development of foreign direct investment in Algeria during the same period, which witnessed many economic and financial reforms of the national economy. Part of these reforms was dedicated to the investment sector, through amendments and the issuance of laws and regulations, including tax incentives and financial guarantees.

Despite all these measures, the flow of foreign direct investment remained modest and below the required level, limited to the hydrocarbons sector and excluding other economic sectors. The study also considered the nature of the existing investment climate and the stability of its political and social indicators, especially macroeconomic indicators, this includes economic factors and determinants that determine whether or not foreign direct investment flows into Algeria and affect its flow. Our study concluded the following:

• The results of the unit Rot tests by (Dickey Fuller and Phillips Peron) showed that some of the study variables stabilize at the level and others stabilize after taking their initial differences, which allows us to perform a cointegration test to detect the existence of a long-term equilibrium relationship;

• Through the bounds test for cointegration, it appears that the calculated (f-statistic) value is greater than the tabulated value of the upper limit at a significance level of 5% in the presence of 4 variables (k=4) and a fixed limit. Therefore, there is a long-term equilibrium relationship between the independent variables (exchange rates, GDP, inflation, imports) and the dependent variable (foreign direct investment), so there is a cointegration between the study variables.

• All model parameters are economically acceptable; exchange rates, GDP, inflation, and imports have a positive and negative impact on foreign direct investment flows in Algeria;

• All independent variables are statistically significant (exchange rates, GDP, inflation, imports at a significance level of 1%);

• The results of the Error Correction Coefficient (ECM) show a negative and significant sign, with a value of (cointEq(-1)= -1.558179) in the short-term model. From this, we can say that there is a long-term equilibrium relationship, meaning that the correction of the relationship from the short term to the long term takes place within 0.65 years ($\gamma = 1/-1.55$), which is six and a half months. This is explained by the fact that the error in the short term is corrected to return to the equilibrium position in the long term with an adjustment rate estimated at 0.65 years. It determines the time period sufficient to return to the equilibrium position;

• The value of the coefficient of determination, R-Squared = 0.75, also appears, which is 75%, indicating that the model has a high explanatory power. The incoming foreign direct investment flows are explained by the independent variables included in the model, meaning that they explain 75% of the changes in incoming investment flows to Algeria, and the remaining percentage is explained by other variables not included in the model;

• It is also evident that the error correction limit parameter (δ = -1.558179) is statistically significant with a value of -1.55 and a negative sign, indicating the correction of the equivalent of 65% of the deviations and imbalance of the foreign direct investment variable in the short term from its equilibrium value in the long term for less than a year due to the deviation of the independent variables in the long term. That is, 65% of the short-term errors are corrected in one time unit (one year) in order to return to the equilibrium position in the long term, and the difference in equilibrium is corrected in less than a year by an amount of 65%. That is, if the difference in equilibrium in the short term in period (t-1) from its equilibrium value in the long term, then the equivalent of (65%) of this deviation is corrected in period t;

• Algeria has not achieved the required level of global share and value of foreign direct investment flows despite the facilities and incentives granted, the guarantees provided, and the exemptions from the laws and regulations in force in all economic activities;

• Instability in investment climate indicators in Algeria and its negative impact on foreign direct investment flows due to a range of administrative, financial, and legal obstacles that prevent the completion of procedures and the implementation of economic projects;

- The problem of financing and credit facilities, in addition to the problem of industrial real estate, bureaucratic obstacles, administrative and financial corruption, and the long response time, are all factors that discourage investment.

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Appendices:

Appendix No. 1: Results of the cointegration test (bounds test).

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	5.436812	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Appendix No. (02): Determining the optimal slowdown period for the model .

```
VAR Lag Order Selection Criteria
Endogenous variables: FDI EXC GDP IMP INF
Exogenous variables: C
Date: 10/18/25  Time: 22:43
Sample: 1990 2024
Included observations: 33
```

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-456.1636	NA	946019.6	27.94931	28.17605	28.02560
1	-351.6158	171.0783*	7779.788*	23.12823*	24.48869*	23.58598*
2	-332.2007	25.88675	12206.52	23.46671	25.96089	24.30592

```
* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion
```
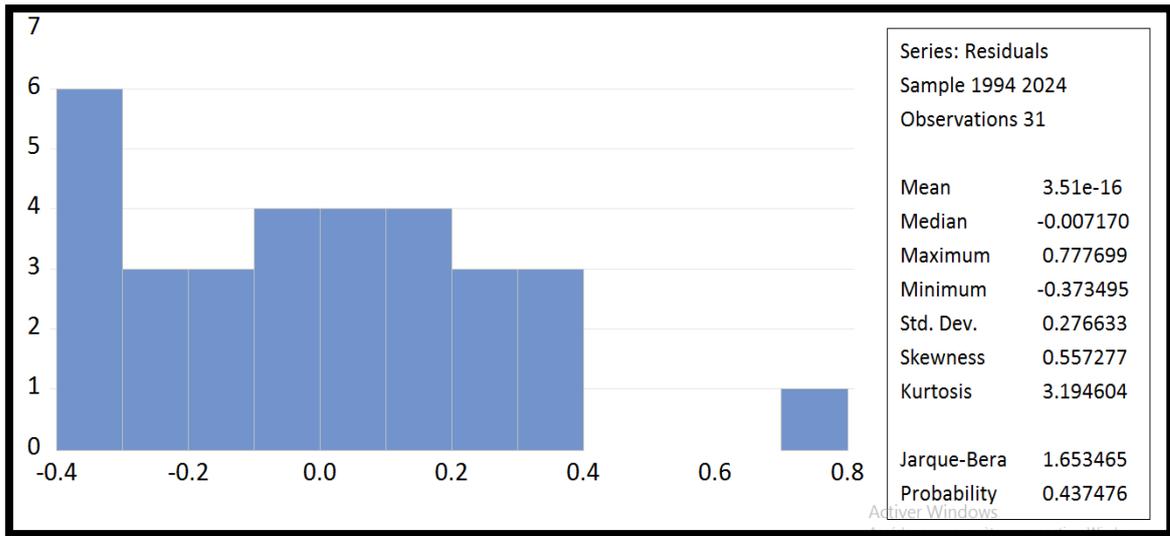
Appendix No. (03): Results of estimation the long-term relationship

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXC	-0.008604	0.003144	-2.736356	0.0161
GDP	-0.151950	0.049803	-3.051037	0.0086
IMP	0.031281	0.021749	-1.438318	0.0172
INF	-0.070918	0.012355	-5.739933	0.0001
C	3.497965	0.622536	5.618896	0.0001

Appendix No. (04): Self-Correlation Test.

Breusch-Godfrey Serial Correlation LM Test: Null hypothesis: No serial correlation at up to 2 lags			
F-statistic	9.227332	Prob. F(2,12)	0.0037
Obs*R-squared	18.78512	Prob. Chi-Square(2)	0.4374

Appendix No. (05): Normality distribution Test for Residues

Series: Residuals	
Sample 1994 2024	
Observations 31	
Mean	3.51e-16
Median	-0.007170
Maximum	0.777699
Minimum	-0.373495
Std. Dev.	0.276633
Skewness	0.557277
Kurtosis	3.194604
Jarque-Bera	1.653465
Probability	0.437476

Appendix No. (06): Error Reliability of Variance Test.

Heteroskedasticity Test: Breusch-Pagan-Godfrey Null hypothesis: Homoskedasticity			
F-statistic	1.041881	Prob. F(16,14)	0.4736
Obs*R-squared	16.84941	Prob. Chi-Square(16)	0.3954
Scaled explained SS	3.770888	Prob. Chi-Square(16)	0.9992

Figure (03): The Evolution of time series for the standard model variables during the study period.