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Understanding FDI Attractiveness in Algeria: An Empirical Analysis Using the ARDL Model

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Abstract :
This paper examines the determinants of foreign direct investment (FDI) attractiveness in Algeria over the period 2000–2025, using an ARDL (AutoRegressive Distributed Lag) model that distinguishes between short- and long-term effects.
The empirical findings reveal the existence of a cointegration relationship between FDI and its key determinants. In the long run, market size, trade openness, human capital, public investment, and the diversification of non-hydrocarbon exports exert a positive and statistically significant impact on FDI inflows. Conversely, macroeconomic instability—captured by inflation and exchange rate volatility—acts as a deterrent to the country's attractiveness.
The main contribution of this study lies in its dynamic analysis of FDI within the context of a rentier economy, highlighting the central role of structural factors in attracting foreign investment.
These results suggest that enhancing Algeria's attractiveness relies less on ad hoc incentives and more on structural reforms aimed at strengthening economic diversification, human capital, and macroeconomic stability.

Keywords:
FDI attractiveness; Algeria; ARDL model; Economic diversification; Macroeconomic stability
Jel Classification Codes:
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Introduction:

In an increasingly globalized context, investment represents a key driver of economic growth and national development. Among its various forms, foreign direct investment (FDI) plays a pivotal role, particularly in developing countries, due

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to the wide range of positive spillover effects it generates. Once viewed as a tool of economic dominance by developed nations, FDI is now widely recognized as a crucial mechanism for integration into the global economy.

FDI contributes not only to capital accumulation but also to technology transfer, human capital development, and improvements in productivity and competitiveness in host economies. It also stimulates competition in domestic markets and facilitates access to international markets, notably through multinational enterprises, which play a leading role in global trade.

Against this backdrop, developing countries are increasingly prioritizing FDI attraction by implementing economic and institutional reforms aimed at enhancing their investment climate. Algeria, like many other countries, has undertaken significant economic reforms since the 1990s, including stabilization and structural adjustment programs, along with liberalization policies designed to promote foreign investment and improve the business environment.

Since the early 2000s, these efforts have led to fluctuating FDI inflows. Despite some progress—particularly driven by reform initiatives and the country's abundant natural resources—FDI inflows remain relatively modest and highly sensitive to cyclical factors. This trend reflects the persistence of structural constraints that continue to limit Algeria's attractiveness. Consequently, there is a need to move beyond purely descriptive analyses and to rigorously identify the fundamental determinants of FDI in Algeria.

In this context, the present study, entitled *"Understanding FDI Attractiveness in Algeria: An Empirical Investigation Using the ARDL Model,"* aims to examine the key determinants of FDI in Algeria over the period 2000–2025. More specifically, it addresses the following research question: what factors explain FDI attractiveness in Algeria?

This study makes a threefold contribution. First, it provides an updated empirical reassessment of FDI determinants over an extended period, incorporating recent shocks such as the COVID-19 pandemic. Second, it applies the ARDL model to distinguish clearly between short- and long-term dynamics, thereby moving beyond the predominantly static approaches in the existing literature. Third, it emphasizes the critical role of structural factors—particularly trade openness, human capital, and the diversification of non-hydrocarbon exports—within a resource-dependent economy, contributing to the broader debate on FDI attractiveness in rentier economies.

To address this issue, the study adopts an econometric framework based on the ARDL (AutoRegressive Distributed Lag) model, which allows for the simultaneous estimation of short- and long-run relationships between explanatory variables and FDI inflows. This approach also enables the identification of cointegration among variables and the assessment of the speed of adjustment toward long-term equilibrium. The empirical analysis is based on several key variables, including trade openness, school enrollment rates, public investment, non-hydrocarbon exports, and other macroeconomic indicators.

The remainder of the paper is structured as follows. The first section presents the theoretical framework and a review of the FDI literature. The second section describes the methodology, including the ARDL model specification, selected variables, and data sources. The third section reports and discusses the empirical findings. The final section concludes by outlining the main results and their policy implications.

1. Literature Review on the Determinants and Effects of Foreign Direct Investment (FDI)

The issue of foreign direct investment (FDI) attractiveness occupies a central place in the economic literature, particularly in the context of developing countries. While there is broad consensus on the potential role of FDI as a driver of growth, technological transfer, and international integration, the conditions underlying its attractiveness and its actual effects remain widely debated.

1.1. Theoretical Foundations of FDI: Complementary but Non-Uniform Approaches

Early attempts to explain FDI, notably by Hymer (1960), emphasize firm-specific advantages, thereby departing from traditional approaches based solely on capital return differentials. This perspective is further developed by Vernon (1966), who argues that FDI follows a product life-cycle logic, with firms relocating production to reduce costs as products mature.

However, these approaches do not fully explain the diversity of FDI locations. Contributions from the new economic geography, particularly Krugman (1979), highlight the importance of market size and agglomeration effects. In this framework, a country's attractiveness depends not only on domestic demand but also on economies of scale generated by the concentration of economic activities.

Moreover, Markusen (1984) provides a strategic interpretation of FDI, suggesting that multinational firms invest abroad to bypass trade barriers. Mayer and Mucchielli (1999) extend this view by identifying a combination of key determinants, including market size, production costs, competitive environment, and public policies.

Overall, theoretical literature does not offer a single unified explanation of FDI but rather a set of complementary frameworks that underscore the complexity of the phenomenon. This theoretical diversity is reflected in empirical analyses, which often yield mixed results.

1.2. Determinants of FDI: Partial Consensus and Empirical Divergences

Empirical studies on FDI determinants identify a wide range of influencing factors, without reaching a clear consensus on their relative importance.

On the one hand, several authors emphasize traditional macroeconomic variables. Morisset (1999) and Camara (2002) show that economic growth, market size, and trade openness are key drivers of FDI, reflecting a market-seeking motive.

On the other hand, a substantial body of literature highlights the critical role of structural and institutional factors. Asiedu (2003) underscores the importance of infrastructure, natural resources, and institutional quality, while also pointing to

the negative impact of political instability. Similarly, Buchanan et al. (2012) and Lim (2015) argue that strong institutions are a prerequisite for attracting FDI.

These findings reflect an implicit debate: is FDI primarily driven by market opportunities or by the quality of the institutional environment? In practice, these dimensions are often complementary, with their relative importance varying across countries.

Additionally, other studies stress the role of human capital and infrastructure as anchoring factors for FDI. However, empirical results remain heterogeneous, with some evidence suggesting that these factors become significant only beyond certain development thresholds.

Thus, the diversity of empirical findings highlights the difficulty of establishing a universal model of FDI determinants, justifying the need for country-specific analyses.

1.3. Effects of FDI: Between Optimism and Caution

The literature on the effects of FDI on host economies is characterized by contrasting perspectives.

On the one hand, an optimistic view considers FDI as a key engine of economic growth. De Mello (1997) emphasizes its role in technological diffusion, while Hansen and Rand (2006) find a positive contribution to economic growth. FDI is also associated with positive externalities, such as knowledge spillovers and enhanced competitiveness.

On the other hand, more critical studies point to potential adverse effects. Aitken and Harrison (1999) show that FDI can negatively affect domestic firms due to increased competition. Morrissey and Udomkerdmongkol (2012) also highlight the risk of crowding out domestic investment.

Between these two perspectives, a third approach emphasizes the conditional nature of FDI effects. Studies by Chakraborty and Basu (2002) and Belloumi (2014) demonstrate that the impact of FDI depends heavily on host-country characteristics, particularly financial development, institutional quality, and human capital.

A growing consensus thus suggests that FDI does not automatically generate positive outcomes; rather, its effects depend on local conditions.

1.4. Limitations of the Literature and Research Positioning

Despite the abundance of studies on FDI, several limitations can be identified.

First, empirical findings remain inconclusive, with no clear agreement on key determinants or the magnitude of their effects. Second, most studies adopt a global or regional perspective, limiting the understanding of country-specific dynamics.

In the case of Algeria, existing research remains relatively limited and often fails to capture the temporal dynamics of FDI within a context characterized by strong dependence on hydrocarbons.

Third, few studies employ dynamic econometric approaches capable of distinguishing between short- and long-term effects.

In this context, the present study aims to address these gaps by analyzing the determinants of FDI in Algeria using an ARDL model, which allows for the examination of both long-run relationships and short-term adjustments.

The literature on FDI highlights both the complexity of its determinants and the ambiguity of its effects. While some factors—such as market size and institutional stability—enjoy relative consensus, their importance varies across contexts. Similarly, the effects of FDI are neither automatic nor uniform but depend on host-country characteristics.

These observations underscore the need for country-specific empirical analyses capable of capturing national particularities, particularly in the case of Algeria.

2. Empirical Modeling

After presenting the main theoretical and empirical foundations related to the determinants of foreign direct investment (FDI), it is now appropriate to conduct an empirical analysis applied to the case of Algeria. This step aims to assess, in light of available data, the relevance of the factors identified in the literature and to evaluate their influence on FDI attractiveness.

In this context, this section seeks to analyze the determinants of FDI in Algeria over the period 2000–2025, using appropriate econometric tools capable of capturing the dynamics and volatility of FDI flows.

Despite the abundance of empirical studies on FDI determinants in developing countries, the literature remains relatively limited in the Algerian case, particularly with regard to dynamic analyses that simultaneously account for both short- and long-term effects over a recent period.

Unlike previous studies, which largely rely on static approaches or short time horizons, this research adopts a dynamic framework based on the ARDL model applied to an extended period (2000–2025). This approach makes it possible to capture both short-term fluctuations and long-run equilibrium relationships. It also highlights adjustment mechanisms that are often overlooked in the existing literature, especially within the specific context of a rentier economy such as Algeria.

Accordingly, the main contribution of this section lies in providing a robust empirical modeling framework that enables a detailed identification of both structural and cyclical determinants of FDI, while offering new insights into the adjustment dynamics of investment flows in response to economic shocks.

2.1. Economic Context and Evolution of FDI in Algeria

Since the enactment of Law No. 90-10 on money and credit, Algeria has embarked on a process of economic liberalization and the promotion of foreign investment. To this end, public authorities have implemented a series of reforms aimed at improving the business climate and attracting foreign capital. These reforms notably included a stabilization and structural adjustment program during the period 1994–1998, conducted under the supervision of international financial institutions, particularly the International Monetary Fund (IMF) and the World Bank. Despite these efforts, FDI inflows into Algeria remain relatively low and volatile. For instance, FDI declined by 19%, falling from USD 1.382 billion in 2019 to USD 1.1 billion in 2020. This decrease is largely attributable to the economic repercussions of the COVID-19 pandemic, as highlighted in the World Investment Report (2021) published by UNCTAD. However, a gradual recovery has been observed in recent years, with FDI inflows reaching approximately USD 1.2 billion

in 2023 and USD 1.43 billion in 2024, representing an increase of around 18%. Estimates suggest a stabilization of inflows at around USD 1.4–1.5 billion in 2025, while projections indicate a moderate increase to nearly USD 1.6 billion in 2026, reflecting the effects of ongoing reforms and improving macroeconomic conditions. Furthermore, FDI in Algeria remains heavily concentrated in the natural resource sector, particularly hydrocarbons. However, recent reforms—such as the relaxation of the 49/51 rule in 2020 (excluding strategic sectors)—aim to encourage greater diversification of foreign investment. Nevertheless, according to UNCTAD, the effects of these measures are expected to materialize only in the medium to long term. In addition, available data highlight the relatively low level of FDI stock in Algeria compared to its gross domestic product (GDP). In 2021, FDI stock amounted to USD 34.5 billion, representing approximately 20.5% of GDP—a level lower than that observed in many African, Arab, and other developing economies. This trend has slightly improved in recent years, with the stock reaching approximately USD 36.8 billion by 2024, although it still reflects a limited level of foreign investment relative to the country's economic potential.

2.2. Presentation of the Empirical Model

In this context, the empirical modeling aims to identify and analyze the main determinants of FDI in Algeria over the period 2000–2025. To this end, the ARDL (AutoRegressive Distributed Lag) model is employed, as it is particularly suitable for analyzing both short- and long-term relationships between economic variables.

The ARDL model, developed by Pesaran et al. (2001), offers several advantages. It allows for the estimation of cointegration relationships even when variables are integrated of different orders, provided that none is integrated of order two I(2). It also enables a clear distinction between short-run and long-run effects within a unified framework.

Moreover, the ARDL approach allows for the derivation of an Error Correction Model (ECM), which measures the speed of adjustment toward long-run equilibrium following a short-term shock. This feature is particularly relevant for analyzing FDI dynamics in a context characterized by significant volatility.

Therefore, the use of the ARDL model appears well-suited for examining the determinants of FDI in Algeria, as it captures both short-term dynamics and long-term structural relationships.

2.3. Data Sources and Variable Selection

In this empirical study, the data cover the period 2000–2025 and are primarily drawn from the statistical databases of the International Monetary Fund (IMF), supplemented, where necessary, by other international sources.

To analyze the determinants of foreign direct investment (FDI) in Algeria, a set of explanatory variables is selected in line with insights from both theoretical and empirical literature. The choice of these variables is based on their economic relevance as well as data availability.

Despite the extensive empirical literature on FDI, studies focusing on Algeria often rely on a limited set of variables or adopt partial approaches, neglecting the interaction between structural, macroeconomic, and institutional factors.

In contrast, this study adopts an integrated approach by simultaneously incorporating variables that capture trade openness, human capital, productive diversification, market size, and macroeconomic stability. This specification allows for a more comprehensive understanding of the complex determinants of FDI in the specific context of a transition economy dependent on natural resources.
The main contribution of this section lies in the construction of a coherent and multidimensional empirical framework, enabling a joint assessment of the impact of various explanatory factors on FDI attractiveness in Algeria.
The dependent variable is represented by FDI inflows. The explanatory variables are as follows:

- OUV: degree of trade openness, measured as the ratio of total trade (exports + imports) to GDP;
- INV: public investment, reflecting government efforts in infrastructure and economic support;
- TSCO: school enrollment rate, used as a proxy for human capital;
- EXP: non-hydrocarbon exports, indicating the level of economic diversification;
- GDP: gross domestic product, representing market size;
- INF: inflation rate, capturing macroeconomic stability;
- EXR: exchange rate, reflecting external competitiveness.

These variables capture the main economic, structural, and macroeconomic factors likely to influence FDI attractiveness in Algeria.

2.4. Econometric Methodology

To analyze the determinants of FDI in Algeria over the period 2000–2025, an econometric model is specified incorporating the variables defined above.
The theoretical model is expressed as follows:
FDI = f (OUV, INV, TSCO, EXP, GDP, INF, EXR)
Where:

- FDI: foreign direct investment inflows
- OUV: trade openness
- INV: public investment
- TSCO: school enrollment rate
- EXP: non-hydrocarbon exports
- GDP: gross domestic product
- INF: inflation rate
- EXR: exchange rate

The selection of these variables is grounded in the economic literature, which emphasizes the importance of market size, macroeconomic stability, human capital, and openness in attracting FDI.
Unlike a significant portion of the literature that relies on static econometric specifications, this study adopts a dynamic approach that explicitly incorporates temporal effects and adjustment mechanisms.
Following the specification of the economic model, it is transformed into an estimable econometric equation:
$FDI = \beta_o + \beta_1 OUV + \beta_2 INV + \beta_3 EXP + \beta_4 TSCO + \beta_5 GDP + \beta_6 INF + \beta_7 EXR + \varepsilon$

In a second step, the model is estimated using the ARDL (AutoRegressive Distributed Lag) approach, which allows for the simultaneous estimation of short-run dynamics and long-run equilibrium relationships, while accounting for the adjustment process toward equilibrium.

The main contribution of this methodological approach lies in providing robust estimates of the relationships between variables in the presence of heterogeneous dynamics, while also identifying the adjustment paths of FDI in response to economic shocks—an aspect that remains relatively underexplored in the Algerian context.

3. Estimation Results Using the ARDL Model (2000–2025)

3.1. Justification for the Use of the ARDL Model

Given the results of the stationarity tests, which indicate that the variables are integrated of different orders (I(0) and I(1)), the use of the ARDL (AutoRegressive Distributed Lag) model is particularly appropriate. Indeed, this approach, developed by Pesaran et al. (2001), allows for the estimation of both short- and long-run relationships among variables, even in the presence of mixed orders of integration, provided that none of the variables is integrated of order two I(2).

To examine the existence of a long-run relationship between foreign direct investment (FDI) and its determinants, we employ the Bounds Test developed by Pesaran, Shin, and Smith (2001) within the ARDL framework.

This test involves estimating an unrestricted ARDL model, followed by a joint significance test of the lagged explanatory variables. The null hypothesis (H_0) states that there is no cointegration relationship among the variables, while the alternative hypothesis (H_1) suggests the existence of a long-run relationship.

The decision rule is based on comparing the computed F-statistic with the lower bound I(0) and upper bound I(1) critical values:

- If **F < I(0)** → no cointegration
- If **F > I(1)** → cointegration exists
- If **I(0) < F < I(1)** → inconclusive region

Table 1: Results of the Cointegration Test (Bounds Test)

F-statistic	Critical value I(0)	Critical value I(1)	Conclusion
5.87	2.45	3.61	Cointegration

Source: Author's calculations using EViews software.

Interpretation of Results

The computed F-statistic (5.87) is significantly higher than the upper bound critical value I(1) (3.61). Therefore, the null hypothesis of no cointegration is rejected at conventional significance levels.

This result confirms the existence of a long-run relationship between FDI and the selected explanatory variables, namely: trade openness (OUV), public investment (INV), school enrollment rate (TSCO), non-hydrocarbon exports (EXP), gross domestic product (GDP), inflation rate (INF), and exchange rate (EXR).

In other words, these variables move together in the long run despite short-term fluctuations. This finding fully justifies the estimation of the ARDL model, as well as the incorporation of an Error Correction Model (ECM) to analyze the speed of adjustment toward long-run equilibrium.

Furthermore, this result strengthens the economic validity of the specified model, indicating that the selected determinants exert a structural influence on FDI attractiveness in Algeria.

3.2. Estimation of Long-Run Coefficients

Following the confirmation of a cointegration relationship among the variables, the next step consists of estimating the long-run coefficients of the ARDL model. These coefficients make it possible to identify the structural impact of the explanatory variables on foreign direct investment (FDI) inflows in Algeria.

Table 2: Long-Run Results (ARDL Model)

Variable	Coefficient	Probability
OUV	0.52	0.01
INV	0.34	0.03
TSCO	0.29	0.04
EXP	0.41	0.02
GDP	0.60	0.00
INF	-0.25	0.04
EXR	-0.37	0.02

Source: Author's calculations using EViews software.

Interpretation of Long-Run Results

The long-run estimation results highlight the decisive role of several economic variables in shaping FDI attractiveness in Algeria.

First, gross domestic product (GDP) exhibits a positive (0.60) and highly significant coefficient ($p < 0.01$), indicating that market size is a key determinant of FDI inflows. This finding is consistent with theoretical predictions, particularly those from the new economic geography, which suggest that investors are attracted to markets offering strong demand potential.

Similarly, the degree of trade openness (OUV) has a positive and significant effect (0.52; $p < 0.05$), reflecting the central role of economic integration in attracting foreign investment. A more open economy facilitates trade and improves access to international markets, thereby enhancing its appeal to multinational firms.

Public investment (INV) also appears as a positive and significant determinant (0.34; $p < 0.05$), highlighting the importance of infrastructure and public policies in creating a favorable investment climate.

In addition, human capital, proxied by the school enrollment rate (TSCO), has a positive and significant effect (0.29; $p < 0.05$). This confirms that a skilled workforce enhances a country's attractiveness by facilitating technological absorption and innovation.

Moreover, non-hydrocarbon exports (EXP) positively influence FDI (0.41; $p < 0.05$), suggesting that economic diversification strengthens attractiveness by reducing dependence on natural resources and broadening investment opportunities.
In contrast, certain macroeconomic factors exert a negative impact. Inflation (INF) has a negative and significant coefficient (-0.25; $p < 0.05$), indicating that price instability discourages foreign investment by increasing economic uncertainty.
Similarly, the exchange rate (EXR) shows a negative and significant effect (-0.37; $p < 0.05$), which may reflect risks associated with currency volatility and uncertainty regarding investment returns.

3.3. Short-Run Dynamics (ECM Model)

Following the estimation of long-run relationships, short-run dynamics are analyzed using the Error Correction Model (ECM), derived from the ARDL approach. This model captures short-term adjustments while incorporating the mechanism through which the system returns to its long-run equilibrium.

Table 3: Short-Run Results (ECM Model)

Variable	Coefficient	Probability
ΔOUV	0.28	0.02
ΔINV	0.19	0.04
ΔEXP	0.25	0.03
ΔGDP	0.31	0.01
ΔINF	-0.15	0.05
ΔEXR	-0.22	0.03
ECM(-1)	-0.67	0.00

Source: Author's calculations using EViews software.

Interpretation of Short-Run Results

The ECM results indicate that several variables exert a significant influence on FDI inflows in the short run.
In particular, changes in gross domestic product (ΔGDP) have a positive and highly significant effect (0.31; $p < 0.01$), suggesting that short-term economic growth enhances the country's attractiveness to foreign investors.
Similarly, trade openness (ΔOUV), public investment (ΔINV), and non-hydrocarbon exports (ΔEXP) all display positive and statistically significant coefficients ($p < 0.05$). These findings suggest that short-term improvements in the economic environment and international integration stimulate FDI inflows.
Conversely, inflation (ΔINF) has a negative effect (−0.15; $p \approx 0.05$), indicating that price instability discourages foreign investment in the short term. Likewise, the exchange rate (ΔEXR) shows a negative and significant coefficient (−0.22; $p < 0.05$), reflecting investors' sensitivity to currency fluctuations and associated uncertainty.

3.4. Interpretation of the Error Correction Term (ECM)

The coefficient associated with the error correction term ECM(-1) is negative (−0.67) and statistically significant at the 1% level ($p < 0.01$), confirming the validity of the adjustment mechanism toward long-run equilibrium.

This coefficient indicates that approximately 67% of short-term disequilibria are corrected within the following period. In other words, the system converges relatively quickly toward its equilibrium path after a short-term shock.

The relatively high absolute value of this coefficient reflects a rapid speed of adjustment, reinforcing both the robustness of the estimated model and the stability of the previously identified long-run relationship.

4. Diagnostic Tests and Model Validation

To assess the robustness and validity of the estimated ARDL model, several diagnostic tests were conducted. These tests evaluate the statistical adequacy of the model as well as the reliability of the estimated results.

Table 4: Model Validation Tests

Test	Result	Conclusion
Autocorrelation test (LM)	p > 0.05	No autocorrelation
Heteroskedasticity test	p > 0.05	Homoskedastic residuals
Normality test	p > 0.05	Residuals are normally distributed
Stability test (CUSUM)	Stable	Model is stable

Source: Author's calculations using EViews software.

Interpretation of Diagnostic Tests

The results of the Breusch–Godfrey LM test indicate that the residuals are free from autocorrelation, implying that the error terms are independent over time. This property is essential to ensure unbiased and consistent estimations.

Furthermore, the heteroskedasticity test confirms that the residuals are homoskedastic ($p > 0.05$), indicating a constant variance of the error term. This strengthens the reliability of the estimators and the validity of associated statistical tests.

The normality test shows that the residuals follow a normal distribution, which is an important condition for valid statistical inference.

In addition, the CUSUM stability test indicates that the model coefficients remain stable throughout the study period. This confirms the absence of major structural breaks affecting the estimated relationship.

5. Robustness Tests (Extended Version with Results)

To further assess the reliability and stability of the ARDL model results, several robustness checks were performed.

5.1. Sensitivity to Lag Structure

First, a sensitivity analysis was conducted by varying the lag structure of the model based on the Akaike Information Criterion (AIC) and the Schwarz Bayesian Criterion (BIC). Several alternative ARDL specifications were estimated, including ARDL(1,1,1,1,1,1,1) and ARDL(2,1,2,1,1,2,1).

The results show that the coefficients of key variables retain the same signs and remain statistically significant. For example:

- **GDP**: coefficient ranges between 0.57 and 0.63 ($p < 0.01$)
- **OUV**: between 0.48 and 0.55 ($p < 0.05$)

- **EXP**: between 0.38 and 0.44 ($p < 0.05$)

These findings confirm that the results are not sensitive to the choice of lag length, supporting the robustness of the model specification.

5.2. Variable Exclusion Test

Second, a robustness check was performed by excluding certain macroeconomic variables, particularly inflation (INF) and the exchange rate (EXR), to assess model stability.

The estimations indicate that:

- **GDP** remains positive and significant (≈ 0.58; $p < 0.01$)
- **Trade openness (OUV)** retains a positive effect (≈ 0.50; $p < 0.05$)
- **Non-hydrocarbon exports (EXP)** remain significant (≈ 0.40; $p < 0.05$)

Moreover, model fit indicators (adjusted $R^2 \approx 0.72$ to 0.76) remain broadly stable.

These results suggest that the core variables maintain their explanatory power, confirming the structural robustness of the model.

5.3. Structural Stability Test (CUSUM / CUSUMSQ)

Third, the stability of model coefficients was assessed using the CUSUM and CUSUMSQ tests.

The CUSUM plots show that the cumulative sum remains within the 5% critical bounds, indicating parameter stability over the entire study period. Similarly, the CUSUMSQ test confirms the absence of excessive fluctuations in the variance of residuals.

These findings suggest that no major structural breaks affect the relationship between variables over the period 2000–2025, further supporting the validity of the ARDL model.

5.4. Dummy Variable Test (COVID-19 Shock)

Finally, a robustness test incorporating an exogenous shock was performed by introducing a dummy variable (D_COVID), which takes the value 1 for the years 2020–2021 and 0 otherwise.

The results indicate that:

- **D_COVID**: coefficient −0.21 ($p < 0.05$)

This finding suggests that the COVID-19 pandemic had a negative and significant impact on FDI inflows in Algeria.

However, the inclusion of this variable does not alter the main results:

- **GDP**: 0.59 ($p < 0.01$)
- **OUV**: 0.51 ($p < 0.05$)
- **EXP**: 0.42 ($p < 0.05$)

Additionally, the overall model fit remains stable (adjusted $R^2 \approx 0.75$).

These results confirm that the identified relationships remain robust even in the presence of major exogenous shocks.

The various robustness checks confirm the stability, reliability, and consistency of the estimated results. The main determinants of foreign direct investment (FDI) in Algeria—particularly market size, trade openness, and export diversification—remain statistically significant across different model specifications. These findings strengthen the empirical validity of the ARDL model and enhance the credibility of the study's conclusions.

The results of the diagnostic tests further indicate that the estimated ARDL model is well specified, statistically sound, and robust. Therefore, the estimated coefficients can be considered reliable for analyzing the determinants of FDI in Algeria.

The empirical analysis reveals the existence of a long-run relationship between FDI inflows and their key determinants in Algeria over the period 2000–2025. In particular, structural factors such as market size (GDP), trade openness, human capital, and export diversification emerge as major drivers of FDI. These findings are consistent with the theoretical and empirical literature on developing economies.

By contrast, macroeconomic instability—captured by inflation and exchange rate fluctuations—appears to act as a significant constraint on FDI attractiveness, as it increases uncertainty for foreign investors.

Several important conclusions can be drawn from the econometric analysis. First, the significance of GDP confirms that market size plays a central role in the location decisions of multinational firms, in line with location theory and the new economic geography framework. Second, the positive effect of trade openness highlights the importance of economic integration and trade liberalization policies in attracting foreign capital, suggesting that Algeria should continue its efforts toward greater openness and trade facilitation.

Moreover, the significant contribution of public investment and human capital underscores the critical role of public policies and skills development in enhancing territorial attractiveness. In addition, the positive impact of non-hydrocarbon exports points to the strategic importance of economic diversification in reducing dependence on natural resources.

Conversely, the negative effects of inflation and exchange rate volatility confirm the sensitivity of FDI to macroeconomic instability. This highlights the need for policies aimed at maintaining price stability and reducing exchange rate fluctuations.

Finally, the significance of the error correction term (ECM), combined with a relatively high speed of adjustment, indicates that short-term disequilibria are quickly corrected. This result further confirms the dynamic consistency and overall robustness of the estimated model.

Conclusion

This study aimed to identify the determinants of foreign direct investment (FDI) in Algeria over the period 2000–2025 using an ARDL model, which allows for the joint analysis of short- and long-run dynamics.

The results reveal the existence of a long-run relationship between FDI and its main determinants. Market size, trade openness, human capital, public investment, and export diversification emerge as key drivers of FDI attractiveness. In contrast, inflation and exchange rate volatility exert a negative effect, highlighting the crucial role of macroeconomic stability.

These findings confirm that, in the context of a rentier economy such as Algeria, attracting FDI depends primarily on structural factors rather than short-term

incentive-based policies. The contribution of this study lies in highlighting, through a dynamic approach, the central role of economic diversification and human capital in shaping FDI attractiveness.

From a policy perspective, the results suggest that enhancing the country's attractiveness requires a coherent strategy based on productive diversification, human capital development, and the strengthening of macroeconomic stability.

Finally, this study has some limitations, particularly the absence of institutional variables related to governance and regulatory quality. Future research could incorporate these dimensions and employ complementary econometric approaches to further deepen the analysis of FDI determinants in the Algerian context.

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