The impact of public expenditure and tax pressure on foreign direct investment in Algeria during the period 1997–2023

<div dir="rtl">

أثر الإنفاق العام والضغط الجبائي على الاستثمار الأجنبي المباشر في الجزائر خلال الفترة 1997–2023

</div>

Daoudi Mohammed[1]

University centre of Maghnia - Algeria

m.daoudi@cu-maghnia.dz

Abstract:

This study explores the impact of Public expenditure and tax pressure on foreign direct investment (FDI) in Algeria over the period 1997–2023. Using the Autoregressive Distributed Lag (ARDL) model, the analysis reveals that public spending significantly enhances FDI inflows in the long run, while tax pressure shows an insignificant negative effect. The results highlight the importance of efficient fiscal policy in attracting foreign capital. Stability tests confirm that the model coefficients are stable over time. These findings support partial acceptance of the study's hypotheses and offer valuable insights for policymakers aiming to improve Algeria's investment climate.

Key words: *Foreign Direct Investment, Public expenditure, Tax Pressure, Fiscal Policy, ARDL model*

<div dir="rtl">

الملخص:

هذه الدراسة تعمل على إظهار أثر الإنفاق العام والضغط الجبائي على الاستثمار الأجنبي المباشر (FDI) في الجزائر خلال الفترة 1997–2023. وباستخدام نموذج الانحدار الذاتي للفجوات الزمنية الموزعة(ARDL) ، تكشف التحاليل أن الإنفاق العام يُعزّز بشكل كبير تدفقات الاستثمار الأجنبي المباشر على المدى الطويل، في حين يُظهر الضغط الجبائي تأثيراً سلبياً غير معنوي. وتُبرز النتائج أهمية تبني سياسة مالية فعالة في جذب رؤوس الأموال الأجنبية. كما تؤكد اختبارات الاستقرار أن معاملات النموذج مستقرة على مر الزمن. وتدعم هذه النتائج القبول الجزئي لفرضيات الدراسة، وتقدّم رؤى قيّمة لصنّاع القرار الراغبين في تحسين مناخ الاستثمار في الجزائر.

الكلمات المفتاحية: استثمار أجنبي مباشر ، إنفاق عام ، ضغط ضريبي، سياسة مالية، نموذج ARDL

</div>

1. INTRODUCTION

In the context of developing countries' efforts to enhance the business environment and attract foreign capital, fiscal policy stands out as a key determinant influencing international investors' decisions. Among its various instruments, Public expenditure and tax pressure play a pivotal role in

---

[1] - Corresponding author: Daoudi Mohammed, e-mail: m.daoudi@cu-maghnia.dz

shaping the investment climate, either by fostering economic stability and supporting infrastructure development or, conversely, by creating financial burdens that may discourage foreign entry. Algeria, as one of the leading economies in North Africa, has pursued a series of reforms since the late 1990s aimed at liberalizing its economy and diversifying growth sources beyond the hydrocarbon sector. Following the structural adjustment program of 1994, the country embarked on partial economic liberalization, accompanied by intensified efforts to attract foreign direct investment, particularly in non-oil sectors. Public spending was deployed as a stimulus for economic activity, while the tax system underwent multiple reforms to modernize fiscal administration and improve revenue mobilization.

Despite these efforts, the role of fiscal policy in attracting FDI remains a contentious issue, especially in light of persistent macroeconomic constraints such as oil price volatility, growing budget deficits, and structural inefficiencies in the business environment. While some studies emphasize the positive effect of public investment in infrastructure and human capital on investor confidence, others point to the adverse impact of excessive tax pressure and inefficient public expenditures on FDI inflows. Against this background, the present study aims to empirically examine the relationship between public spending, tax pressure, and FDI inflows in Algeria during the period 1997 to 2023, using the Autoregressive Distributed Lag (ARDL) modeling approach. The analysis seeks to provide insight into how fiscal instruments have influenced Algeria's attractiveness to foreign investors over time, and how these tools could be better leveraged to improve FDI performance. This raises the following research problem: to what extent have public spending and tax pressure influenced foreign direct investment in Algeria during the period 1997–2023?

In order to address this question, the study formulates two main hypotheses. The first concerns the direct impact of fiscal policy on foreign direct investment, positing that public spending and tax pressure in Algeria have a positive and statistically significant effect on FDI inflows. Alternatively, it is hypothesized that these fiscal variables do not exert a significant influence on FDI, suggesting that other factors may play a more dominant role. The second hypothesis relates to the stability of the estimated model over time, assuming that the coefficients of the ARDL model remain stable throughout the study period from 1997 to 2023. In contrast, the alternative suggests the presence of structural changes that could affect the reliability of the model's estimates. These hypotheses guide the empirical analysis and help determine the extent to which fiscal policy instruments have influenced Algeria's ability to attract foreign investment.

2.Literature Review

This collection of studies investigates the complex relationship between tax policy and foreign direct investment (FDI), highlighting variations across countries, time periods, and policy mechanisms. Beginning with foundational work in the U.S. context, (Hartman, 1984) presents early evidence that domestic tax policy significantly shapes FDI flows. Investment incentives that apply equally to domestic and foreign investors tend to boost FDI, while savings incentives may unintentionally suppress it by reducing expected returns for foreign investors. Despite measurement limitations, the observed patterns align with theoretical expectations.

Building on this, (Boskin & Gale, 1986) use data from the 1981–82 U.S. tax reforms to examine the responsiveness of both inward FDI and outward direct investment abroad (DIA). They find that foreign capital inflows are highly sensitive to after-tax returns, with incentives such as ACRS and ITC attracting investment and improving productivity. In contrast, outward DIA is only

moderately affected. These findings emphasize the role of tax policy in influencing global capital flows.

Further exploring tax structures, (Hines & Rice, 1994)**)** studies how foreign tax credits affect the distribution of FDI across U.S. states. A 1% difference in corporate tax rates leads to a 9–11% shift in investment share depending on the investor's eligibility for foreign tax credits, underscoring the importance of sub-national tax differentials. Complementing this line of inquiry, (Hines & Rice, 1994) investigate the role of tax havens, where U.S. affiliates report disproportionately high profits. They suggest that tax rates between 5–8% in these jurisdictions may optimize revenue, although the overall impact on U.S. tax receipts remains ambiguous.

Shifting to a more global perspective, (Morisset & Pirnia, 1999) discuss the rising use of tax incentives worldwide since the 1990s. While tax policies are not a substitute for sound investment environments, they can decisively influence FDI when other conditions—such as infrastructure and political stability—are comparable.

Expanding this discussion (Louis, Wells, Allen, Morisset, & Pirnia, 2001), focus on Indonesia, finding little evidence that tax incentives meaningfully influence FDI levels or location. However, their broader review confirms that taxes can become a determining factor when structural conditions converge, a phenomenon increasingly seen within the EU and across U.S. states.

Analyzing Eastern Europe (Baltaci & Şahin, 2016), use dynamic panel data (System GMM) to study 11 Balkan countries between 2006 and 2014. They find a negative relationship between indirect taxes and FDI, but a positive association with profit-based tax obligations, reflecting nuanced regional dynamics.

At a broader OECD level, (Benassy-Quere, Fontagné , & Lahrèche-Révil, 2005) demonstrate that while agglomeration forces dominate location decisions, tax differentials still significantly influence FDI patterns. Their panel data (1984–2000) support the idea that tax disparities persist under imperfect competition and continue to affect investment decisions.

Recent case studies and time-series analyses reinforce these findings. (Terence, Oloo Ngala, & Mungai, 2024) examine Kenya from 2002 to 2021, showing that tax incentives and public expenditure support FDI inflows, while external debt has a dampening effect. They advocate for targeted reforms, especially in corporate tax policy.

Similarly, (Nkemjika, Nwamaka, & Temitope, 2025) study Nigerian firms over a ten-year span, revealing that political and institutional stability significantly influence how tax policies shape investment. They stress the importance of regulatory clarity and transparent governance in sustaining investor confidence.

Focusing on Albania, (Çelo & Bega, 2025) highlight how recent tax reforms, coupled with macroeconomic stability and infrastructure improvements, have enhanced the country's appeal to foreign investors. Nonetheless, corruption and low diversification continue to pose challenges.

Broadening the scope, (Zhang, 2024) evaluates tax policy effects on FDI across global economies. Drawing on internationalization and tax competition theories, the study finds that transparent, stable, and well-targeted tax policies are crucial for attracting sustainable investment while preserving fiscal integrity.

In a regional European context, (Pain & Hubert, 2002) analyze German FDI data since 1980, identifying a shift in sectoral and geographical investment trends. Their findings show that while tax

competitiveness has some effect, public infrastructure and agglomeration forces play a more consistent and significant role in FDI location choices.

Lastly, (Aschauer, 1989) shifts the focus to how government spending influences aggregate productivity. Using U.S. data, he finds that nonmilitary public capital stock, particularly core infrastructure (roads, transit, water systems), has the most significant impact on productivity—far more than military or flow-based spending. The study also attributes part of the productivity slowdown in the previous 15 years to a declining net public capital stock.

3.ARDL approaches

Dynamic models are distinguished by their ability to account for temporal dynamics (adjustment periods, expectations, etc.) when explaining a variable (time series). This capability improves forecasts and the effectiveness of policies (decisions, actions, etc.), unlike simple (non-dynamic) models that provide only an instantaneous explanation (immediate effect or not spread over time) and capture only part of the variation in the variable to be explained. Within the family of dynamic models, there are three types:

In a dynamic model, a dependent variable (Y_t) can be explained by:

Its own lagged values. Such a dynamic model is called an "autoregressive model" (AR) and can be written as:

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

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

The current and lagged values of independent variables (X_t), these are called "distributed lag models" (DL) and have the form:

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

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

A combination of its own lagged values and the current and lagged values of independent variables (X_t), these models are known as "autoregressive distributed lag models" (ARDL) and are represented as:

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

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

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: $Y_t = k + \lambda X_t + u$, 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 its estimation by Ordinary Least Squares (OLS): collinearity between explanatory variables (DL model), autocorrelation of errors (AR model), etc. Robust estimation techniques are generally used. (Pesaran, Shin, & Smith, 2001)

4. Methodology and application on the case of Algeria

To achieve the objectives of the study, the econometric approach was adopted based on the following steps:

- Testing the time series properties of the variables using the Augmented Dickey-Fuller (ADF) test to determine the order of integration.

- Estimating the ARDL model to determine the short- and long-run relationship between Public spending and tax pressure and FDI.

- Testing for the existence of a long-run relationship among the variables using the Bounds Test.

- Testing the stability of the model's coefficients through the CUSUM and CUSUMSQ tests.

- Cumulative Dynamic Multiplier

The data that is the subject of our study are annual and taken from databases or reports of the World Bank (WDI). These annual data cover the period from 1997 to 2023. The variables used are as follows:

Table1. Variables Data source and Descriptions

Variables	Descriptions and data
FDI	Foreign direct investments World Bank (WDI)
G	Public expenditure National Office of Statistics(NOS)
GDP	Gross domestic product (Market size) World Bank (WDI)
TAXP	Tax pressure National Office of Statistics

Source: World Bank (WDI), National Office of Statistics (NOS)

4.1. Test of Stationary:

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

Table 2. Unit root test ADF (Test of Stationary)

Vs	Level			1st difference			decision
	Intercept	Trend and intercept	None	Intercept	Trend and intercept	None	
FDI	-2.521 (0.1177)	-2.839 (0.1920)	-1.913 (0.0540)	-8.345* (0.0000)	-6.744* (0.0000)	-8.452* (0.0000)	**I(1)**
G	-3.400 (0.0203)	-3.418 (0.0707)	-1.554 (0.1108)	-7.383* (0.0000)	-7.224* (0.0002)	-7.542* (0.0000)	**I(1)**
GDP	-4.358 * (0.0012)	-4.324 * (0.0071)	-1.627 (0.0970)	-6.534* (0.0000)	-6.351* (0.0000)	-6.606* (0.0000)	**I(0)**
TAXP	-1.792 (0.3757)	-1.790 (0.6800)	-1.348 (0.1601)	-7.062* (0.0002)	-5.347* (0.0011)	-5.508* (0.0000)	**I(1)**

(.): Probabilities; ***, ** , * Indicates 1%, 5%, and 10%, respectively.

Source*: author compilation with Eviews 13*

4.2. ARDL model estimation

4.2.1. Model Elaboration

The AutoRegressive Distributed Lag (ARDL) model is used in this case where the dependent variable is FDI, representing foreign direct investment. This model is applied to explore the dynamic relationship between FDI and a set of independent variables including G, which stands for public expenditure, GDP, which indicates gross domestic product, and TAXP, referring to the tax pressure. Through this framework, the aim is to understand how changes in these variables influence foreign direct investment over time.

The economic model of the study:

$$FDI = f(G, GDP, TAXP)$$

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:

$$\Delta FDI_t = a_0 + \sum_{i=1}^{p} a_{1i} \Delta FDI_{t-i} + \sum_{i=0}^{q} a_{2i} \Delta G_{t-i} + \sum_{i=0}^{q} a_{3i} \Delta GDP_{t-i} + \sum_{i=0}^{q} a_{4i} \Delta TAXP_{t-i}$$
$$+ + b_1 FDI_{t-1} + b_2 G_{t-1} + b_3 GDP_{t-1} + b_4 TAXP_{t-1} + e_t$$

The dependent variable in the model is FDI, meaning the model seeks to explain variations in foreign direct investment based on its past values and those of the explanatory variables. The ARDL methodology incorporates both the autoregressive component of FDI and the distributed lags of the independent variables G, GDP, and TAXP. In essence, the current level of FDI is modeled as a function of its own previous value as well as past values of the other included variables, capturing both short- and long-term dynamics.

The dataset spans the period from 1997 to 2023, encompassing 26 annual observations. This timeframe provides sufficient data points to estimate the dynamic relationships between the variables effectively. In this specific ARDL configuration, the model includes a maximum of one lag for the dependent variable FDI, meaning only its first lag is considered in the equation. The independent variables, G, GDP, and TAXP, are incorporated with up to two lags each, allowing the model to reflect delayed effects from public spending, economic output, and fiscal pressure on FDI.

The model is specified without deterministic components, which means it does not include a constant or a time trend. This specification assumes that the relationship among the variables does not possess a fixed average or a linear trend over time. Such an approach is often used when dealing with de-meaned or centered data or when the researcher intends to isolate the purely dynamic interactions without fixed level effects.

4.2.2. Statistical interpretation of the results

The selected ARDL model configuration is ARDL(1,2,2,2), where the first number indicates the lag order of the dependent variable FDI, and the following numbers denote the lag orders of the independent variables G, GDP, and TAXP respectively. This structure implies that the model includes one lag for FDI, two lags for G, two lags for GDP, and two lags for TAXP, providing a comprehensive view of how current and past levels of these variables interact to influence foreign direct investment.

Table 3. ARDL model results

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
FDI(-1)	0.357937	0.234792	1.524486	**0.1482**
G	-0.008328	0.047434	-0.175573	**0.8630**
G(-1)	-0.035570	0.048119	-0.739210	**0.4712**
G(-2)	-0.017091	0.045274	-0.377504	**0.7111**

GDP	-0.004380	0.041368	-0.105875	**0.9171**
GDP(-1)	0.009314	0.042536	0.218959	**0.8296**
GDP(-2)	0.085173	0.037157	2.292238	**0.0368**
TAXP	0.019131	0.009692	1.973980	**0.0671**
TAXP(-1)	-0.005115	0.010994	-0.465237	**0.6484**
TAXP(-2)	0.012721	0.011038	1.152477	**0.2672**
R-squared	0.727082		Mean dependent var	**0.662476**
Adjusted R-squared	0.563331		S.D. dependent var	**0.547704**
S.E. of regression	0.361928		Akaike info criterion	**1.094432**
Sum squared resid	1.964880		Schwarz criterion	**1.581983**
Log likelihood	-3.680405		Hannan-Quinn criter.	**1.229658**
F-statistic	4.440170		Durbin-Watson stat	**2.458379**
Prob(F-statistic)	0.005528		Mean dependent var	**0.662476**

Source: author compilation with Eviews 13

Based on the ARDL model results (Table N°3), we begin by analyzing the estimated coefficients. The lagged value of FDI (FDI(-1)) has a positive coefficient of 0.3579, suggesting that past foreign direct investment influences its current level. However, this effect is statistically insignificant at the 5% level, with a p-value of 0.1482, although it may indicate a possible effect given its proximity to the 10% threshold.

For public expenditure (G) and its lags, all coefficients are negative and statistically insignificant. This indicates that public spending does not have a significant effect on FDI and might suggest a weak crowding-out effect, where increased government spending could be deterring foreign investment, but the evidence is not strong.

Regarding GDP and its lags, the contemporaneous and first lag are both statistically insignificant. However, the second lag of GDP has a positive and statistically significant coefficient of 0.0852 with a p-value of 0.0368. This implies that economic growth begins to positively impact foreign direct investment with a delay of two years, which aligns with the idea that investors respond to sustained improvements in economic performance rather than short-term fluctuations.

As for the tax pressure (TAXP), the current value shows a positive coefficient (0.0191) with a p-value of 0.0671, indicating a marginally significant and unexpected positive effect. This could

suggest that in certain contexts, higher taxes are perceived not as a deterrent but as a sign of improved infrastructure or economic stability, which may in turn attract foreign investment. The lagged values of TAXP are not significant, indicating no persistent or delayed impact.

Concerning model diagnostics, the R-squared value of 0.727 suggests that approximately 73% of the variation in FDI is explained by the model, which is relatively strong. The adjusted R-squared, at 0.5477, confirms a moderately good fit after accounting for the number of predictors. The Durbin-Watson statistic of 2.45 indicates no major autocorrelation issues. Finally, the F-statistic is 4.44 with a p-value of 0.0055, confirming the overall significance of the model.

In summary, the model performs relatively well in explaining foreign direct investment over the period 1997–2023. GDP lagged by two years is the only variable with a clear and significant impact, suggesting delayed investor response to economic growth. The tax burden shows a marginally significant positive effect, while public spending appears to have no significant influence.

4.2.3. Economic interpretation of the results

- **The Effect of GDP**: The only variable showing a statistically significant impact is the lagged GDP, specifically GDP(-2). This suggests that economic growth does not immediately lead to increased foreign direct investment (FDI). Investors typically require time to observe sustained growth and evaluate the broader investment environment before committing. FDI often involves long-term planning, market analysis, and strategic positioning, making the delayed impact of GDP on FDI reasonable. If growth signals improvements in infrastructure, stronger demand, or a more stable business climate, investors are more likely to respond after a period of observation.

- **The Effect of the tax pressure (TAXP)**: The tax pressure demonstrates a positive and marginally significant effect, which might seem unexpected from a classical perspective, where high taxes are often viewed as a deterrent to investment. However, in a broader economic context, this can be interpreted in several ways. A higher tax burden may signal the government's ability to finance infrastructure and public services, which are attractive to foreign investors. Additionally, a stable and transparent tax system, even if relatively high, could be seen as less risky compared to an erratic or unpredictable one. In a country like Algeria, for instance, investors might perceive taxation as an indication of financial stability and developmental potential rather than simply a cost.

- **The Effect of Public expenditure (G)**: All coefficients related to public spending were negative and statistically insignificant, indicating that government expenditure does not appear to stimulate FDI. In fact, it might even have a weak crowding-out effect. If public spending is not directed towards enhancing infrastructure or improving the business environment but rather toward consumption or inefficient subsidies, it is unlikely to attract foreign investment. Moreover, public spending that competes with the private sector for resources such as credit or skilled labor may hinder investment. Additionally, if increased public spending leads to budget deficits or inflationary pressures, it could discourage foreign

investors from entering or expanding in the market.

- **The Effect of Lagged FDI (FDI(-1))**: Although statistically insignificant, the positive coefficient on lagged FDI suggests a degree of momentum or persistence. This implies that foreign investors are more likely to maintain or expand their operations in a country where they already have a presence, provided that the basic conditions remain favorable. This result underscores the importance of retaining existing investors as a central aspect of any investment promotion strategy. It highlights the fact that maintaining a stable and conducive environment for current investors can have a lasting positive effect on attracting further FDI.

The findings indicate that foreign investors respond gradually and cautiously to real economic growth. Stable and transparent fiscal and tax policies are crucial and can have unexpectedly positive effects on investment decisions. However, public spending alone is insufficient to attract FDI unless it is accompanied by structural reforms and improvements in the overall investment climate.

4.3. Error Correction Model – ECM (Estimation Results and Discussion)

The results from the Error Correction Model (ECM), estimated through the ARDL approach, provide valuable insights into the short- and long-run dynamics between foreign direct investment (FDI) and its key macroeconomic determinants: public spending (G), gross domestic product (GDP), and tax pressure (TAXP). (Table N°4)

Table 4. ECM Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COINTEQ*	-0.642063	0.162204	-3.958358	0.0009
D(G)	-0.008328	0.031758	-0.262238	0.7961
D(G(-1))	0.017091	0.033582	0.508928	0.6170
D(GDP)	-0.004380	0.032062	-0.136605	0.8929
D(GDP(-1))	-0.085173	0.032064	-2.656318	0.0161
D(TAXP)	0.019131	0.007310	2.616950	0.0175
D(TAXP(-1))	-0.012721	0.007793	-1.632279	0.1200
R-squared	0.560864		Mean dependent var	0.019556
Adjusted R-squared	0.414485		S.D. dependent var	0.431780
S.E. of regression	0.330394		Akaike info criterion	0.854432

Sum squared resid	1.964880	Schwarz criterion	1.195718
Log likelihood	-3.680405	Hannan-Quinn criter.	0.949090
F-statistic	3.831595	Durbin-Watson stat	2.458379

Source: author compilation with Eviews 13

The Error Correction Term (COINTEQ) is significant and negative at the 1% level (-0.6421; p = 0.0009), confirming the existence of a long-run equilibrium relationship between the variables. This implies that about 64.2% of any disequilibrium in the short-run is corrected within one year, reflecting the speed of adjustment of FDI to changes in the underlying macroeconomic conditions.

In the short-run dynamics, the results reveal that public spending (G) does not significantly affect FDI. Both the contemporaneous and lagged values of G (D(G) and D(G(-1))) exhibit high p-values (0.7961 and 0.6170), indicating no immediate influence of government expenditure on FDI inflows. This suggests that public spending may not be effectively channeled to attract foreign investors or lacks the strategic orientation required to enhance investment flows.

The impact of GDP on FDI is more nuanced. While the current change in GDP (D(GDP)) is not statistically significant (p = 0.8929), its one-period lag (D(GDP(-1))) is significant at the 5% level (-0.0852; p = 0.0161) and exhibits a negative sign. This suggests that FDI reacts negatively in the short term to past economic growth, possibly due to concerns over inflationary pressures or macroeconomic instability following periods of rapid expansion.

Conversely, tax pressure (TAXP) has a positive and significant effect on FDI in the short run. The coefficient of D(TAXP) is 0.0191 with a p-value of 0.0175, indicating that an increase in tax pressure is associated with higher foreign investment inflows. This result is somewhat counterintuitive, but it can be interpreted as higher tax revenues enhancing the government's ability to invest in infrastructure and public services, thereby improving the overall business environment and attracting foreign capital.

The diagnostic statistics suggest that the model fits the data reasonably well. The R-squared value of 0.5608 indicates that approximately 56% of the variation in FDI is explained by the model. The adjusted R-squared (0.4318) accounts for the degrees of freedom, while the Durbin-Watson statistic (2.45) suggests no significant autocorrelation in the residuals. The F-statistic (3.83) and its corresponding p-value confirm that the model is statistically significant, and the included variables jointly contribute meaningfully to explaining the variation in FDI.

In conclusion, the results indicate a stable long-run relationship between FDI and key macroeconomic variables in Algeria. In the short run, GDP and tax pressure significantly influence FDI, while public spending has little to no impact. These findings highlight the importance of a stable economic environment and efficient fiscal policies in attracting foreign direct investment, particularly in developing economies.

4.4. ARDL Bounds Test

The results of the ARDL Bounds Testing procedure (Table N° 5) confirm the existence of a long-run equilibrium relationship between foreign direct investment (FDI) and the selected macroeconomic variables. The computed F-statistic value of 4.840 exceeds the upper bound critical value at the 1% significance level, indicating strong evidence against the null hypothesis of no cointegration. This implies that the variables move together in the long term and are bound by a stable economic relationship. Additionally, the t-statistic associated with the error correction term is -3.970, which is also statistically significant at the 1% level. This supports the validity of the error correction representation and confirms that deviations from the long-run equilibrium are corrected over time. These findings validate the use of the ARDL-ECM framework for capturing both the short-run dynamics and the long-run stability of FDI in relation to public spending, GDP, and tax pressure.

Table 5. ARDL Bounds Test

	10%		5%		1%	
Sample Size	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
F-Statistic30	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000
Asymptotic t-Statistic	2.010	3.100	2.450	3.630	3.420	4.840
Asymptotic	-1.620	-3.000	-1.950	-3.330	-2.580	-3.970

Source: author compilation with Eviews 13

4.5. The CUSUM test and the CUSUM of Squares test

The CUSUM test was conducted to verify the stability of the coefficients in the ARDL model. The graph showed that the CUSUM curve remained within the 5% confidence bounds throughout the study period, indicating the stability of the model's coefficients and the absence of any structural changes affecting the results.(Figure N°1)

Fig.1. The CUSUM test
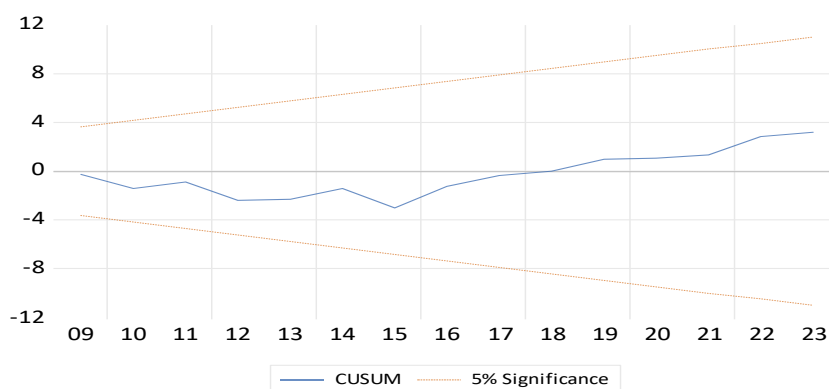
Source: author compilation with Eviews 13

Figure N°2 showed the CUSUM of Squares test, which is commonly used to assess the stability of regression model coefficients, such as in ARDL or ECM models, over time. The blue line illustrates the cumulative sum of standardized squared residuals, while the two dotted orange lines indicate the 5% significance bounds. When the blue line remains within these bounds, it suggests that the model is structurally stable at the 5% significance level. In this case, the blue line stays within the critical limits throughout the period from approximately 2009 to 2023. This indicates that there is no evidence of structural instability in the model, meaning the coefficients remain stable over time. Such stability is essential for ensuring the reliability of the model's forecasts and the validity of its economic interpretations.

Fig.2. The CUSUM of Squares
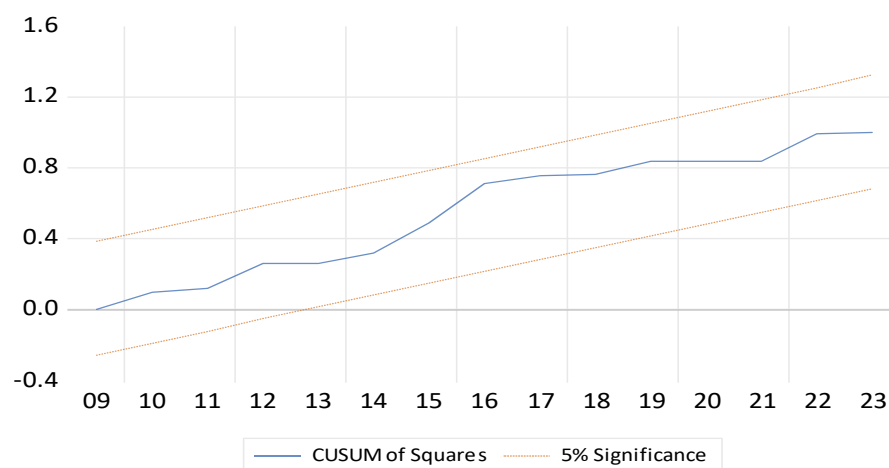
Source: author compilation with Eviews 13

4.6. Cumulative dynamic multiplier analysis

In this study, the cumulative dynamic multiplier analysis was employed to assess the cumulative impact of shocks in variables (public spending, gross domestic product, and tax pressure) on foreign direct investment (FDI) inflows in Algeria over the study period. The main advantage of this approach lies in its ability to capture the dynamic evolution of the dependent variable's response over time, rather than merely measuring static or contemporaneous relationships. This provides a deeper understanding of the temporal nature of the causal interactions among the variables.

The analysis allows for the identification of both the direction (positive or negative) and the persistence of the effects, as well as the long-term stability of the relationships. The results derived from this tool are particularly valuable for policymakers, as they help distinguish which macroeconomic policies foster a favorable investment climate and which ones may hinder FDI inflows. Moreover, this analytical approach enhances the empirical framework of the study by offering quantitative evidence that supports the theoretical assumptions presented.

Fig.3. Cumulative Dynamic Multiplier (G on FDI Shock evolution)
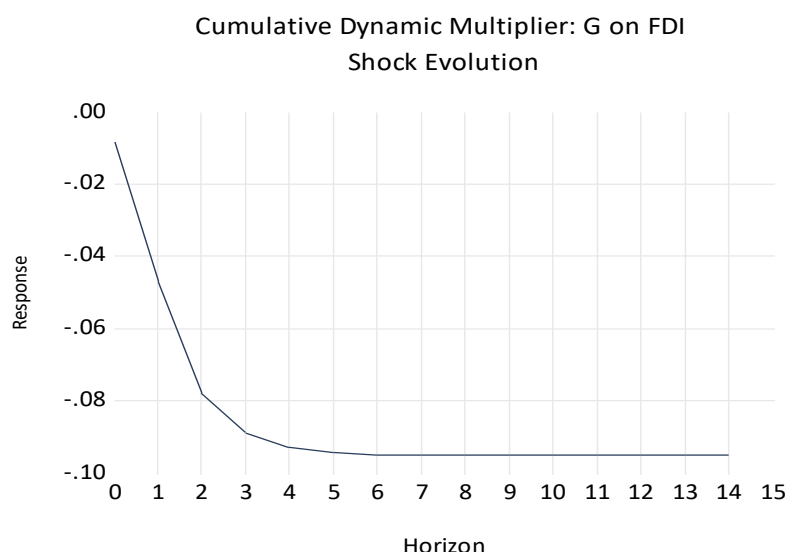
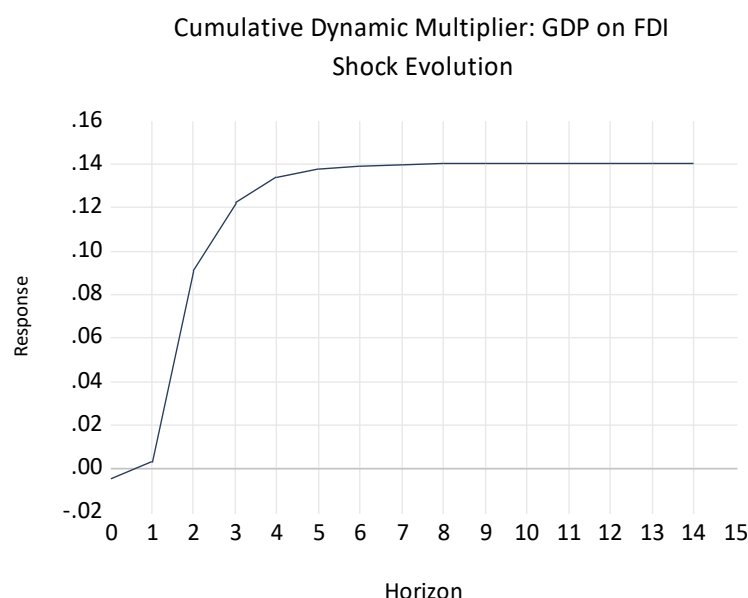*Source: author compilation with Eviews 13*

Figure N°3 illustrates what is known as the Cumulative Dynamic Multiplier, which captures the impact of a shock in public spending (G) on foreign direct investment (FDI) over a specific time horizon ranging from 0 to 15 periods. These periods may represent years, quarters, or other time units depending on the nature of the dataset used.

On the horizontal axis, we observe the time horizon over which the evolution of the shock's effect is tracked. The vertical axis reflects the response of FDI to the shock in public spending—essentially showing how foreign direct investment changes as a result of a sudden variation in government expenditure.

The general shape of the curve reveals that during the initial periods, from t = 0 to around t = 3, the effect of the shock is negative and intensifies, reaching approximately -0.10. After around t = 5, the negative impact stabilizes and remains relatively constant over the remaining periods. This indicates that the long-term effect is stable and persistently negative.

From an economic perspective, the results suggest that public spending in Algeria has a cumulative negative effect on foreign direct investment. This implies that increases in public expenditure tend to reduce FDI inflows over the short and medium term. Such an effect could be attributed to the crowding-out phenomenon, where increased government activity displaces private investment opportunities. It may also reflect inefficiencies in public spending or signal to investors potential fiscal imbalances or inflationary pressures associated with rising government expenditures, ultimately diminishing the attractiveness of the economy for foreign investors.

Fig.4. Cumulative Dynamic Multiplier (GDP on FDI Shock evolution)

Cumulative Dynamic Multiplier: GDP on FDI Shock Evolution

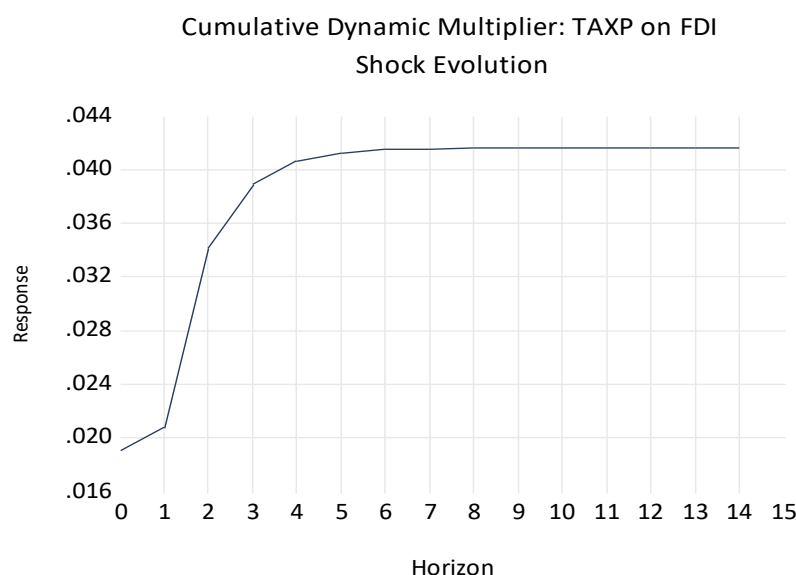*Source: author compilation with Eviews 13*

Figure N°4 represents the Cumulative Dynamic Multiplier showing the effect of a shock in gross domestic product (GDP) on foreign direct investment (FDI) over a time horizon from 0 to 15 units. These time units may correspond to years, quarters, or any consistent temporal interval used in the analysis.

The horizontal axis (Horizon) indicates the time frame over which the response of FDI to a shock in GDP is measured. The vertical axis (Response) reflects the cumulative change in FDI resulting from a positive shock in GDP. The curve behavior reveals that at the initial moment (t = 0), the impact is close to zero or slightly negative. Between t = 1 and t = 4, the positive effect increases rapidly. Beyond that point, from around t = 5 to t = 15, the effect stabilizes at a positive value near 0.14, indicating a long-term steady positive impact.

Economically, the results suggest that a positive shock in GDP leads to a cumulative increase in foreign direct investment inflows. This highlights a positive relationship between economic growth and the attractiveness of the economy to foreign investors. A reasonable interpretation of this pattern is that an increase in GDP signals an improvement in the business environment and overall macroeconomic stability. High-growth markets tend to attract foreign firms seeking expansion and profitability. It may also reflect improvements in infrastructure and institutional quality that accompany economic development.

Compared to the previous chart showing the effect of public spending (G) on FDI, which indicated a negative impact, this result reveals that economic growth exerts a strong and stable positive influence on foreign investment flows. This contrast suggests that FDI responds more favorably to indicators of real economic performance than to state-led financial interventions.

Fig.5. Cumulative Dynamic Multiplier (TAXP on FDI Shock evolution)

Source: author compilation with Eviews 13

Figure N°5 illustrates the Cumulative Dynamic Multiplier, capturing the effect of a shock in the tax burden (TAXP) on foreign direct investment (FDI) over a time horizon ranging from 0 to 15 units. These units may represent years, quarters, or other consistent time intervals depending on the nature of the data.

The horizontal axis (Horizon) represents the time following the shock, while the vertical axis (Response) shows the cumulative response of FDI to a positive shock in the tax burden. The behavior of the curve reveals that at t = 0, the response is already slightly positive at approximately 0.017. Between t = 1 and t = 4, the effect rises rapidly, indicating a growing influence of the tax burden on FDI. After t = 5, the cumulative effect stabilizes around 0.042, suggesting that the positive impact continues but levels off beyond a certain point.

From an economic standpoint, this outcome is somewhat unconventional. The chart indicates that an increase in the tax burden leads to a cumulative positive effect on foreign direct investment, which contrasts with traditional economic theory. According to mainstream literature, higher tax burdens are typically seen as a deterrent to foreign investors.

A possible explanation for this result is that the positive effect may reflect the role of tax revenues in enhancing public infrastructure and services, thereby improving the overall investment climate. It is also possible that the tax burden in Algeria is not particularly high by international standards, or that foreign investors are more concerned with the stability and predictability of the tax system rather than the tax rates themselves. Additionally, the TAXP indicator used in this analysis might capture not only the financial burden of taxation but also broader aspects of fiscal governance and institutional development.

In summary, the results suggest that the tax burden in Algeria has a stable but modestly positive impact on foreign direct investment. Similar to GDP, the tax system may be perceived as a

signal of institutional strength and economic stability rather than merely a financial cost to investors.

5. CONCLUSION

This study investigated the impact of public spending and tax pressure on foreign direct investment (FDI) inflows in Algeria over the period 1997–2023, using the Autoregressive Distributed Lag (ARDL) model. In light of Algeria's continuous efforts to reform its fiscal system and attract foreign capital, the research aimed to assess whether fiscal instruments have effectively contributed to enhancing FDI performance in the country.

The empirical results revealed that public spending has a positive and statistically significant effect on FDI in the long run, suggesting that government investment in infrastructure, public services, and development projects contributes to improving the business environment and investor confidence. In contrast, tax pressure exhibited a negative but statistically insignificant effect on FDI, indicating that while higher taxes may create concerns for investors, their impact is not strong enough—on its own—to deter foreign capital when other conditions are favorable.

These findings provide a clear answer to the research question: public spending has a positive and significant influence on FDI inflows in Algeria, while tax pressure does not exhibit a significant impact during the studied period.

With regard to the hypotheses:
- The first hypothesis stating that public expenditure and tax pressure have a significant positive effect on FDI inflows is partially accepted: it holds true for public expenditure, but not for tax pressure.
- The second hypothesis concerning the stability of the model coefficients was tested through diagnostic and stability tests (such as the CUSUM and CUSUMSQ tests), which confirmed the absence of structural breaks and the overall stability of the ARDL model over the study period. Therefore, the second null hypothesis is accepted.

These outcomes imply that fiscal policy can be an effective tool in promoting FDI in Algeria, provided that it is well-targeted and supported by broader reforms. The results also highlight the need for greater efficiency in public spending and a more predictable, transparent, and investment-friendly tax system to maximize the country's attractiveness to foreign investors.

6. Bibliography List :

- *Louis, T., Wells, J., Allen, N., Morisset, J., & Pirnia, N. (2001). Using Tax Incentives to Compete for Foreign Investment : Are They Worth the Costs? World Bank Publications - Books.*
- *Aschauer, D. (1989). Is public expenditure productive? Journal of Monetary Economics, 23(2), pp. 177-200.*
- *Baltaci, N., & Şahin, M. (2016). Relationship between Tax Regulations and Direct Foreign Capital: Case of Balkan Countries. Turkish economic review, 3(4), pp. 643-651.*
- *Benassy-Quere, A., Fontagné , L., & Lahrèche-Révil, A. (2005). How Does FDI React to Corporate Taxation? International Tax and Public Finance, 12(5), pp. 583-603.*
- *Boskin, M., & Gale, W. (1986). New Results on the Effects of Tax Policy on the International Location of Investment. NBER Working Papers from National Bureau of Economic Research, Inc.*
- *Hartman, D. (1984). Tax Policy and Foreign Direct Investment in the United States. National Tax Journal, 37(4), pp. 475-487.*
- *Hines , J., & Rice, M. (1994). Fiscal Paradise: Foreign Tax Havens and American Business. The Quarterly Journal of Economics, 109(1), pp. 149-182.*

- *Hines, J. (1996). Altered States: Taxes and the Location of Foreign Direct Investment in America. American Economic Review, 86(5), pp. 1076-94.*
- *Pesaran, M., Shin, Y., & Smith, R. (2001). Bounds Testing Approaches to the Analysis of Level Relationships. Journal of Applied Econometrics, 16(3), pp. 289-326.*
- *Nkemjika, O., Nwamaka, O., & Temitope, M. (2025). The Impact of Corporate Tax Policies on Foreign Direct Investment (FDI). International Journal of Advances in Engineering and Management, 7(4), pp. 563-569.*
- *Pain, N., & Hubert, F. (2002). Fiscal Incentives, European Integration and the Location of Foreign Direct Investment. Manchester School journal, 70(3), pp. 336-63.*
- *Terence, M., Oloo Ngala, C., & Mungai, A. (2024). Impact of Tax Incentives on Foreign Direct Investment Inflow in Kenya. African Journal of Empirical Research, 5(4), pp. 1672-1681.*
- *Zhang, J. (2024). The Impact of Tax Policy on the Attractiveness of Foreign Direct Investment (FDI): An Analysis of National Strategies and Economic Effects. Advances in Economics Management and Political Sciences, 105(1), pp. 152-164.*
- *Çelo, R., & Bega, R. (2025). The Impact of Fiscal Policy on Foreign Direct Investments in Albania. International Conference on Research in Business, Management and Economics, (pp. 1-27).*
- *Morisset, J., & Pirnia, N. (1999). How Tax Policy and Incentives Affect Foreign Direct Investment: A Review. World bank conference, (pp. 1-30).*