

The Impact of Investment on Food Exports: The Case of Algeria 2000-2023

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Received: 09/06/2025

Accepted: 23/09/2025

Published: 30/10/2025

Abstract:

This paper attempted to study the impact of investment on food exports in Algeria in the Context of Economic Diversification during the period from 2000 to 2023. The inductive approach was followed to cover all theoretical aspects related to the study, using both descriptive and analytical methods. As for the empirical side, a quantitative approach was adopted using (ARDL) model.

Among the findings of the study, it was observed that foreign direct investment did not contribute to the promotion of Algerian exports during the period from 2000 to 2023. It was found that the impact of FDI on Algerian exports is negative, indicating an inverse relationship between FDI and exports. Specifically, an increase of one unit in investment would lead to a decrease of 10.55825 units in Algerian exports. This result aligns closely with the current reality of the Algerian economy.

Keywords: : Investment; Diversification; Food Exports; ARDL model; Algeria.

Jel Classification Codes : E00 ; F19.

1. Introduction :

Investment is seen as one of the primary catalysts for development and economic growth in many developing countries, this contributes to stimulating the national economy and achieving various benefits, as it also plays a crucial role in enhancing economic growth and increasing productivity. This type of investment differs from simple financial investments, as it involves purchasing productive assets such as factories, real estate, or companies. The Algerian economy has seen significant development in recent decades, with the Algerian government focusing on attracting investments to strengthen the business environment in non-oil sectors such as manufacturing, technology, and tourism. This aims to reduce the Algerian economy's reliance on a single sector, thereby increasing its resilience to fluctuations in oil prices.

Despite some challenges that Algeria has faced and continues to face today, it is important to understand the relationship between investment and exports in the context of economic diversification. This would help improve and develop Algeria's economic structure by providing the necessary capital and expertise to raise the quality of local production and raise the competitiveness of Algerian.

1.1 The problem of the study: Given the significant importance that Algeria should place on investment to promote Algerian food exports and diversify the Algerian economy, The core focus of the study centers on the following key question:

What is the Effect of investment on Algerian exports in the context of economic diversification during the period 2000-2023?

Based on the central issue of the study, a set of sub-questions can be raised as follows:

- What is the impact of total capital formation on exports in Algeria?
- What is the impact of investment on exports in Algeria?

1.2 The assumptions of the study: As an initial answer to the central issue of the study mentioned above, the following hypotheses were adopted:

- Total capital formation has a positive impact on exports in Algeria.
- The level of investment achieved in Algeria has not reached the threshold necessary to have a positive effect on the promotion of exports during the period 2000-2023.

1.3 The goals of the study: This study aimed to address the most important theoretical concepts related to foreign direct investment and exports. It also Aimed to assess the effect of FDI on Algerian exports in the context of economic diversification during the period between 2000 and 2023, by adopting an econometric model to assess the extent to which the study variables influence one another.

1.4 Methodology of the study: In order to answer the central issue and address the elements of this study, the inductive approach was followed using descriptive and analytical methods in the theoretical aspect. In the practical aspect, a quantitative approach was employed, where the Autoregressive Distributed Lag model was used, collecting all data related to the study topic from the World Bank database.

2. Theoretical Concepts on Foreign Direct Investment and Exports

This section addresses the key concepts related to foreign direct investment (FDI), starting with its definition, followed by its forms, importance, and the main factors that encourage the attraction of FDI, as well as exports.

2.1 The Importance of Investment:

"The importance of foreign direct investment is reflected in the following points (Bongab & Lazhari, 2018, pp. 91-92) :

- Foreign direct investment does not involve fixed burdens in the form of interest and principal payments on the host country's balance of payments.
- FDI helps enhance the competitiveness of the host country's economy and serves as a source of hard currency.
- Foreign direct investment is not merely a tool for transferring foreign currency; it also involves the transfer of real resources from abroad, such as equipment, machinery, technical expertise, and managerial and organizational skills, which can overcome many obstacles to development.
- Foreign investments contribute to creating numerous economic efficiencies that drive industrialization in the host country. Additionally, they encourage domestic producers to improve their production methods by emulating foreign investors".

2.2 The Concept of Exports:

Many economists have provided different definitions related to exports. Among these definitions, the following can be distinguished:

- " It pertains to a country's capacity and its partners to achieve flows of goods and services, information, finance, culture, tourism, and human resources to other countries and global markets, in order to achieve the goals of exports, such as profits, added value, expansion, growth, outreach, job opportunities, exposure to other cultures, and more" (Al-Dajar, 2002, p. 15) .
- "The value of goods and productive services produced by residents and transferred permanently to non-residents" (Aqsaam, 2002, p. 74).
- "Exports refer to the continuous presence in foreign markets and the ability to compete for the largest market share. In other words, it is the internationalization related to the strategic

choice of the company, which depends on the resources and capabilities available to the company” (Corinne, 2006, p. 01).

As a comprehensive definition, it can be stated that exports are a process that occurs in stages of business activity, with the goal of transferring goods and services from the national territory to outside the country's geographical boundaries. In other words, it involves selling specific goods from their production centers to their marketing centers.

2.3 Types of Exports:

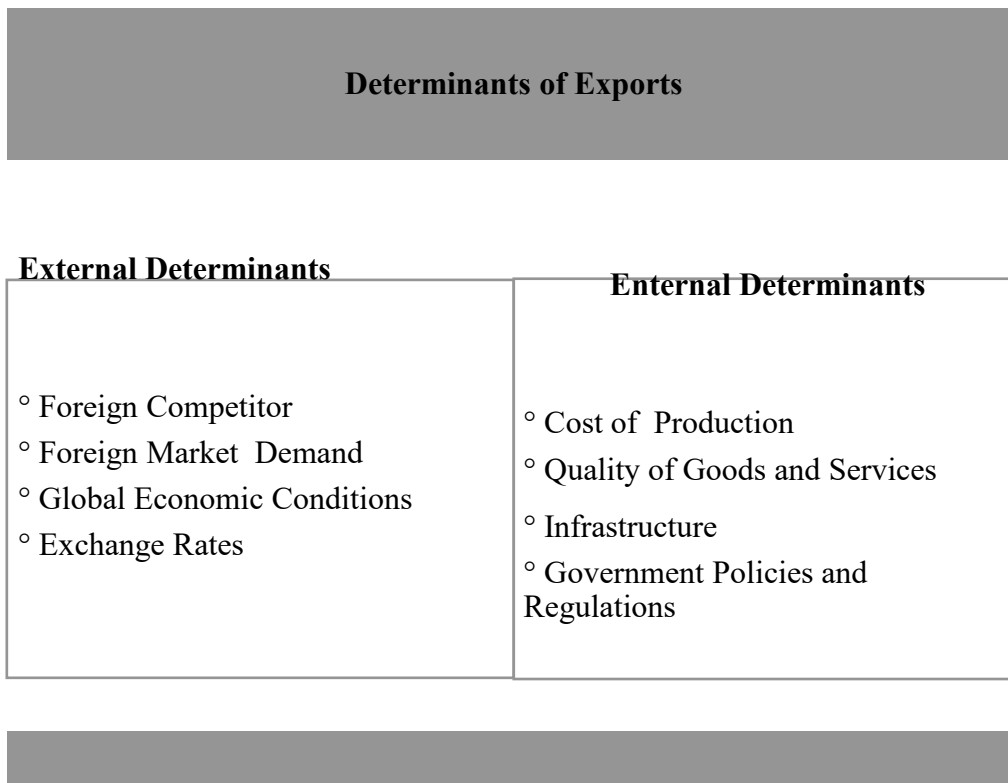
There are various types of exports, and despite their diversity, the following can be distinguished:

- **Visible Exports:** "This type includes goods and commodities that residents of one country sell to residents of another country. These goods cross the border and are known as visible exports because they are under the scrutiny of customs officials at the border, where they can be seen, inspected, and counted" (Aliya, 1990, p. 110).
- **Invisible Exports:** "This includes several services exchanged between residents of the country and residents abroad. These services encompass transportation, insurance, tourism, and others. Additionally, capital exports are part of this category, which refers to the transfer of capital from one country to another, typically by global financial monopolies. The aim is to increase the profits of these monopolies and strengthen their economic and political positions in markets, as well as expand their areas of capital investment" (Khalil, 1997, p. 66)

2.4 Determinants of Exports:

Exports have both internal and external determinants. Among these determinants, the ones illustrated in the diagram below are as follows:

Figure (01): Déterminants of Exports



The source: Compiled by the researchers using various references.

3. Measuring the effect of Investment on Algerian Exports in the Context of Economic Diversification during the Period 2000-2023

In this study, the impact of Investment on Algerian exports during the period from 2000 to 2023 was measured using the (ARDL) model, applied through the Eviews10 software. The model was based on three time series, where the first series represented the dependent variable, which is the exports of goods and services. The second series consisted of the independent variables, namely Foreign Direct Investment and Gross Capital Formation. The studied model is expressed by the following equation:

$$EXPRT = \alpha + \beta_1 invx + \beta_2 dsf + \epsilon_i$$

Where:

- **EXPRT** : Exports of goods and services;
- **invx** : Investment (FDI) as a percentage of GDP;
- **dsf** : Gross Capital Formation (GCF) as a percentage of GDP;
- **β_2, β_1** : The Elasticities of (FDI) and (GCF), respectively;
- **ϵ_i** : Represents the random error term.

3.1 Testing the Stationarity of Time Series:

"The unit root test is one of the most important methods for determining the stationarity of time series data. Its objective is to examine the time series of the variables under study to assess their stability. This is a critical condition for cointegration".

Table (01): Time Series Stationarity -(ADF) Test

First Difference			Level			Variable
Intercept	Trend and Intercept	None	Intercept	Trend and Intercept	None	
4.515738 (0.0019)	4.407303 (0.0107)	4.594026 (0.0001)	1.186350 (0.6621)	1.773173 (0.6844)	0.998427 (0.2758)	EXPRT
4.780712 (0.0017)	4.542844 (0.0114)	5.012053 (0.0001)	4.662095 (0.0013)	4.754088 (0.0049)	3.415287 (0.0016)	INVX
3.761170 (0.0102)	3.807238 (0.0358)	3.829577 (0.0006)	2.219590 (0.2051)	1.213294 (0.8836)	0.400095 (0.7908)	DSF

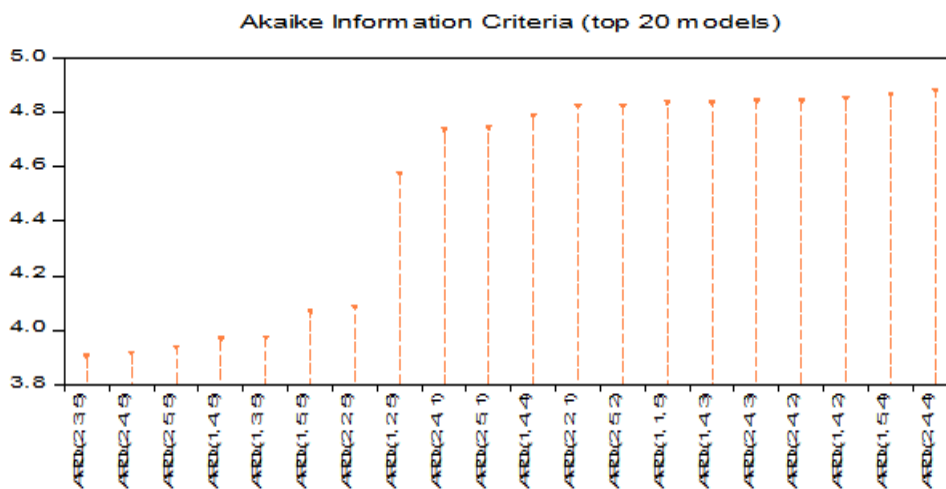
The source: Compiled by the researcher -Eviews10

"We observe from Table 01 That the outcomes of the time series stationarity test for the three models using the ADF test show that they are not stationary at the level. However, after first differencing (I(1)), the series became stationary and integrated at a 5% significance level. Therefore, this result provides a clear justification for the use of the (ARDL) model".

3.2 Determining the Optimal Lag Length:

This can be explained in the table shown below.

Figure (02): Determining the Optimal Lag Length



The source: Compiled by the researcher -Eviews10

"From Figure 02, we observe that among the estimation of 20 lag models, the best model for the variables in the study is the ARDL (2, 3, 5) model, according to the AIC criterion for estimating the long-run equilibrium relationship".

3.3 Cointegration Test Using the Bounds Method:

"The main goal of this test is to verify whether there is a long-run relationship between the dependent and independent variables in the study model".

Table(02): Bounds Testing Method

K	Value	F-Statistics
2	8.780298	
	<u>Asymptotic:</u>	
	n=1000	
I 1	I 0	<u>Signif</u>
3.35	2.63	%10
3.87	3.1	%5
4.38	3.55	%2.5
5	4.13	%1

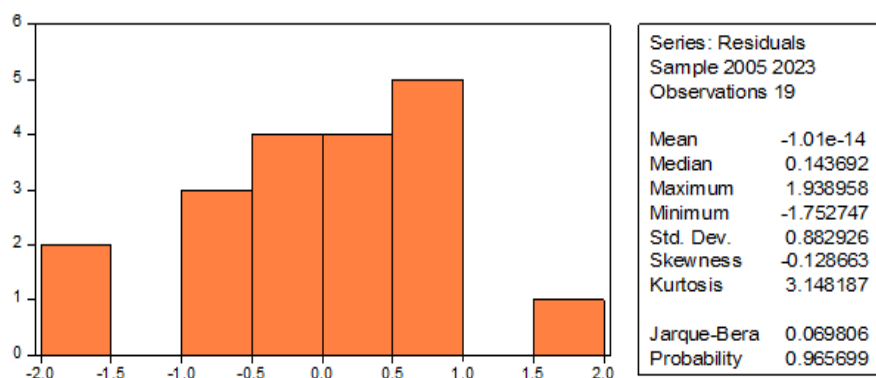
The source: Compiled by the researcher -Eviews10

From Table 02, we observe that the F-statistic for the bounds test is 8.780298, which is significantly greater than both the upper bound (I1) and the lower bound (I0) at the 10%, 5%, 2.5%, and 1% significance levels.

3.4 Diagnostic Tests:

"Among the most important diagnostic tests for the (ARDL) model, the following were addressed":

Figure (03) : Normality Test for Model Residuals



The source: Compiled by the researcher -Eviews10

"The results of the normality test for the residuals indicate is confirms the acceptance of the null hypothesis, which suggests that the residuals follow a normal distribution".

Table (03): LM Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.952954	Prob. F(2,4)	0.1631
Obs*R-squared	11.32781	Prob. Chi-Square(2)	0.0035

The source: Compiled by the researcher -Eviews10

"The findings of the autocorrelation test, As presented in the table above, indicate that the F-statistic equals 2.952954 with a p-value of 0.1631. This p-value is much greater than the 5% significance level, leading us to accept the null hypothesis, meaning there is no issue with serial correlation in the residuals".

Table (04): ARCH Test

Heteroskedasticity Test: ARCH

F-statistic	0.649060	Prob. F(1,16)	0.4323
Obs*R-squared	0.701726	Prob. Chi-Square(1)	0.4022

The source: Compiled by the researcher -Eviews10

"Heteroscedasticity refers to a systematic pattern in the errors where the variance of the residuals is not constant. The results presented in the figure below show that the F-statistic equals 0.649060 with a p-value of 0.4323, which is greater than the 5% significance level. This leads us to accept the null hypothesis, which states that the variance of the residuals is constant, meaning that the estimated model does not have an issue with heteroscedasticity".

3.5 Estimating the ARDL Model

"In order to estimate the (ARDL) model and determine the relationships in the long and short run, several stages were followed, as outlined below".

Table (06): Estimation of the (ARDL) Model

Dependent Variable: EXPRT
Method: ARDL
Date: 11/15/24 Time: 13:56
Sample (adjusted): 2005 2023
Included observations: 19 after adjustments
Maximum dependent lags: 2 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (5 lags, automatic): INVX DSF
Fixed regressors: C
Number of models evaluated: 72
Selected Model: ARDL(2, 3, 5)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
EXPRT(-1)	0.399328	0.198993	2.006746	0.0916
EXPRT(-2)	0.275538	0.257091	1.071752	0.3250
INVX	7.870752	3.576375	2.200763	0.0700
INVX(-1)	-7.230466	3.467531	-2.085192	0.0821
INVX(-2)	-9.991872	4.475311	-2.232665	0.0670
INVX(-3)	5.918737	4.180927	1.415652	0.2066
DSF	-0.925606	0.180012	-5.141905	0.0021
DSF(-1)	0.468749	0.273968	1.710962	0.1379
DSF(-2)	-0.224979	0.345721	-0.650753	0.5393
DSF(-3)	0.172348	0.208219	0.827725	0.4395
DSF(-4)	0.248062	0.218524	1.135167	0.2996
DSF(-5)	-0.524536	0.131812	-3.979421	0.0073
C	42.02353	10.90977	3.851917	0.0084
R-squared	0.992366	Mean dependent var		32.39906
Adjusted R-squared	0.977098	S.D. dependent var		10.10518
S.E. of regression	1.529272	Akaike info criterion		3.903203
Sum squared resid	14.03204	Schwarz criterion		4.549398
Log likelihood	-24.08043	Hannan-Quinn criter.		4.012565
F-statistic	64.99527	Durbin-Watson stat		3.174392
Prob(F-statistic)	0.000024			

*Note: p-values and any subsequent tests do not account for model selection.

The source: Compiled by the researcher -Eviews10

"From the results of the ARDL model estimation, we observe that the R-squared value equals 99.2366%, indicating that the independent variables, namely Foreign Direct Investment and Gross Capital Formation, explain 99.23% of the variation in exports. The remaining 0.77% can be attributed to the margin of error, other variables not included in the model, or measurement errors. We also observe that the calculated F-statistic value equals 64.99527, which is greater than the critical value at the 5% significance level. This suggests that the model as a whole is appropriate and statistically significant".

3.5.1 Estimating the Long-Run Model:

"After establishing the presence of a long-term relationship between the study variables, as evidenced by the results of the bounds testing method, we now proceed to estimate that as follows":

Table (07): The Long-Run Parameters

J

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INVX	-10.55825	33.04341	-0.319527	0.7602
DSF	-2.417345	0.827453	-2.921430	0.0266
C	129.2498	34.61167	3.734283	0.0097

EC = EXPRT - (-10.5583*INVX - 2.4173*DSF + 129.2498)

The source: Compiled by the researcher -Eviews10.

"From the table above, we observe that the estimated long-run constant term of 129.2498 is positive and statistically significant. However, we notice that the impact of Foreign Direct Investment on exports is economically negative and statistically insignificant in the long run. This indicates an inverse relationship between FDI and exports, meaning that for every one-unit increase in FDI, exports will decrease by 10.55825 units. Additionally, we see that Gross Capital Formation (GCF) also has a negative impact on exports in the long run. This suggests an inverse relationship between GCF and exports, meaning that for every one-unit increase in GCF, exports will decrease by 2.417345 units. This finding aligns with the characteristics of the Algerian economy, which is primarily dependent on the hydrocarbons sector".

3.5.2 Estimating the Error Correction Model (ECM) Methodology:

"For this test, two conditions must be met:

- The CointEq(-1) should have a negative sign.
- It should be statistically significant".

Table (08): Results of Estimating the Short-Run Relationship

ARDL Error Correction Regression
 Dependent Variable: D(EXPRT)
 Selected Model: ARDL(2, 3, 5)
 Case 2: Restricted Constant and No Trend
 Date: 11/15/24 Time: 14:08
 Sample: 2000 2023
 Included observations: 19

ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXPRT(-1))	-0.275538	0.129578	-2.126424	0.0776
D(INVX)	7.870752	2.427661	3.242113	0.0176
D(INVX(-1))	4.073135	2.842799	1.432790	0.2019
D(INVX(-2))	-5.918737	2.175424	-2.720728	0.0346
D(DSF)	-0.925606	0.083236	-11.12027	0.0000
D(DSF(-1))	0.329104	0.144409	2.278975	0.0629
D(DSF(-2))	0.104126	0.118112	0.881585	0.4119
D(DSF(-3))	0.276474	0.107981	2.560384	0.0429
D(DSF(-4))	0.524536	0.102842	5.100380	0.0022
CointEq(-1)*	-0.325134	0.044795	-7.258222	0.0003

R-squared	0.964688	Mean dependent var	-0.685609
Adjusted R-squared	0.929377	S.D. dependent var	4.698565
S.E. of regression	1.248646	Akaike info criterion	3.587413
Sum squared resid	14.03204	Schwarz criterion	4.084486
Log likelihood	-24.08043	Hannan-Quinn criter.	3.671538
Durbin-Watson stat	3.174392		

* p-value incompatible with t-Bounds distribution.

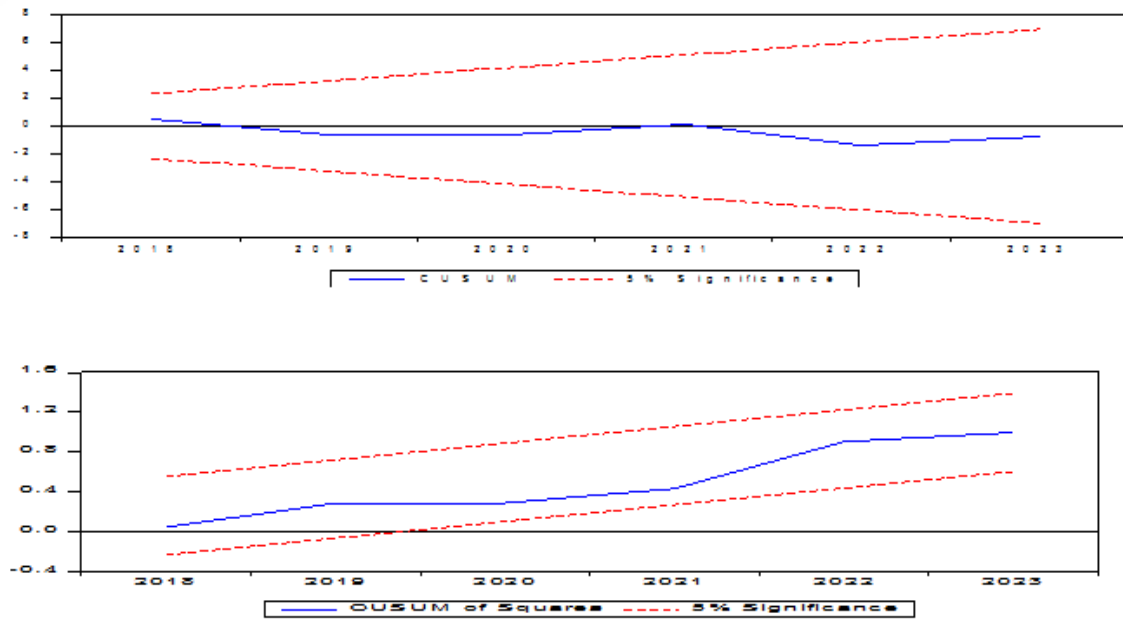
The source: Compiled by the researcher -Eviews10

"From Table 09, we observe that the error correction term (CointEq(-1)) has a negative and statistically significant value of -0.325134, confirming the existence of a long-run equilibrium relationship between the studied variables in the short term. Moreover, the effects of both (FDI) and (GCF) on exports in the short run are positive and statistically significant".

3.6 Structural Stability Test for ARDL Model Coefficients:

"The aim of this test is to ensure that the data used in this study are free from any structural breaks over time. Additionally, it helps assess the degree of consistency and stability between the long-run and short-run parameters.

Figure (03): CUSUM of Squared and CUSUM Test



The source: Compiled by the researcher -Eviews10

"From the figure above, we observe that both the CUSUM and CUSUM of Squares tests lie within the critical bounds, within the confidence interval at the 5% significance level. This indicates that the study variables are stable, and the model remains consistent over both the long and short term".

4. Conclusion:

The goal of this study was to assess the effect of Investment (FDI) on Algerian exports by first addressing the theoretical aspects to understand the nature of FDI, its key driving factors, and the concept and types of exports. In addition, the study examined the effect of FDI on Algerian exports over the period from 2000 to 2023 by conducting an empirical analysis using the (ARDL) model.

4.1 Results of the Study:

- Exporting is considered one of the easiest ways to enter foreign markets through economic diversification, as it does not require significant efforts.
- Investments have helped diversify the Algerian economy to some extent, reducing its traditional reliance on oil and gas exports.
- The impact of investment on Algerian exports was found to be negative and statistically insignificant in the long run, indicating an inverse relationship between FDI and Algerian exports. Specifically, for every one-unit increase in foreign direct investment, the GDP would

decrease by 10.55825 units. This finding is largely consistent with the characteristics of the Algerian economy.

- The impact of gross capital formation on exports was found to be negative in the long run, indicating an inverse relationship between gross capital formation and exports. Specifically, for every one-unit increase in gross capital formation, exports would decrease by 2.417345 units.
- The impact of both foreign direct investment and gross capital formation on exports in the short run was positive and statistically "

4.2 Study Recommendations:

- The Algerian authorities should place significant emphasis on investing in renewable energy and economic diversification by thoroughly reviewing and updating the investment law. They should also focus on keeping pace with technological advancements by addressing existing drawbacks and obstacles.
- It is essential to accelerate integration into international markets and economic diversification.
- Improving the structural indicators for investment in renewable energy in Algeria by tackling corruption and promoting competition in the markets.
- Algeria should learn from the experiences of countries that have successfully created an attractive investment climate and environment in the renewable energy sector.
- There should be continuous coordination and communication between the relevant authorities and ministries to achieve the goals of promoting and enhancing foreign direct investment in Algeria, in order to develop Algerian exports, diversify the economy, and reduce dependency on oil".

5. Referrals and references:

Al-Dajar, F. (2002). Arab Export Marketing, Mechanisms for Activating International Marketing and Major Arab Free Trade Areas. Cairo: Dar Qabaa for Printing, Publishing, and Distribution.

Aliya, M. B. (1990). The Economic Dictionary. Beirut: Lebanon: Arab Institute for Studies and Publishing.

Aqsaam, Q. (2002). National Accounting. Algiers: National Publishing Office.

Bongab, M., & Lazhari, Z. (2018). The Impact of the Investment Climate on Foreign Direct Investment Flow (Case Study of Algeria). *Journal of Marketing Studies and Business Management* , 2 (1).

Bouabid, M. (2021). The Role of the Investment Climate in Attracting Foreign Direct Investment in Singapore. *Algerian Journal of Security and Development* , 10 (2).

Boudlala, A. (2017). Evaluating the Algerian Experience in Attracting Foreign Direct Investment under the Partnership with the European Union. *Business and Trade Economics* , 2 (2).

Corinne, P. (2006). *commerce international* (éd. 6 édition). paris: dunod.

Khalil, K. A. (1997). *Dictionary of Economic Terms*. Lebanon: Dar Al-Fikr Al-Lubnani.