Journal of Economics and Sustainable Development
Volume: 07 / N°: 01 (2024), P:292-304
ISSN : 2661-7986 EISSN: 2773-2606

THE IMPACT OF FOREIGN DIRECT INVESTMENT ON EXPORTS IN ALGERIA PERIOD 1980-2020

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Received:*24/09/2023* ***Accepted:****20/02/2024* ***Published:****01/03/2024*

Abstract:
Algeria is interested in raising the value of domestic and foreign investments, especially in order to improve the economic situation and raise the value of exports, and this can only be achieved through improving the investment climate.
This study aims to try to shed light on foreign investment in Algeria and its impact on exports, by applying the Autoregressive Distributed Time Gaps (ARDL) model, in order to study the impact of changes and developments of variables in the short and long term, as the study concluded that foreign direct investment affects the Exports in the long term increased by 0.36%, while the inverse relationship between exports and domestic investment remains due to the latter's directing to domestic consumption

Keywords: Foreign direct investment, exports, domestic investment, competitiveness, economic growth

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Introduction

The promotion of competitive today is more than ever before an indispensable basis for each country audited to bright tomorrow, willing to stimulate and maintain an environment that creates a value of their duties and achieving more well-known for its people. Improving the investment environment is the lies shortly to increase investment rates, which is the main engine of economic growth.

In the light of the above, the following problems can be put in advance:

the problem: How extent direct foreign investment in exports in Algeria?

Study hypotheses:

- There is a direct relationship between foreign direct investment and exports.
- Domestic investment has a positive impact on exports, and negative with inflation.

1. There are multiple definitions of FDI that we can draw from:

1.1-Definition of FDI:

According to the International Monetary Fund (FMI): "Foreign direct investment (FDI) is the set of different processes geared towards influencing the market and operating the endemic enterprise in a State other than the parent enterprise"[i].

According to Dr. Farid Al-Najjar : "FDI is every investment made outside its home country in search of a host country in pursuit of a package of economic, financial and political objectives, both for a temporary target and for a fixed term for long-term generations".[ii]

1.2-Definition of exports:

Exports are defined as: "The sum of goods and services sold in foreign markets. It adds that capital incomes appear in the balance of payments as exports because they represent the sale of domestic financial or real elements to foreign investors.[iii]"

1.3- Macroeconomic theories of FDI:

- **New classical growth theory:**

One of the first theories to clarify FDI; Solow[iv] attempted to formulate a growth model with a simple production function and explore key variables that could provide stable growth rates, capturing in its model a specific variable FDI in growth rates. Technological progress and employment growth were seen as external variables, and FDI flows merely increased the

investment rate, leading to a transition increase in per capita income growth, but had no long-term impact on growth.

- **Internal growth theory:**

FDI flows contributed directly or indirectly to the host country's economic growth through technology transfer. Wang[v] considers the effects of FDI activity positive on the domestic State by intensifying production and transferring knowledge to local suppliers and spillover effects by upgrading the quality of their workforce, FDI is the main source of economic growth for the least developed countries Barrell and Pain[vi]. Other studies have found that FDI affects the recipient country's economic growth through new inputs Feenstra and Markusen[vii]. and the emergence of internal growth theory from channels of FDI to promote long-term projected growth of Barro & Sala-i-Martin.

2.PREVIOUS STUDIES:

1. Tawir Amal study, Mukhtari Abdeljabar, entitled "Impact of FDI on exports outside the burning sector in Algeria" during 1990-2018. This study aimed to determine the impact of FDI on exports outside the burning sector and this study was divided into two theoretical aspects, including a theoretical study of both FDI and exports outside the burning sector, Applied side after selecting Ardl distributed temporal gaps self-regression model The results showed a long-term balance between FDI and exports outside Algeria's burning sector, This means that FDI has a long-term impact on exports outside Algeria's incineration sector, i.e., the higher foreign direct investment (FDI), the higher exports outside the incineration sector, always in the long term, several years later.
2. The study of Kadri Mohammed Al Taher, Shilaq Rabah, bin Alia Abdelkader entitled: The reality of FDI in Algeria and its role in the promotion of exports outside of burning This study examines the role played by FDI in the promotion of exports outside the incinerators sector in Algeria during the 2000-2013 period. The impact of foreign investment on exports outside the incinerators sector was assessed in small squares. The study found that the increase in the level of foreign investment flows played a role in increasing exports outside the incinerators sector.
3. Nchuy Mohamed Abd Rabbo Study: The Impact of FDI on Egyptian Exports in the Short and Long Term Using the ARDL Model) (Faculty of Commerce, University of Tanta). This research

aims to determine the impact of FDI on Egyptian exports in the short and long term for 1977-2007 using the ARmodel. First, there is a moral and positive impact of FDI on Egypt's exports in the short term. A second moral and positive impact of all model variables (real exchange rate, GDP, domestic savings, gross fixed capital formation, industry value added). on Egyptian exports in the short term. Thirdly, there is no moral impact of FDI on Egypt's exports in the long term. The Egyptian government must therefore seek to shift from the industrialization strategy to replace imports to the industrialization strategy to encourage exports, so that FDI has a positive impact on exports. These companies can increase exports by benefiting from common markets, customs unions and free zones in developing countries.

4. Dina Ahmed Omar's study, entitled: The impact of exports on foreign direct investment in selected Arab countries, aims to attempt to measure and analyse the factors affecting FDI, particularly exports in a number of Arab countries. Our study relied on the quantitative method of estimating these factors (GNP, exports, inflation, government spending and savings). In order to test the research hypothesis, an applied study was conducted using descriptive and quantitative analysis according to the pilot 1980-2002 curriculum of eight selected Arab countries (Algeria, Bahrain, Egypt, Jordan, Kuwait, Saudi Arabia, Oman, Tunisia) for which data were available and using the SL.S method.
5. Study: Okechukwu D. Anyamele, under the heading:Foreign Direct Investment, Exports, and Education on Economic Growth in Sub-Saharan African.

This paper examines the impact of FDI, exports and education on sub-Saharan Africa's economic growth. Recent studies have emphasized the importance of attracting FDI to developing countries. The question of the impact of FDI, exports and education in developing countries has not been fully examined. Using dashboard data we investigate the impact of FDI, exports and educational attainment on sub-Saharan Africa's economy, the results show that both FDI and exports have a significant impact on sub-Saharan Africa's growth output. The current study indicates an improvement in the search for FDI and exports in sub-Saharan countries by integrating the educational attainment variable, educational attainment production, FDI and exports as a channel through which growth occurs. The study provided policymakers with an additional tool to use in accelerating economic growth through FDI and export-oriented policies in African countries, but perhaps

more pressing is the need to improve educational attainment in sub-Saharan Africa.

6. Study Obiora Okechukwu, and Yun Luo, under the heading: The impact of FDI on Nigeria's export performance.

This paper examines the relationship between FDI and exports in Nigeria using disaggregated FDI and export data. Design/methodology/approach. This paper applies ARDL's joint integration approach to examining the long-term relationship between FDI and exports results. Our results indicate that aggregate FDI has a positive impact and a statistical implication of a long-term impact on total exports. Once exports are classified into oil and non-oil exports, the positive and integrative relationship applies only to oil exports. When disaggregated by FDI in the sector, primary sector and manufacturing sector has a positive and significant long-term impact on the relationship with both total exports and oil exports but FDI in the services sector does not appear to have any significant impact on Nigeria's exports.
Authenticity/value. This is the first paper to use sectoral FDI and data export classification to examine the relationship between FDI and exports in Nigeria.

3.Model Estimation:

3.1 Data and study methodology:

This study uses annual data for the Algerian economy covering the period (1980-2020). The beginning of the period was chosen due to developments in oil prices and their impact on exports. The decline in hard currency revenues caused a decline in imports, as well as developments in domestic prices and exchange rates. Data were collected from the World Bank database (World Bank, 2021). In line with recent trends in time chain analysis, which makes economic relationships measurable and quantifiable, we will use the ARDL model to study the impact of variables' changes and developments.

3.2 Study Model:

To study the relationship between the dependent variable and the autonomous variables, we use a linear regression model to study the export function we would like to test through this study, and to predict the values of its variables where it carries the following general mathematical shape:

$$\mathbf{EX = f(FDI, INV)} \quad \textbf{(01)}$$

The model's standard format is as follows:

$$\mathbf{EX_t = \beta_0 + \beta_1 FDI_t + \beta_2 INV_t + \mu_t} \dots\dots\dots\dots\dots (02)$$

Dependent variable: exports;

Independent variables: The elements influencing the dependent variable are as follows:

1. FDI: direct foreign investment;
2. Domestic investment: (investment), (INCt)

Table number (01): Défini Model Variables:

unity	symbol	index	variable
dependent variable			
United States dollar fixed prices in 2010	EX	Value of all goods and services provided to the rest of the world	**export**
independent variables			
Dollar (s) current)	FDI	FDI, net inflows (balance of payments, current US dollar prices)	**foreign direct investment**
Fixed Prices for Local Currency	INV	Total expenditure on the increase in the economy's fixed assets plus net changes in the level of inventory.	**local investment**

Source: Prepared by researchers

3.3 Estimate study model:

As a result of the heterogeneity of time series data, the series (exports and FDI) in US dollars and domestic investment is estimated in Algerian dinar local currency, and therefore we deal with the natural logarithm of these chains, as follows:

$$LnEX_t = \beta_0 + \beta_1 LnFDI_t + \beta_2 LnINV_t + \mu_t \dots\dots\dots\dots (03)$$

Where:

The efficiency factor, which is independent of fluctuations in independent variables, measures the value of exports.

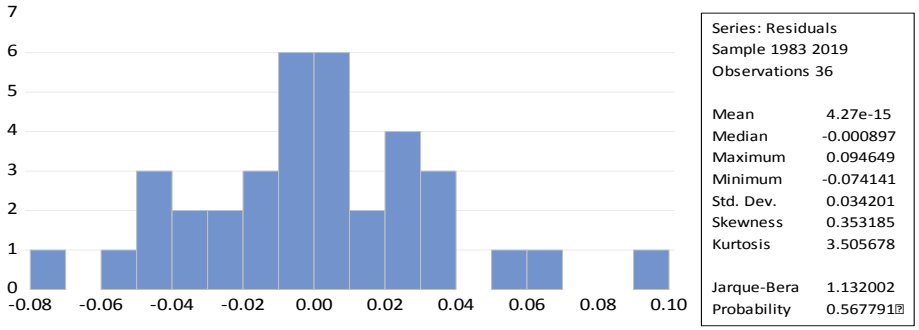
The amount of error, the rest of the indicators are non-model variables, which affect exports;

Model parameters:

1. Natural Distribution Test:

It is necessary before the beginning of the estimation process, to test the normal distribution of the model (Normality Test), by conducting a test (Jarque & Bera,1987) and by reading the outputs of EViews.12, we were assured of acceptance of the imposition of zero (H0) confirming the normal distribution of the portfolio, as the probability value (Jarque-Bera) reached (Probability greater than the Noble = 0.567791).

Figure 1: Natural Distribution Test



Source: Prepared by researchers based on the outputs of the Eviews.12 programme

2.Test of stability (stillness)

In order to avoid the false deviation as pointed out (Granger & New Bold, 1974), and to determine the appropriate method of assessment, tests of "Unit Root Test" must be carried out, where the majority of time series suffer from this false deviation as indicated by Nelson & Plosser,1982) and Peter, 1986.

To analyse the characteristics of the mono-time chains used in the study, it must be ensured that they are stable. If they are not stable, we use the root of each variable, using EViews.12, using the ADF: Augmented Dickey-Fuller test statistic test. The results can be summarized as follows:

Table 2: ADF Test Results for Stability

UNIT ROOT TEST RESULTS TABLE (ADF) **Null Hypothesis: the variable has a unit root**				
At Level				
		LNEX	**LNFDI**	**LNINV**
With Constant	**t-Statistic**	**-2.2503**	**-2.22**	**-0.0277**
	Prob.	**0.1927**	**0.2031**	**0.9502**
		No	**No**	**No**
With Constant & Trend	**t-Statistic**	**0.7378**	**-3.2063**	**-1.3618**
	Prob.	**0.9995**	**0.0997**	**0.8569**
		No	*****	**No**
Without Constant & Trend	**t-Statistic**	**0.4738**	**-0.2421**	**1.1062**
	Prob.	**0.8127**	**0.5918**	**0.9275**
		No	**No**	**No**
At First Difference				
		d(LNEX)	**d(LNFDI)**	**d(LNINV)**
With Constant	**t-Statistic**	**-3.3805**	**-5.9754**	**-4.6623**
	Prob.	**0.0178**	**0.0000**	**0.0005**
		**	***	***

With Constant & Trend	**t-Statistic**	**-5.0074**	**-5.8778**	**-4.8813**
	Prob.	**0.0012**	**0.0002**	**0.0017**
		***	***	***
Without Constant & Trend	**t-Statistic**	**-3.4017**	**-6.0338**	**-4.6525**
	Prob.	**0.0012**	**0.0000**	**0.0000**
		***	***	***
Notes: **a: (*)Significant at the 10%; (**)Significant at the 5%; (***) Significant at the 1% and (No) Not Significant** **b: Lag Length based on SIC** **c: Probability based on MacKinnon (1996) one-sided p-values.**				

Source: Prepared by researchers based on the outputs of the Eviews.12 programme

H0: Zero hypothesis, the variable time series contain the unit root, i.e. it is unstable.

H1: Alternative hypothesis, the variable's time chain does not contain the root of the unit, i.e. it is stable.

Through the outputs of the EViews.12 program related to the ADF test to detect the root of the unit in table No. (02), note that at the level (At Level), the independent variable is foreign investment (LnFDI) is static (stable) at the error field (1%) with a cutter and direction, and other independent variables are non-static, leading to the statistical result that the model is inadequate at the level, which requires a test of its age at the first difference. (At First Difference), a test that confirmed the refusal to impose nowhere (H0) that there is the root of the unit, and acceptance of the alternative imposition (H1) that there is no root of the unit at the first difference.

3. Joint Integration Test

Joint integration determines the long-term impact of variables, and there are several ways to conduct the joint integration test, each with its terms and limits, and we will conduct the joint integration test through the "F-Bounds Test" method developed by Pesaran, & Shin, & Smith, 2001.

After reading the outputs of the EViews.12 program, the refusal to impose nowhere was confirmed (H0) that there is no common integration, and acceptance of alternative imposition (H1) that confirms a common integration of model variables, that is, the test proves a long-term relationship between the variables that make up the model, which means that variables move in the same direction in the long term, given that the calculated value (F-statistic = 7.275165) is greater than the table value of the upper limit (I (1) = 4.26) at signif = 5% as shown in the following table:

Table 3: Wald Test for Statistical Calculation (F)

Number of independent	**value**	**statistical test**

variables N		
2	7.275165	Statistical F
Upper Limit I1	Minimum I0	Morale/n = 36
3.585	2.835	%10
4.26	3.435	%5
5.855	4.77	%1

Source: Prepared by researchers based on the outputs of the Eviews.12 programme

4. Diagnostic tests (heterogeneity, model stability)

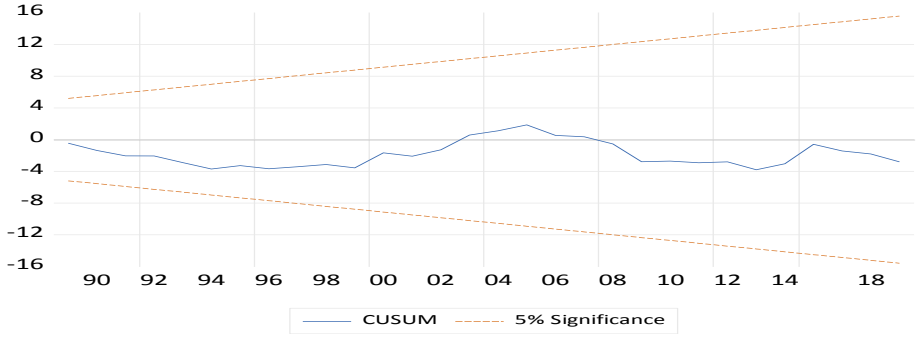
4.1 Heteroskedasticity Test: ARCH:

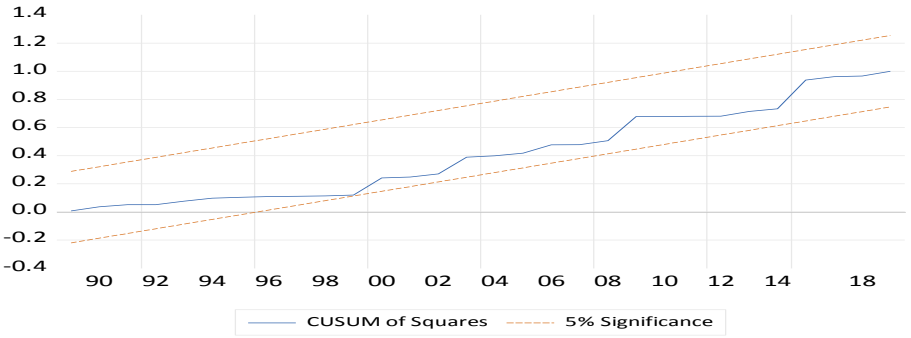
Through the outputs of the (EViews.12) program it can be observed that the probability value of the test (Porob. F (1,32) = 0.3260) is immoral at the presumed level of morale (5%), meaning acceptance of the alternative imposition (H1) that there is a homogeneity between discrepancies, and refusal to impose nowhere (H0).

4.2 Model Structural Stability Test (Cumulative SOM):

The structural stability of the model is achieved when the chart of each of the two statistics falls (CUSUM) and (CUSUMSQ) are within critical limits at the presumed morale level (5%), transactions are unstable if the graph of the two tests count moves out of bounds, the test is used to ensure that the data in this study is free of any structural changes, and the test shows two important things: the existence of any structural change in the data, and the stability and consistency of the long-term parameters Long Run Coefficients with Short Run Coefficients is one of the most important tests used and accompanied by the ARDL methodology used in this study.

Form 2: Model stability test using CUSUMSQ&CUSUM tests:*





Source: Prepared by researchers based on the outputs of the Eviews.12 programme.

Note figure No. (02) showing test results (CUSUMSQ&CUSUM) We are assured of the stability of the study variables and the consistency of the model between the short- and long-term error correction results, where the graph of the two test counts of this model fell within the critical limits at the presumed morale level (5%). s data ", thus, there is no structural change in the data used in the study, as also evidenced by these tests that there is stability and consistency of abilities and consistency between the results of the parameters over the study period.

4.3Test (Ramsey RESET: Test specification of regression error):

With regard to the appropriateness of the written version of the study data, and through the outputs of the EViews.12 programme, we note the probability of testing (Prob= 0.4626), greater than the presumed level of morale (5%), which means acceptance of the H0 imposition that the model is well described, which means adequate written version of the study data.

4.4 Fault correction factor (ECM: Error correction model):

Through the outputs of the programEViews.12 the correction coefficient can be observed that (Coefficient = -0.124865) is a negative value that meets the theoretical requirements of the coefficient, especially the negative reference, and is confined between [0, -1], and is moral as the value of its morale test (Prob. = 0.0000) Below the presumed level of morale (5%), these terms will ensure an affinity in the model which indirectly means a long-term relationship, so the model in question corrects the error by 12.48% within one period of a full year.

5. Model morale test and binding coefficient:

Before the assessment and testing process it is very important to choose the optimal delay period, the method (ARDL) One of its advantages is to

automatically determine the optimal limit of time slows among a large number of possibilities, which is impossible to handle manually, an estimate that offers us the best model for measurement, and based on a standard (AIC) Of the estimated 486 models, the best slow-down limit as shown in Table 04 is as follows:

Table 4: Optimized slotting of model variables by standard (AIC)

Model variables	**LnINV**	**lnFDI**	**LnEX**
Down tag	**2**	**0**	**1**

Source: Prepared by researchers based on the outputs of the Eviews.12 programme

Through the outputs of the Views.12 program and a statistical reading of Fisher (F-statistic = 211.1883), greater than the tabular value, and Prob (F-statistic) = 0.000000 below the presumed level of morale (5%), we therefore reject the imposition of nowhere (H0) and accept the alternative imposition (H1) which confirms that the model, and therefore, is moral.

To test the interpretation of the independent variables and their impact on the LnEX variable, we use the Adjusted R-squared factor, which means that the independent variables are 96.77% explained by Algeria's export changes and the remaining 0.3.23% by other variables not included in this model.

6. Results of model assessment and economic reading:

For the morale test of the model parameters, and through the outputs of EViews.12, we note that at the level of morale (5%) in the short and long term it is shown that:

In the long term:

Table 5: Results of assessment of equation N (03) and long-term results

Dependent Variable: LNEX			
Variable	**Coefficient**	**Std. Error**	**t-[P-value]**
LnFDI	**0.035993**	**0.013916**	**2.586378 [0.0148]**
LnINV	**-0.346816**	**0.144188**	**-2.405299 [0.0225]**
C	**33.65428**	**4.056868**	**8.295631 [0.0000]**
R-squared	**0.972374**	**DW**	**1.932707**
Adjusted R-squared	**0.967770**		
F-statistic	**211.1883**		
Prob(F-statistic)	**0.000000**		

Source: Prepared by researchers based on the outputs of the Eviews.12 programme

The equation of long-term joint integration is as follows:

EC = LNEX - (0.0360*LNFDI -0.3468*LNINV + 33.6543)

Through the long-term outputs of the Views.12 program represented in Table No. (05) Note that both FDI (LnFDI) are likely (Prob = 0.0148), local investment (LnINV) with probability (Prob = 0.0225) is statistically significant and moral at a level (10%). In the long term, FDI affects exports. The unilateral relationship between FDI and FDI increases by 0.036 units, while the relationship with domestic investment is inverse.

In the short term:

Table 6: Short-term equation assessment results ECM Regression

Dependent Variable: LNEX			
Variable	**Coefficient**	**Std. Error**	**t-[P-value]**
D(LNINV)	**-0.061899**	**0.037483**	**-1.651383 [0.1091]**
D(LNINV(-1))	**0.101172**	**0.039265**	**2.576613 [0.0151]**
CointEq(-1)*	**-0.124865**	**0.022070**	**-5.657802 [0.0000]**
R-squared	**0.502075**	**DW**	**1.932707**
Adjusted R-squared	**0.471897**		

Source: Prepared by researchers based on the outputs of the Eviews.12 programme

In the short term and without delay the likelihood of an independent variable is D (LNINV (1), (Prob = 0.0151) which is smaller than the allowable area of error, meaning that it is statistically significant and can therefore be relied upon in economic analysis as an explanatory variable of the change in export volume, with a short-term expulsion relationship between exports and domestic investment rising by a single unit of 1012.

Conclusion:

Through this study we tried to apply a standard study using the ARDL distributed time gap self-regression model in order to examine the impact of FDI on Algeria's exports during the time period 1980-2020 and in an effort to answer the questions raised, As a first stage, we tried to present the theoretical aspect of the study of some concepts for both variants of FDI and exports outside the burning sector. Both Dickie Fuller and Phillips Perron tested for stability and then estimate the long and short-term relationship model The study showed the following results:

- A long-term balance between FDI and exports in Algeria, which means that FDI has a long-term impact on Algeria's exports.
- Foreign direct investment has a direct impact on exports in Algeria, i.e., the higher the foreign direct investment, the higher the exports, and vice versa, a shortage of foreign direct investment has had a negative impact on exports after several years.

Recommendations:

- The provision of interest-free loans to encourage investment
- Revitalizing the economy and increasing economic growth rates
- Interest in creating an investment climate to attract external funds through the provision of infrastructure.
- Enact laws and provide facilities for investors

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