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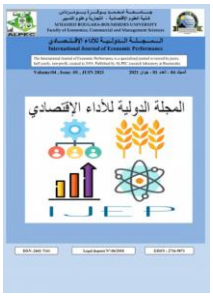

The importance of foreign direct investment in Algeria and its impact on its trade balance using the ARDL model

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Abstract:

This study dealt with the importance of foreign direct investment in Algeria and its impact on its trade balance during the time period of 2003-2018 using the ARDL model. The study concluded that foreign direct investment, gross domestic product and exchange rate have a positive impact on trade balance, and that economic openness has a negative impact on trade balance. Hence, the study recommends diversifying exports by attracting foreign direct investment in the non-oil sectors in order to improve national economy.

Key words: Foreign Investment , Trade balance, Model ARDL.

JEL Classification Codes: F32, F17.

Introduction:

Foreign direct investment is considered done of the most important tools in supporting the growth of world countries economies in general and developing countries in particular. That is why, most countries have adopted new policies and measures by providing facilities, incentives and guarantees, removing obstacles that hinder the flow of these investments and issuing highly encouraging legislations and laws in order to create an attractive investment environment for foreign direct investment.

Foreign trade is the channel that helps transmitting the positive impact of foreign direct to the economies of host countries. Modern studies interested in studying the relationship between foreign direct investment and economic growth is concerned with identifying the impact of foreign direct investment on trade, as foreign trade reflects the development of the movement of trade balance, and thus reveals the nature of this relationship (positive/negative). Foreign direct investment leads to a decrease in the country's imports and/or an increase in the exports of host countries, which is considered an alternative to domestic exports to foreign markets and stimulates further economic growth in host countries. Hence, foreign direct investment is a linking bridge between trade and growth.

1-Study problematic: the Algerian economy suffers from severe irregularities in the external economic balance and a distortion of the trade balance through the deficit exacerbation in non-oil exports despite the relatively abundant economic potential and resources that help attracting many foreign investment projects. That is why; Algeria was forced to resort to foreign direct investment as key source in introducing modern technologies into production, raising the efficiency of local products, and increasing their competitiveness among world countries. In light of the foregoing, the following question is to be asked: to what extent can we know the impact of foreign direct investment in Algeria on improving its trade balance? To answer this question, the following subject is to be studied:

- Analysis of the development of foreign direct investments in Algeria, with reference to their ranking.

- Analysis of the development of foreign trade in Algeria.

- Measuring the impact of foreign direct investment in Algeria on trade balance using a model.

2- The study importance: nowadays, foreign direct investment is an absolute necessity to finance the requirements of the nation's growth and economic development, as it plays a significant role in improving trade balance. This importance is illustrated in the provision of foreign currency by exports and their contribution in financing imports to meet the requirements of the economic growth process.

First: The concept of foreign direct investment and its importance

1-1-The concept of foreign direct investment: according to the World Trade Organization that a stable investor in one country owns an asset located in another country, with his intention to manage that asset. Therefore, the administrative dimension is the most important characteristic that distinguishes foreign direct investment from Portfolio investment (Hassan and Abdel Ghaffar, 1998 :8).

According to the International Monetary Fund, it is defined as taking a contribution to a foreign company by creating a branch or buying all or part of a pre-existing local company, with the aim of exercising permanent control over it, unlike when buying shares for a purely financial purpose (De Laubier. D, 1993:4).

As defined by the Algerian legislator, it is investment that expands production capabilities by raising productivity and increasing the number of business. It is every activity linked to the expansion of the institution in various ways through productive capacities created for goods and services, especially the granting of incentives.(Order No. 01-03 dated in August 20, 2001).

1-2-Forms of foreign direct investment:

Foreign direct investments in the host countries take different forms, including:

1-2-1-Joint foreign direct investment: It is defined as a project in which two or more parties from two different countries are permanently owned or participated in - the foreign investor and the local capital - and the participation here is not limited to the share in the capital, but extends to management, expertise and patents. Or trademarks ...etc.(Abu Qahaf, 1989:27)

1-2-2-Investments wholly owned by a foreign investor, it is also called independent investment (Abu Qahaf, 2002:170). This type is preferred by multinational investment institutions, where they have wholly owned production or service branches, as they take over supervision, management, control and decision-making authority. (Said, 1998: P19).

1-2-3-Assembly Operations projects or operations: This type is embodied by carrying out merger operations of national companies with international companies

and owning a share of the capital of national companies by foreign investors (Fodhil, 2004:28). It may take the form of joint investments or the form of full ownership of the foreign investor (Attia, 2001:163). In most cases, the foreign party provides expertise, factory interior design, process flow, storage methods and capital equipment in return for an agreed upon return.

1-2-4-Investment in the free zones: The customs free zone is considered an extension of the outside, but it is subject to national sovereignty from a political point of view, and in general, it is allowed within the free zone to establish special projects with foreign, national or joint capital, which local and foreign goods are traded. It has some industrial operations, and customs duties are not paid on those goods except when they cross the borders of the free zone into the country (Abdel Muttalib, 2008:85).

1-2-5-Investments in infrastructure projects: These are in the form of concession contracts with a duration of between 20 to 50 years, directed at infrastructure projects. This type is beneficial for both parties, the government and the foreign investor, as the government needs these projects to advance development, while the foreign investor sees projects as economically feasible for him and bring economic returns during the concession period(Boulkour, 2009:219).

1-3-The importance of foreign direct investment:

The development of countries today is measured by the size of their investment returns, which are one of the most important material factors for raising national income and the standard of living, because of its economic, social and strategic importance that can be allocated as the following points (Al-Quraish, 2001: 24-26) :

• Possession of the latest production technology methods; (Raising the efficiency of national labor...) Possessing advanced administrative methods; (Optimum utilization of economic resources, reducing production costs, following modern scientific methods in the areas of storage);

• The huge amount of capital owned by foreign direct investments, to cover various economic development projects;

• The establishment of many industries that supply the foreign project with needs or maintenance;

• Contributes to increase productivity and helps to create new industries;

• Providing the foreign investor with advertising and marketing experiences and prior communication channels with global markets.

Second: Algeria's ranking in quantitative indicators of the business climate in Algeria and its share of investment flows

2-1-The development of quantitative indicators of the business climate in Algeria: The table below shows that most indicators didn't register any improvement but a significant and continuous decline during the selected years due to the difficulty of obtaining licenses in term of high costs, long deadline and the hindering administrative management of a centralized and bureaucratic nature. In 2020, the index of extraction and building permits and the index of access to electricity, in addition to the index of trade across borders knew a remarkable improvement. Yet, foreign investors still face many obstacles to work in the Algerian market; which reduce the nation attractiveness as an incubator for foreign direct investments.

Table No. (1): Ranking in quantitative indicators of the business climate in Algeria for the selected years

Sub-indicators	2010	2012	2014	2016	2018	2020
Ranking on Doing Business Topic-Algeria	136	148	153	163	166	**157**
Starting a Business	147	153	164	145	145	**152**
Dealing with Construction Permits	110	118	147	122	146	**121**
Getting Electricity	122	164	148	130	120	**102**
Registering Property	160	167	176	163	163	**165**
Getting Credit	135	150	130	174	117	**181**
Protecting Minority Investors	73	79	98	174	170	**179**
Paying Taxes	168	164	173	169	157	**158**
Trading across Borders	122	127	133	176	181	**172**
Enforcing Contracts	123	122	129	106	103	**113**
Resolving Insolvency	51	59	60	73	71	**81**

Source: World Bank Group, Doing Business 2010, 2012, 2014, 2016, 2018-2020. http: //www .doing business.org/data/exploreeconomies/algeria.

2-2- The development of foreign direct investment flows in Algeria:

At the turn of the new millennium, Algeria started attracting more investments due to a series of reforms that have granted local and foreign investors many valuable privileges, namely, legislative reforms represented in the issuance of Order No. 01-03 dated in August 20, 2001 calling for the establishment of investment promotion agencies along with an association agreement with the European Union in preparation for joining the World Trade Organization. In addition to that, the Algerian government granted a license to Orascom Telecom and privatized the Iron Industries Company in the Hajjar region to the Indian company ISPAT.

In 2006, the Algerian economy knew an increase in flows of 1795 million dollars, i.e. 66.05%thanks the issuance of Order No. 06-08 of July 15, 2006, amending and completing articles of Law 01-03 of August 20, 2001, in addition to selling the third license to the Kuwaiti Al-Watania Telecom Company, which lead to a maximum increase in 2009 compared to previous years to 2746 million dollars, despite a decline in the pace of global investments due to the global financial crisis. However, the year of 2010 knew a decline of $2,264 million, meaning a growth rate of 19.2%, which can be justified by the end of the economic growth support program by 2009. The year of 2011 knew an increase in inflows of $2571 million, due to Algeria's announcement of significant investment plans to attract foreign direct investments, namely, the Electricity and Gas Company "Sonelgaz": $24 billion during the year of 2016, in addition to the announcement of the French Total alliance of an investment of $920 million for developing Timimoun fields by 2013.This growth started to fluctuate by 2012 then rose again in 2015, amounting to 1822 million dollars.

Table No. (2): The development of foreign direct investment flows during the period(2003-2019) **million US dollars**

Years	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
FDI	634	882	1081	1795	1662	2594	2746	2264	2571
Years	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
FDI	2005	1737	1718	1822	1877	1232	1466	1381	1125

Source: -Unctadstat .unctad.org/wds/table viewer/tableview.aspx.The Arab Investment Guarantee Corporation, Investment Climate in the Arab Countries 2021, P48.

In recent years, in which Algeria witnessed the flow of foreign direct investment, which amounted to 1381 million dollars in 2019 and continued to decline to 1125 million dollars in 2020, and this is due to the company's rule 51/49, which represents an obstacle to attracting these investments to Algeria, and this affects the business climate.

2-3-Sectoral distribution of foreign direct investment in Algeria: During the period from 2011 to 2015, Arab and foreign investments incoming to Algeria were concentrated on the sectoral distribution as shown in Table No. (3).We find minerals ranked first, followed by real estate, construction, textiles, pharmaceutical products, cars and original equipment, respectively, and health care and auto components occupied the Last ranks in the amounts invested.

Table No. (3) The amounts invested by sectoral distribution in Algeria during the period (2011-2015) Million dollars

sectors	Industrial machine, equipment and tools	Software and information technology	Building material	Aviation and defense	Pharmaceutical	Products original cars	Auto Components	Lunch and tobacco
Amounts invested in the serctor	108.5	17.4	1307	72.2	343.6	291.4	2.3	48.6
sectors	Chemicals	Sustainable energy	Medical devices	Textiles	Telecommunication	Ceramic and glass	Transportation equipment	Metal
Amounts invested in the serctor	6.2	155.5	4.6	947.6	185.9	58.6	121.2	3377.4
sectors	Business services	Healthcare	Real estate	Plastic	Transportation	Financial service		
Amounts invested in the serctor	54.4	2.7	1729.8	26.9	61.2	154.9		

Source: The Arab Investment Guarantee Corporation, Investment Climate in the Arab Countries 2016, P119.

2-4-Geographical distribution of foreign direct investment in Algeria: Table No. (4) shows that during the period from 2011-2015, Spain, Qatar and Turkey, respectively, ranked among the most important countries investing in Algeria according to the amount invested in projects, while Their share is about 65% of the total, with Luxembourg, the United Kingdom and France occupying the other places, respectively. It should be noted that the volume of investments made in Algeria is due to developed countries.

The number of projects established in Algeria reached, as France ranked first with 15 projects, followed by Spain and the United Kingdom with 7 projects each, Germany

ranked third with 6 projects, and the rest came according to the number of its projects, and the number of projects established in Algeria during the period 2011 -2015 with 87 projects. And from it, Algeria acquired 3.5% of the distribution of the total inter-Arab investment projects (number of projects) between 2003 and 2018. In recent years, we find that the number of projects reached 24 projects in 2019 compared to 2018 with 18 projects by 17 companies at a capital cost $9,257 million, creating 10,349 jobs. In 2020, Algeria acquired 6 projects at a cost of $77 million and created 251 jobs.

Table No. (4):The most important countries investing in Algeria during the period (2011-2015)

Countries	Number of projects	Amount (million $)	Number of jobs	Number of companies
Spain	7	2232.1	2880	3
Qatar	2	2150	3089	2
Turkey	2	1737.3	3342	2
Luxembourg	1	837.3	342	1
United kingdom	7	408.7	2659	6
France	15	376.6	1631	13
South africa	1	350	638	1
Switzeland	3	286.2	561	3
Germany	6	175.8	1360	6
Myanmar (Roma)	1	159.8	342	1
Other	42	664.1	3858	39
Total	87	9378	20702	77

Source: The Arab Investment Guarantee Corporation, Investment Climate in the Arab Countries 2016, P119.

Third: The development of foreign trade in Algeria

Foreign trade plays an active role in the national economy. Algeria resorts to global and regional markets to obtain its requirements of various commodities and materials. We will address Algerian exports and imports in terms of commodity composition and geographical distribution during the period (2003-2018), in addition to the development of the trade balance for the same period.

3-1- The development of the foreign trade structure

3-1- Development of Algerian exports during the period (2003-2018)

3-1-1-Commodity structure of exports: The growth rate of non-oil exports of the total Algerian exports during the study period reached 3.6%. The reason is the lack of experience in the field of export, the lack of quality required for production and the high costs of its production because most of its components are imported materials. As

for the growth rate of oil exports from the total Algerian exports, it ranged during the study period between (93% - 98%), knowing that this sector is subject to fluctuations in oil prices as well as the volume of production, and this imbalance in the commodity structure makes Algerian exports vulnerable to shocks and inability to Influencing the global market.

The commodity composition of Algerian exports for the average study period shows the following: Energy, oils ranked first in exports at a rate of 96.5%, and in the second place came semi-manufactured products at a rate of 2.6%, and in the third place came foodstuffs at a rate of 0.5%, and raw materials and Industrial equipment ranked the fourth with a rate of 0.1% and 0.26% respectively, while non-food consumer goods ranked fifth with a rate of 0.04%, and a zero ranking for agricultural equipment .

3-1-2- Geographical distribution of exports: The European Union countries ranked first in total exports, with an average rate of 55.9% in the study period. The countries of the Cooperation and Economic Development region occupied the second place at an average rate of 26.1% in this period. Non-Arab Asian countries were in the third place with an average rate of 7.1% in this period. Latin American countries occupied the fourth place, with an average rate of 5.2% in this period. The rest of the Arab countries and Maghreb countries ranked fifth, with an average rate of 2.6%-2.7% in this period, respectively. while the Remaining European Nations countries and African countries ranked sixth at an average rate of 0.1%-0.3 in this period respectively. It is evident from the foregoing that the oil sector occupies the largest proportion of Algeria's total exports to the European Union countries, which reinforces partnership ties with the two parties.

3-2- Development of Algerian imports during the period (2003-2018)

3-2-1- Commodity structure of imports: The Algerian economy still depends heavily on imports to meet its needs and requirements of various materials and commodities from the outside world. The commodity composition of Algerian imports for the average study period shows the following: Industrial equipment ranked first in imports at a rate of 35.1%, and in the second place came semi-manufactured products at a rate of 23.4%, and in the third place came foodstuffs at a rate of 18.1%, and non-food consumer goods ranked the fourth with a rate of 16.1%, while energy, oils and raw materials ranked fifth with a rate of 3% and 3.5%, respectively, and agricultural equipment ranked sixth with a rate of 0.8%.

3-2-2- Geographical distribution of imports: It shows the distribution of Algerian imports according to the economic zones of their most important economic partners. The European Union countries ranked first in total imports, with an average rate of 51.6% in the study period. Non-Arab Asian countries occupied the second place at an average rate of 18.6% in this period. The countries of the Cooperation and Economic Development region were in the third place with an average rate of 15.31% in this period. Latin American countries occupied the fourth place, with an average rate of 6.2% in this period, while the Remaining European Nations countries and the rest of the Arab countries ranked fifth, with an average rate of 3.1%in this period, Maghreb countries ranked sixth at an average rate of 1.23%in this period. African countries and ocean countries occupied the seventh place at an average rate of 0.82%-0.04% in this period, respectively. It is clear from the foregoing that half of Algeria's total imports are acquired by the European Union due to bilateral and multilateral cooperation agreements, which strengthen the partnership ties between the two parties. However, trade exchange percentage between Maghreb and African countries and Algeria was extremely low to zero during the study period.

3-3- Trade balance:

Trade balance knew a remarkable improvement in the middle of the millennium, as exports increased from 46 billion dollars in 2005 to 79.29 billion dollars in 2008 before marking a decrease of 45.19 billion dollars in 2009 due to the drop in oil prices in the middle of 2008 following the global economic crisis. These facts indicate that the economies of developing countries are vulnerable to fluctuations in the prices of exported raw materials. Following the gradual improvement in oil prices in 2010, trade balance improved, as exports rose by 57.05 billion dollars and to 73.98 billion dollars in 2012, then gradually decreased by $30.02 billion in 2016, and then increased by $41.16 billion in 2018, but it quickly dropped to $35.82 billion in 2019 and continued to decline to $23.79 billion in 2020, due to the pandemic crisis that befell the world, affecting the world's economies.

On the other hand, we find that imports have witnessed an increase, reaching a value of $20.35 billion in 2005, rising to $46.19 billion in 2018, due to the increase in domestic demand for goods, services and various equipment related to investment, after that, it witnessed a decline of $41.93 billion in 2019 and this decline continued to $34.39 billion in 2020, due to the Corona crisis that swept the world.

Table No. (5) : Development of trade balance during the period (2003-2018)

Billion US dollars

Year	Total Exports	Total Imports	Trade Balance	Coverage Rate	Total non-oil Exports
2003	24612	13534	11078	181.85	673
2004	31713	18308	13405	173.22	788
2005	46001	20357	25644	225.97	877
2006	54613	21456	33157	254.53	1184
2007	60163	27631	32532	217.74	1332
2008	79298	39479	39819	200.86	1937
2009	45194	39294	5900	115.02	1066
2010	57053	40473	16580	140.97	1526
2011	73489	47247	26242	155.54	2062
2012	73981	50376	23605	146.86	2187
2013	65917	54852	11065	120.17	2160
2014	95662	58330	37332	164	2810
2015	34668	51702	-17034	67.05	1969
2016	30026	46727	-17844	61.8	1805
2017	35191	46059	-10868	76	1930.3
2018	41168	46197	-5029	89	2830.3

Source: http://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx. and http://www.andi.dz/index.php/ar/statistique/bilan-du-commerce-exterieu.

While the trade balance, it recorded an overflow in 2008 and 2014, amounting to $39.8 billion and $37.3 billion, with a coverage rate of 200.8% and 164%, respectively. The rise in oil prices helped improve the trade balance. However, in recent years, the trade balance recorded a deficit about 5.29 billion dollars due to an increase in the volume of exports to 42.16 billion dollars in 2018 compared to 2017, also witnessed a slight increase in the volume of imports to 46.19 billion dollars, thus the coverage rate rose to 89%, this deficit continued to reach $10.59 billion in 2020 compared to $6.11 billion in 2019.

As for the coverage ratio of non-oil exports to imports during the study period, it ranged between 2.7% and 6.1%, and this indicates the weakness of the export sector due to its incomplete dependence on the export sector.

Fourth: Measuring the impact of foreign direct investment on the trade balance in Algeria

The study relies on the standard quantitative approach in studying the impact between foreign direct investment and the trade balance in Algeria. The study will depend on a standard model for the impact of foreign direct investment on the trade

balance in Algeria with the help of a study used by (Tamim Bayoumi and Gabrielle Lipworth, 1997). This is based on an autoregressive model using ARDL, and the following equation was used in its study as follows:

$$TB = EXP - IMP = f\left[GDP_t, EX_t, OPEN, FDI_t\right] \quad (1)$$

Whereas :

TB: represents the trade balance, which is the difference between the percentage of exports and the percentage of imports in a particular country during a certain period.

EXP: represents total exports: it is regarded as one of the most important economic indicators used to analyze foreign trade, and a main engine for increasing the returns of this sector, it also helps to increase imports to satisfy the local demand of various products in order to diversify the production structure (Behnam, 2013: 183)

IMP: represents total imports: it is one of the most important economic indicators used to analyze foreign trade, as both exports and imports are seen to be valuable components of foreign trade. (Behnam, 2013:183).

GDP: represents the gross local product at constant prices, and it is considered as one of the most important economic indicators in clarifying the level of economic activity. It is also one of the most common measurements used to measure economic growth.

EX: represents real exchange rate, which is the number of units of foreign goods needed to purchase one unit of domestic goods, meaning that the exchange rate is a real concept that measures the relative prices of two goods.

OPEN: represents economic openness. This indicator reflects the relative importance of foreign trade (total exports and merchandise imports) related to the gross local product. It also represents the degree of exposure and connection with the outer world(Al-Sawai, 2010: 283-284).

FDI: represents foreign direct investment.

Assuming that relationship (1) can be represented as:

$$TB_t = \gamma \ (GDP_t)^{\gamma_1} (EX_t)^{\gamma_2} (OPEN_t)^{\gamma_3} (\wedge FDI)_t^{\gamma 4} \quad (2)$$

By taking the natural logarithm of both sides of the previous equation, we get the following equation:

$$\log TB_t = \gamma_0 + \gamma_1 \log GDP_t + \gamma_2 \log EX_t + \gamma_3 (OPEN)_t + \gamma_4 \log(FDI) \quad (3)$$

Where as $\gamma_0 = \log\gamma$

4-1- Unit Root test for stationary: In order to apply the co-integration test, it is necessary to know whether the time series are stable or unstable. This is based on a unit root check for stability testing, using the Augmented Dickey Fuller Test (ADF).

After conducting the stability test for variables using the Extended Dickey-Fuller Test (ADF) for time series, we obtained through the above table. The time series were unstable at level I(0), the exception of economic openness, which is stable at level I(0), the first difference at a significant level (10%), and the rest of the variables were stable at the first difference I(1), such as the trade balance, inflation and foreign direct investment at the level of significance (5%).As for the gross domestic product at a level of significance (1%), whether it is with the presence of a categorical only or with the presence of a categorical and general trend or without them, that is, the time series is free from a unit root and does not contain a false deviation, then it will be integrated of degree I (1).

Table No. (6): Unit Root Test Results of the Variables Using ADF

Variable	At Level			At First Difference			Result
	Without Constant & Trend	**With Constant & Trend**	**With Constant**	**Without Constant & Trend**	**With Constant & Trend**	**With Constant**	
Log TB	-2.45910	-2.48901	-3.86502	-3.87340	-2.28908	-2.34678	Stationary in I(1)
Log GDP	-1.87928	-4.09831	-1.09213	-0.87390	-2.88903	-1.64749	Stationary in I(1)
Log EX	-2.67844	-0.45112	-0.98234	-2.43522	-0.54673	-2.98212	Stationary in I(1)
Log OPEN	-2.76301	-1.09812	2.87903	1.87462	0.93231	-0.98352	Stationary in I(0) & I(1)
Log FDI	-1.65387	-2.02218	-0.23141	-0.73684	-0.76278	-1.84658	Stationary in I(1)

Source : Authors'calculation based on E-views 9.

4-2-Autoregressive Distributed Lag (ARDL) test: The error correction methodology is applied by estimating the ARDL model by estimating the statistical indicators of the variables under study, and through the results of the table below, the explanatory power index shows (0.863), which shows the ability of the independent variables to explain (86%) of the changes in the dependent variable, the trade balance (TB), and that (14%) belong to other variables that were not included in the model. , as well as the model was significant where the calculated (F) value was equal to (5.7635)

and with a significant degree less than 0.01 and this means that the estimated model is highly significant.

Table No. (7): Statistical Indicators for Case Study Using The ARDL model

Test Statistic	Result	Statistic Test	Results
R^2	0.863	**F**	**5.7635**
R^2	0.797	**Prob(F-statistic)**	**0.0009**
AIC	0.764	**H-Q**	**0.8733**
SC	0.987	**D W**	**1.19**

Source : Authors 'calculation based on E-views 9.

Table No. (8): Estimated Long run Coefficient Using The ARDL model

Cointegration Form				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	Prob.
D(LogGDP)	0.279342	0.574829	0.764392	**0.00010**
D(LogEX)	0.045621	0.846311	0.212378	**0.000609**
D(logOPEN)	0.378903	0.341123	0.039833	**0.00000**
D(LogFDI)	0.837202	0.093833	0.281803	**0.00014**
Coint Eq(-1)	-0.782092	0.043216	-5.9484822	**0.00000**
CointEq = TB- (0.342561*logGDP+ 0.534362*LogEX− 0.937645*logOPEN+ 0.987492*logFDI – 4.892121)				
Long Run Coefficients				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	Prob.
LogGDP	0.342561	0.975343	2.430993	**0.03132**
LogEX	0.534362	0.674653	-2.212137	**0.34050**
LogOPEN	0.937645−	0.342527	4.874922	**0.00010**
LogFDI	0.987492	0.435672	0.737382	**0.01321**
C	-4.892121	0.735331	-0.212890	**0.00872**

Source : Authors 'calculation based on E-views 9.

Through the results of the estimation, we note that the model is statistically acceptable at 5% (Fisher probability 0.0009). As for the strength of the correlation between the independent variables and the dependent variable, it explains only (86.3%) of the dependent variable, while the rest (13.7%) is explained by non-dependent variables. included in the form. As for the DW test, it shows that there is no autocorrelation between errors.

As we note that the error correction coefficient [Coint Eq(-1)] is statistically significant with its expected negative sign, and this implicitly indicates the existence of an integrative relationship between the variables, the error correction parameter [Coint

Eq(-1)] amounted to (0.782092) Significant at the (1%) level, meaning that the deviations were corrected at a rate of (-0.782) between two periods of time, as he corrected the error from the short-term to the long-term quickly (78.2%), and that the adjustment is relatively very fast in the sense that there is an integrative relationship between the model variables.

4-3- The bounds test: In order to test the extent of a long-term equilibrium relationship between the CA and the independent variables, the statistic F computed through the bounds test was calculated, by assuming two different hypotheses. The first one (the null hypothesis) implies that there is no co-integration between the model variables i.e. There is an absence of a long-term equilibrium relationship, while the second (alternative hypothesis) states that there is a co-integration between the variables of the model, that is, the existence of a long-term equilibrium relationship (Al-Sawai, 2014, p. 8) (Kuma, 2018, p. 31). The calculated F-statistic value of (6.10985) is greater than the upper bound values of (5.29) at a significance level of 5%, which lead us to reject the null hypothesis implying that there is no co-integration between the variables and the existence of a long-term relationship between the variables during the study period.

Table No. (9): Results from the Bounds Test

Variables	**Test Statistic**		**Result**
F-statistic	6.10985		**Existence of a co-intergration relationship at a signification level of 5%**
Signification	**Lower Bound**	**Upper Bound**	
1%	4.45	4. 02	
5%	4.33	5.29	
10%	3.09	4.12	

Source : Authors 'calculation based on E-views 9.

4-4- auto-correlation test and heterogeneity of variance in the ARDL model: Through the table below, we conclude that the estimated model is free from the problem of autocorrelation according to the (Breusch-Godfrey Serial Correlation LM Test) and according to the (F-statistic) test because the value of (Prob.F) and (Prob.Chi). -Square is not significant at the (5%) level. We accept the null hypothesis and reject the alternative hypothesis, as well as the estimated model being free of the problem of heterogeneity of variance according to the (Heteroskedasticity Test: ARCH) and according to the (F-statistic) test, where the values of (Prob.F) and (Prob.Chi-Square) Not significant at the 5% level.

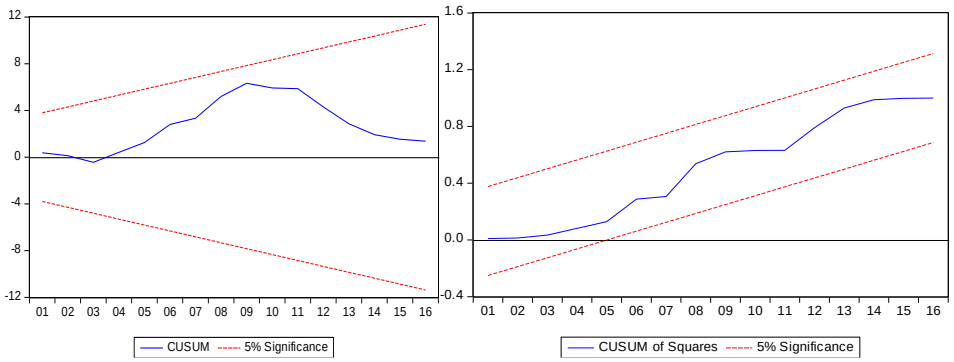
Table No. (10):Serial Correlation Testand Heteroskedasticity Test

Breusch-Godfrey Serial Correlation LM Test			
F-statistic	1.175865	Prob.F	**112390.**
Obs*R-squared	2.574680	Prob.Chi-Square	**284630.**
Heteroskedasticity Test : ARCH			
F-statistic	1.37585	Prob.F	**0.19012**
Obs*R-squared	3.948474	Prob.Chi-Square	**0.30929**
Scaledexplained SS	3.758602	Prob.Chi-Square	**0.67482**

Source : Authors 'calculation based on E-views 9.

4-5-Testing the stability of the estimated model using the test (CUSUM, CUSUMSQ Squares): We test the structural stability of the estimated parameters in UECM format for the ARDL model, by using two tests: the Cumulative Sum of Recursive Residual, CUSUM) as well as the cumulative sum of Square Recursive Residual test (Pesaran, 1997, P121). The period under study, due to their presence within the critical limits at a significant level of 5%.

Fig.1: Sensitivity and Stability Test (CUSUM Test and CUSUM of Squares)



Source : Authors 'calculation based on E-views 9.

Regarding the economic analysis of all the variables under study:

-The GDP is governed by a direct correlation, as we notice an increase in this variable in the short term by 1%, leading to an increase in trade balance by 27%. As for the long-term, an increase of 1% leads to an improvement in trade balance by 34%, which explains that any increase in oil prices leads to an increase in oil exports; thus increases the gross domestic product and improves trade balance and payments balance.

-The real exchange rate is governed by a direct correlation, as it did not deviate from the norm. In the short term, we notice an increase in this variable by 1%, leading to an improvement in trade balance by 4%. As for the long-term, an increase of 1% leads to an

improvement in the trade balance by 53%, which explains the positive role of devaluation in improving trade balance, as the main objective behind decreasing the national currency is the liberalization of foreign trade, the elimination of numerous restrictions imposed on imports, encouraging non-fuel exports and the integration of the national economy into the global market, in addition to attracting foreign direct investment. These changes positively affect the economy in improving trade payment balance.

- Economic openness is governed by an inverse correlation, as it deviates from the norm. In the short term, an increase in this variable by 1% is noticed, which leads to an improvement in trade balance by 37%. In the long term, an increase of 1% leads to a remarkable improvement in trade balance by 93%, which explains the emergence of a deficit in the trade balance in recent years due to the huge value of imports compared to exports completely dependent on fuel, which negatively affected the economy.

- Foreign direct investment is governed by a direct correlation, as it did not deviate from the norm. In the short term, an increase in this variable by 1%leads to an increase in the improvement of trade balance by 83%. As for the long-term, an increase of 1% leads to a large improvement in trade balance by 98%, which explains the direct dependence of economy on investment in the hydrocarbon sector, as being the most important sector attracting foreign direct investment in Algeria, leading to a positive impact on national economy.

Conclusion:

Accordingly, the following remarks are to be drawn:

- Algeria suffers from a very weak and non-competitive investment climate according to the sub-indices of the ease of doing global business index, due to the lack of readiness for international competition compared to other nations' economies. Hence, many reforms are to be made in this regard.

- The present research study found an imbalance in the commodity composition of Algerian exports, as the average period for non-oil exports ranged by 3.5%, compared to oil exports, which ranged between (93% - 98%), exposing it to shocks.

- The diversification of exports and the increase of the non-oil sectors integration help reducing the risks to fluctuations and crises.

- European Union countries rank first in the geographical distribution of exports and imports thanks to bilateral and multilateral cooperation agreements, which strengthen partnerships between the two parties.

- Attracting investments in value-making sectors to promote national economy and avoid the negative impact of fluctuations in oil prices.

- Algeria enjoys a strategic geographic location and economic resources that help attracting foreign direct investment.

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Annex1: Volume of Exports during the period (2003-2018) Million dollars

Year		Total non-oil Exports	Total Exports	Consumer Goods	Industrial Equipment Cmmodities	Agricultural Equipment Commodities	Semi-finished Materials	Raw Materials	Energy and Oil	Foodstuff
2003	Value	673	24612	35	30	1	509	50	23939	48
	%	2.7	100	0.1	0.1	0	2.1	0.2	97.3	0.2
2004	Value	788	31713	16	52	1	552	102	30925	65
	%	2.5	100	0.04	0.2	0	1.7	0.3	97.5	0.3
2005	Value	907	46001	14	36	-	656	134	45094	67
	%	2	100	0.03	0.08	0	1.5	0.3	98	0.1
2006	Value	1184	54613	43	44	1	828	195	53429	73
	%	2.2	100	0.09	0.08	0	1.5	0.4	97.8	0.1
2007	Value	1332	60163	34	46	0.61	993	170	58831	88
	%	2.2	100	0.06	0.08	0	1.7	0.3	97.8	0.1

2008	Value	1937	79298	16.75	67	1.25	1401	333	77361	**118**
	%	2.4	100	0.02	0.08	0	1.8	0.4	97.6	**0.1**
2009	Value	1066	45194	49	42	-	692	170	44128	**113**
	%	2.4	100	0.11	0.09	-	1.5	0.4	97.6	**0.3**
2010	Value	1526	57053	30	30	1	1056	94	55527	**315**
	%	2.7	100	0.05	0.05	0	1.8	0.2	97.3	**0.6**
2011	Value	2062	73489	15	35	-	1496	161	71427	**355**
	%	2.8	100	0.02	0.05	-	2.03	0.2	97.2	**0.5**
2012	Value	2187	73981	16	30	1	1660	167	71794	**313**
	%	3	100	0.02	0.04	0	2.24	0.2	97	**0.5**
2013	Value	2160	65917	17	28	0	1604	109	63757	**402**
	%	3.3	100	0.03	0.04	0	2.5	0.2	96.7	**0.6**
2014	Value	2810	95662	10	15	2	2350	110	92852	**323**
	%	2.9	100	0.01	0.02	0	2.5	0.1	97.1	**0.3**
2015	Value	1969	34668	11	19	1	1603	100	32699	**235**
	%	5.6	100	0	0	0	4.6	0.3	94.4	**0.7**
2016	Value	1780	30026	19	54	-	1321	84	28221	**327**
	%	6.0	100	0.09	0.2	-	4.41	0.3	93.9	**1.1**
2017	Value	1930	35191	20	78	0.29	1410	73	33261	**349**
	%	5.5	100	0.06	0.22	0	4	0.2	94.5	**1**
2018	Value	2830.3	41168.3	33	90	0.30	2242	92	38338	**373**
	%	6.9	100	0.08	0.22	0	5.4	0.2	93.1	**1**

Source:www.andi.dz/index.php/ar/statistique/bilan-du-commerce-exterieure (consulted on 20/07/2022).

- Authors' calculation .

Annex2: Geographical Distribution of Exports during the period (2003-2018) Million dollars

Year		Total	Ocean Countries	African Countries	Rest of the Arab Countries	Meghreb Countries	Asian Countries without Arab Countries	North American Countries	Countries in the Cooperation & Economic Development Region	Other European Countries	European Union
2003	Value	24612	-	13	355	260	507	1220	7631	123	**14503**
	%	100	-	0	1.4	1	2.1	5	31	0.5	**59**
2004	Value	31713	-	26	604	337	699	1480	10068	174	**18325**
	%	100	-	0	1.9	1.1	2.1	4.7	31.7	0.5	**58**
2005	Value	46001	-	49	621	418	1218	3124	14963	15	**25593**
	%	100	-	0.1	1.3	0.9	2.6	7	32.5	0	**55.6**
2006	Value	54613	-	14	591	515	1792	2398	20546	7	**28750**
	%	100	-	0	1.1	0.9	3.1	4.4	37.5	0	**53**
2007	Value	60163	55	42	479	760	4004	2596	25387	7	**26833**
	%	100	0	0	0.8	1.3	6.7	4.4	42.2	0	**44.6**
2008	Value	79298	-	365	797	1626	3765	2875	28614	10	**41246**
	%	100	-	0.5	1	2.1	4.7	3.6	36.1	0	**52**
2009	Value	45194	-	93	569	857	3320	1841	15326	7	**23186**
	%	100	-	0.2	1.3	1.9	7.3	4.1	33.9	0	**51.3**
2010	Value	57053	-	79	694	1281	4082	2620	20278	10	**28009**
	%	100	-	0.1	1.1	2.1	7.2	5	35.5	0	**49**
2011	Value	73489	41	146	810	1586	5168	4270	24059	102	**37307**
	%	100	0	0.2	1.2	2.3	7	5.8	32.7	0.1	**50.7**
2012	Value	71866	-	59	1069	2075	4704	3586	22325	36	**40127**
	%	100	-	0	1.4	2.8	6.4	4.8	30.4	0	**54.2**
2013	Value	64974	-	81	1950	2439	4697	3211	12210	52	**41277**
	%	100	-	0.1	3	3.7	7.2	4.9	18.5	0	**62.6**
2014	Value	62956	-	80	721	3248	4851	3005	10482	49	**40520**
	%	100	-	0.1	1	5.2	7.7	5	16.6	0	**64.4**
2015	Value	34668	71	82	572	1550	2409	1683	5288	37	**22976**
	%	100	0.2	0.2	1.6	4.5	6.9	4.9	15.3	0.1	**66.3**
2016	Value	30026	-	94	663	1368	2531	1678	6251	80	**17561**
	%	100	-	0.2	2.1	4.5	8.3	5.4	20.8	0.3	**58.4**
2017	Value	35191	71	103	799	1273	3595	2530	6465	40	**20386**
	%	100	0.2	0.3	2.2	3.6	10.1	7.2	18.4	0.1	**57.9**
2018	Value	41168	-	132	5351	1669	6950	2660	40	712	**23654**
	%	100	-	0.3	12.9	4.1	16.9	6.5	0.09	1.7	**57.51**

Source:www.andi.dz/index.php/ar/statistique/bilan-du-commerce-exterieure (consulted on 22/07/2022).

- Authors 'calculation .

Annex3: Volume of Imports during the period (2003-2018) Million dollars

Year		Total Imports	Consumer Goods	Industrial Equipment Cmmodities	Agricultural Equipment Commodities	Semi-finished Materials	Raw Materials	Energy and Oil	Foodstuff
2003	Value	13534	2112	4955	129	2857	689	114	2678
	%	100	15.6	36.6	1	21.1	5.1	0.8	19.8
2004	Value	18308	2797	7139	173	3645	784	173	3597
	%	100	15.3	39	0.9	20	4.3	0.9	19.6
2005	Value	20357	3149	8333	186	3981	732	293	3683
	%	100	15.5	41	0.9	19.6	3.6	1.4	18
2006	Value	21456	3011	8528	96	4934	843	244	3800
	%	100	14	39.7	0.4	23	3.9	1	18
2007	Value	27631	3753	10025	156	7104	1324	324	4945
	%	100	13.6	36.3	0.6	25.7	4.8	1.1	17.9
2008	Value	39479	4346	15144	173	10015	1395	594	7812
	%	100	11	38.4	0.4	25.4	3.5	1.5	19.8
2009	Value	39294	6145	15139	233	10165	1200	549	5863
	%	100	15.6	38.5	0.6	25.9	3.1	1.4	14.9
2010	Value	40473	5836	15776	341	10098	1409	955	6058
	%	100	14.3	39.9	0.8	24.7	3.4	2.2	14.7
2011	Value	47247	7328	16050	387	10685	1783	1164	9850
	%	100	15.5	34	0.8	22.6	3.8	2.5	20.8
2012	Value	47490	9955	13699	469	10673	1824	1887	8983
	%	100	21	28.8	1	22.5	3.8	4	19
2013	Value	54852	7473	19897	506	11223	1832	4341	9580
	%	100	13.6	36.3	0.9	20.4	3.3	8	17.5
2014	Value	58330	10287	18906	657	12740	1884	2851	11005
	%	100	17.6	32.4	1.1	21.8	3.2	4.9	19
2015	Value	51702	8676	17200	540	12564	1200	2206	9316
	%	100	16.8	33.3	1	24.3	2.3	4.3	18
2016	Value	47089	8275	15154	726	10321	1490	1987	9136
	%	100	17.6	32.2	1.5	21.9	3.2	4.2	19.4
2017	Value	46059	8114	14585	519	10032	1459	2195	9155
	%	100	17.6	31.7	1.2	21.8	3.2	4.7	19.8
2018	Value	46197	9756	13433	563	10959	1898	1015	8573
	%	100	21.1	29	1.2	23.7	4.2	2.2	18.6

Source:www.andi.dz/index.php/ar/statistique/bilan-du-commerce-exterieure (consulted on 21/07/2022).

- Authors 'calculation .

Annex4: Geographical Distribution of Imports during the period (2003-2018) Million dollars

Year		Total	Ocean Countries	African Countries	Rest of the Arab Countries	Meghreb Countries	Asian Countries without Arab Countries	Latin American Countries	Countries in the Cooperation & Economic Development Region	Other European Countries	European Union
2003	Value	13534	47	125	418	120	1206	567	2242	855	7954
	%	100	0.3	0.9	3.1	0.9	8.9	4.2	16.6	6.3	58.8
2004	Value	18308	66	129	474	160	1654	1071	3119	1526	10109
	%	100	0.4	0.7	2.6	0.9	9	5.8	17	8.4	55.2
2005	Value	20357	-	148	427	217	2504	1248	3506	1088	11219
	%	100	-	0.7	2.2	1.1	12.3	6.1	17.2	5.3	55.1
2006	Value	21456	-	148	493	235	3055	1281	3738	777	11729
	%	100	-	0.7	2.3	1.1	14.2	6	17.4	3.6	54.7
2007	Value	27631	-	231	621	284	4318	1672	5363	715	14427
	%	100	-	0.8	2.2	1	15.6	6.1	19.4	2.6	52.3
2008	Value	39479	-	395	705	395	6916	2179	7245	659	20985
	%	100	-	1	1.7	1	17.5	5.5	18.4	1.7	53.2
2009	Value	39294	2	350	1089	478	7574	1866	6435	728	20772
	%	100	0	0.9	2.8	1.2	19.3	4.7	16.4	1.8	52.9
2010	Value	40473	-	396	1262	544	8280	2380	6519	388	20704
	%	100	-	1	3.1	1.3	20.5	5.9	16	1	51.2
2011	Value	47247	-	578	1760	691	8873	3931	6219	579	24616
	%	100	-	1.2	3.7	1.5	18.8	8.3	13.2	1.2	52
2012	Value	46801	-	677	1536	755	9410	3587	5892	1086	23858
	%	100	-	1.4	3.3	1.6	20.1	7.7	12.6	2.3	51
2013	Value	55028	-	594	2414	1029	10623	3466	6965	1213	28724
	%	100	-	1.1	4.4	1.9	19.2	6.3	12.7	2.2	52.2
2014	Value	58330	-	440	1958	711	12576	3796	8443	886	29494
	%	100	-	0.8	3.4	1.1	21.6	6.5	14.5	1.5	50.6
2015	Value	51702	-	359	1918	680	11850	2822	7363	1225	25485
	%	100	-	0.7	3.7	1.3	23	5.5	14.2	2.4	49.2
2016	Value	47089	-	238	6193	754	11678	2957	6595	1009	21922
	%	100	-	0.5	4.1	1.6	24.8	6.3	14	2.1	46.5
2017	Value	46059	-	186	1542	592	12369	3209	5953	1910	20298
	%	100	-	0.4	3.3	1.3	26.9	6.9	12.9	4.2	44.1
2018	Value	46197	-	166	1904	546	11557	3546	5837	1542	21099
	%	100	-	0.3	4.1	1.1	25	7.6	12.6	3.3	46

Source:www.andi.dz/index.php/ar/statistique/bilan-du-commerce-exterieure (consulted on 24/07/2022).

- Authors 'calculation .