Measuring the Impact of Oil Price Fluctuations on the General Budget in Algeria during the Period (1980-2020)

Mesurer l'impact des fluctuations des prix du pétrole sur le budget général en Algérie au cours de la période (1980-2020)

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Summary: This study targets to measure and determine the impact of oil prices changes on the general budget in Algeria in the course of the period (1980-2020) by using ARDL the Model. This study reveals the short-term and long-term equilibrium relationship between oil prices and public budgets in Algeria in which the model fits economic and statistical standard criteria; However, the study recommends particularly to rationalise public spending and reducing wasteful spending, as well as activating financial policy tools and working to reform the financial and tax instruments, besides of stimulating and diversifying exports.

keyword: General Budget; Oil Prices; Expenses; Revenues

Jel Classification Codes : C52; H61; Q43

Résumé : Cette étude vise à mesurer et déterminer l'impact des variations des prix du pétrole sur le budget général en Algérie au cours de la période (1980-2020), à l'aide du modèle ARDL.L'étude a constaté une relation d'équilibre entre les prix du pétrole et le budget général en Algérie à court et à long terme, outre l'existence d'une relation causale entre le prix du pétrole et le budget général dans un sens, et que le modèle est compatible aux propres critères économiques et statistiques ; Cependant, l'étude recommande en particulier de rationaliser les dépenses publiques et de réduire le gaspillage, ainsi que d'activer les outils de politique financière et de travailler à la réforme des instruments financiers et fiscaux, en plus de stimuler et de diversifier les exportations.

mot-clé : budget général ; Prix du pétrole; dépenses; Revenus

JEL Code de classification : C52; H61; Q43.

I- Introduction :

The fuel sector plays a pivotal role in the Algerian economy, as Algeria relies on oil extraction to finance its development programs and public spending. However, petroleum extraction revenues are subject to oil prices in the global market, which are characterized by volatility and instability. The rise or fall of oil prices constitutes a serious threat to the economic development of several nations worldwide, and Algeria specifically.

This fluctuation and instability in oil prices affects the volume of petroleum revenues, which is reflected in its general budget, by affecting both public revenues and public expenditures. The focus has been on Algeria as one of the countries that depends entirely on the oil resource to collect public revenues; and to find out the repercussions caused by the fluctuation of oil prices on the balance of the general budget according to the oil prices oil prices changes recorded during the period (1980-2020). In addition to this, this research paper trying to analyze impacts of these changes upon the general budget in Algeria by answering the following issue

1.1. The study issue: Based on the above, this research paper seeks to answer the following question:

To what extent do oil price fluctuations affect the general budget balance in Algeria during the period (1980-2020)?

1.2. The Study questions: To answer the main question, the following sub-questions are asked:

How do oil price changes affect the general budget?

What is the nature of the relationship between oil prices and the balance of the general budget in Algeria?

Is there a cointegration relationship between oil prices and the general budget balance in Algeria?

1.3. The Study hypotheses: Special hypotheses were formulated for addressing the aforementioned research questions; The hypotheses are cited as follow:

The fall in oil prices conducts to a deterioration in the balance of the general budget in Algeria.

There is a direct and significant relationship between changes in oil prices and the balance of the general budget in Algeria.

There is a short- and long-term equilibrium relationship between oil prices and the Algerian general budget balance during the period (1980-2020).

1.4. The Importance of the study: The significance of the study lies in analyzing the impact of the oil price changes on the improvement or the deterioration of the general budget balance, based on the comprehensive idea that oil prices have a strong role in influencing the general budget balance in Algeria. This is according to the components and characteristics of the Algerian economy, economic policy measures, and financial policy outcomes.

1.5. The Objectives of the study: The study seeks to address the theoretical framework that links oil prices to the general budget balance by showing the relationship between oil prices and the balance of the general budget in Algeria; and assessing the influence of oil price changes on the general budget balance in Algeria during the period (1980-2020).

1.6. The Boundaries of the study: The time limits are represented by the period (1980-2020), and the spatial limits are represented by the Algerian state, being the subject of the study.

1.7. The Research methodology: In our theoretical study, we relied on the descriptive approach due to its suitability to the nature of the subject. We also relied in our empirical study on the econometric method in order to determine the optimal model to explain the studied problem, as well as the relationship and direction of the impact of oil prices on the general budget balance, by relying on the program Statistical Eviews10.

1.8. The Literature Review: There are many studies that have dealt with the question of the effect of oil price fluctuations on the balance of the general budget in Algeria by description and analysis through the application of different standard models. Among the most important of these studies we mention the following:

a. Bin Dahman's study is safe. Rakrak Mounia, 2007, entitled The Impact of Oil Price Shocks on the Public Budget in Algeria: An econometric Study. This study aimed to investigate the nature of the impact of oil price fluctuations on financial policy in the country. Using Granger causality methodology, during the time period 1970-2014, by determining the direction of causality between crude oil price fluctuations (real oil price, positive oil price shocks, negative oil price shocks) and the most important main variables of fiscal policy in Algeria (government spending, expenditures Management and equipment expenses).The results of the benchmark study indicate, there is a causal relationship moving from oil prices towards the general budget indicators in the country. All of this strongly indicates the need to diversify the economy to reduce the influence of oil price fluctuations on government revenues, and the government should include the planning strategy in terms of country public spending.

b. The study by François Lescaroux and Valérie Mignon, 2008, entitled: On the influence of oil prices on economic activity and other macroeconomic variables, aimed to discover the links between oil prices and macroeconomic variables represented by gross domestic product, unemployment, and the general level of prices, in addition to represented in the stock price index for a large group of countries, including oil-importing and oil-exporting countries, where the two researchers analyzed both short-term and long-term interactions by implementing Granger causality tests, The researchers reached the conclusion that there are different

relationships between oil prices and macroeconomic variables, with a strong causality extending from oil prices to stock prices, especially for oil-exporting countries. As for the impact of oil prices on economic activity variables, a long-term relationship was revealed.

c. Study by Al-Taher Shalihi, 2016, entitled The state's general budget in light of oil price fluctuations, the case of Algeria (2000-2016). This study showed that financing the state's general budget depends largely on petroleum collection, which is instantly linked to oil prices. Changes in oil prices unavoidably affect the proceeds of petroleum collection. The fall in oil prices constitues a challenge to economic stabilization in Algeria, with the budget deficit has worsened and the resources of the Revenue Control Fund have been eroded. The continued decline in prices just as a result of the oil shock will pose another challenge to the persistence of government spending as usual, making it necessary for the government to rethink the expansionary policy pursued and to take different measures to diversify sources of income, mainly to encounter the negative consequences on the state's general budget situation.

d. Study by Abdelmalek Belouafi, 2017, entitled Fluctuations in oil prices and their repercussions on the general budget in Algeria during the period (2000-2016). The study aims to analyze the impact of developments in crude oil prices in the global oil market on the general budget in Algeria during the period (2000-2016). Since the beginning of the current millennium, oil prices have witnessed sharp fluctuations that have clearly affected the public budget in Algeria, which relies on petroleum collections to cover its public expenses. The study concluded that the general budget experienced a noticeable deficit during most of the years of the study despite the recorded rise in oil prices during the period. This is due to the expansionary spending policy pursued by Algeria and to the estimated petroleum collection based on the reference price of petroleum.

e. Study by Idris Amira, 2019, entitled: Oil price fluctuations and their impact on fiscal policy, an econometric study on the Algerian economy (1980-2014). This study aimed to measure the impact of oil price fluctuations on financial policy tools represented in government revenues and expenditures in Algeria, based on Annual data for the period 1980-2014. To achieve this goal, the VAR autoregressive model was used. The study found that a positive structural shock in exchange rates estimated at 1% or one US dollar would cause a positive impact at the beginning of the response period. It is clear from the results that the impact of the expenditure shock will be greater than the revenue shock throughout the response period. Noting that the impact of government spending is greater than the impact of government revenue, which indicates that the policy followed by political decision makers is a pro-cyclical fiscal policy.

f. Study by Belgla Brahim, 2021, entitled Foundations and Principles of Formulating General Budget Policy in Algeria to Face Fluctuations in Global Oil Prices. This study indicated that Algeria's reliance primarily on the hydrocarbons sector has made Algeria's general budget closely linked to fluctuations in oil prices in global markets, and that The result is that public revenues in Algeria are characterized by a special feature, which is that a large part of them comes through petroleum collection revenues, which was evident during the crisis of low oil

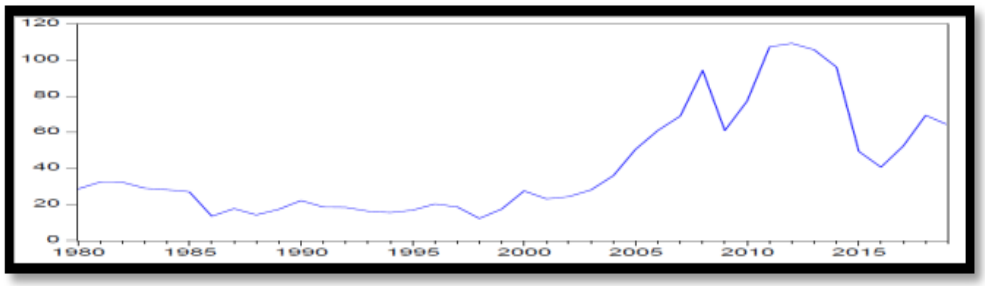
prices since mid-2014, which had a significant negative impact on the budget and oversight of the state's public finances. It succeeded in highlighting and formulating some general principles and measures that are important for managing and evaluating the general budget policy in light of the effects resulting from oil price fluctuations on the general budget in Algeria.

What distinguishes our study from previous studies is that it is original and examines the impact of oil price changes on the balance of the general budget in Algeria during the period (1980-2020), relying on the autoregressive distributed time lags (ARDL) model, in contrast to previous studies that relied on a statistical or analytical study. Or it was econometric ones but differed in its use of the model that expresses the relationship of the dependent variable with the explanatory variable, such as the simultaneous integration model or the VAR model, or in the study period that extended to the year 2020.

II– Methods and Materials:

1. **The historical development of oil prices during the period (1980-2020) :** Oil prices witnessed many changes during this period, as it is exhibited in Figure No. (01).

Figure No. (01): Historical Development of Oil prices during the Period (1980-2020)



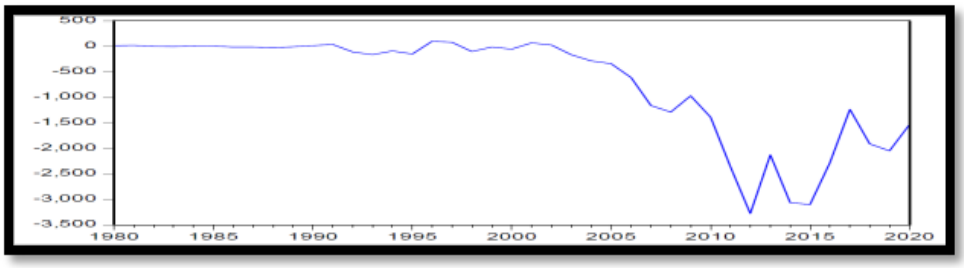
Source: Prepared by the researchers based on OPEC data and the outputs of the EVIEWS10 program.

Through Figure No. (01), it is clear that oil prices witnessed several fluctuations, oscillating between rising at times and falling at other times. Oil prices began to fall due to the Iran-Iraq war in 1980, reaching $39. per barrel in 1981, to record $14 per barrel in 1982 and then $10 in 1986, following the oil crisis of 1986. This decline continued for several reasons, including the decline in demand for oil in 1985, and the intense competition that OPEC countries faced after adopting the quota system and production ceiling. By producing countries that do not join the organization, with the encouragement of the International Energy Agency, such as Britain and Norway (Abdallah, 2006, p. 68). The development and production of petroleum substitutes from coal and natural gas due to the high prices experienced by the petroleum market in the seventies. The difference occurring between the OPEC countries, and the use by Saudi Arabia, the United Arab Emirates, and Kuwait of the policy of raising production, in protest against the high production of countries outside the organization, especially the North Sea (Jaafar, 2011, p. 100). Then oil prices witnessed an improvement during the year 1989 following the Second Gulf War, but this improvement did not last long as it witnessed a sharp decline in 1998, causing the price of a barrel to fall to $12.28. The oil market was exposed in 1998 to a set of circumstances that led to a major imbalance between supply and demand. Oil prices deteriorated, including some OPEC member countries exceeding

their share of oil production due to their economic problems, and Iraq's return to production through the oil-for-food program (Suleiman, 2009, p. 162). By the year 2000, it witnessed a significant improvement, as a result of several economic and political factors, the most important of which were the events of September 11, 2001, the American-British war against Iraq. It was able to follow an upward trend since that time, reaching $28.1 per barrel in 2003, and in 2004 the world experienced an oil shock. Prices rose to $51.1 per barrel, and remained constantly rising until they approached $94.45 per barrel in 2008. This was due to the cessation of Russian production as a result of the dispute between the Russian government and Yukos Petroleum Company, which caused the industrialized countries to increase their demand from the Middle East until OPEC production reached 30 million barrels per day (Sheikh, 2009, p. 15). However, as the global recession deepened in late 2008 and the first months of 2009 as a result of the 2008 financial crisis, oil prices fell to $61.06 per barrel in 2009. This was due to the rampant speculation on oil prices in the beginning, so prices rose to $147 per barrel in July. 2008 (Musa, 2015, p. 65). But in the second half of 2008, prices collapsed after speculation diminished and demand weakened. American banks went bankrupt and mortgage companies collapsed (Mohammed, 2013, p. 334). OPEC took a decision at the Oran meeting to make a collective reduction, withdrawing 4.2 million barrels per day from the market, and prices recovered, recording their highest level at $109.45 per barrel in 2012, despite price movements that were influenced by the geopolitical and security conditions witnessed by some countries in the Eastern region. The Middle East and North Africa, especially after the deterioration of the situation in Libya (Salameh, 2015, p. 14), The decline in the prices of major currencies, especially the dollar, and the sovereign debt crisis that affected a number of European Union countries, in addition to the ban on the export of Iranian oil imposed by the United States and the European Union in 2012, which caused the exit of about one million barrels per day from the market (OAPEC, 2015, p.03). However, this recovery did not last long, as oil prices witnessed a steady decline since June 2014, as the price of a barrel was around $105 in 2013, but it declined to $66 in 2020. This decline is attributed to the interaction between supply and demand, the impact of speculators' activity, and the shale oil boom in The United States, and abundant supplies contributed 60% of the steady decline in prices (OAPEC, 2016, p. 08).

2 The Development of the General Budget Balance in Algeria during the Period (1980-2020) : We track the development of the general budget balance in Algeria through Figure No. (02) below.

Figure No. (02): Development of the general budget balance in Algeria for the period (1980-2020)



Source: Prepared by the researchers based on ONS data and the outputs of the EVIEWS10 program.

We note from Figure No. (02) that the balance of the general budget recorded a surplus during the first four years of the study period, as the year 1980 recorded a surplus of 15.58 billion dinars, then it decreased in 1985 to 6.01 billion. DZD, recording a deficit of (12.03) billion DZD during the year 1986. Then this deficit decreased in 1987, reaching (10.99) billion DZD, then it increased in 1988 to (26.2) billion DZD. This increase is due to the rise in public spendigs by 15.12% in 1988. In exchange for a slight increase in public revenues by 0.55%, the beginning of the

year 1988 witnessed several economic reforms, as the new legislation included amending the directive law for public economic institutions and the law related to planning (Arqoub, 2013, p. 71). This measure aims to reduce general budget expenditures. However, although this contributed to covering part of the budget deficit, its effect was weak (Abdelkader, 2007, p. 334), as the deficit decreased in 1989 to (8.10) billion DZD, i.e. by 69.08%. This is due to a decrease in public expenditures by 4.01%, and also to an increase in the collection of public revenues to 24.49%. As a result of the reforms undertaken by the state, the balance of the general budget recorded a surplus estimated at 16 billion DZD and 36.8 billion DZD during the years 1990-1991, respectively. The reason for this is the increase in public revenues from 152.50 billion DZD in 1990 to 248.90 billion DZD in 1991. This increase was mainly caused by the increase in petroleum collection, which moved from 76.20 billion DA in 1990 to 161.50 billion DA in 1991, i.e. a rate of 111.94%, and also an increase in the revenue of regular collection from 71.10 billion DA to 82.70 billion DA in 1991. But the budget deficit soon returned in 1992, reaching (27.108) billion DZD. The deficit also increased in 1993 by 50.25%, then it decreased by 45% in 1994, then it rose again in 1995 by 65.88%, reaching (88.147) billion DZD. This is due to Due to the decline in oil prices, which fell from 18.4 dollars per barrel in 1992 to 53.15 dollars per barrel in 1995, and to the rise in public expenditures at a faster pace, as they moved from 420.13 billion dinars during 1992 to 724.61 billion dinars during 1995. Then, during the years 1996 and 1997, a surplus of 100.55 billion dinars was recorded. DZD and 81.57 billion DZD, respectively. This is due to the increase in petroleum collection from 496 billion DZD to 564.77 billion DZD during these two years. This is on the one hand and on the other hand the adjustment that affected the exchange rate, through reducing the Algerian dinar and increasing imports of hard currency by The way to liberalize foreign trade, thus opening the way for private individuals to export and import after it was limited to the state. The deficit reappeared again during the years 1998 and 1999 due to the decline in oil revenues, as oil prices moved from $19.49 per barrel in 1997 to $12.94 per barrel in 1998 and then to $17.91 per barrel in 1999. This affected the oil collection revenue, which in turn moved from 564.77 billion. DZD in 1997 to 378.56 billion DZD in 1998. During 2001 and 2002, after economic reforms and the improvement of the exchange rate, financial surpluses reappeared, as the general budget recorded a surplus of 68.71 billion DZD and 26.03 billion DZD, respectively, noting that these surpluses are not surpluses. A reality resulting from productive sectors, but rather from a rentier sector affected by international changes. Starting in 2003, the deficit returned again, and this deficit was due to the rise in public expenditures on the one hand and the decrease in the price of oil on the other hand. Then financial surpluses returned again in the following years, and a surplus of 8.1186 billion dirhams was recorded in 2006, and this indicates that revenues covered The state's expenditures decreased again in 2007 by an amount of 3.579 billion dirhams, then it resumed rising again in 2008, recording an amount estimated at 5.999 billion dirhams. This surplus in the budget is due to the stable situation that Algeria experienced during this stage due to the recovery in oil prices, that was returned in Positively, Algeria's financial resources increased, but the situation quickly deteriorated, and oil prices declined in global markets and state revenues declined, recording a deficit amounting to 5.541 billion dirhams in 2009, which reflects Algeria's impact on the global crisis (Bank, September 2009, p. 110). The budget continued to record a deficit over the following years, but at a low rate, estimated at 74 billion dirhams in 2010 and 5.63 billion dirhams in 2011. This is due to the method of financing this deficit, as the state resorted to financing it through the Revenue Control Fund, as well as cash issuance and financing. Non-banking (Bank, November 2013, p. 110). The general budget deficit increased in 2012, as the deficit was estimated at 8.718 billion dinars. This is due to the inability of public revenues, despite the increase they recorded, to cover public expenditures, which in turn witnessed a significant increase. During the same year, In 2013, the deficit decreased again to reach 6.66 billion dirhams, with a decrease in

state revenues and expenditures by varying amounts, so that budget revenues remained in a continuous decline in light of the increase in expenditures during the years 2014 and 2015, so the deficit worsened, recording an amount of 2.1261 billion dirhams in 2014 and 2.2553 million dirhams Yes, please In 2015, then it decreased again, reaching 74.1234 billion DZD in 2017, then to 51.1913 billion DZD in 2018. This fluctuation is due to changes in oil prices (Bank, December 2019, p. 72), which in turn decreased during this period. From $105 per barrel in 2013 to $64.1 in 2019, which in turn led to a decrease in petroleum collection. Despite the improvement in oil prices in 2020, we note the continued state of the public budget deficit, as this deficit is due to the significant expansion in public expenditures. This indicates the instability of the country's economic situation and its entry into a kind of recession due to the decline in petroleum collection revenues, which reflects the decline in oil prices in international markets.

3. The Study Methodology: To conduct an econometric analysis of the impact of oil price fluctuations on the balance of the general budget of Algeria during the period (1980-2020), we use the annual data covering this period, which were obtained from various official sources, mainly represented by the National Bureau of Statistics and OPEC reports. The state's general budget balance (RB) is expressed as the difference between public revenues and public expenditures, which is a dependent variable. As for the independent variable, it is oil prices (OP).

In this study, we also relied on the bounds approach to cointegration based on the autoregressive distributed lags (ARDL) model, which was developed by Pesaran and Shin (1995), and then Pesaran et al (2001), as this model does not require the same degree of integration for the variables. That is, the tests can be performed regardless of whether the chains are stable at the level I(0), stable at the first difference I(1), or a combination of both, provided that they are not integrated at the second difference I(2) (Pesaran MH, 2001 , p. 289). To ensure this, you must go through the following steps:

Studying the stability of time series, testing cointegration using the Bounds test approach, estimating relationships in the long run, estimating the error correction model, testing the validity of the model through testing the normal distribution of residuals, testing the heterogeneity of variance of the model, testing the autocorrelation of errors, and testing the range Correctness of the functional form used Ramsey RESET, and testing the structural stability of the model CUSUM Test

III- Results and discussion :

The Results of the Study: We explain them through the following steps:

1. Time series stability study: The results are listed in Table No. (01) **below.**

Table No. (01): Testing the stability of time series

UNIT ROOT TEST TABLE (PP)			
At Level		RB	OP
With Constant	t-Statistic	-1.2723	-1.4025
	Prob.	0.6330	0.5714
With Constant & Trend	t-Statistic	-2.2784	-2.1222
	Prob.	0.4355	0.5182
Without Constant & Trend	t-Statistic	-0.7052	-0.3505
	Prob.	0.4032	0.5368
At First Difference		d(RB)	d(OP)
With Constant	t-Statistic	-6.6715	-5.5111
	Prob.	0.0000	0.0000
With Constant & Trend	t-Statistic	-6.5553	-5.5408
	Prob.	0.0000	0.0003
Without Constant & Trend	t-Statistic	-6.6885	-5.5685
	Prob.	0.0000	0.0000
UNIT ROOT TEST TABLE (ADF)			
At Level		RB	OP
With Constant	t-Statistic	-1.3016	-1.3197
	Prob.	0.6185	0.6111
With Constant & Trend	t-Statistic	-2.8483	-2.1232
	Prob.	0.1905	0.5182
Without Constant & Trend	t-Statistic	-0.7462	-0.3717
	Prob.	0.3868	0.5442
At First Difference		d(RB)	d(OP)
With Constant	t-Statistic	-6.5765	-5.6353
	Prob.	0.0000	0.0000
With Constant & Trend	t-Statistic	-6.4765	-5.5745
	Prob.	0.0000	0.0002
Without Constant & Trend	t-Statistic	-6.6011	-5.6515
	Prob.	0.0000	0.0000

Source: Elabourated by the researchers relied on the outputs of the EVIEWS10 program.

From the previous table it appears that the time series related to the balance of the general budget and oil prices are not stationary at the level, but they become so in the first differences, that is, they are integrated of the first order (1)I, and as a result it is possible to test The presence of a long-term relationship between the aforementioned variables and the use of the bounds approach to cointegration based on the autoregressive distributed lags model (ARDL).

2. Estimating the ARDL model: The following table No. (02) summarizes the results of estimating the model, and it is noted that the model used is ARDL(4,4), which means that the model specified 4 lag periods for the adopted variable, the general budget balance, and 4 periods for the oil price variable,

Table No. (02): ARDL model estimation results

Dependent Variable: DRB
Method: ARDL
Date: 06/21/21 Time: 01:05
Sample (adjusted): 1985 2020
Included observations: 36 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): DOP
Fixed regressors: C
Number of models evaluated: 20
Selected Model: ARDL(4, 4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
DRB(-1)	-0.382729	0.119159	-3.211908	0.0035
DRB(-2)	-0.415974	0.125919	-3.303515	0.0028
DRB(-3)	-0.168619	0.122758	-1.373260	0.1814
DRB(-4)	0.435773	0.125024	3.485092	0.0020
DOP	-12.44492	3.287647	-3.785357	0.0008
DOP(-1)	-15.27913	3.408521	-4.482624	0.0001
DOP(-2)	-10.85945	3.674551	-2.955312	0.0066
DOP(-3)	-8.116043	3.710206	-2.187221	0.0379
DOP(-4)	-16.35808	3.907271	-4.186574	0.0003
C	-15.20243	44.25125	-0.343548	0.7339

R-squared	0.784225	Mean dependent var	-42.86583
Adjusted R-squared	0.709533	S.D. dependent var	457.6436
S.E. of regression	246.6469	Akaike info criterion	14.08393
Sum squared resid	1581703.	Schwarz criterion	14.52379
Log likelihood	-243.5107	Hannan-Quinn criter.	14.23745
F-statistic	10.49952	Durbin-Watson stat	1.954278
Prob(F-statistic)	0.000001		

Source: the researchers relied on the outputs of the EVIEWS10

program. It is noted from Table No. (02) that there is an inverse link between the dependent variable, the general budget balance, and the independent variable, oil prices, as improving oil prices leads to an increase in public revenues, but due to the state's extravagance in spending (policy Expansionary spending) and embarking on huge investment programs, such as the growth support program and the economic recovery program, make the increase in public expenditures much greater than the increase in public revenues, which results in a deficit in the general budget balance, as it is noted that the value of (R = 0.78), meaning that the variable The independent model explains 78% of the changes in the general budget balance, and the model has high quality, as shown by the probability F statistic (0.0000001), and the model does not suffer from autocorrelation, as shown by the Durbin-Watson statistic (1.95).

3. Co-integration test using the Bounds test approach :

Table No. (03) below represents the results of the Bounds test.

Table No. (03): Results of the border approach test

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	16.64614	10%	3.02	3.51
k	1	5%	3.62	4.16
		2.5%	4.18	4.79
		1%	4.94	5.58

Source: Elabourated by the researchers based on the outputs of the EVIEWS10 program.

Table No. (03) shows the results of the bounds test. It turns out that the value of F (16.64) is greater than the upper limits of Pesaran at all levels of significance, which confirms the existence of a cointegration relationship between the variables of the study in the long run.

4. Estimating relationships in the long run: The results are presented in Table No. (04) below.

Table No. (04): Estimating relationships in the long run

ARDL Long Run Form and Bounds Test
Dependent Variable: D(DRB)
Selected Model: ARDL(4, 4)
Case 2: Restricted Constant and No Trend
Date: 06/21/21 Time: 01:07
Sample: 1980 2020
Included observations: 36

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-15.20243	44.25125	-0.343548	0.7339
DRB(-1)*	-1.527549	0.336467	-4.539971	0.0001
DOP(-1)	-63.05660	9.058954	-6.960653	0.0000
D(DRB(-1))	0.144821	0.275204	0.526230	0.6032
D(DRB(-2))	-0.271153	0.192383	-1.409447	0.1706
D(DRB(-3))	-0.439773	0.128024	-3.435092	0.0020
D(DOP)	-12.44492	3.287647	-3.785357	0.0008
D(DOP(-1))	35.33256	7.489081	4.717877	0.0001
D(DOP(-2))	24.47312	5.713822	4.283143	0.0002
D(DOP(-3))	16.35808	3.907271	4.186574	0.0003

* p-value incompatible with t-Bounds distribution.

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DOP	-41.27958	7.918106	-5.213315	0.0000
C	-9.952167	28.30910	-0.351554	0.7280

EC = DRB - (-41.2796*DOP -9.9522)

Source: Prepared by the researchers based on the outputs of the EVIEWS10 program**.**

The results indicate that the long-term relationship coefficient for the oil price variable is significant at 5%, and its sign is negative, as improving oil prices leads to raising public revenues, but due to the expansionary spending policy and the initiation of investment programs Huge, making the increase in expenditures much greater than the increase in revenues, resulting in a deficit in the general budget balance.

5. Estimating the Error Correction Model: The results are presented in Table No. (05) below.

Table No. (05): Estimation of the ECM error correction model

ARDL Error Correction Regression
Dependent Variable: D(DRB)
Selected Model: ARDL(4, 4)
Case 2: Restricted Constant and No Trend
Date: 06/21/21 Time: 01:08
Sample: 1980 2020
Included observations: 36

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DRB(-1))	0.144821	0.177988	0.813654	0.4232
D(DRB(-2))	-0.271153	0.128380	-2.112114	0.0444
D(DRB(-3))	-0.439773	0.100160	-4.390709	0.0002
D(DOP)	-12.44492	2.830432	-4.396826	0.0002
D(DOP(-1))	35.33256	7.166582	4.930183	0.0000
D(DOP(-2))	24.47312	5.453684	4.487447	0.0001
D(DOP(-3))	16.35808	3.729457	4.386182	0.0002
CointEq(-1)*	-1.527549	0.208298	-7.333474	0.0000

R-squared	0.899613	Mean dependent var	13.93333
Adjusted R-squared	0.874517	S.D. dependent var	670.9502
S.E. of regression	237.6749	Akaike info criterion	13.97282
Sum squared resid	1581703.	Schwarz criterion	14.32471
Log likelihood	-243.5107	Hannan-Quinn criter.	14.09564
Durbin-Watson stat	1.954278		

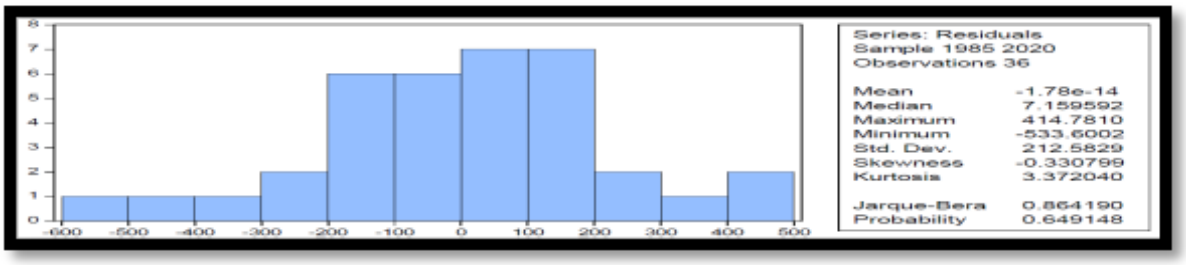
Source: elabourated by the researchers relied on the outputs of the EVIEWS10 program.

The results of the error correction model for the Algerian general budget balance show that most of the transactions are significant at the 5% level of significance, and the error correction term CointEq(-1) is negative and significant at various levels (0.000), which is It is considered an indicator of the strength and credibility of the long-term relationship, and therefore it can be confirmed that the causal relationship exists in at least one direction. As for the coefficient (-1.52), it gives us an idea of the rate of convergence to equilibrium, and its percentage is somewhat acceptable in this model. As for the value of the coefficient of determination, it is high (R = 0.89), which means that the explanatory power of the independent variable is high, as it represents the dependent variable by 89%, while the remaining percentage is related to other variables that were not included in the model.

6. Diagnostic tests: In order to know whether the model is effective, we must ensure:

- Testing the normal distribution of the residuals: TEST DE NORMALITE: We explain it in Figure No. (03) below.

Figure No. (03): Testing the normal distribution of the residuals of the estimated model



Source: Prepared by the researchers based on the outputs of the EVIEWS10 program.

We notice from Figure (03) that the value of the Jarque-Bera statistic is equal to 0.86, which is smaller than the chi-square statistic at a significance level of 5% and a degree of freedom equal to 1. Also, prob (0.64) is greater than 5%, so we say that the residuals of the model follow a normal distribution.

- Test of heterogeneity of variance of the model: shown in the following table No. (06).

Table No. (06): Breusch test results

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	2.526186	Prob. F(9,26)	0.3513
Obs*R-squared	5.79435	Prob. Chi-Square(9)	0.3320
Scaled explained SS	6.38956	Prob. Chi-Square(9)	0.3199

Source: Elabourated by the researchers based on the outputs of the EVIEWS10 program

through Table No. (09). We note that prob=0.33 is greater than the 5% level of significance, which indicates the stability of the variance. - Autocorrelation test for errors: We show it in **Table No. (07) below.**

Table No. (07): Breusch-Godfrey test results

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.965195	Prob. F(2,24)	0.3952
Obs*R-squared	2.680022	Prob. Chi-Square(2)	0.2618

Source: Prepared by the researchers based on the outputs of the EVIEWS10 program

through Table No. (10), the value of prob=0.26 is greater than the 5% level of significance, which indicates that the model does not mean the problem of autocorrelation between errors.

- Testing the validity of the functional form used, Ramsey RESET: shown in Table No. **(08)**

Table No. (08): Results of testing the validity of the functional form used, Ramsey RESET.

Ramsey RESET Test
Equation: ARDL
Specification: DRB DRB(-1) DRB(-2) DRB(-3) DRB(-4) DOP DOP(-1) DOP(-2) DOP(-3) DOP(-4) C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.040146	25	0.3082
F-statistic	1.081904	(1, 25)	0.3082

Source: Elabourated by the researchers based on the outputs of the EVIEWS10 program

through Table No. (8). It turns out that the functional formulation of the model is correct, because the estimated probability value of 30% is greater than the significance level of 5%.

- Structural stability test of the CUSUM Test model: The test results are shown in Figure No. (04) below.

Figure No. (04): Structural stability test of the model (CUSUM SQ-CUSUM)

Source: Prepared by the researchers based on the outputs of the EVIEWS10 program

From Figure No. (04), it is clear that the coefficients of the Cumulative Sum of Residuals Test (CUDUM) and the Cumulative Sum of Squares of Residuals Test (CUDUM SQ) fell within the limits at a 5% significance level, and thus there is stability in the model between the short-term and long-term results.

- Study of causality: The causal relationship means the ability of one variable to predict or cause the movement of the other variable, as Granger (1969) proposed a criterion to determine the causal relationship between two variables (Granger, 1969, p. 430), and the results of this test are shown in Table No. (09).).

Table No. (09): Granger causality test results

Pairwise Granger Causality Tests
Date: 06/21/21 Time: 01:22
Sample: 1980 2020
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
DRB does not Granger Cause DOP	38	0.85709	0.4336
DOP does not Granger Cause DRB		4.08225	0.0261

Source: Elabourated by the researchers based on the outputs of the EVIEWS10 program.

Through Table No. (09), we note that the first probability value (prob = 0.43) is greater than the 5% level of significance, and therefore we accept the null hypothesis which states that the general budget balance in Algeria does not affect the price of... Oil, and the second probability value (prob = 0.02) is less than the 5% level of significance, and therefore we accept the alternative hypothesis which states that there is a causal relationship from the oil price variable that flows towards the variable general budget balance in Algeria.

previous studies results[1].

IV- Conclusion:

Through this study, an attempt was made to measure the impact of oil price fluctuations on the general budget balance in Algeria, through which the validity of the previous hypotheses was tested. The first hypothesis is that lower oil prices lead to a deterioration in the general budget balance. It appears to be correct, as the general budget balance in Algeria is affected by the rise and fall of oil prices, as the decline and collapse of oil prices drives to a deterioration in general budget revenues, and in view of the increasing expenditures, the general budget balance will decrease, causing a budget deficit. As for the second hypothesis, which states that there is a direct and significant relationship between changes in oil prices and the general budget balance in Algeria. It appeared to be incorrect, because the coefficient of the oil prices variable appeared significant at (5%) and its sign was negative, that is, there is an inverse relationship between the dependent variable, the general budget balance, and the independent variable, oil prices, as improving oil prices leads to an increase in public revenues, but due to the extravagance of the Algerian authorities. In spending (expansionary spending policy), and embarking on huge investment programs, such as the growth support program and the economic recovery program, making the increase in public expenditures much greater than the increase in public revenues, resulting in a deficit in the general budget balance; As for the third hypothesis, which mentions that there is a short- and long-term equilibrium connection between oil prices and the general budget balance in Algeria during the period (1980-2020), it appeared that the hypothesis is correct, as we reached the existence of a short- and long-term equilibrium link (a cointegration relationship according to the ARDL model).

Based on the study outputs, the following suggestions and recommendations could be presented: Restoring the information systems charged with measuring and estimating macroeconomic indicators, and providing an information base on which to base research and studies; Establishing new rules for the national economy and the necessity of encouraging and diversifying exports, and freedom from the problem of fuels; The necessity of rationalizing public spending and reducing wasteful public spending when oil prices rise so that the state avoids the pressures it may face when prices fall; The necessity of working to activate financial policy tools with the aim of achieving financial and economic stability, and working to reform the financial and tax apparatus.

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