

Challenges of Oil Revenue Management: Procyclicality of Fiscal Policy in Response to Oil Price Volatility During the Period (1990-2020)

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Received: 06/04/2025

Accepted: 24/04/2025

Published: 30/06/2025

Abstract:

This study seeks to elucidate the procyclicality of the fiscal policy in Algeria in response to oil price fluctuation as the main channel for the transmission of oil price volatility to the economy. Using First-Differenced Multiple Linear Regression (OLS) on data from 1990 to 2020 we measured how the non-oil primary budget balance responded to three factors; oil prices, the ratio of public expenditures to gross domestic product (GDP), and the proportion of oil revenues within the budget. The results validate the procyclicality of the Algerian fiscal policy. We further examine the influence of this policy on the management of the Algerian Revenue Regulation Fund and its role in mitigating the consequences of oil revenue fluctuation.

Keywords: oil price volatility, fiscal policy, oil revenue management, non-oil primary budget balance, Revenue Regulation Fund.

Jel Classification Codes: E62; Q3; H62.

1. INTRODUCTION:

The economies of Oil Exporting Countries (OECs) are heavily dependent on oil prices, especially when oil revenues account for a large share of public budgets and Gross Domestic Product (GDP). Among raw materials markets, the oil market stands out as one of the most volatile. Moreover, oil prices shocks tend to persist through irregular and prolonged cycles (Cachin, Liang, & McDermott, 1999).

Without sound management of oil revenues, Oil Exporting Countries (OECs) may experience poor economic outcomes even when prices are high. The period from 2003 to 2013 has brought substantial gains to most

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OECs, except for the 2008–2009 global financial crisis. Yet, many oil-rich countries have recorded lower economic growth and weaker development outcomes compared to resource-poor nations. This phenomenon, widely referred to as the “Resource Curse Hypothesis,” has been linked to a range of economic and political factors, including oil price volatility, symptoms of the “Dutch Disease,” and the failure to implement appropriate fiscal policies.

As oil prices are determined by global supply and demand, their fluctuations are beyond the control of individual OECs. The main channel through which these price swings impact domestic economies is fiscal policy, given the central role of oil revenues in national budgets. This underscores the critical need for well-designed fiscal strategies to protect economies against external shocks and promote long-term stability.

In Algeria, the oil sector continues to dominate the economic activity. It accounts for approximately 95% of total exports, contributing between 60 and 75% of fiscal revenues. It also represents about 30% of GDP, with a peak of 45.6% in 2006. The rise of oil prices since 2003 has helped build significant financial surpluses until 2013. These surpluses were channelled into the Revenue Regulation Fund (RRF), Algeria’s main instrument for managing oil revenues and one of Africa’s major sovereign wealth funds at the time.

The government adopted an expansionary fiscal policy to stimulate development and finance several public investment programs beginning in 2001. However, this policy did not fully account for the volatility and unpredictability of oil revenues. The combination of a persistent structural deficit outside the hydrocarbon sector and the lack of strict regulations governing the FFR led to the depletion of its reserves twice—in 2017 and 2020. Consequently, public finances became vulnerable, undermining economic stability and weakening growth each time oil prices declined.

This tendency toward overspending following a rise in oil prices is common. Many studies have showed that fiscal policies in OECs are procyclical and emphasised the struggle of these countries to implement countercyclical programmes. Procyclicality of fiscal policy is defined as a policy that amplifies economic cycles by increasing spending during boom periods and reducing it when prices decrease.

This paper investigates whether the fiscal policy in Algeria exhibited procyclical behaviour in response to oil price volatility from 1990–2020. The aim is to evaluate the effectiveness of the fiscal policy in alleviating oil

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prices shocks and the Revenue Regulation Fund management during this timeframe.

We applied a differenced multiple regression model to examine the relationship between oil revenue and fiscal policy in Algeria. The dependent variable is the fiscal policy stance in Algeria, represented by the non-oil primary balance (NOPB) as a percentage of non-oil GDP. This indicator captures the government's fiscal effort excluding oil-related revenues and thus provides a clearer view of underlying fiscal behaviour. The model evaluates the response of this variable to three principal factors: the proportion of oil revenues in total government revenues, the ratio of government expenditure to GDP, and oil prices.

The results revealed that the Algerian fiscal policy was indeed procyclical. Specifically, the government tended to overspend during periods of rising oil prices and relied heavily on the RRF during downturns, often without adequate safeguards, which led to its depletion on two separate occasions.

The paper is organised as follows. The literature review briefly outlines several studies that examined the alienation of Algerian fiscal policy to oil prices and oil revenue. We also analyse the administration of oil revenues during the study period. we subsequently present the approach and the data gathered. The findings section includes the descriptive statistics, stationarity tests, the estimated model, and the assumptions check. We then discuss the results in light of findings from similar studies. Lastly, we conclude with some policy implications and prospects for future research.

2. LITERATURE REVIEW:

Several studies have found that fiscal policy in OECs tends to be procyclical. Procyclicality refers to an increase in the ratio of government spending to GDP during periods of prosperity and a decrease during downturns, as well as expansion of the budget deficit during booms and contraction during recessions (IMF, 2015; Arezki; Hamilton; Kazimov, 2011; Erbil, 2011; Alesina & Tabellini, 2005). Gavin and Perotti were the pioneers in asserting that fiscal policy in Latin America is procyclical in relation to the economic cycle. Several studies have found that fiscal policy in OECs tends to be procyclical. Other studies have found this phenomenon common in almost all third-world countries (Talvi & Vegh, 2005; Catão &

Sutton, 2002; Manasse, 2005; Kaminski; Reinhart; Vegh, 2004; Alesina & Tabellini, 2005).

2.1 Algerian fiscal policy response to cyclical shocks:

The International Monetary Fund (IMF) identifies two main approaches in research that assess policymakers' effectiveness in reducing the effects of cyclical shock. The initial approach analyses the degree to which fiscal policy interact with the business cycle beyond the resource sector. The second method assesses the extent to which public expenditure responds to annual price fluctuations (IMF, October 2015).

Most studies follow one of these approaches, often with some modifications and additional variables.

In Algeria, few studies tackled the cyclical behaviour of fiscal policy, and they fall under the second approach. (Chibi, Benbouziane, & Chekouri, 2012) studied the responsiveness of fiscal policy to changes in oil prices and found that fiscal policy is one of the most important channels through which oil price volatility is transmitted to the Algerian economy. In another study, (Chibi, Benbouziane, & Chekouri, 2014) analysed the impact of fiscal policy on economic activity in Algeria using an MSVAR model. They found that fiscal policy has asymmetric effects during economic cycles, with stronger effects during recessions. They also found that fiscal policy is cyclical, as government spending has a more potent impact than public revenues during downturns – contrary to Keynesian point of view.

These studies underscore that the authorities tend to increase public spending when oil revenues are high and decrease it when they are low. This procyclical fiscal policy aggravates cyclical economic shocks and disturbs development efforts in the long run.

However, these studies used aggregate variables, such as total spending, and total revenues as a ratio to GDP, as indicators of fiscal policy. This can lead to misleading results because, as noted by many studies, these variables are already influenced by the volatility of oil prices (Barnett & Ossowski, 2002; Erbil, 2011).

To avoid this shortcoming, we decided to measure the stance of fiscal policy not through overall budget balance (OB), but rather using the Non-Oil Primary Balance (NOPB)– meaning the budget balance excluding the net oil revenue and net interest payments (mostly related to financial savings accumulated in sovereign funds). (Villafuerte & Lopez-Murphy, 2010) Most studies agree that NOPB is a reliable and essential fiscal

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indicator for analysing fiscal stance in OECs, in both the short and long term.

2.2 Trends in Oil Revenue Management and Fiscal Policy :

The early 1990s witnessed a significant fiscal tightening. The fiscal policy was contractionary, marked by a reduction in public spending due to the scarcity of financial resources at the time. The budget deficit reached approximately 6% of GDP in 1993. The budget balance was highly dependent on oil revenues, which, on average represented more than 60% of the budget. Following the enhancement of oil prices and the implementation of structural reforms under the guidance of the IMF, the budget balance lifted from a deficit to a surplus of 4% of GDP in 1996. However, it quickly returned to deficit with the onset of the Asian financial crisis in 1997.

In 2000, the Revenue Regulatory Fund (RRF) was created as an instrument to manage the fluctuation of oil revenues. The objective was to save the financial surplus resulting from higher-than-expected oil prices in the Financial Low. These surpluses were intended to finance the public treasury deficit and reduce the public debt, if any. The fund was placed under the authority of the Minister of Finance, which means that the RRF functioned more as a stabilisation fund than a savings fund (الجريدة الرسمية

للجمهورية الجزائرية. العدد 37. 2000. ص7)

The early 2000s and even the late 1990s saw significant economic growth, reaching 5% in 1998 and 7,2% in 2003. This was largely due to the substantial increase in oil prices, especially between 2003 and 2008, driven by growth led by emerging economies. Under these favourable conditions, Algeria adopted an expansionary fiscal policy, spending heavily on investment plans such as the Economic Recovery Plan (2001-2004) and the Complementary Growth Support Plan (2005-2009). The objective was to stimulate development, improve living standards, and reduce poverty and unemployment. During this period, the budget balance accumulated a surplus that reached 14% in 2006.

To enhance the management of the RRF, the government established a regulation in the Finance Law of 2006 that restricts withdrawals from the fund. The law imposed a minimum RRF balance of 740 billion DZD (الجريدة الرسمية للجمهورية الجزائرية. العدد 47. 2006. ص8)

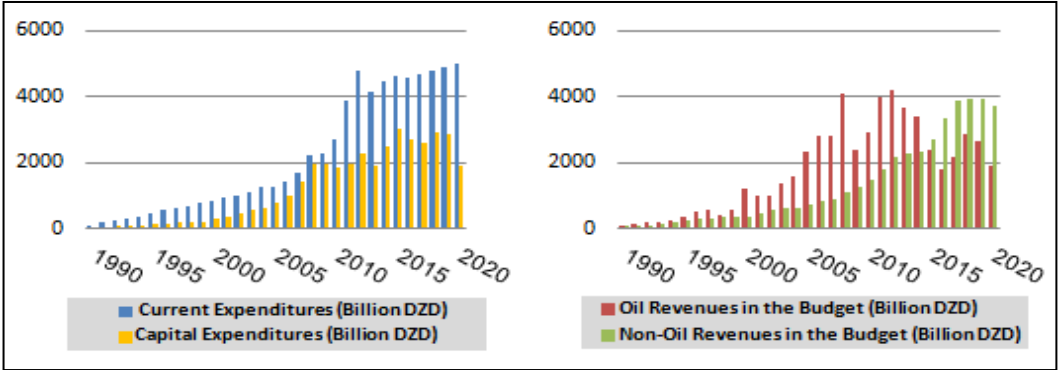
The financial crisis of 2008 led to a slowdown in global economic growth and a 37% decline in oil prices in 2009. However, the Algerian financial stance remained strong, thanks to the accumulated revenues in the RRF and reduced levels of public and foreign debt. As a result, the government was able to maintain its social spending –particularly on employment and housing – and implemented countercyclical measures to mitigate the impact of the global crisis (IMF, 2013). According to the IMF, the economic performance remained acceptable in the late 2000s and the early 2010s.

When oil prices improved after the crisis, the RRF grew up to become one of the largest sovereign funds in Africa. Its assets exceeded 30% of GDP in the (2011-2013) period, when oil prices surpassed 100 Dollars per barrel. The government maintained its generous expansionary fiscal policy to finance the Quinquennial Development Plan (2010-2014) and the Growth Support Program (2015-2019), allocating substantial resources. When oil prices plummeted during the (2014-2016) period –reaching a historic 44,28 Dollars per barrel in 2016, the lowest level since 2004 – the budget deficit widened to 15,3% of GDP. As a result, the limit imposed on withdrawals from the RRF was lifted, and the RRF was fully depleted (الجريدة الرسمية العدد 77. 2016. ص50). This depletion occurred again in 2020 due to financial pressures linked to the Covid-19 pandemic. As a result of this downturn, the government resorted to Financing by Deficit, a riskier option for maintaining economic stability.

The evolution of governmental revenue and spending from 1990 to 2020 is illustrated in Fig. 1. The primary burden on the budget is public employment, it accounts for most of the current spending. Next are the subsidizing expenditures and social handouts. As this expense is not covered by non-oil revenue, a portion of oil revenue that should be used to fund development initiatives (equipment expenditures) is diverted.

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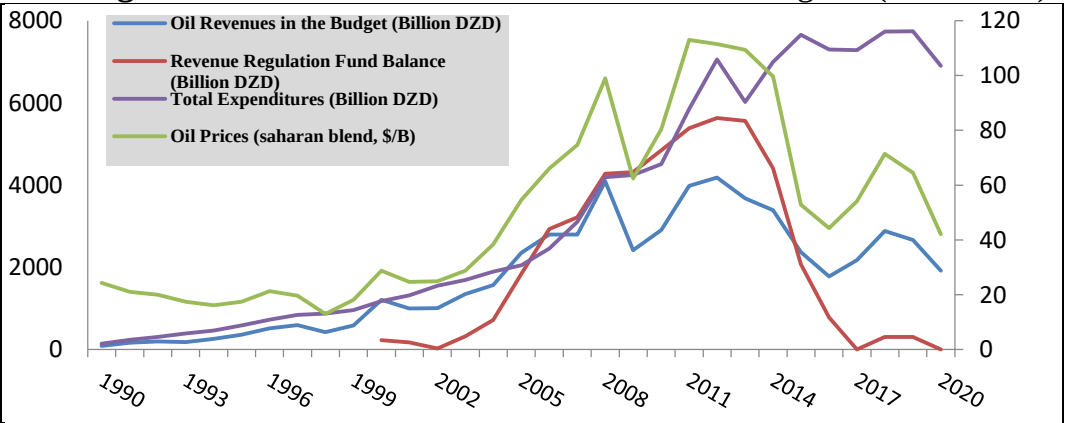
Fig. 1. The evolution of governmental revenue and spending (1990-2020)



Source: Based on (Bank of Algeria reports, 2002, 2006, 2010, 2015, 2020, 2022), and (IMF Staff Country Reports, 1995, 1998).

The relationship between the study variables is illustrated in Fig. 2. It shows the evolution of oil prices, total oil revenues in the budget, and total public expenditures, in addition to the Revenue Regulation Fund (RRF) balance, in Algeria from 1990 to 2020. When oil prices rose during the oil boom years (2003–2008 and 2010–2013), they were accompanied by sharp increases in both oil revenues, total expenditures, and the RRF balance. However, when oil prices declined—especially during the 2014–2016 collapse and again after 2018—the total public expenditure levels remained high. As a result, the government resorted to intensified withdrawals from the RRF, leading to its depletion in 2017 and again in 2020. (IMF, 2023)

Fig. 2. Evolution of some financial indicators in Algeria (1990-2020)



Source: Based on (Bank of Algeria reports, 2002, 2006, 2010, 2015, 2020, 2022), (IMF

Staff Country Reports, 1995, 1998). For oil prices, we relied on (OPEC Annual Statistical Bulletin, 1999, 2010-2011, 2016, 2021).

Note: Oil prices are on the right axe.

These trends underscore the heavy reliance on oil revenues to maintain public spending, even when prices are decreasing. They also highlight the expansionary nature of the fiscal policy and the need for more effective stabilization mechanisms to smooth external shocks.

The reliance on oil revenue for investment funding caused significant economic instability and slowed the progress of the planned objectives. Analyses suggest that a fiscal approach reliant on natural resources is unlikely to be sustainable in the long term, even when the national budget appears balanced (IM F, 1998).

3. METHODOLOGY AND MATERIALS:

To empirically assess the procyclicality of the fiscal policy in response to oil price volatility, we conducted a time series analysis covering the study period. This section presents the study variables, the data sources, basic descriptive statistics, and the results of stationarity tests.

The data collected cover the period 1990–2020 on an annual basis. The variables used are defined as follows:

- **NOPB (Non-Oil Primary Balance as a percentage of non-oil GDP).** This variable serves as an indicator of the direction and stance of actual fiscal policy. Data were obtained from the Bank of Algeria reports and IMF Staff Country Reports.
- **OILR (Oil Revenue Ratio):** Ratio of oil revenues to total budget revenues. OILR was calculated based on data from the Bank of Algeria reports and IMF Staff Country Reports.
- **POIL (Oil Price):** Represents the price of Saharan Blend crude oil, with data sourced from the OPEC Annual Statistical Bulletin.
- **G (Government Expenditure Ratio):** Ratio of total government expenditures to GDP. It reflects the relative size of the public sector within the economy. G was calculated using data from the Bank of Algeria reports and IMF Staff Country Reports.

Table 1 presents the descriptive statistics for the study variables. The Non-Oil Primary Balance (NOPB) shows a consistently negative average (-30.87%), reflecting a structural non-oil fiscal deficit throughout the period. The Oil Revenue Ratio (OILR) averages around 60.43%, highlighting the heavy reliance of the budget on oil revenues. Government expenditures (G) account for an average of 34.17% of GDP, indicating a relatively large public sector. Oil prices (POIL) exhibit significant volatility. It ranges from

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\$13.02 per barrel to a peak of \$112.92. Its high standard deviation (32.13) underscores the external shocks to which the Algerian economy is exposed.

These statistics confirm the importance of analysing the responsiveness of fiscal policy to oil market fluctuations.

Table 1. Descriptive Statistics for Study Variables

Statistic	NOPB (%)	OILR (%)	G (%)	POIL (\$/b)
Mean	-30.8684	60.4341	34.1693	49.4777
Median	-28.4000	62.8680	32.8227	42.1200
Maximum	-15.2858	78.7708	45.8113	112.9200
Minimum	-53.1000	34.0655	25.7035	13.0200
Std. deviation	8.8166	12.5610	5.5136	32.1276
Observations (N)	31	31	31	31

Source: Author's calculations using EViews 12-SV.

To ensure the validity of the time series regression and to prevent spurious results, we tested the stationarity of the variables utilising two conventional unit root tests: the Augmented Dickey-Fuller (ADF) test and the Phillips-Perron (PP) test, applied at the level and the first difference. The null hypothesis in these tests is the existence of a unit root (i.e., non-stationarity). Table 2 presents the results of stationarity tests.

Table 2. Stationarity Test Results

	ADF Stat	ADF p-value	PP Stat	PP p-value	Stationarity Result
NOPB	-2,2518	0,1934	-2,3034	0,1774	non-stationary
DNOPB	-5,1050	0,0016	-6,0028	0,0000	stationary
OILR	-0,7013	0,8316	-0,7013	0,8316	non-stationary
DOILR	-5,0855	0,0003	-5,1245	0,0003	stationary
G	-1,9819	0,2927	-1,9819	0,2927	non-stationary
DG	-5,2793	0,0002	-6,2023	0,0000	stationary
PIOL	-1,4540	0,5426	-1,4897	0,5250	non-stationary
DPOIL	-4,5590	0,0011	-4,4510	0,0015	stationary

Source: Author's calculations using EViews 12-SV.

The results of the ADF and PP tests indicate that all variables are non-stationary at the level and become stationary after first differencing, as evidenced by the significant p-values (less than 0.05) for their first differences. These findings confirm that the series are integrated of order one, I(1). This result validates the use of differenced data in the regression model.

4. RESULTS:

This section presents the estimation results of the econometric model used to examine the short-term relationship between fiscal policy and oil-related variables in Algeria.

As the unit root tests revealed that the time series for all model variables are non-stationary at levels, we conducted the Johansen cointegration test to determine whether a long-term equilibrium relationship exists among them. The test results showed no statistical evidence of cointegration at the 5% significance level (for conciseness, we omit the detailed results of this test). Hence, the regression model is estimated using first-differenced variables to capture the short-run dynamics among the variables. The model is specified as follows:

$$\text{DNOBP} = \alpha + \beta_1 * \text{DOILR} + \beta_2 * \text{DPOIL} + \beta_3 * \text{DG} + \varepsilon$$

In the equation, D denotes the first difference of the corresponding variable, which is applied to eliminate non-stationarity and focus on short-term changes. The model examines how changes in oil revenue (DOILR), oil prices (DPOIL), and government spending (DG) affect the change in the Non-Oil Primary Balance (DNOBP), which serves as a proxy for the Algerian fiscal policy stance. Table 3 presents the model estimation results.

Table 3. Model estimation results

	coefficient	Std. error	t -stat
intercept	-0.2487	0.5392	-0.4612
DOILR	-0.4460**	0.1123	-3.9720**
DPOIL	-0.0888*	0.0462	-1.9211*
DG	-1.2073**	0.1743	-6.9253**
R ²	0,7466	F-statistic	25.5398**
Adjusted R ²	0.7174	Observations (N)	30

Source: Author's calculations using EViews 12-SV.

Note: * Significant at the 10% level ($p < 0.10$); ** Significant at the 1% level ($p < 0.01$)

The model estimation results support the hypothesis of procyclical fiscal policy in Algeria. All explanatory variables are statistically significant, with expected signs.

- The coefficient on DOILR (change in the ratio of oil revenues to total revenues) is negative and highly significant at the 1% level. This indicates that an increase in reliance on oil revenues is associated with a deterioration in the non-oil primary balance (i.e., more expansionary fiscal behaviour), confirming procyclicality.

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- The coefficient on DPOIL (change in oil prices) is also negative and marginally significant at the 10% level. This suggests that rising oil prices are associated with more expansionary fiscal policy, though the effect is relatively weaker compared to DOILR.
- DG (change in government expenditure relative to GDP) has a strong and significant negative impact on DNOPB. This confirms that increased spending—particularly during high-revenue periods—worsens the non-oil fiscal balance, further reinforcing the procyclical nature of Algerian fiscal policy.

The model explains a substantial portion of the variation in DNOPB, with an R^2 of 0.75, and the overall model is statistically significant ($F = 25.54$, $p < 0.01$). These findings highlight the vulnerability of Algerian fiscal position to oil price cycles and underline the need to countercyclical measures and instruments.

The diagnostic test findings in Table 4 indicate that the model satisfies to the main econometric assumptions. The White and Breusch-Pagan-Godfrey tests fail to reject the null hypothesis, indicating no evidence of heteroskedasticity, all p-values are well above the 5% threshold. Similarly, the Breusch-Godfrey test shows the absence of autocorrelation in the residuals. The Jarque-Bera test suggests that the residuals seem to be normally distributed, which supports the validity of statistical inference. Additionally, the Variance Inflation Factor (VIF) values for all explanatory variables are well below the common threshold of 5, indicating no multicollinearity issues. Finally, the Ramsey RESET test fails to reject the null hypothesis, suggesting that the model is correctly specified.

Table 4. The tests conducted to check the model assumptions

Model assumption	test	Test statistic	P-value	Diagnostic result
Heteroskedasticity	White	$F = 0.5237$; $\text{Obs} \cdot R^2 = 5.7219$	0.8403 ; 0.7674	No evidence of heteroskedasticity
	Breusch-Pagan-Godfrey	$F = 1.4507$; $\text{Obs} \cdot R^2 = 4.3015$	0.2510 ; 0.2307	
Autocorrelation	Breusch-Godfrey	$F = 0.2080$; $\text{Obs} \cdot R^2 = 0.5111$	0.8137 ; 0.7745	No evidence of autocorrelation
Normality	Jarque-Bera	$JB = 0.7479$	0.6880	Residuals seem to be normally distributed

Multicollinearity	Variance Inflation Factor (VIF)	DOILR: 1.89; DPOIL: 1.90; DG: 1.10	-	All VIF < 5: no multicollinearity issues
Model Specification	Ramsey RESET	F = 0.0246	0.8767	The model is correctly specified

Source: Author's calculations using EViews 12-SV.

Overall, these results show that the estimated regression model is valid and reliable.

5. DISCUSSION:

The model estimation results in Table 3 indicate that the estimated model is significant and explains a considerable portion ($R^2 = 0.75$) of the variation in the dependent variable (DNOPB). Furthermore, all coefficients of explanatory variables are statistically significant and have the expected negative sign, consistent with previous empirical studies such as (Chibi, Benbouziane, & Chekouri, 2014) and (شكوري، شبي، و بن بوزيان، 2012).

The coefficients of the change in both the ratio of oil revenue in the budget of (DOILR) and in Government spending (DG) are significant at the 0,01 level. A 1% increase in DOILR results in a drop of the non-oil primary balance (NOPB) by 0,45%, indicating an increase in the budget deficit. The results also show that an increase of 1% in the change of government spending (DG) leads to a decline of 1,2% in NOPB, reinforcing the procyclical nature of fiscal policy in Algeria.

The effect of the change in oil prices is also significant, though at a lower significance level (10%). Its coefficient indicates that a 1% increase in oil prices leads to a decline of 0,09% in NOPB. Data show that this weak influence of oil prices on NOPB is linked to the expansionary nature of fiscal policy. As illustrated in Fig. 2, the government tends to increase its expenditure in oil boom times, however, when the prices decline, the government is slow to respond to that decline in oil prices, preferring to cover the deficit by resorting excessively to the RRF. The relatively weak influence of oil prices shocks on economic outcome in OCEs is due to the absence of fiscal response to shocks, as confirmed by (Husain, Tazhibayeva, & Ter-Martirosyan, 2008).

These findings are consistent with broader literature that shows that fiscal policy in many oil exporting countries tends to be procyclical due to dependence on oil revenues. However, some studies that dealt with this subject in Algeria used aggregate variables, such as total spending and total

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revenues as a ratio to GDP, to measure fiscal policy. This choice can lead to biased results because these variables are already influenced by the volatility of oil prices (Barnett & Ossowski 2002, Erbil 2011). In this study, instead, we measure the stance of fiscal policy not through overall budget balance (OB) but using the Non-Oil Primary Balance (NOPB). Most studies agree that NOPB is a reliable and important fiscal indicator for analysing fiscal stance in OECs.

Overall, the model confirms that fiscal policy in Algeria has been sensitive to oil price fluctuations. This result highlights the vulnerability of the Algerian fiscal position to oil price cycles and underline the need for countercyclical measures and robust mechanisms dedicated to smooth external shocks. Such measures are crucial to ensure economic stability, continuous development and the ability to sustain spending to cover the immediate societal needs during crises.

While this study provides valuable insights into the nature of fiscal policy in Algeria, it has some limitations that should be noted. Although the analysis covers a 31-year period, which is significant, it is based on annual data. Therefore, the sample size is limited; consequently, only a few fundamental economic variables could be included. Moreover, this study focuses on a single country, which limits the scope of the generalisability of the results. Future research could expand this work by including other countries or extending the study period, which would increase the sample size. The inclusion of multiple countries (panel data) would enlarge the sample size considerably and allow for the inclusion of more variables, such as institutional or even political indicators. By adding a second dimension to the data, the analysis could compare procyclicality and fiscal policy across several countries, account for more variables, and widen the scope and the generalisability of the results.

6. CONCLUSION:

This study aimed to examine whether the Algerian fiscal policy exhibited procyclical behaviour in relation to oil price fluctuations during the period 1990-2020. The study also examined the impact of this policy on the management of the Revenues Regulation Fund and its role in smoothing external shocks associated with falling oil prices.

The results confirmed that fiscal policy in Algeria has been influenced by oil price fluctuations. Government spending, oil prices, and oil revenue contributed significantly to fluctuations in non-oil primary balance. These

findings align with existing literature on fiscal policy in oil-export countries and reinforce previous studies that have emphasized the difficulty these countries encounter in implementing countercyclical fiscal policies.

These findings underscore the need for robust fiscal policy and the adoption of countercyclical measures to smooth the damaging impact of external shocks on the economy. Improving the governance of stabilisation mechanisms, such as the Revenues Regulation Funds, would help the country better withstand periods of low oil revenues and maintain a stable level of investment and current government expenditure.

This study is limited by its reliance on annual data and the focus on one single country. Future research could expand this work by including other countries and extending the period. The use of panel data would result in larger data, allowing for the inclusion of additional economic variables and cross-country comparisons.

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