THE IMPACT OF RISING OIL PRICES ON PUBLIC EXPENDITURE, BUDGET BALANCE, CURRENT ACCOUNT BALANCE, INFLATION, GDP, AND OIL REVENUE IN CAMEROON

Njoudiyimoun Gbetnkom Mama Najip[1*], Ngouhouo Ibrahim[2], Njoupouognigni Moussa[3]

[1*]PhD Candidate at the University of Douala, Department of Economics, Cameroon.

[2]Full Professor at the University of Dschang, Department of Economics, Cameroon.

[3]Associate Professor (Senior Lecturer) at the University of Douala, Department of Economics, Cameroon.

* Correspondence: Njoudiyimoun Gbetnkom Mama Najip

ABSTRACT: This paper analyzes the impact of rising oil prices on the Cameroonian economy, focusing on public expenditure, the budget balance, the current account balance, inflation, real GDP, and oil revenues over the period 1985–2024. Using annual data and a Vector Autoregressive (VAR) model in first differences, the study examines the short-run dynamics generated by oil price shocks in a context characterized by structural constraints and data limitations. The results show that oil price increases lead to an immediate and significant rise in oil revenues, strengthening short-term public financing capacity, but these gains are not sustained and are accompanied by procyclical public spending that ultimately deteriorates the budget balance. The current account improves only temporarily before being offset by rising imports, consistent with Dutch disease effects, while real GDP responds weakly, reflecting limited transmission of oil rents to long-term growth. oil price shocks generate mild and short-lived inflationary

pressures, reflecting limited pass-through to domestic prices. The forecast error variance decomposition further indicates that oil price shocks explain only a small share of fluctuations in most domestic macroeconomic variables, except for oil revenues, underscoring the dominant role of structural and institutional factors. Overall, the findings support the resource curse hypothesis and emphasize the need for countercyclical fiscal policies, effective oil revenue management, and economic diversification to reduce vulnerability to oil price volatility and promote sustainable economic growth in Cameroon.

Keywords: *Oil prices, Macroeconomic shocks, VAR model, Public finances, Inflation.*

RESUME:

Cet article analyse l'impact de la hausse des prix du pétrole sur l'économie camerounaise, en mettant l'accent sur les dépenses publiques, le solde budgétaire, le solde du compte courant, l'inflation, le PIB réel et les recettes pétrolières sur la période 1985–2024. À partir de données annuelles et d'un modèle vectoriel autorégressif (VAR) en différences premières, l'étude examine les dynamiques de court terme engendrées par les chocs pétroliers dans un contexte marqué par des contraintes structurelles et des limites de données. Les résultats montrent que l'augmentation des prix du pétrole entraîne une hausse immédiate et significative des recettes pétrolières, renforçant la capacité de financement public à court terme, mais que ces gains ne sont pas durables et s'accompagnent d'un comportement procyclique des dépenses publiques, conduisant à une dégradation du solde budgétaire. Le solde du compte courant ne s'améliore que temporairement avant d'être neutralisé par la hausse des importations, conformément aux mécanismes de la maladie hollandaise, tandis que le PIB réel réagit faiblement, traduisant une transmission limitée de la rente pétrolière vers la croissance de long terme. Des pressions inflationnistes apparaissent à la suite des chocs pétroliers, mettant en évidence des vulnérabilités en matière de stabilité des prix. La décomposition de la variance de l'erreur de prévision indique en outre que les chocs pétroliers n'expliquent qu'une faible part des fluctuations de la plupart des variables macroéconomiques domestiques, à l'exception des recettes pétrolières, soulignant le

rôle prépondérant des facteurs structurels et institutionnels. Dans l'ensemble, les résultats confortent l'hypothèse de la malédiction des ressources et mettent en évidence la nécessité de politiques budgétaires contracycliques, d'une gestion efficace des revenus pétroliers et d'une diversification économique afin de réduire la vulnérabilité aux chocs pétroliers et de favoriser une croissance économique durable au Cameroun.

Mots-clés: *Prix du pétrole, Chocs macroéconomiques, Modèle VAR, Finances publiques, Inflation.*

1. Introduction

Oil constitutes one of the fundamental pillars of the Cameroonian economy. Since the discovery of its first deposits off the coast of Rio del Rey in the 1970s, this energy resource has shaped the country's macroeconomic trajectory, both through its budgetary contributions and its role in the balance of payments. As a major export commodity, oil represents a key source of foreign exchange and public revenue, but it also exposes the national economy to strong dependence on international economic conditions (IMF, 2021). Fluctuations in global crude oil prices, particularly Brent prices, directly affect key macroeconomic aggregates such as real GDP growth, inflation, the current account balance, public revenues, and the budget balance (World Bank, 2023).

Experiences observed in several oil-exporting countries show that periods of oil booms generally stimulate domestic demand, leading to higher production, income, and public spending, but also generate inflationary pressures and a loss of competitiveness in other sectors of the economy. This phenomenon, known as the "Dutch disease," reflects the difficulty of transforming oil rents into sustainable and balanced economic growth (Corden & Neary, 1982; Gelb, 1988; Brahmbhatt et al., 2010). Cameroon is no exception to this pattern, as its public finances and current account balance remain closely dependent on revenues derived from crude oil exports (BEAC, 2022).

This dependence increases the vulnerability of the national economy to the volatility of international oil prices. When prices rise, the country benefits from an inflow of budgetary resources, an improvement in the current account, and stronger economic

growth. Conversely, during periods of price declines, the effects are reversed: a contraction in fiscal revenues, widening budget deficits, increased pressure on public debt, and economic slowdown (Hamilton, 2003; Kilian, 2009). The succession of oil price shocks particularly those of 2008, 2014, and 2022 has highlighted Cameroon's high sensitivity to fluctuations in Brent prices, making it necessary to achieve a better understanding of the transmission mechanisms through which these variations affect macroeconomic indicators.

The economic objective of this article is to assess the extent to which increases in oil prices can serve as a lever for macroeconomic stabilization and development financing in Cameroon.

Within this framework, the present study seeks to answer the following research question:

To what extent do increases in Brent oil prices influence real GDP growth, inflation, the current account balance, oil revenues, public expenditure, and the budget balance in Cameroon?

To this end, the analysis is based on the following hypothesis: increases in oil prices generate immediate macroeconomic gains in Cameroon particularly through higher oil revenues and budgetary resources but these effects remain transitory and are accompanied by persistent structural imbalances.

By combining a stylized analysis of key facts with an econometric investigation using a VAR model, this research aims to shed light on the relationship between oil price shocks and Cameroon's macroeconomic performance, while identifying policy levers for more resilient management of natural resources in the face of international price cycles.

This paper contributes to the literature in three ways. First, it provides updated empirical evidence on the macroeconomic effects of oil price shocks in Cameroon using data up to 2024. Second, it simultaneously analyzes fiscal, real, and external channels within a unified VAR framework. Third, it offers policy-relevant insights for oil-dependent economies in Sub-Saharan Africa facing recurrent price volatility.

2. Literature Review

The analysis of the relationship between oil prices and macroeconomic performance is grounded in a rich body of literature, both theoretical and empirical. This literature highlights the complexity of the transmission channels of oil price shocks, their asymmetric nature, and the differences in their effects between oil-exporting and oil-importing countries.

Early theoretical analyses of the effects of oil price shocks date back to the 1980s, notably the seminal work of Corden and Neary (1982) on the Dutch disease. These authors show that the exploitation of natural resources, particularly oil, often leads to an appreciation of the real exchange rate and a reallocation of production factors toward the resource sector, to the detriment of the manufacturing and agricultural sectors. This process results in relative deindustrialization and weakens long-term competitiveness.

In the same vein, Gelb (1988) further developed the concept of the "resource curse," emphasizing that oil booms generate rapid budgetary expansion, often poorly managed, leading to excessive dependence on volatile revenues and increased vulnerability to external shocks. These effects translate into amplified economic cycles, whereby rising oil prices temporarily support growth before triggering fiscal and monetary imbalances during downturns.

From a macroeconomic perspective, the studies by Hamilton (1983, 2009) and Kilian (2008, 2009) highlight the transmission channels of oil price shocks through relative prices, aggregate demand, and expectations. For oil-exporting countries, price increases lead to higher national income and consumption but also intensify inflationary pressures and exchange rate volatility. Kilian (2009) distinguishes three types of oil price shocks supply shocks (wars, OPEC restrictions), global demand shocks (world economic growth), and speculative demand shocks each of which has differentiated effects on oil-producing economies.

Other authors, such as Arezki and Blanchard (2014), emphasize that the management of oil rents determines the ability of governments to transform these resources into sustainable economic growth. Countries that establish stabilization funds and adopt countercyclical fiscal policies (e.g., Norway and Botswana) are better able to

mitigate the effects of price volatility. By contrast, countries that finance recurrent expenditures with temporary oil revenues tend to experience recurrent macroeconomic instability.

Empirical analyses focusing on Africa confirm these findings. Several oil-exporting countries, including Nigeria, Gabon, Congo, Angola, and Equatorial Guinea, exhibit a high sensitivity of macroeconomic indicators to fluctuations in oil prices.

In Nigeria, for example, Iwayemi and Fowowe (2011) show that increases in oil prices stimulate GDP growth and fiscal revenues in the short term, but also generate monetary instability and sustained inflation. The studies by Akpan (2009) and Adeniyi et al. (2018) confirm these asymmetric effects, indicating that price increases have a stronger impact than price declines due to structural rigidities and fiscal dependence on the oil sector.

For Gabon and Congo, Ndiaye and Bassolé (2018) highlight that the management of oil revenues remains procyclical: public spending rises during boom periods and contracts sharply during price downturns, thereby exacerbating economic volatility. In the cases of Chad and Equatorial Guinea, Arezki et al. (2011) note that the establishment of sovereign wealth funds has helped to partially smooth the effects of oil shocks, although governance deficits have limited their effectiveness.

A regional study by the African Development Bank (AfDB, 2020) on CEMAC economies concludes that oil dependence remains the main source of macroeconomic instability in the subregion. Fluctuations in Brent oil prices account for more than 60% of the variance in budget balances and current account balances in several countries, including Cameroon.

With respect to Cameroon, the literature remains relatively limited, but several recent contributions provide valuable insights. Fofack and Ndikumana (2010) show that the country's budgetary structure amplifies the effects of oil price shocks: oil revenues, representing between 20% and 30% of public resources depending on the year, directly influence public spending and the overall fiscal deficit. Similarly, Seidou Moussa and Saha (2021), using data from the National Hydrocarbons Corporation (SNH) and the Ministry of Finance (MINFI), highlight that periods of rising Brent

prices (2003–2008 and 2021–2022) coincide with improvements in revenues but also with an intensification of fiscal dependence.

From a structural perspective, BEAC (2022) and the IMF (2023) note that Cameroon exhibits an intermediate level of vulnerability within the CEMAC region: although it is less dependent on oil than Chad or Equatorial Guinea, it remains exposed to oil price shocks due to the significant role of the National Hydrocarbons Corporation (SNH) in financing the state budget. Fuel subsidy policies, which at times amount to as much as 3% of GDP, further amplify this sensitivity.

Finally, the World Bank (2023) and EITI Cameroon (2022) emphasize that economic diversification remains insufficient to absorb the effects of price volatility. The absence of a fully operational stabilization fund prevents the country from transforming oil windfalls into reserves that could be used during periods of price downturns.

3. Methodology and Data

3.1. Data Sources

The quality and relevance of econometric results largely depend on the reliability of the data used as well as on the chosen study period. In this study, the selected variables include real gross domestic product (real GDP), the international price of crude oil (Brent), oil revenues, inflation (measured by the consumer price index), the budget balance, public expenditure, the current account balance, and the real effective exchange rate. These variables capture the main transmission channels through which oil price shocks affect the Cameroonian economy and allow for an analysis of the interdependencies between the oil sector, public finances, external competitiveness, and macroeconomic stability.

The data are drawn from several well-established sources, including annual reports from the Ministry of Finance (MINFI), statistical bulletins of the Bank of Central African States (BEAC), reports from the National Hydrocarbons Corporation (SNH), and annual reports from the Extractive Industries Transparency Initiative (EITI). Additional information is obtained from academic articles and international databases such as the World Bank's World Development Indicators, the International

Monetary Fund's International Financial Statistics, and Statista for international oil price data. The use of these complementary sources helps address occasional data gaps and ensures greater consistency and reliability of the statistical series.

3.2. Choice of the Study Period (1985–2024)

The study period, spanning from 1985 to 2024, is justified by both technical constraints and economic considerations. On the one hand, the regular and reliable availability of several key macroeconomic series is ensured only from the mid-1980s onward. On the other hand, this period encompasses major episodes of oil price increases as well as significant macroeconomic reforms in Cameroon, while also incorporating recent shocks related to the 2014 oil price collapse, the COVID-19 pandemic, and the energy crisis triggered by the war in Ukraine. It therefore provides sufficient temporal depth to analyze both long-term effects and short-term adjustments induced by fluctuations in Brent oil prices, while constituting an appropriate sample for estimating a VAR model and assessing the impact of oil price shocks on key macroeconomic indicators.

3.3. Econometric Model Specification

In the context of our analysis, we adopt a VAR model in first differences. Although the Johansen test indicates the presence of cointegration, structural breaks and the fragility of the results make the use of a VECM unreliable. The VAR in differences ensures stationarity and allows for a robust analysis of short-run dynamics despite data constraints.

The vector of endogenous variables Y_t includes the following key macroeconomic aggregates:

$$Y_t = (\text{GDP, Oil Price, Oil Revenues, Inflation, Budget Balance, Public Expenditure, Current Account Balance})' \quad (1)$$

The VAR in first differences of order p is specified as:

$$\Delta Y_t = c + A_1 \Delta Y_{t-1} + A_2 \Delta Y_{t-2} + \cdots + A_p \Delta Y_{t-p} + u_t$$

where:

- $\Delta Y_t = Y_t - Y_{t-1}$ denotes the first difference,

- c is a vector of constants (7×1),

- A_i are coefficient matrices (7×7) for each lag i,

- u_t is the vector of innovations (7×1), with $u_t \sim (0, \Sigma)$.

The explicit form of the differenced vector is

$$\Delta Y_t = (\Delta PIB_t, \Delta Ppet_t, \Delta Rpet_t, \Delta Infl_t, \Delta SB_t, \Delta Dep_t, \Delta SC_t)' \tag{2}$$

This specification is justified by the importance of these variables in the transmission channels of oil price shocks in Cameroon. Real GDP captures the overall impact on economic growth; the international oil price represents the main exogenous source of the shocks under study; oil revenues reflect the direct transmission to public finances; inflation captures pressures on the general price level; the budget balance and public expenditure reflect the fiscal policy response; and the current account balance captures the effects on the balance of payments.

3.4. Justification for the Choice of the Model

The analysis of the impact of oil price increases on Cameroon's macroeconomic indicators requires an econometric methodology capable of capturing both the complexity of dynamic relationships and the simultaneity of interactions among variables. In an open economy that is highly dependent on oil rents, such as Cameroon, oil price shocks simultaneously affect several aggregates, including gross domestic product (GDP), public revenues, the general price level, the current account balance, public expenditure, and the real effective exchange rate. These multiple and intertwined interactions call for a flexible and dynamic analytical framework that goes beyond the limitations of univariate or strictly structural approaches.

In this regard, vector autoregressive (VAR) models, introduced by Sims (1980), and their extension in the presence of cointegration the vector error correction models (VECM) constitute the most appropriate econometric tools. These models allow for

the joint analysis of several time series, all treated as endogenous, and enable the study of their interrelationships in both the short and long run. Before justifying their use in the specific context of Cameroon, it is useful to recall their main characteristics.

4. Results of the Model Estimation

4.1. Results of Stationarity Tests (with ADF/PP Statistics Table)

Econometric analysis requires determining the order of integration of the variables in order to select an appropriate model specification. Accordingly, unit root tests Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) were applied to the selected time series. The table below reports the results obtained and the corresponding order of stationarity for each variable.

Table 1: Order of Stationarity of the Selected Variables

Variable	Definition / Interpretation	ADF/PP Test (Level)	ADF/PP Test (First Difference)	Order
OILPRICE	International oil price (Brent)	Non-stationary	Stationary	I(1)
OILREVENUE	Oil revenues of the Cameroonian government	Non-stationary	Stationary	I(1)
GDP	Real Gross Domestic Product	Non-stationary	Stationary	I(1)
PUBLICEXPENDITURE	Total public expenditure	Stationary	–	I(0)
BUDGETBALANCE	Overall budget balance	Stationary	–	I(0)
CURRENTACCOUNTBALANCE	External current account balance	Stationary	–	I(0)
INFLATION	Inflation rate (CPI)	Stationary	–	I(0)

Source: Author's computation using Stata 17

The results of the unit root tests (ADF and PP) highlight heterogeneity in the order of integration of the series. Oil prices, real GDP, and oil revenues are integrated of order one (I(1)), indicating the presence of a common stochastic trend and justifying the investigation of cointegration relationships among them.

By contrast, the other macroeconomic variables public expenditure, the budget balance, the current account balance, and inflation are stationary in levels (I(0)). These results suggest that they fluctuate around a stable mean without a persistent stochastic trend.

This combination of I(1) and I(0) variables makes the estimation of a standard VECM problematic, but supports the use of a VAR model in first differences to analyze short-run dynamics, while still accounting for the existence of cointegration relationships among key strategic variables, namely oil prices, GDP, and oil revenues.

4.2. Optimal Lag Length

The following table reports the results of the lag order selection criteria for lag lengths 0, 1, 2, and 3.

Table 2: Lag Order Selection

Lag	Log-Likelihood (LL)	LR Statistic	df	Prob $> \chi^2$	FPE	AIC	HQIC	SBIC
0	-2218.20	–	–	–	3.9e+46	127.154	127.262	127.465
1	-2168.98	98.432	49	0.000	4.1e+46	127.142	128.001	129.630
2	-2133.28	71.400	49	0.020	1.3e+47	127.902	129.513	132.568
3	-2056.57	153.440	49	0.000	8.0e+46	126.318	128.680	133.162
4	**-1336.45**	**1440.20***	**49**	**0.000**	**5.4e+31***	**87.9683***	**91.0824***	**96.9893***

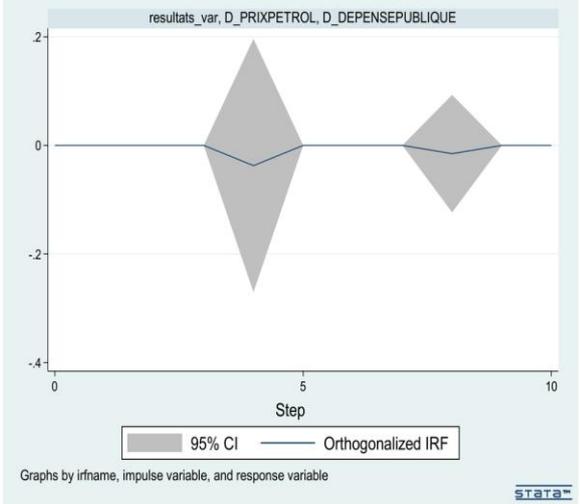**Source:** Author's computation using Stata 17

All information criteria namely the Final Prediction Error (FPE), Akaike Information Criterion (AIC), Hannan–Quinn Information Criterion (HQIC), and Schwarz Bayesian Information Criterion (SBIC) select a lag length of four (p = 4), as indicated by the minimum values marked with an asterisk. In addition, the likelihood ratio (LR) test strongly rejects the null hypothesis of a lower lag order at the 5% significance level. Consequently, a VAR model with four lags is retained for subsequent estimations.

4.3. Impulse Response Functions (IRFs)

To assess the dynamic impact of an increase in oil prices on the Cameroonian economy, we employ impulse response function (IRF) analysis. This econometric approach makes it possible to trace and quantify the response of each key macroeconomic variable following an unexpected and exogenous shock.

The results presented below, illustrated by the corresponding graphs, describe the trajectory of the economy after a sudden 1% increase in the price of crude oil. The analysis of these responses provides insights into the magnitude, persistence, and statistical significance of the effects of this shock.

Table 3: IRF Results

Response Variable	Dynamics (Magnitude and Duration of the Effect)	Statistical and Economic Interpretation	Graphs
Public Expenditure	Weak and short-lived positive response. A slight increase is observed in the first periods, followed by a rapid return to zero.	The response is globally weak and statistically insignificant, as confidence intervals largely include zero. This suggests limited and cautious fiscal adjustment to oil price shocks, possibly reflecting budgetary rigidities or fiscal rules that prevent sustained increases in public spending.	

Inflation	Slight negative response initially, followed by quick convergence toward zero. The amplitude remains very small throughout the horizon.	The effect is statistically insignificant, indicating weak pass-through of oil price shocks to domestic inflation. This may reflect fuel subsidy policies, price controls, or structural rigidities that dampen inflationary pressures in Cameroon.	
Real GDP	Positive and noticeable short-term response, peaking in the early periods, then gradually declining toward zero.	The initial response is economically meaningful and partially significant, indicating a short-run expansionary effect of oil price increases. However, the lack of persistence suggests that oil windfalls do not translate into sustained economic growth, highlighting structural constraints and weak diversification.	
Oil Revenues	Positive but moderate response, concentrated in the short run, followed by a rapid dissipation of the effect.	Although oil revenues increase following a price shock, the effect is not statistically robust over time. This points to an incomplete or delayed transmission of international prices to fiscal revenues, possibly due to contractual arrangements, taxation mechanisms.	

Budget Balance	Slight improvement in the short run, followed by oscillations and a tendency to revert toward zero.	The response is statistically insignificant. This indicates that higher oil prices do not generate a durable improvement in fiscal balances.	
Current Account Balance	Immediate positive response with a noticeable initial improvement, which fades rapidly over time.	The short-term effect appears economically meaningful, reflecting a mechanical improvement driven by higher export revenues. However, the rapid dissipation suggests that increased imports and structural leakages quickly neutralize external gains, consistent with Dutch disease dynamics.	

Source: Author's computation using Stata 17

Overall, the impulse response analysis reveals that oil price shocks generate short-term fiscal and external gains in Cameroon, mainly through oil revenues and the current account. However, these effects lack persistence and statistical robustness, while real GDP benefits only temporarily. Inflation and public spending responses remain weak, reflecting strong institutional and structural rigidities. These findings are consistent with the literature on the resource curse and Dutch disease, highlighting the difficulty of transforming oil windfalls into sustained macroeconomic stability and long-term growth.

4.4. Forecast Error Variance Decomposition (FEVD)

The analysis of impulse response functions has highlighted the dynamic effects of oil price shocks on Cameroon's main macroeconomic variables. However, this approach

does not directly indicate the relative contribution of oil price shocks to the overall fluctuations of these variables compared with other sources of disturbances. To complement this assessment, it is therefore necessary to rely on the Forecast Error Variance Decomposition (FEVD).

In this study, the FEVD is computed over a horizon of 10 periods (i.e., 10 years, given the annual frequency of the data). The table below presents the summary results obtained from the estimation of the model.

Table 4: Forecast Error Variance Decomposition (FEVD)

Response Variable	Share of Variance Explained by Oil Price Shock (%)	Brief Interpretation
Oil Price	42.62	Strong self-explanatory power: oil price dynamics are largely driven by their own shocks, reflecting high persistence.
Oil Revenues	6.92	The most important transmission channel among domestic variables, confirming the central role of oil prices in public finances.
Real GDP	3.76	Weak contribution: oil price shocks explain only a limited share of fluctuations in economic growth.
Public Expenditure	2.77	Low contribution, suggesting a moderate and weakly responsive fiscal policy to oil price variations.
Budget Balance	1.75	Very small contribution, indicating that increases in oil prices do not lead to a sustained improvement in fiscal balances.
Current Account Balance	0.61	Marginal impact, as external gains from oil exports are quickly offset by other flows (imports, leakages).
Inflation	0.14	Quasi-null contribution, revealing a very weak transmission of oil price shocks to domestic prices.

Source: Author's computation using Stata 17

The variance decomposition analysis shows that, aside from the intrinsic dynamics of oil prices themselves, oil price shocks explain only a relatively small share of the fluctuations in Cameroon's macroeconomic variables. Their impact is mainly concentrated on oil revenues, while the effects on economic growth, inflation, public finances, and the external position remain marginal. These findings confirm the weak transmission of oil price shocks to the real economy.

4.5. Model Validation Tests

In order to ensure the robustness and reliability of the results obtained from the VAR model, several diagnostic tests were conducted. These tests aim to verify the stability of the model, the absence of residual autocorrelation, and the normality of the error terms.

✓ **Confirmation of Model Stability**

The first validation criterion concerns the stability of the model. The varstable test checks whether all inverse roots of the characteristic polynomial lie within the unit circle. The results show that this condition is satisfied, indicating that the model is globally stable and that the impulse response functions (IRFs) and the forecast error variance decomposition (FEVD) can be interpreted reliably. Figure 10 below presents the results obtained using the STATA software.

Figure 1: Position of All Roots
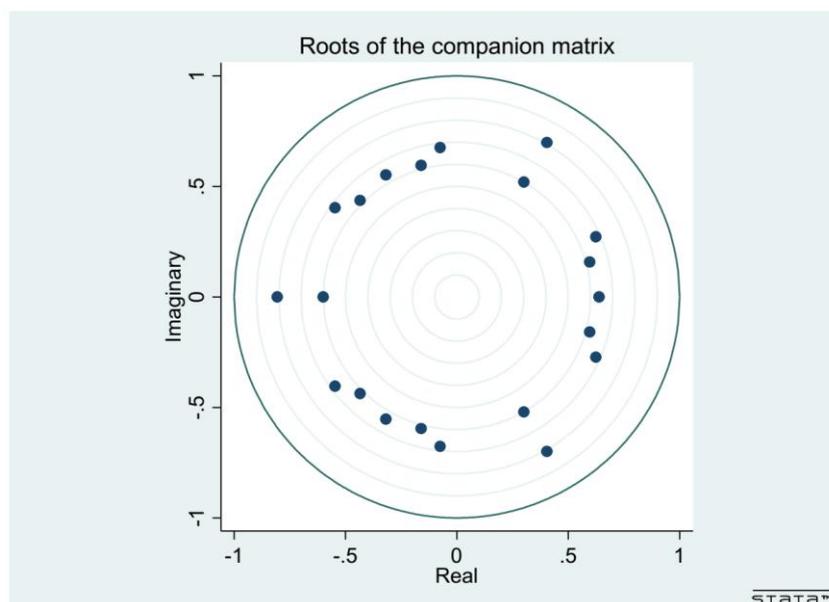
Source : Author's computation using Stata 17

✓ **Residual Autocorrelation Test**

The second test examines the absence of residual autocorrelation. The Lagrange Multiplier (LM) test was applied for different lag lengths, and the results do not reject the null hypothesis of no autocorrelation, as the p-values are not statistically significant. This confirms that the residuals of the model do not exhibit serial dependence and that the model adequately captures the dynamic relationships among the selected variables. Figure 11 below presents the results of the Lagrange Multiplier (LM) test.

Figure 2: Output of the LM test (values of the test statistic and p-values), showing that the null hypothesis is not rejected.

```
Lagrange-multiplier test
```

lag	chi2	df	Prob > chi2
1	66.4847	49	0.04877
2	31.7717	49	0.97323

```
H0: no autocorrelation at lag order
```

Source: Author's computation using Stata 17

✓ **Normality Test**

The Jarque–Bera test reveals that normality is rejected for some equations, notably real GDP and the budget balance, while other variables largely satisfy the normality assumption. Such outcomes are common in VAR models using macroeconomic data due to the influence of exceptional events and shocks. Importantly, this violation does not invalidate the results, as it mainly affects the precision of confidence intervals without undermining the overall validity of the IRF and FEVD analyses.

Tableau 5: Normality test

Equation (Residuals)	JB χ^2	Df	p-value	Conclusion (Normality)
Real GDP	1.302	2	0.521	Normality not rejected
Inflation	39.532	2	0.000	Normality rejected
Budget Balance	120.638	2	0.000	Normality rejected
Current Account Balance	0.572	2	0.751	Normality not rejected
Oil Revenues	0.397	2	0.820	Normality not rejected
Public Expenditure	0.420	2	0.811	Normality not rejected
Oil Price	0.703	2	0.703	Normality not rejected
All Equations (Joint Test)	163.564	14	0.000	Overall normality rejected

Source: Author's computation using Stata 17

The Jarque–Bera normality test results indicate that the residuals associated with real GDP, the current account balance, oil revenues, public expenditure, and oil prices follow a normal distribution. By contrast, the null hypothesis of normality is rejected for the residuals of inflation and the budget balance. The joint test applied to all equations also confirms the rejection of overall residual normality.

However, this partial violation of the normality assumption does not invalidate the VAR estimation. The econometric literature emphasizes that VAR estimators remain consistent and asymptotically valid in the presence of non-normal errors, particularly when the sample size is moderate and other diagnostic conditions such as model stability and the absence of residual autocorrelation are satisfied.

5. Discussion

The empirical results derived from the VAR model reveal an ambivalent dynamic of the Cameroonian economy in response to oil price shocks. On the one hand, increases in oil prices have an immediate, positive, and significant effect on oil revenues, thereby strengthening the government's financing capacity. In the short run, these price increases improve public cash flows and expand available fiscal space.

However, this favorable effect on public finances is accompanied by persistent and structural imbalances. Public expenditure rises with a lag but in a procyclical manner, leading to a deterioration of the budget balance despite higher revenues. The current account balance, which improves slightly in the short run, is quickly offset by rising imports, confirming the presence of a "Dutch disease" mechanism. Moreover, real GDP benefits only marginally from oil rents, reflecting weak transmission to real economic growth due to dependence on the primary sector and insufficient productive diversification. oil price shocks generate limited and short-lived inflationary pressures, rather than persistent inflation.

Overall, the economic narrative emerging from these results is that of a country that benefits from oil revenues in the short term but remains vulnerable to fiscal imbalances, price instability, and the absence of sustainable growth. This

configuration strongly aligns with the resource curse literature and illustrates the challenges of oil rent management in African oil-exporting economies.

The impulse response analysis further highlights that positive oil price shocks generate contrasted effects on the Cameroonian economy. Three main results stand out: an immediate and sustained increase in oil revenues, confirming strong fiscal dependence; a deterioration of the budget balance, reflecting the procyclicality of public finances; and an acceleration of inflation, revealing tensions associated with energy price pass-through. These findings are consistent with the works of Djiofack (2011) and Gauthier (2010) for Cameroon, Villafuerte and Lopez-Murphy (2010) and Coady et al. (2015) for Sub-Saharan Africa, as well as international evidence on the resource curse and inflationary vulnerability in resource-dependent economies (Auty, 2001; Hamilton, 1983).

By contrast, some effects appear weak and statistically insignificant. Real GDP responds only marginally to oil price shocks, confirming the limited transmission of oil rents to economic growth, as previously documented by Djiofack (2011), Akanni (2007), and Sachs and Warner (2001). The current account balance, although slightly improved in the short run, is rapidly neutralized by rising imports, in line with the Dutch disease framework described by Collier and Goderis (2012). Public expenditure responds with a delay, confirming fiscal inertia, while partially diverging from the findings of Mfouapon (2015), who occasionally identified a temporary improvement in the budget balance.

From an econometric standpoint, the model generally satisfies standard validity criteria: stability is confirmed, as all roots lie within the unit circle; residuals exhibit no autocorrelation; and normality is partially rejected a common outcome in VAR models that affects the precision of confidence intervals without undermining the overall robustness of the results. These diagnostic checks strengthen the credibility of the estimations and support the economic interpretation of the impulse response functions (IRFs) and forecast error variance decompositions (FEVD).

Overall, the findings confirm that oil price shocks generate immediate fiscal gains but exacerbate budgetary and inflationary vulnerability, underscoring the need for

countercyclical management of oil rents and a comprehensive strategy of economic diversification.

6. Conclusion and Policy Implications

This study examined the macroeconomic effects of rising oil prices in Cameroon over the period 1985–2024, focusing on public expenditure, the budget balance, the current account balance, inflation, real GDP, and oil revenues, using a Vector Autoregressive (VAR) model in first differences. The empirical results show that oil price increases generate immediate and significant gains in oil revenues, thereby strengthening the government's short-term financing capacity. However, these gains are not sustained over time. Public expenditure responds in a procyclical manner, leading to a deterioration of the budget balance, while the current account balance improves only temporarily before being offset by rising imports. Real GDP reacts weakly to oil price shocks, and inflationary pressures emerge, highlighting vulnerabilities in price stability. The FEVD results further indicate that oil price shocks explain only a limited share of the variance of most domestic macroeconomic variables, except for oil revenues.

Overall, these findings confirm the study's central hypothesis, namely that increases in oil prices generate short-term macroeconomic gains in Cameroon, but that these effects remain transitory and are accompanied by persistent structural imbalances. The results therefore support the resource curse hypothesis and the Dutch disease framework, showing that oil windfalls are not effectively transformed into sustained economic growth or lasting macroeconomic stability.

From a policy perspective, the results underscore the urgent need for countercyclical fiscal policies in Cameroon. Strengthening mechanisms for smoothing oil revenue volatility such as the establishment or reinforcement of a stabilization or sovereign wealth fund would help limit procyclical spending and preserve fiscal space during downturns. In addition, improving the transparency and efficiency of oil revenue management, reforming fuel subsidy policies, and enhancing fiscal discipline are essential to reduce inflationary pressures and budgetary vulnerability. More fundamentally, the weak response of real GDP highlights the importance of

economic diversification, particularly toward productive non-oil sectors capable of generating employment and sustainable growth.

Despite its contributions, this study has some limitations. The use of annual data restricts the analysis of very short-term dynamics, and the presence of structural breaks related to major global shocks may affect the stability of estimated relationships. Moreover, the VAR framework, while suitable for capturing dynamic interactions, does not explicitly model structural transmission channels.

Despite its contributions, this study has some limitations. The use of annual data limits the analysis of high-frequency dynamics, and potential structural breaks related to major global shocks may affect parameter stability. Future research could rely on higher-frequency data, structural VAR approaches, or explicitly incorporate institutional and governance variables.

Future research could address these limitations by employing higher-frequency data, incorporating structural VAR (SVAR) or regime-switching models, and explicitly accounting for institutional and governance factors in oil revenue management. Comparative analyses with other oil-exporting countries in the CEMAC region or Sub-Saharan Africa could also provide valuable insights into the conditions under which natural resource revenues can be transformed into sustainable development outcomes.

7-References

1. Adeniyi, O., Omisakin, O., Yaqub, J., et Oyinlola, A. (2018). Oil price shocks and economic growth in Nigeria: Are thresholds important? *OPEC Energy Review, 42*(3), 308–333.

2. African Development Bank (AfDB). (2020). *Economic outlook for Central Africa*. AfDB.

3. Akanni, O. P. (2007). Oil wealth and economic growth in oil exporting African countries. *African Development Review, 19*(2), 211–224.

4. Arezki, R., & Blanchard, O. (2014). Seven questions about the recent oil price slump. *IMF Research Bulletin, 15*(1), 1–4.

5. Arezki, R., Gylfason, T., et Sy, A. (2011). Beyond the curse: Policies to harness the power of natural resources. *IMF Finance & Development, 48*(1), 20–23.

6. Auty, R. M. (2001). *Resource abundance and economic development*. Oxford University Press.

7. Banque des États de l'Afrique Centrale (BEAC). (2022). *Rapport annuel*. BEAC.

8. Banque des États de l'Afrique Centrale (BEAC). (2022). Rapport de politique monétaire. Yaoundé: BEAC.

9. Banque mondiale. (2023). *World Development Indicators*. World Bank.

10. Brahmbhatt, M., Canuto, O., & Vostroknutova, E. (2010). Dealing with Dutch disease. *Economic Premise*, No. 16, World Bank.

11. Coady, D., Parry, I., Sears, L., & Shang, B. (2015). How large are global energy subsidies? *IMF Working Paper* No. 15/105.

12. Collier, P., et Goderis, B. (2012). Commodity prices and growth: An empirical investigation. *European Economic Review, 56*(6), 1241–1260.

13. Corden, W. M., et Neary, J. P. (1982). Booming sector and de-industrialisation in a small open economy. *The Economic Journal, 92*(368), 825–848.

14. Djiofack, C. Z. (2011). *Oil price shocks and macroeconomic performance in Cameroon*. World Bank Policy Research Working Paper.

15. EITI Cameroun. (2022). *Rapport ITIE Cameroun*. EITI.

16. Gauthier, B. (2010). Oil price shocks and fiscal adjustment in developing countries. *Journal of African Economies, 19*(3), 417–448.

17. Gelb, A. (1988). *Oil windfalls: Blessing or curse?* Oxford University Press.

18. Hamilton, J. D. (1983). Oil and the macroeconomy since World War II. *Journal of Political Economy, 91*(2), 228–248.

19. Hamilton, J. D. (1994). *Time series analysis*. Princeton University Press.

20. Hamilton, J. D. (2003). What is an oil shock? *Journal of Econometrics, 113*(2), 363–398.

21. International Monetary Fund (IMF). (2021). *Cameroon: Selected issues*. IMF Country Report.

22. International Monetary Fund (IMF). (2023). International Financial Statistics (IFS) Database. Washington, DC: IMF.

23. International Monetary Fund (IMF). (2023). *Regional economic outlook: Sub-Saharan Africa*. IMF.

24. Iwayemi, A., et Fowowe, B. (2011). Impact of oil price shocks on selected macroeconomic variables in Nigeria. *Energy Policy, 39*(2), 603–612.

25. Kilian, L. (2008). Exogenous oil supply shocks: How big are they and how much do they matter? *Review of Economics and Statistics, 90*(2), 216–240.

26. Kilian, L. (2009). Not all oil price shocks are alike: Disentangling demand and supply shocks in the crude oil market. *American Economic Review, 99*(3), 1053–1069.

27. Lütkepohl, H. (2005). *New introduction to multiple time series analysis*. Springer.

28. Mfouapon, A. (2015). Oil revenue management and fiscal sustainability in Cameroon. *African Development Review, 27*(4), 410–423.

29. Ministry of Finance of Cameroon (MINFI). (2023). Annual Public Finance Report. Yaoundé: Ministry of Finance.

30. National Hydrocarbons Corporation (SNH). (2022). Annual Report. Yaoundé: SNH.

31. Ndiaye, M. B., et Bassolé, L. (2018). Resource dependence and fiscal policy in oil-exporting countries. *Journal of African Economies, 27*(3), 299–327.

32. Sachs, J. D., & Warner, A. M. (2001). The curse of natural resources. *European Economic Review, 45*(4–6), 827–838.

33. Seidou Moussa, R., et Saha, S. (2021). Oil revenues and fiscal dependence in Cameroon. *African Development Review, 33*(S1), S80–S95.

34. Sims, C. A. (1980). Macroeconomics and reality. *Econometrica, 48*(1), 1–48.

35. Statista. (2024). Brent crude oil prices: Historical data. Statista Database.

36. Villafuerte, M., et Lopez-Murphy, P. (2010). Fiscal policy in oil producing countries during the recent oil price cycle. *IMF Working Paper* No. 10/28.

37. World Bank. (2023). Cameroon Economic Update: Navigating Volatility. Washington, DC: World Bank.