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Dynamics of Nigeria's Fiscal Policy Responses to Oil Price Shocks: Implications for Revenue Stabilization, Public Health Outcomes, and External Debt Sustainability

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Abstract

Nigeria's fiscal policy framework remains highly susceptible to oil price fluctuations due to its heavy reliance on petroleum revenue. This study investigates the dynamics of Nigeria's fiscal policy responses to oil price shocks and their implications for revenue stabilization, public health outcomes, and external debt sustainability. The motivation stems from Nigeria's persistent fiscal vulnerabilities, recent subsidy reforms, and increasing concerns over debt sustainability. The study examined the patterns of Nigeria's fiscal policy responses to oil price shocks and assess their effectiveness in achieving revenue stabilization, improving public health outcomes, and ensuring external debt sustainability from 1980 to 2023. Grounded in the Oil Price Shock Theory, New Keynesian Theory and Theory of Fiscal Federalism, this study builds on existing literature on oil price shocks and macroeconomic stability. Empirical findings suggest that oil price volatility significantly influences fiscal performance, debt accumulation, and healthcare financing. Prior studies have explored fiscal responses to oil price shocks, but limited attention has been given to their effects on health equity and external debt sustainability. Employing a Vector Autoregression (VAR) model, Impulse Response Functions (IRF) and Variance Decomposition (VD) were used to evaluate the transmission mechanisms of oil price fluctuations on Nigeria's fiscal and health sectors. Findings reveal that oil price shocks significantly affect fiscal stability, healthcare funding, and debt sustainability. Effective revenue diversification, fiscal buffers, and public health investments are necessary to enhance economic resilience and mitigate oil price volatility risks.

Keywords: Oil Price Shocks, Revenue Stability, Public Health Outcomes, Debt Sustainability, Vector Autoregressive model

JEL CLASSIFICATION: F34, I18, Q 31

Introduction

The volatility of global oil prices has remained a persistent challenge for resource-dependent economies like Nigeria. As one of Africa's largest oil exporters, Nigeria derives over 80% of its foreign exchange earnings and a substantial portion of government revenue from petroleum, making the economy highly susceptible to cyclical economic shocks. Fluctuating oil prices disrupt revenue stability, fiscal planning, and external debt sustainability while influencing critical sectors such as public health and inflation (Leo, 2024; Bamaiyi, 2024). During periods of oil price booms, Nigeria often experiences revenue surpluses that facilitated increased investments in infrastructure, education, healthcare and other sector of the economy. However, such fiscal

gains are rarely sustained due to pro-cyclical spending behaviours, where government expenditure expands during revenue booms but contracts sharply during downturns (Okorie & Lin, 2024). Moreover, weak institutional capacity, inconsistent implementation, and governance challenges undermine fiscal tools like the Excess Crude Account (ECA) and Sovereign Wealth Fund (SWF), which are intended to cushion the economy against oil price shocks. The inability to effectively deploy these mechanisms has entrenched fiscal vulnerabilities, as evidenced in studies by Dauda et al. (2023).

The fiscal repercussions of oil price volatility have severe implications for healthcare financing. Revenue shortfalls during downturns often constrain government spending, leading to underfunded health services and adverse health outcomes such as reduced life expectancy and increased child mortality rates (Leo, 2024; Bamaiyi, 2024, Dauda et al. (2023) further emphasize that fiscal instability exacerbates inequities in healthcare access, disproportionately affecting marginalized groups and eroding gains in public health. Compounding these challenges is Nigeria's frequent recourse to external borrowing during fiscal crises. As oil revenues fluctuate, the government increasingly relies on external debt to finance fiscal deficits, raising concerns about the long-term sustainability of the country's debt (Iliyasu et al., 2024). Conversely, some scholars, such as Bamaiyi (2024), argue that Nigeria's vulnerability to oil price shocks could be mitigated through diversification strategies, which would enhance economic resilience and reduce r6eliance on oil revenues.

The interaction between fiscal policy and macroeconomic stability extends beyond a one-directional influence. While fiscal instability, often triggered by oil price fluctuations, affects government expenditure on public health and debt accumulation, health outcomes themselves can exert feedback effects on the economy. Poor health indicators, such as high disease burdens and low life expectancy, reduce labor productivity, constrain economic growth, and indirectly contribute to fiscal imbalances by increasing social spending pressures (Iliyasu et al., 2024). Furthermore, inadequate healthcare funding exacerbates inequalities, affecting workforce efficiency and long-term economic sustainability. The bidirectional nature of these relationships suggests that fiscal policies and macroeconomic performance must be examined through a more integrated approach.

This study employs a Vector Autoregression (VAR) methodology to examine the dynamic interdependencies between oil price shocks, fiscal adjustments, healthcare financing, and external debt accumulation in Nigeria from 1980 to 2023. The VAR model captures the causal relationships among oil revenue fluctuations, public expenditure adjustments, external borrowing patterns, inflationary pressures, and healthcare funding. Impulse response functions and variance decomposition techniques provide insights into the magnitude, direction, and persistence of these interlinkages, shedding light on the transmission mechanisms underlying Nigeria's fiscal policy responses.

This research focuses on three critical dimensions: revenue stabilization, public health outcomes, and external debt sustainability. First, it evaluates how fiscal policies can stabilize revenue flows in the face of oil price fluctuations, emphasizing governance and institutional capacity. Second, it examines the reciprocal effects between fiscal adjustments and healthcare financing, particularly during periods of economic distress. Third, it assesses the implications of oil price shocks on external debt sustainability, highlighting potential risks to long-term economic stability. By integrating these dimensions, the study contributes to the literature on oil-dependent economies and proposes policy strategies that enhance fiscal resilience while safeguarding social welfare and macroeconomic stability.

Literature Review

Theoretical Literature

The theoretical foundation of this study is anchored on the Oil Price Shock Theory, the New Keynesian Theory, and the Theory of Fiscal Federalism, each offering critical insights into the

cyclical nature of oil price fluctuations, the necessity for government intervention in economic stabilization, and the structural challenges within Nigeria's fiscal framework. Together, these theories provide a comprehensive lens for evaluating Nigeria's fiscal policy responses to oil price shocks, particularly in the context of revenue stabilization, debt sustainability, and public health expenditure.

The Oil Price Shock Theory serves as a foundational framework for understanding the economic disruptions caused by oil price fluctuations in oil-dependent economies like Nigeria. It posits that sudden changes in oil prices act as external shocks, significantly impacting government revenues and, consequently, fiscal stability. During periods of oil price booms, increased revenues enable expansionary fiscal policies, allowing greater public investment in infrastructure and social services. However, downturns trigger revenue shortfalls, forcing governments to implement contractionary fiscal measures that often involve budgetary cuts in critical sectors such as healthcare (Taghizadeh-Hesary et al., 2023). The theory highlights the cyclical nature of these shocks and underscores the need for robust fiscal management strategies to ensure economic resilience. Within the context of Nigeria's fiscal policy responses, this theory explains the recurring pattern of expansionary spending during oil price hikes and subsequent austerity measures during price declines, which have historically undermined economic stability and social welfare.

Complementing this perspective, the New Keynesian Theory underscores the necessity of active government intervention to counteract economic volatility induced by oil price shocks. It argues that due to market imperfections such as price and wage stickiness, economies do not automatically self-correct in response to external shocks, necessitating counter-cyclical fiscal policies (Schettkat, 2022). The theory advocates for increased public spending and tax reductions during economic downturns to stimulate demand and cushion the adverse effects of revenue shortfalls. It also emphasizes the importance of fiscal discipline during revenue booms, recommending that surplus revenues be saved in stabilization funds to provide buffers during economic downturns. In the Nigerian context, the theory provides a strong justification for the establishment of sovereign wealth funds and excess crude accounts, which, if effectively managed, could mitigate the impact of oil price volatility on fiscal sustainability and public service delivery, including healthcare financing.

Further reinforcing the discussion, the Theory of Fiscal Federalism offers critical insights into the structural dimensions of fiscal policy implementation in Nigeria. It postulates that the efficiency of fiscal policy depends on the appropriate allocation of resources and decision-making authority across different levels of government. Given Nigeria's federal structure, fiscal decentralization plays a crucial role in determining how oil revenues are allocated and utilized at both national and subnational levels. The theory highlights three key principles relevant to Nigeria's fiscal management: the Resource Allocation principle, which supports decentralized revenue and expenditure management as a means of fostering economic development (Nkoro & Otto, 2023); the Intergovernmental Coordination principle, which stresses the importance of harmonizing fiscal strategies across different tiers of government to address inefficiencies caused by fragmentation (Weissert, 2023); and Revenue Allocation Issues, which reveal that revenue distribution in Nigeria has often been politically motivated, leading to inefficiencies and exacerbating economic disparities (Eteudo & Ufomba, 2022). This theory is particularly relevant in analyzing the implications of fiscal decentralization on Nigeria's ability to respond effectively to oil price shocks and maintain stable funding for essential sectors such as healthcare.

Taken together, these theories provide a robust framework for evaluating Nigeria's fiscal policy responses to oil price fluctuations. By integrating these perspectives, this study offers a comprehensive analysis of how Nigeria's fiscal policies have evolved in response to oil price shocks and their implications for economic stability, debt sustainability, and healthcare financing.

Empirical Review

Evaluating the dynamics of Nigeria's fiscal policy responses to oil price shocks necessitates an examination of methodologies and empirical evidence from similar contexts. Existing literature provides insights into the complex interactions between oil price volatility, fiscal performance, and macroeconomic stability, employing various econometric approaches beyond VAR models.

Rasheed (2023) and Omojolaibi & Egwaikhide (2014) applied panel VAR models to analyze the impact of oil price volatility on fiscal performance in oil-exporting countries. Their findings indicate that oil price volatility significantly affects the real sector, particularly gross investment, underscoring the need for stabilizing public investment during downturns. Similarly, Yorulmaz and Kaptan (2022) assessed fiscal cyclicality in MENA countries using a VAR framework, concluding that counter-cyclical fiscal policies mitigate the adverse effects of oil price fluctuations. However, Egert (2010) noted that Nigeria's fiscal policy has historically been pro-cyclical, exacerbating economic instability during oil price downturns.

Beyond VAR-based studies, alternative methodologies have been employed to assess the relationship between oil price shocks and fiscal performance. Al-Hassan (2023) utilized the Induced Response Function to examine fiscal policy shocks in Iraq, highlighting the importance of flexible fiscal strategies in mitigating oil price volatility. Similarly, Naini and Naderian (2019) applied Structural Equation Modeling (SEM) to explore the role of counter-cyclical fiscal policies in ensuring economic stability. Their findings suggest that well-calibrated fiscal responses during oil booms and busts enhance long-term fiscal sustainability.

More recent studies have expanded the scope of analysis. Leo (2024) employed a Dynamic Stochastic General Equilibrium (DSGE) model to investigate the fiscal responses of oil-exporting economies, finding that countries with well-structured sovereign wealth funds experience less fiscal distress during oil price shocks. Bamaiyi (2024) used an Autoregressive Distributed Lag (ARDL) approach to assess the long-run relationship between oil price fluctuations and public healthcare expenditure in Nigeria, revealing that oil price volatility negatively impacts healthcare spending, particularly during revenue shortfalls. Similarly, Okorie & Lin (2024) applied a Difference-in-Differences (DiD) approach to analyze the fiscal effects of subsidy removal, showing that targeted social spending can mitigate the adverse impacts on vulnerable populations.

Dauda et al. (2023) conducted a panel data analysis to examine the link between oil price volatility and public debt sustainability in sub-Saharan Africa, emphasizing the need for debt management strategies that account for external shocks. Meanwhile, Iliyasu et al. (2024) employed a Bayesian Structural VAR approach to assess the dynamic effects of oil price fluctuations on Nigeria's macroeconomic stability, reinforcing the argument that policy coordination between fiscal and monetary authorities is crucial in minimizing economic disruptions.

From the reviewed literature, several gaps remain unaddressed. First, while numerous studies have examined the impact of oil price shocks on fiscal performance, limited attention has been given to the disaggregated effects on key expenditure categories such as healthcare and infrastructure. Second, while counter-cyclical fiscal policies are widely recommended, empirical assessments of their effectiveness in Nigeria remain sparse, necessitating further exploration of how specific policy measures have influenced macroeconomic stability in different oil price regimes. Additionally, existing literature often employs conventional oil price shock measures, overlooking the more reliable decomposition framework proposed by Baumeister & Hamilton (2019) and Kilian (2020), which distinguishes between different sources of oil price shocks. By integrating this decomposition approach, this study provides a more precise understanding of how various oil price shocks influence fiscal stability, healthcare financing, and debt sustainability in Nigeria.

Methods

Theoretical Framework

At the heart of this study is a robust theoretical framework that integrates the Oil Price Shock Theory and New Keynesian Theory, providing the foundational principles for analyzing the dynamic and causal relationships between fiscal policy, public health outcomes, and external debt sustainability. This framework underscores the critical role of fiscal policy in mitigating the socioeconomic disruptions caused by oil price shocks, particularly in an oil-dependent economy like Nigeria, where revenue fluctuations directly impact government expenditure, debt accumulation, and public service delivery.

The Oil Price Shock Theory posits that fluctuations in global oil prices can have profound effects on macroeconomic variables in oil-dependent economies. These effects include changes in GDP, inflation, exchange rates, and government revenue, ultimately influencing fiscal policy decisions. The theory assumes that oil price changes can lead to significant economic disturbances, particularly in economies that are heavily reliant on oil exports or imports. It posits that these shocks can affect production costs, consumer prices, and ultimately, the overall economic activity. For example, a rise in oil prices typically leads to increased government revenue, currency appreciation, and expanded fiscal space, allowing for higher public spending and reduced borrowing needs. Conversely, a decline in oil prices can lead to fiscal deficits, exchange rate depreciation, and constrained government revenue, necessitating increased borrowing to sustain public expenditures, including healthcare investments. This cyclical dependence on oil prices makes external debt accumulation highly sensitive to oil price volatility, raising concerns about debt sustainability when borrowing becomes excessive during periods of low oil revenues. This theory aligns with Nigeria's economic structure, where oil revenues constitute a dominant share of government income and directly influence fiscal policy choices.

The New Keynesian Theory complements this by emphasizing price and wage rigidity, as well as the crucial role of government intervention in stabilizing the economy during periods of economic shocks. Due to price stickiness, adjustments to external shocks are often slow and inefficient, necessitating counter-cyclical fiscal measures to smooth economic fluctuations. In this context, fiscal policy serves as a buffer against economic downturns, ensuring the continuity of public services, including healthcare, while managing external debt sustainability. However, when fiscal deficits persist due to prolonged oil price declines, governments often resort to external borrowing, which can create long-term debt sustainability risks, particularly if borrowed funds are not allocated efficiently.A key concern within this framework is the fiscal sustainability constraint, which dictates that governments must balance short-term fiscal responses with long-term debt sustainability

To formally model these theoretical foundation, the study consider how oil price fluctuations influence key macroeconomic indicators, particularly fiscal policy, health expenditure and debt. The oil price impact on aggregate supply can be expressed as:

The Oil Price Shock Theory suggests that oil price fluctuations impact government revenue (R_t),which in turn affects fiscal policy decisions. We express government revenue as:

$$R_t = P_{o,t}Q_t + T_t \text{.....3.1}$$

where:

- $P_{o,t}$ is the oil price at time t,
- Q_t is the quantity of oil produced/exported,
- T_t represents non-oil revenue (e.g., tax revenue).

Given that Nigeria's revenue is largely oil-dependent, a decline in $P_{o,t}$ leads to a fiscal shortfall, necessitating government adjustments in expenditure and borrowing.

For the Fiscal Balance and Expenditure Dynamics, the government's budget constraint can be written as:

$$G_t = R_t + B_t \text{……..3.2}$$

where:

- G_t is government expenditure,
- R_t is total government revenue (from equation 1),
- B_t is borrowing (including external debt accumulation).

When oil revenue declines, the government increases borrowing (B_t) to finance expenditures. The relationship between borrowing, fiscal deficit, and external debt accumulation is captured as:

$$B_t = (G_t - R_t) + iD_{t-1} \text{……..….3.3}$$

where:

- D_t represents external debt stock,
- iD_{t-1} is the interest payment on previous debt.

The Relationship between Public Health Spending and Debt Sustainability follows the intuition that Public health spending (H_t) is a function of government revenue and fiscal policy choices:

$$H_t = \alpha G_t + \epsilon_t \text{ ……..3.4}$$

where α represents the share of government expenditure allocated to healthcare, and ϵ_t is a stochastic disturbance. However, when oil revenue declines and borrowing increases, debt service obligations (iD_{t-1}) grow, potentially crowding out public health spending:

$$H_t = \alpha(R_t + B_t) - \beta iD_{t-1} + \epsilon_t \text{……3.5}$$

where β captures the sensitivity of health expenditure to debt servicing.

The external debt accumulation equation is derived from government borrowing dynamics:

$$D_t = D_{t-1} + B_t - P_O \text{……3.6}$$

where P_O represents oil-related debt repayments. To ensure external debt sustainability, the government must manage its primary balance and borrowing efficiently. The debt sustainability condition is:

$$\frac{D_t}{GDP_t} \leq \delta \text{……3.7}$$

where δ is the sustainable debt-to-GDP threshold. If $\frac{D_t}{GDP_t}$ exceeds this threshold, debt distress arises, leading to fiscal constraints on public health investment and macroeconomic stability.

Given the interdependence of oil revenue, fiscal policy, health spending, and debt sustainability, the final model specification is:

$$H_t = \alpha\left(P_{o,t}Q_t + T_t + B_t\right) - \beta iD_{t-1} + \gamma\frac{D_t}{GDP_t} + \epsilon_t \text{……3.8}$$

Where γ captures the feedback effect of debt sustainability on public health expenditure.

Variables Description, Measurements, and Sources of Data

The selection of variables for this study is meticulously guided by their direct relevance to the research questions and objectives.

Foremost, to capture the objectives of this study, oil price shocks are decomposed into four distinct categories following Baumeister & Hamilton (2019) and Killian (2020): Aggregate Demand Shock (AGGDDS), Oil Inventory Demand Shock (INDDS), Oil-Specific Demand Shock (OSDDS), and Oil Supply Shock (SSS). However, only the Aggregate Demand Shock (AGGDDS) and Oil Supply Shock (SSS) are used in this study. According to Baumeister & Hamilton (2019) and Killian (2020), Aggregate demand shocks arise from changes in global

economic activity that influence the overall demand for oil, while supply shocks stem from production disruptions caused by geopolitical instability or natural disasters. Each of these shocks has unique characteristics and impacts that influence the macroeconomic variables in different ways. Fiscal Policy Variables encompass Government Revenue, and Public External Debt. Government Revenue is represented by Total Government Revenue, indicating the government's income generation capabilities. Public External Debt is measured as percentage of GDP, reflecting the government's borrowing patterns internationally. Health Outcomes include Health Expenditure and Life Expectancy. Health Expenditure is measured as a percentage of GDP, highlighting the proportion of national resources allocated to health services. Life Expectancy is captured through the Average Life Expectancy at Birth, a fundamental indicator of long-term population health. Data on the variables are sourced from the World Bank Development Indicator, Central Bank of Nigeria Statistical Bulletin while Oil price shocks are computed from Oil Price data.

Model Specification

The theoretical framework, based in the Oil Price Shock Theory and New Keynesian Theory**,** provides a robust foundation for specifying the study's empirical model. The Vector Autoregression (VAR) methodology is adopted to analyze the dynamic and causal relationships between oil price shocks, fiscal policy responses, public health outcomes, and external debt sustainability. The VAR model is particularly suited for capturing lagged interactions and feedback effects among these key variables, ensuring a comprehensive examination of Nigeria's fiscal policy adjustments to oil price fluctuations. For instance, the equation $AS = f(P_0, W, K)$ illustrates how oil prices (P_0) affect aggregate supply by altering production costs, labor wages (W), and capital accumulation (K). Similarly, capital changes ($\Delta K = s(Y - C - Po) - \delta K$) highlight the cyclical nature of investment and savings in response to oil price fluctuations, where P_0 denotes the oil price, W represents labor wages, and K is capital accumulation, Y is national income, C is consumption, s is the savings rate, and δ represents capital depreciation. The New Keynesian model, with its emphasis on price stickiness and policy interventions, provides additional structure to the model. For example, the Phillips Curve equation $\pi_t = \beta \mathbb{E}_t[\pi_{t+1}] + \kappa y_t + u_t$ models the inflation-output relationship under cost-push shocks such as oil price increases. The IS Curve, $y_t = \mathbb{E}_t[y_{t+1}] - \frac{1}{\sigma} 1\sigma(i_t - \mathbb{E}_t[\pi_{t+1}] - r*)$ explains how aggregate demand responds to interest rate changes, while the Taylor Rule, $i_t = \mathrm{r}^* + \pi_t + \phi_\pi(\pi_t - \pi^*) + \phi_y y_t$ captures monetary policy responses to economic deviations, where π_t represents inflation, y_t denotes output gap, and u_t is a shock term, i_t is the interest rate, and r^* represents the natural rate of interest.

These theoretical relationships guide the specification of a VAR model by providing insights into the causal relationships between oil price shocks, fiscal dynamics, such as government revenue, expenditure, and external debt sustainability and public health outcomes including health expenditure and life expectancy.

Specification of Vector Autoregressive (VAR) Model

The VAR model was employed for this analysis and variables that capture the core aspects of oil price shocks, fiscal dynamics, public health outcomes, and macroeconomic stability are included. The VAR methodology captures the lagged and contemporaneous effects of these shocks on fiscal variables, facilitating an understanding of their endogenous dynamics and is expressed as:

$$Z_t = A_0 + \sum_{i=1}^{p} A_i Z_{t-i} + \epsilon_t \qquad 3.9$$

where Z_t is the vector of endogenous variables at time t, A_0 is the vector of intercepts, A_i are matrices of coefficients for lagged variables (lags from 1 to p) and ϵ_t is the vector of error terms (innovations).

$Z_t = [P_{o,t}, R_t, G_t, D_t, HE_t, LEB_t]$

- $P_{o,t}$ = Oil price shocks (AGGDDS & SSS)
- R_t = Government revenue
- G_t = Government expenditure
- D_t = External debt stock
- HE_t = Health Expenditure
- LEB_t = Life Expectancy

The Impulse Response Functions (IRF) and Variance Decomposition (VD) will be employed to analyze the impact of oil price shocks on these variables over time.

For this study, Z_t includes the relevant variables:

$$Z_t = \begin{bmatrix} AGGDDS_t \\ SSS_t \\ GREV_t \\ DEBT_t \\ HEXP_t \\ LEB_t \\ GDP_t \\ INF_t \end{bmatrix} \qquad 3.10$$

Where:

AGGDDS is Aggregate Demand Shock; SSS is Oil Supply Shock; GREV is Government Revenue

DEBT is Public Debt; HEXP is Health Expenditure; LEB is Life Expectancy

INF is Inflation; GDP is Real GDP.

Equation 10 is specified in a VAR framework as:

$$AGGDDS_t = \alpha_0 + \sum_{i=1}^{k} \alpha_{1i}\, AGGDDS_{t-1} + \sum_{i=1}^{k} \alpha_{2i}\, \mathrm{SSS}_{t-1} + \sum_{i=1}^{k} \alpha_{3i}\, \mathrm{GREV}_{t-1} + \sum_{i=1}^{k} \alpha_{4i}\, \mathrm{DEBT}_{t-1} + \sum_{i=1}^{k} \alpha_{5i}\, \mathrm{HEXP}_{t-1} + \sum_{i=1}^{k} \alpha_{6i}\, \mathrm{LEB}_{t-1} + \sum_{i=1}^{k} \alpha_{7i}\, \mathrm{GDP}_{t-1} + \sum_{i=1}^{k} \alpha_{8i}\, \mathrm{INF}_{t-1} + \varepsilon_{1t}$$

$$SSS_t = \beta_0 + \sum_{i=1}^{k} \beta_{1i}\, SSS_{t-1} + \sum_{i=1}^{k} \beta_{2i}\, \mathrm{AGGDDS}_{t-1} + \sum_{i=1}^{k} \beta_{3i}\, \mathrm{GREV}_{t-1} + \sum_{i=1}^{k} \beta_{4i}\, \mathrm{DEBT}_{t-1} + \sum_{i=1}^{k} \beta_{5i}\, \mathrm{HEXP}_{t-1} + \sum_{i=1}^{k} \beta_{6i}\, \mathrm{LEB}_{t-1} + \sum_{i=1}^{k} \beta_{7i}\, \mathrm{GDP}_{t-1} + \sum_{i=1}^{k} \beta_{8i}\, \mathrm{INF}_{t-1} + \varepsilon_{2t}$$

$$GREV_t = \gamma_0 + \sum_{i=1}^{k} \gamma_{1i}\, GREV_{t-1} + \sum_{i=1}^{k} \gamma_{2i}\, \mathrm{AGGDDS}_{t-1} + \sum_{i=1}^{k} \gamma_{3i}\, \mathrm{SSS}_{t-1} + \sum_{i=1}^{k} \gamma_{4i}\, \mathrm{DEBT}_{t-1} + \sum_{i=1}^{k} \gamma_{5i}\, \mathrm{HEXP}_{t-1} + \sum_{i=1}^{k} \gamma_{6i}\, \mathrm{LEB}_{t-1} + \sum_{i=1}^{k} \gamma_{7i}\, \mathrm{GDP}_{t-1} + \sum_{i=1}^{k} \gamma_{8i}\, \mathrm{INF}_{t-1} + \varepsilon_{3t}$$

$$DEBT_t = \delta_0 + \sum_{i=1}^{k} \delta_{1i}\, DEBT_{t-1} + \sum_{i=1}^{k} \delta_{2i}\, \mathrm{AGGDDS}_{t-1} + \sum_{i=1}^{k} \delta_{3i}\, \mathrm{SSS}_{t-1} + \sum_{i=1}^{k} \delta_{4i}\, \mathrm{GREV}_{t-1} + \sum_{i=1}^{k} \delta_{5i}\, \mathrm{HEXP}_{t-1} + \sum_{i=1}^{k} \delta_{6i}\, \mathrm{LEB}_{t-1} + \sum_{i=1}^{k} \delta_{7i}\, \mathrm{GDP}_{t-1} + \sum_{i=1}^{k} \delta_{8i}\, \mathrm{INF}_{t-1} + \varepsilon_{4t}$$

$$HEXP_t = \vartheta_0 + \sum_{i=1}^{k} \vartheta_{1i}\, HEXP_{t-1} + \sum_{i=1}^{k} \vartheta_{2i}\, \mathrm{AGGDDS}_{t-1} + \sum_{i=1}^{k} \vartheta_{3i}\, \mathrm{SSS}_{t-1} + \sum_{i=1}^{k} \vartheta_{4i}\, \mathrm{GREV}_{t-1} + \sum_{i=1}^{k} \vartheta_{5i}\, \mathrm{DEBT}_{t-1} + \sum_{i=1}^{k} \vartheta_{6i}\, \mathrm{LEB}_{t-1} + \sum_{i=1}^{k} \vartheta_{7i}\, \mathrm{GDP}_{t-1} + \sum_{i=1}^{k} \vartheta_{8i}\, \mathrm{INF}_{t-1} + \varepsilon_{5t}$$

$$LEB_t = \mu_0 + \sum_{i=1}^{k} \mu_{1i}\, LEB_{t-1} + \sum_{i=1}^{k} \mu_{2i}\, \mathrm{AGGDDS}_{t-1} + \sum_{i=1}^{k} \mu_{3i}\, \mathrm{SSS}_{t-1} + \sum_{i=1}^{k} \mu_{4i}\, \mathrm{GREV}_{t-1} + \sum_{i=1}^{k} \mu_{5i}\, \mathrm{DEBT}_{t-1} + \sum_{i=1}^{k} \mu_{6i}\, \mathrm{HEXP}_{t-1} + \sum_{i=1}^{k} \mu_{7i}\, \mathrm{GDP}_{t-1} + \sum_{i=1}^{k} \mu_{8i}\, \mathrm{INF}_{t-1} + \varepsilon_{6t}$$

$$GDP_t = \varphi_0 + \sum_{i=1}^{k} \varphi_{1i}\, GDP_{t-1} + \sum_{i=1}^{k} \varphi_{2i}\, \mathrm{AGGDDS}_{t-1} + \sum_{i=1}^{k} \varphi_{3i}\, \mathrm{SSS}_{t-1} + \sum_{i=1}^{k} \varphi_{4i}\, \mathrm{GREV}_{t-1} + \sum_{i=1}^{k} \varphi_{5i}\, \mathrm{DEBT}_{t-1} + \sum_{i=1}^{k} \varphi_{6i}\, \mathrm{HEXP}_{t-1} + \sum_{i=1}^{k} \varphi_{7i}\, \mathrm{LEB}_{t-1} + \sum_{i=1}^{k} \varphi_{8i}\, \mathrm{INF}_{t-1} + \varepsilon_{7t}$$

$$INF_t = \omega_0 + \sum_{i=1}^{k} \omega_{1i}\, INF_{t-1} + \sum_{i=1}^{k} \omega_{2i}\, \mathrm{AGGDDS}_{t-1} + \sum_{i=1}^{k} \omega_{3i}\, \mathrm{SSS}_{t-1} + \sum_{i=1}^{k} \omega_{4i}\, \mathrm{GREV}_{t-1} + \sum_{i=1}^{k} \omega_{5i}\, \mathrm{DEBT}_{t-1} + \sum_{i=1}^{k} \omega_{6i}\, \mathrm{HEXP}_{t-1} + \sum_{i=1}^{k} \omega_{7i}\, \mathrm{LEB}_{t-1} + \sum_{i=1}^{k} \omega_{8i}\, \mathrm{GDP}_{t-1} + \varepsilon_{8t}$$

…… 3.11

Results and Discussion

Preliminary Analysis

This section outlines the preliminary analysis conducted on the data set for the study, specifically through descriptive statistics and unit root tests.

Descriptive Statistics

The descriptive statistics presented for the study variables offer crucial insights into the distribution, central tendency, variability, and skewness of the variables for understanding the dynamic relationships between oil price shocks, fiscal policy, public health outcomes, and macroeconomic indicators in Nigeria.

Table 1: Descriptive Statistics

Variables	AGGDDS	SSS	HEXP	INF	LEB	GDP	PED	GOVTR
Mean	-0.02090	-0.05968	2.35578	1.16678	3.88376	11.1405	6.53509	6.73827
Median	-0.00791	-0.11775	3.35207	1.11198	3.86647	11.0765	6.50580	7.63167
Maximum	0.33015	0.63059	6.08112	1.86234	4.01530	11.759	9.83640	9.44038
Minimum	-0.70628	-1.03099	-3.21888	0.73143	3.81743	10.4433	0.84587	2.35138
Std. Dev.	0.18476	0.39067	3.05031	0.29042	0.05792	0.42245	2.12130	2.48891
Skewness	-1.13379	-0.15938	-0.42783	0.86281	0.42275	0.07981	-0.80710	-0.58859
Kurtosis	6.00665	2.73322	1.72993	3.01702	1.76616	1.42097	3.26790	1.85156
Jarqu-Bera	24.81829	0.302376	4.104143	5.21154	3.91514	4.40795	4.68548	4.73319
Probability	0.000004	0.859686	0.128469	0.07385	0.14120	0.11036	0.09606	0.09380
Sum	-0.877845	-2.506380	98.94280	49.0049	163.118	467.9025	274.474	283.007
SSD.	1.399627	6.257538	381.4798	3.45817	0.13754	7.31718	184.497	253.982
Obs	42	42	42	42	42	42	42	42

Source: Author's computation.

The aggregate demand shock (AGGDDS) and supply shocks (SSS) reveal Nigeria's vulnerability to oil market volatility, with mean values of -0.0209 and -0.0597, respectively, and substantial fluctuations (standard deviations of 0.1848 and 0.3907). These negative shocks indicate significant economic instability during the study period. Government revenue (GREV) shows a mean of 6.7383 with a high standard deviation (2.4889), highlighting fiscal volatility driven by oil price fluctuations. Its negative skewness (-0.5886) reflects frequent revenue shortfalls, necessitating borrowing, as evidenced by public external debt (PED) with a mean of 6.5351 and a high standard deviation of 2.1213, constraining fiscal flexibility. Health expenditure (HEXP), with a mean of 2.3558 and a high standard deviation (3.0503), underscores inconsistent public health funding, linked to Nigeria's pro-cyclical fiscal policies. Life expectancy (LEB) is relatively stable (mean 3.8838, standard deviation 0.0579) but shows slow progress due to underinvestment. Inflation (INF) and GDP exhibit moderate volatility, reflecting persistent structural inefficiencies and constrained growth. The Jarque-Bera test confirms non-normal distributions for most variables, notably AGGDDS ($p = 0.000004$), illustrating the asymmetric and leptokurtic nature of oil shocks. These patterns emphasize the challenges of managing fiscal stability in Nigeria's oil-dependent economy.

Unit Root Test

To assess the stationarity of the time series data and avoid spurious regression, the Augmented Dickey-Fuller (ADF) test was employed. Testing for unit roots confirms whether the data are stationary or require differencing, thereby guiding model selection and ensuring reliable results. This result is shown in Table 4.2.

Table 2: Unit Root Test Result

Variable	**Test**	**T Stat. (Level)**	**P-Val. (Level)**	**T Stat. (1st Diff)**	**P-Val. (1st Diff)**	**T Stat. (2nd Diff)**	**P-Val. (2nd Diff)**	**Order of Integr)**
AGGDDS	ADF	-7.8529	0.0000	-	-	-	-	I(0)
SSS	ADF	-5.8701	0.0000	-	-	-	-	I(0)
GOVTR	ADF	-	-	-6.4009	0.0000	-	-	I(1)
PED	ADF	-	-	-4.9291	0.0002	-	-	I(1)
GDP	ADF	-	-	-4.4577	0.0010	-	-	I(1)
INF	ADF	-4.4823	0.0049	-	-	-	-	I(0)
HEXP	ADF	-	-	-10.4537	0.0000	-	-	I(1)
LEB	ADF	-	-	-3.30561	0.0799			I(1)

Source: Author's computation.

The unit root test results reveal mixed integration orders, highlighting the diverse stochastic properties of the study variables. Aggregate Demand Shocks (AGGDDS) and Supply Shocks (SSS) are stationary at levels (I(0)), indicating mean-reverting behavior and allowing for direct model inclusion. This suggests that shocks to these variables are short-lived. Conversely, Government Revenue (GOVTR), Public External Debt (PED), Gross Domestic Product (GDP), Health Expenditure (HEXP) and Life Expectancy at Birth (LEB) are non-stationary at levels but achieve stationarity after first differencing (I(1)). Inflation (INF), stationary at levels, supports the notion of short-term manageability through monetary policy.

Main Findings

Vector Autoregression Result

The Vector Autoregression (VAR) results provide crucial insights into the dynamic relationships and interdependencies between oil price shocks and fiscal/public health variables in Nigeria. By examining the lagged effects of each variable on others, the results underscore how shocks to key economic drivers propagate through fiscal mechanisms, health outcomes, and macroeconomic indicators, highlighting both short- and long-term implications. The results is shown in Table 3

Table 3: Vector Autoregression Estimates

	AGGDDS	SSS	GOVTR	PED	HEXP	LEB	GDP	INF
AGGDDS(-1)	-0.223800	0.378135	0.725255	-0.126370	0.493579	0.007980	0.085009	0.252882
	(0.17151)	(0.38707)	(0.25845)	(0.42561)	(0.51793)	(0.00956)	(0.05973)	(0.22776)
	[-1.30486]	[0.97692]	[2.80613]	[-0.29692]	[0.95299]	[0.83468]	[1.42315]	[1.11032]
AGGDDS(-2)	-0.439548	-0.016701	0.110568	0.361185	1.092697	0.004105	0.038716	-0.217018
	(0.19109)	(0.43125)	(0.28796)	(0.47419)	(0.57705)	(0.01065)	(0.06655)	(0.25375)
	[-2.30020]	[-0.03873]	[0.38397]	[0.76168]	[1.89358]	[0.38536]	[0.58175]	[-0.85523]
SSS(-1)	0.040859	0.017110	-0.153345	0.046544	-0.071874	-0.001955	0.006618	0.103655
	(0.08887)	(0.20056)	(0.13392)	(0.22053)	(0.26837)	(0.00495)	(0.03095)	(0.11801)
	[0.45975]	[0.08531]	[-1.14505]	[0.21105]	[-0.26782]	[-0.39469]	[0.21382]	[0.87834]
SSS(-2)	0.164027	-0.131176	0.028754	-0.087394	-0.071760	-0.006667	0.025858	-0.142150
	(0.08620)	(0.19454)	(0.12990)	(0.21391)	(0.26031)	(0.00481)	(0.03002)	(0.11447)
	[1.90281]	[-0.67428]	[0.22136]	[-0.40855]	[-0.27567]	[-1.38746]	[0.86132]	[-1.24180]
GOVTR(-1)	-0.014993	0.151323	0.519319	-0.473107	-0.000965	-0.004951	-0.009439	-0.021613
	(0.14672)	(0.33111)	(0.22109)	(0.36408)	(0.44306)	(0.00818)	(0.05110)	(0.19483)
	[-0.10219]	[0.45702]	[2.34889]	[-1.29945]	[-0.00218]	[-0.60540]	[-0.18472]	[-0.11093]
GOVTR(-2)	0.004098	0.186298	0.308843	0.344071	1.202769	-0.000372	0.005421	0.319476
	(0.16987)	(0.38337)	(0.25598)	(0.42154)	(0.51298)	(0.00947)	(0.05916)	(0.22558)
	[0.02412]	[0.48595]	[1.20650]	[0.81622]	[2.34468]	[-0.03925]	[0.09163]	[1.41625]
PED(-1)	-0.005494	0.406709	0.194460	1.079090	0.646409	0.004959	-0.032724	0.265311
	(0.08770)	(0.19792)	(0.13216)	(0.21763)	(0.26484)	(0.00489)	(0.03054)	(0.11646)
	[-0.06265]	[2.05488]	[1.47142]	[4.95834]	[2.44077]	[1.01435]	[-1.07138]	[2.27811]
PED(-2)	0.042438	-0.502409	-0.279960	-0.275288	-0.584231	0.000522	-0.016398	-0.241839
	(0.09334)	(0.21064)	(0.14065)	(0.23162)	(0.28186)	(0.00520)	(0.03251)	(0.12394)
	[0.45467]	[-2.38513]	[-1.99046]	[-1.18855]	[-2.07279]	[0.10030]	[-0.50445]	[-1.95118]
HEXP(-1)	0.004580	-0.108576	0.119694	0.087900	-0.397527	0.001500	0.039249	-0.167558
	(0.07328)	(0.16538)	(0.11043)	(0.18185)	(0.22129)	(0.00409)	(0.02552)	(0.09731)
	[0.06250]	[-0.65653]	[1.08392]	[0.48338]	[-1.79641]	[0.36717]	[1.53791]	[-1.72189]
HEXP(-2)	-0.036311	-0.143792	0.109350	0.179355	0.050185	0.002246	0.017259	-0.135242
	(0.06049)	(0.13652)	(0.09116)	(0.15012)	(0.18268)	(0.00337)	(0.02107)	(0.08033)
	[-0.60024]	[-1.05324]	[1.19954]	[1.19477]	[0.27472]	[0.66602]	[0.81919]	[-1.68354]
LEB(-1)	8.287992	-15.14052	-3.083778	-15.92744	81.88798	0.524445	5.109744	-10.84494
	(9.79932)	(22.1150)	(14.7667)	(24.3171)	(29.5918)	(0.54627)	(3.41281)	(13.0128)
	[0.84577]	[-0.68463]	[-0.20883]	[-0.65499]	[2.76726]	[0.96004]	[1.49723]	[-0.83341]

LEB(-2)	-9.007527	15.12289	7.547607	25.24691	-53.48738	0.001171	-1.794248	18.32364
	(7.91858)	(17.8706)	(11.9326)	(19.6500)	(23.9123)	(0.44143)	(2.75780)	(10.5153)
	[-1.13752]	[0.84625]	[0.63252]	[1.28483]	[-2.23681]	[0.00265]	[-0.65061]	[1.74257]
GDP(-1)	0.369446	1.129146	0.141386	-2.332325	0.288684	0.040474	0.642997	0.119797
	(0.64569)	(1.45719)	(0.97300)	(1.60229)	(1.94985)	(0.03599)	(0.22488)	(0.85743)
	[0.57217]	[0.77488]	[0.14531]	[-1.45562]	[0.14805]	[1.12445]	[2.85935]	[0.13972]
GDP(-2)	-0.218328	-1.000701	-1.454983	0.350251	-2.047784	0.015381	-0.262240	-0.868522
	(0.66433)	(1.49924)	(1.00108)	(1.64853)	(2.00612)	(0.03703)	(0.23136)	(0.88218)
	[-0.32864]	[-0.66747]	[-1.45341]	[0.21246]	[-1.02077]	[0.41533]	[-1.13345]	[-0.98452]
INF(-1)	0.040045	-0.393710	0.237663	-0.177773	0.784987	0.007074	-0.012897	0.545411
	(0.13285)	(0.29981)	(0.20019)	(0.32966)	(0.40117)	(0.00741)	(0.04627)	(0.17641)
	[0.30144]	[-1.31321]	[1.18719]	[-0.53926]	[1.95676]	[0.95528]	[-0.27876]	[3.09171]
INF(-2)	0.097690	0.340360	-0.364078	-0.473095	0.029254	-0.009736	0.020379	-0.255053
	(0.13228)	(0.29852)	(0.19933)	(0.32824)	(0.39944)	(0.00737)	(0.04607)	(0.17565)
	[0.73853]	[1.14016]	[-1.82653]	[-1.44129]	[0.07324]	[-1.32041]	[0.44236]	[-1.45203]
C	0.820348	-2.501197	-1.182564	-11.52450	-96.83052	1.218921	-5.763623	-21.29967
	(14.0077)	(31.6124)	(21.1083)	(34.7602)	(42.3001)	(0.78087)	(4.87845)	(18.6012)
	[0.05856]	[-0.07912]	[-0.05602]	[-0.33154]	[-2.28913]	[1.56098]	[-1.18144]	[-1.14507]

Source: Author's computation

Findings reveal that aggregate demand shocks drive short-term revenue increases, reflecting Nigeria's procyclical fiscal behavior during oil booms. However, the volatility of oil revenues poses challenges for long-term stability, necessitating counter-cyclical policies. This aligns with Darma et al. (2022), who identified similar fiscal gains and vulnerabilities. Limited contributions from supply shocks further underscore the need for robust revenue stabilization mechanisms, echoing Bamaiyi (2024).

Increased government revenue positively impacts health expenditure, yet inefficiencies in healthcare spending hinder improvements in life expectancy. Inflationary pressures and structural weaknesses exacerbate these inefficiencies, contrasting theoretical expectations of fiscal space enhancing public service delivery. Awoyemi and Nwibe (2022) similarly emphasize the need for targeted health sector reforms to improve efficiency and equity, particularly for vulnerable groups.

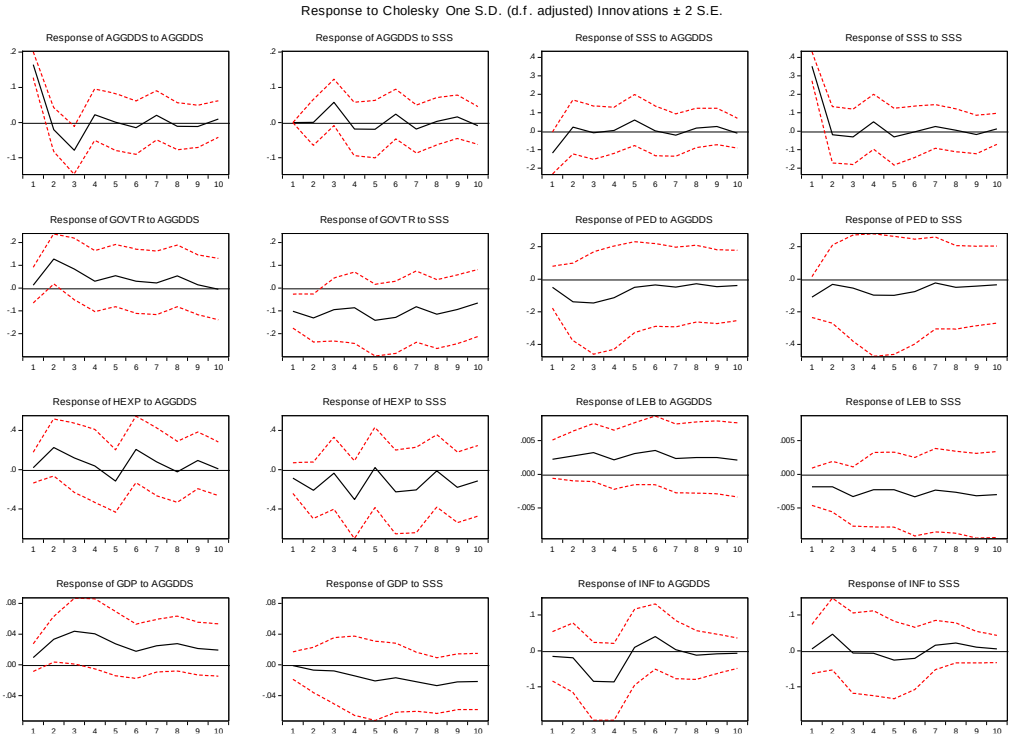
The analysis also reveals Nigeria's cyclical dependence on external borrowing during fiscal strain. While borrowing provides short-term relief, excessive debt accumulation undermines long-term fiscal capacity, crowding out productive investments and essential services. This mirrors findings by Darma et al. (2022) and Abdullahi et al. (2023), advocating for reduced borrowing and revenue diversification to strengthen resilience.

Ultimately, the findings underscore the volatility of an oil-dependent economy, emphasizing the necessity of strategic interventions to stabilize revenues, optimize investments, and manage debt sustainably. These results challenge the notion of oil wealth as a catalyst for broad-based development, highlighting structural inefficiencies that undermine potential benefits.

Impulse Response Result

The Impulse Response Function (IRF) results reveal the dynamic interactions and feedback mechanisms between oil price shocks, fiscal variables, and public health indicators in Nigeria. The result is shown in Table 4

Figure 1: Impulse Response Results



Source: Author's computation

The impulse response analysis highlights the profound impact of oil price shocks on Nigeria's fiscal stability, public health outcomes, and external debt sustainability, underscoring the need for strategic policy interventions. Aggregate Demand Shocks (AGGDDS) boost government revenue (GREV) in the short term, reflecting Nigeria's pro-cyclical fiscal framework. However, the transient nature of these gains and revenue declines during negative shocks expose vulnerabilities, as emphasized by Adedokun et al. (2024). These findings stress the need for robust counter-cyclical policies to stabilize revenue and reduce oil dependency. The relationship between GREV and health expenditure (HEXP) reveals that while revenue gains increase health spending, inefficiencies in the healthcare sector limit improvements in life expectancy (LEB). This aligns with Esu (2024), who identifies systemic bottlenecks and inflationary pressures that erode health funding's real value, exacerbating inequities. Ring-fenced health allocations and sectoral reforms are critical to translating fiscal gains into better health outcomes. Negative oil price shocks lead to sharp increases in public external debt (PED), creating long-term fiscal strain. Borrowing to cover revenue gaps diverts resources from essential sectors like healthcare to debt servicing, as noted by Joshua-Gyang (2024). The cyclical reliance on PED highlights the urgency for diversified revenue streams and robust debt management strategies, as advocated by Adeyemi et al. (2024).

Variance Decomposition Result

The Variance Decomposition (VD) results provide valuable insights into the dynamic responses and interdependencies between oil price shocks and fiscal/public health variables in Nigeria. By decomposing the forecast error variance of each variable, the analysis highlights the relative contributions of oil price shocks (aggregate demand and supply shocks) and other variables to fluctuations over time. The result is shown in Table 4.5.

Table 4: Variance Decomposition Result

VD of AGGDDS Period	S.E.	AGGDDS	SSS	GOVTR	PED	HEXP	LEB	GDP	INF
1	0.164276	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.183160	81.61848	0.001021	0.323986	1.069644	0.938549	15.33875	0.504776	0.204799
3	0.216933	71.39578	7.044681	0.290942	1.388132	2.407269	14.79777	0.498417	2.177008
4	0.238527	59.92137	6.411528	0.396410	6.666073	2.758532	19.76857	0.412330	3.665188
5	0.252497	53.47551	6.275288	0.377480	6.756346	4.432159	22.50777	1.933324	4.242131
6	0.256472	52.15545	6.966634	0.379623	7.343211	4.303979	21.93846	1.886277	5.026364
7	0.261836	50.66527	7.193993	0.391928	7.343948	5.189795	21.83091	2.551681	4.832473
8	0.262793	50.45561	7.160093	0.412202	7.378067	5.293347	21.78685	2.651076	4.862754
9	0.263659	50.30243	7.498883	0.409534	7.346498	5.291837	21.64963	2.664274	4.836916
10	0.264612	50.08514	7.553036	0.430692	7.325495	5.452980	21.66504	2.684231	4.803386
VD of SSS Period	S.E.	AGGDDS	SSS	GOVTR	PED	HEXP	LEB	GDP	INF
1	0.370736	10.17384	89.82616	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.431768	7.773221	66.43443	2.128500	8.570313	4.901801	4.900850	1.728451	3.562433
3	0.445768	7.330103	62.80027	1.996899	9.904319	6.003600	4.703475	3.662000	3.599333
4	0.468252	6.651443	58.09581	2.059855	13.83280	6.331747	5.189684	3.675720	4.162940
5	0.490432	7.569698	53.34876	3.764992	13.97736	7.689585	4.851522	4.015788	4.782293
6	0.496985	7.372447	51.95588	3.945954	14.88196	7.600100	5.592739	3.912755	4.738165
7	0.504385	7.338798	50.69672	4.245569	15.79944	7.470001	5.971619	3.877660	4.600196
8	0.509391	7.307117	49.71456	4.714834	16.17268	7.501769	6.116652	3.802655	4.669734
9	0.513199	7.443783	49.11223	4.908094	16.53758	7.439547	6.190027	3.747065	4.621675
10	0.517926	7.348864	48.27855	5.096750	17.46336	7.311377	6.176539	3.717888	4.606678
Cholesky Ordering: AGGDDS SSS GOVTR PED HEXP LEB GDP INF									

Source: Author's computation

The variance decomposition analysis highlights the interconnectedness of Nigeria's fiscal, economic, and social variables, revealing vulnerabilities in its oil-dependent fiscal framework. Aggregate Demand Shocks (AGGDDS) are the dominant short-term drivers of government revenue (GREV), explaining nearly 100% of its initial variation, consistent with Esu (2024). Over time, the influence of Supply Shocks (SSS), GREV, and Public External Debt (PED) grows, underscoring the precarious nature of revenue dependence on oil prices and the need for diversification and counter-cyclical policies (Adedokun et al., 2024). Rising PED contributions further illustrate the feedback loop of fiscal stress exacerbated by volatile revenue streams, as noted by Falade et al. (2024).

Public health outcomes, measured through Life Expectancy (LEB), increasingly depend on fiscal variables like GREV, PED, and Health Expenditure (HEXP). The feedback between HEXP and LEB underscores the need for sustained health investments, although initial fiscal contributions remain limited due to systemic inefficiencies and volatile revenue, as highlighted by Iheoma (2024) and Joshua-Gyang (2024). AGGDDS and SSS indirectly influence health outcomes through fiscal imbalances, reinforcing the need for ring-fenced health budgets.

External debt sustainability faces pressures from oil price shocks and fiscal dynamics. GREV, HEXP, and LEB increasingly contribute to PED, revealing the strain of borrowing to finance

revenue gaps and health needs. Rising debt servicing risks crowding out critical investments, echoing Joshua-Gyang's (2024) warning about debt spirals. Managing these challenges requires economic diversification, counter-cyclical policies, and prioritizing health investments to foster a resilient, inclusive fiscal framework that stabilizes revenue, supports health outcomes, and ensures debt sustainability.

Conclusion, Policy Implications, and Recommendations

The study concludes that Nigeria's oil-dependent fiscal structure is highly vulnerable to oil price shocks, significantly impacting revenue stability, public health funding, and external debt sustainability. Persistent fiscal volatility and constrained health funding, coupled with rising debt pressures, emphasize the need for targeted policies to ensure macroeconomic stability and sustainable development. As such, a multi-dimensional approach integrating revenue stabilization, health prioritization, and sustainable debt management is crucial to address Nigeria's fiscal vulnerabilities.

First, aggregate demand and supply shocks are key drivers of revenue volatility. To mitigate these, establishing a robust fiscal stabilization mechanism, such as a sovereign wealth fund or enhanced oil stabilization fund, is essential. Counter-cyclical fiscal policies can smooth expenditures during economic downturns, reducing dependence on borrowing. Diversification of revenue sources by investing in agriculture, manufacturing, and technology is critical for reducing reliance on oil. Second, health expenditure volatility highlights the need to prioritize health funding in fiscal policy. Institutionalizing a health equity fund financed by oil windfalls can stabilize health investments during fiscal downturns. Expanding social health insurance and fostering public-private healthcare partnerships will enhance access and equity. Integrating health expenditure into fiscal responsibility frameworks ensures sustainable investment in health services and infrastructure, promoting improved life expectancy and societal well-being. Third, oil price shocks' influence on external debt underscores the urgency of disciplined debt management. Adopting strict borrowing frameworks, diversifying funding sources, and increasing access to concessional loans can mitigate debt service burdens. Transparency and accountability in debt use will bolster public trust and fiscal discipline. Long-term strategies, including infrastructure investments and private sector development, are vital for enhancing debt repayment capacity and fiscal sustainability.

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