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Introduction
The Strategy and Research Division of the Bank of Industry Limited publishes BOI Journal of Development Review (BOI-JDR). The Journal contains original research articles by staff as well as the public. It is a professional blind peer review journal, devoted to the study and analysis of Micro, Small and Medium Enterprises (MSMEs), development policy in Nigeria and that of the African continent. The review emphasizes the policy relevance of research findings, rather than purely theoretical and quantitative issues.

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BOI Journal of Development Review (BOI-JDR) is a Quarterly publication of the Research group of the Bank of Industry Limited.

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Mission
To transform Nigeria's industrial sector by providing financial and business support services to enterprises.

Mandate
Providing financial assistance for the establishment of large, medium, and small enterprises; as well as expansion, diversification, and modernisation of existing enterprises; and rehabilitation of ailing ones.

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Understanding the Link Between Climate Variables and Small and Medium Enterprise Financing in Nigeria

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Abstract
Small and Medium Enterprises (SMEs) are relevant to the global economy, especially in developing countries like Nigeria, where they form a significant portion of the business activities. Nonetheless, despite their prevalence, SMEs contribute only a small fraction of the Nigeria's GDP likely occasioned by negligible access to credit. Using trend and correlation analysis, this study examined the potential link between climate change on SME financing in Nigeria using data on rainfall, temperature, and commercial Bank loans to SMEs spanning from 1991-2022. The analysis demonstrates no significant correlation between rainfall and the percentage of loans to SMEs, indicating that rainfall changes are not associated with SME financing. However, there is a negative correlation between temperatures and SME loans. This could imply that temperature potentially affects the creditworthiness of SMEs, therefore limiting their capacity to expand their operations. The study, therefore, highlights the need for developing strategies to enhance SMEs' adaptive capacity to climate change and improve their creditworthiness to access loans.

Keywords: Climate change, Banks credit, SMEs, Financing

JEL Classification: G21, H32, H81 and Q56

1.0 Introduction

Deposit Money Banks (DMBs) are pivotal in providing credit to Small and Medium Enterprises (SMEs), which typically lack access to capital markets (Ghulam & Iyofor, 2017). These financial institutions bridge the funding gaps, enabling SMEs to continue their role in economic development, particularly in job creation. SMEs, in fact, employ over 90% of the workforce outside the formal sector globally (Thompson et al., 2023). In Nigeria, SMEs represent about 96% of businesses (BOI, 2020), but despite their prevalence, they contribute more than 50% to the country's GDP, in contrast to the nearly over 70% contribution by SMEs in developed countries.

The discrepancy between SME dominance and their limited GDP contribution can be attributed to several factors, including limited access to credit. Financial

institutions often require high collateral and charge elevated interest rates, making it difficult for SMEs to secure financing (Agwu, 2014). Data suggests that while a significant number of SMEs had access to bank credit in 2017 (SMEDAN/NBS, 2017), the overall percentage of loans allocated to SMEs has declined over the years. Beyond traditional financial barriers, there is growing concern about the consequences of climate change on SME creditworthiness. Climate change, characterized by shifts in temperature and rainfall patterns, has been shown to have adverse effects on productivity, particularly for sectors reliant on natural resources (Abidoye & Odusola, 2015; Duan et al., 2022). SMEs in these vulnerable sectors may experience reduced output and increased operational costs, hindering their ability to demonstrate creditworthiness. The integration of Environmental, Social, and Governance (ESG) criteria into lending decisions further complicates this dynamic. Banks increasingly assess firms based on their environmental sustainability, governance practices, and social responsibility, making compliance with ESG standards a critical factor for securing financing (Arnone et al., 2024; Devalle et al., 2017).

While significant research has explored the economic consequences of climate change, existing literature largely focuses on the macroeconomic effects of climate change on specific industries, particularly agriculture and manufacturing (Traore & Foltz, 2018; Somanathan et al., 2021). Studies such as Alam et al. (2022) emphasize innovation in response to climate risks, while Zhao et al. (2017) focus on labor productivity and profitability reductions due to climate shocks.

Climate variables, such as rainfall and temperature, can affect SMEs' ability to comply with the environmental component of ESG standards in several ways. Erratic rainfall patterns, including droughts and floods, often disrupt operations in sectors like agriculture and natural resource extraction, leading to supply chain interruptions, reduced output, and higher costs. SMEs reliant on these sectors may struggle to maintain environmentally sustainable operations, which can hinder their compliance with ESG criteria. Rising temperatures can reduce labor productivity and increase absenteeism (Somanathan et al., 2021), negatively affecting operational efficiency. These environmental challenges make it difficult for SMEs to demonstrate creditworthiness, as their capacity to generate consistent revenue is compromised by climate shocks.

Moreover, temperature fluctuations and irregular rainfall can accelerate the depletion of natural resources, such as water and fertile soil, which are critical to many SMEs. This not only reduces their ability to comply with ESG guidelines

emphasizing responsible resource management but also exposes them to regulatory pressures aimed at curbing environmental degradation. Extreme weather events linked to climate change can also exacerbate waste management challenges, causing firms to struggle with pollution control and further impacting their ESG performance.

Therefore, these climate-driven challenges affect the environmental sustainability of SMEs, making it difficult for them to meet ESG standards, which in turn may limit their access to credit as financial institutions increasingly consider ESG compliance in lending decisions.

This paper addresses this gap by investigating how climate variables, particularly temperature and rainfall, correlate with SMEs Financing in Nigeria.

2.0 Related Literature

The economic impacts of climate shocks in low-income countries have been well-documented. Dell et al. (2012) showed that higher temperatures are associated with lower economic growth in these regions. Subsequent studies have reinforced this finding. For instance, Doğanlar et al. (2024) used panel cointegration techniques to reveal a nonlinear relationship between climate variables and economic development in Sub-Saharan Africa. Abidoye & Odusola (2015) found that a 1°C increase in temperature could lead to a decline in GDP growth by 0.27 percentage points. In China, Duan et al. (2022) demonstrated that temperature, rainfall, and humidity shocks reduce output. Acevedo et al. identified that weather shocks affect economic activity primarily through investment, labour productivity, and human capital channels, with more significant impacts in the agriculture and industrial sectors, particularly in low-income countries.

At the SME level, climate shocks in low-income countries can have both positive and negative effects. On the positive side, climate change can drive innovation. Alam et al. (2022) found a positive link between climate change and innovation among SMEs in 14 developing countries, especially in high-growth sectors. Firms often respond to environmental risks by expanding their knowledge base to stay competitive. Additionally, climate change can create sector-specific opportunities as firms adapt to shifts in demand.

Conversely, climate shocks can negatively impact firm performance. For example, Traore & Foltz (2018) showed that temperature shocks in the Ivory Coast led to lower revenues, profits, and productivity, threatening firm survival. Somanathan et al. (2021) find that productivity decreases on hot days without climate control. Even with climate control, both current and past high temperatures affect absenteeism, indicating workplace adaptation isn't enough to fully counteract heat effects. Over 15 years, they observed that temperature impacts the value of annual plant output significantly through its influence on labour output elasticity.

Climate change can also lead to the reallocation of labour and capital across sectors, causing job losses in the short term. Mawejje (2024) noted that weather and climate shocks are negatively associated with business performance. Further, these effects are stronger among micro and small enterprises, and among firms in the agricultural and industrial sectors. Sectoral differences in recovery from climate shocks depend on the business environment. Business characteristics, including size, sector, and managerial ability, influence how firms experience and cope with climate events. Smaller firms, especially those with limited credit access, tend to have lower survival rates and longer recovery periods after natural disasters. Zhao et al., (2017) found that climate shocks reduced labour productivity, and profitability, potentially limiting their access to finance in countries with weak adaptive capacities, particularly smaller firms in high-risk sectors.

3.0 Methodology

This paper used trend analysis and a Pearson correlation to the variables of interest over the period 1991- 2021. The following are the variables of interest; rainfall, temperature, credit to SME's and percentage of commercial bank to SMEs. The justification for choosing trend analysis and correlation is hinged on the objective of the paper to establish the nature of the co-movement of the variables and explain the potential reasons for such movement.

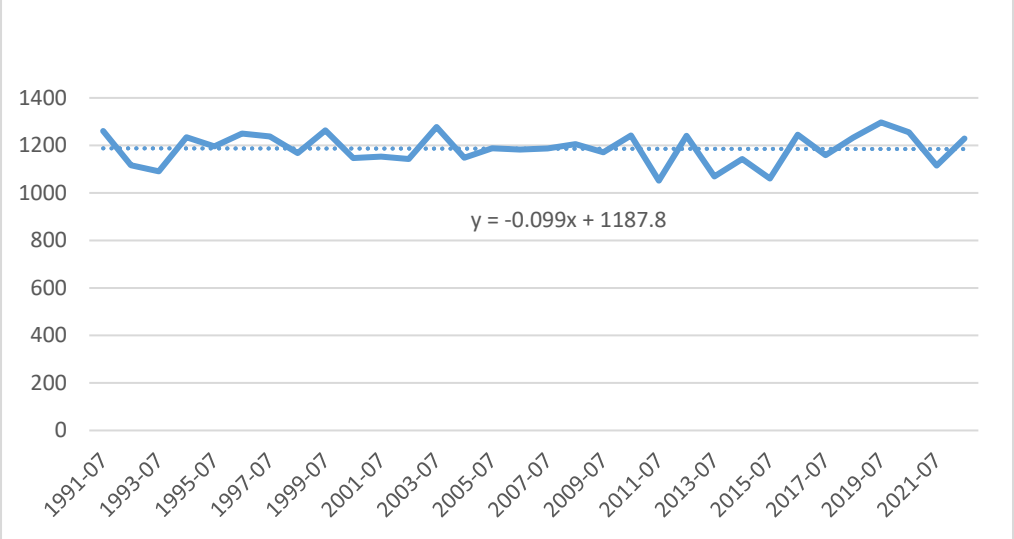
The data for rainfall and temperature were sourced from the World Bank's Climate Change Knowledge Portal (CCKP) while credit to SME's were sourced from the CBN statistical Bulletin.

4.0 Results and Findings

4.1 Trend and Correlation Analysis

As a first step to determine the potential consequences of climate-induced changes on firms' financing, relevant data were arranged from World Banks' Climate Change Knowledge Portal (Rainfall and Temperature) and CBN Statistical Bulletin (Commercial Bank Loans to Private Sector, Commercial Bank loans to SMEs in Billions of Naira and Percentage of commercial loans to SMEs).

Figure 1: Mean Annual Rainfall (1991-2021)

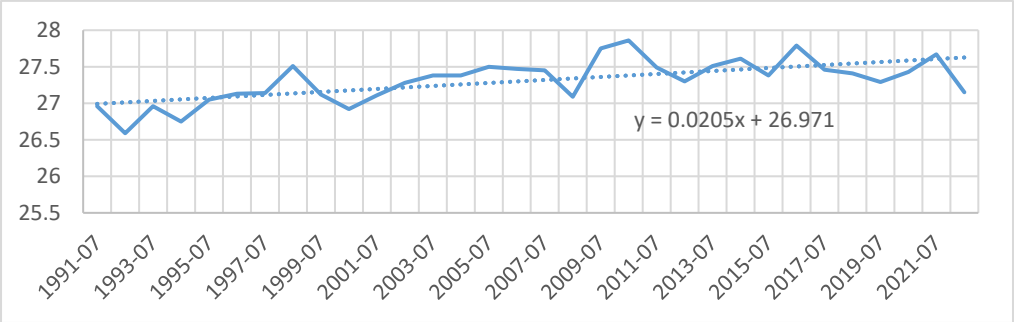


Source: Author's Computation (2024).

The analysis begins with rainfall, given its relevance to Agriculture-based SMEs. Figure 1 provides a chart of the mean annual rainfall spanning over 30 years, from mid1991 to mid-2021. The intercept of the trend line, 1187.8, suggests that the average annual rainfall over the observed period is around 1187.8 mm. This value provides a baseline for what can be considered normal annual rainfall in Nigeria.

The slope (−0.099x) suggests a slight overall decreasing trend in rainfall over the period, suggesting that the annual rainfall has been decreasing by approximately 0.099 mm per year. However, this decrease is minimal, indicating that while there is a slight downward trend, and the changes are not drastic.

Figure 2: Temperature (1991-2021)

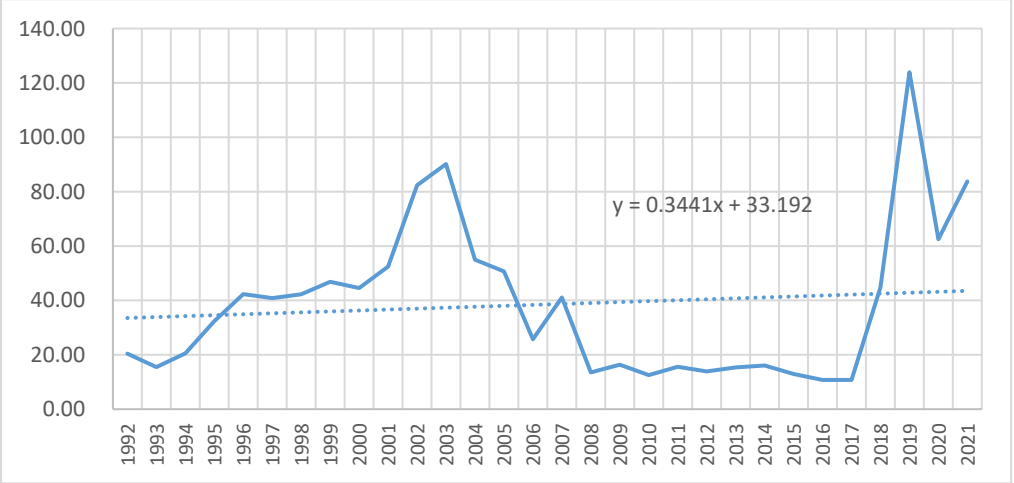


Source: Author's Computation (2024).

Figure 2 provides a chart of a mean annual temperature spanning over 30 years, from mid1991 to mid-2021, providing a substantial period for analysis. The intercept of the trend line, 26.971, suggests that the average annual temperature over the observed period is around 26.971 degrees Celsius. This value provides a baseline for what can be considered normal annual temperature in Nigeria.

The trend line equation y=0.0205x+26.971 indicates a slight overall increasing trend in temperature over the 30 years. The positive slope (0.0205) suggests that the annual temperature has been increasing by approximately 0.0205- degrees Celsius per year.

Figure 3: Credit to SMEs



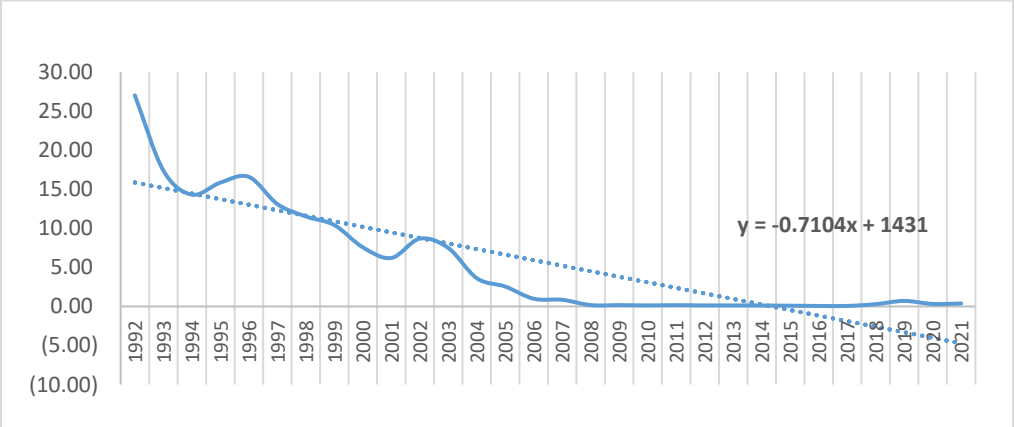
Source: Author's Computation (2024)

Figure 3 indicates that during the early years (1992 to around 2002), there was a general upward trend, with loans increasing steadily. This period is characterized by significant growth, peaking around the early 2000s. From 2004 onwards, the data shows considerable volatility. After reaching a peak, there is a marked decline in the loans provided to small-scale enterprises. This period indicates instability, with loans dropping significantly at several points, particularly noticeable around 2008 and again from 2012 to 2016. This may not be unconnected to the several events in the banking industry during the period. These events include the recapitalization policy of the CBN, establishment of Asset Management Corporation of Nigeria (AMCON) to acquire Non-Performing Loans (NPLs) from commercial banks and collapse of several banks during the period.

A sharp increase was observed starting around 2016, peaking dramatically in 2018. This surge could be attributed to various economic policies or interventions aimed at boosting small-scale enterprises such as the introduction Market Money scheme by BoI as a component of the Government Enterprise and Empowerment Programme (GEEP). However, this peak is followed by a sharp decline in the subsequent years, demonstrating continued volatility in the sector.

In general, the data suggests a modest overall increase in loans over the entire period, despite the significant fluctuations observed in specific years.

Figure 4: Commercial Banks Loans to SMEs as Percentage of Total Credit (%)



Source: Author's Computation (2024)

While Deposit Money Banks (DMBs) loans to SMEs suggest a modest up trend in monetary terms, though somewhat volatile, we move ahead to examine the

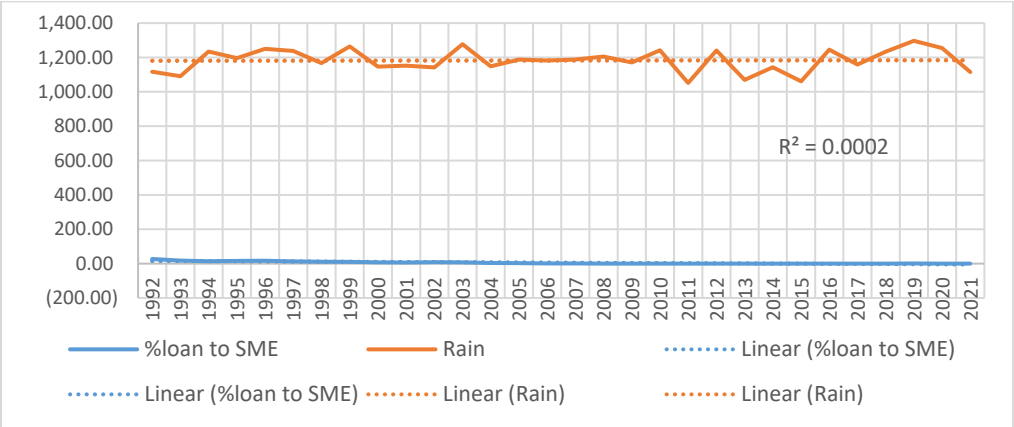
growth rate of the loans throughout the analysis. Figure 4 demonstrates the trend of DMB loans to SMEs as a percentage of total credit in Nigeria from 1992 to 2021. The data reveals a significant decline over the period, highlighting several key points and trends.

In the early 1990s, DMB loans to SMEs comprised a substantial percentage of total credit, peaking at around 30% in 1992. However, this percentage dropped sharply in the subsequent years, indicating a rapid decrease in the proportion of loans allocated to SMEs. From 1995 onwards, the percentage of loans to SMEs continued to decline, albeit at a slower rate. The data shows fluctuations, with minor peaks around 1996 and 1999. However, the overall trend remained downward, with a significant reduction in SME loan percentages by 2005.

The period from 2005 to 2015 shows a more consistent decline, with the percentage of SME loans steadily decreasing. After 2015, the percentage stabilized at a very low level, close to zero, indicating that SME loans constituted a minimal portion of total credit in recent years.

The negative slope of -0.7104 suggests a consistent yearly decrease in the proportion of total credit allocated to SMEs. This could be attributed to various factors, including changes in banking policies, shifts in economic priorities, or a reduced focus on SME financing by commercial banks and indeed the weak ability to repay loans occasioned by weather and climate-related shocks (Traore & Foltz, 2018). The early sharp decline may reflect an initial reallocation of credit resources, possibly driven by economic reforms or a shift towards larger, more established businesses. The continued decline and eventual stabilization at a low level highlight a persistent trend away from SME financing.

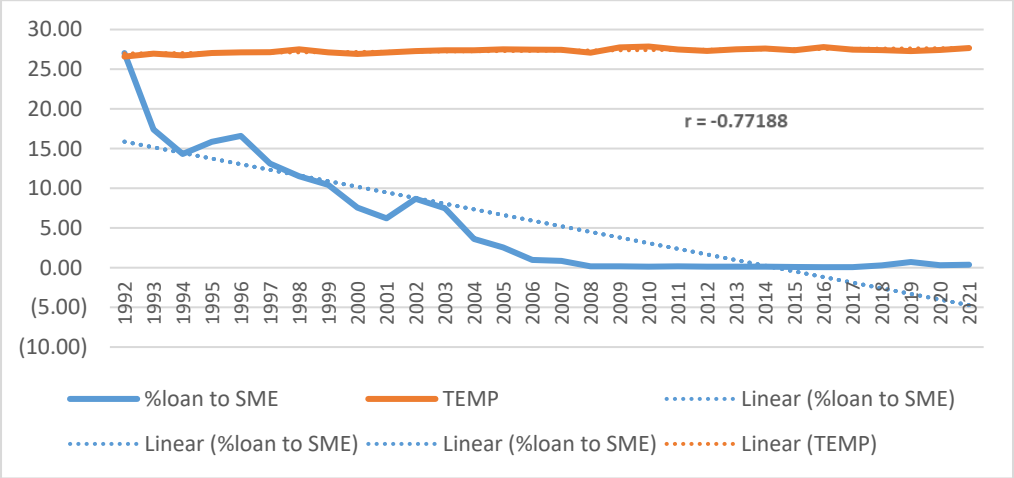
Figure 5 Mean Annual Rainfall and Percentage of Loans to SMEs



Source: Author's Computation (2024)

The chart demonstrates no correlation (r = 0.000167) between rainfall and % loans to SMEs from 1992 to 2020, indicating that changes in rainfall levels have little correlation with percentage of loans given to SMEs. Rainfall values are much higher than the %loan to SMEs and exhibit visible fluctuations, yet the overall trend remains fairly stable with a slight decrease towards the end of the period. In contrast, %loan to SME values is significantly lower, nearly flat, and show minimal fluctuation. The stability in the %loan to SME could suggests that lending policies or the demand for SME loans have remained consistent over the years, unaffected by changes in rainfall. This implies that other factors, rather than rainfall, are likely more influential in determining the percentage of loans allocated to SMEs.

Figure 6 Mean Annual Rainfall and Percentage of Loans to SMEs



Source: Author's Computation (2024)

The chart indicates a strong negative correlation (r = -0.7718) between stable mean annual temperatures (consistently around 25-30 degrees Celsius) and the % of loans to SMEs from 1992 to 2020. The linear trend line for temperature is nearly flat, indicating a very stable temperature range over the period. In contrast, the % loans to SMEs show a significant decline from the early 1990s to the late 2000s, stabilizing around 2010, with the linear trend line for % loans to SMEs indicating a decreasing trend.

This negative correlation suggests that temperature rising temperature to a large extent, correlates with the % of loans to SMEs. The steep decline in % loans to SMEs during the 1990s and 2000s could be attributed to various economic or policy changes not directly related to temperature. Therefore, while temperature is strongly associated with the decline of loans to SMEs, the slight

uptrend of temperature points to the fact that factors other than temperature, such as economic conditions or policy changes, might also be influential in determining the percentage of loans allocated to SMEs.

5.0 Conclusion

This paper examines the potential link between climate variables and SME financing in Nigeria. The findings reveal no correlation between rainfall and the percentage of loans to SMEs. Despite fluctuations in rainfall, the overall lending trend remains stable, indicating that changes in rainfall do not correlate with SME financing.

Conversely, the study identifies a negative correlation between rising temperatures and SME loans. As temperatures have slightly increased, the percentage of loans to SMEs has significantly decreased. This suggests that higher temperatures may correlate negatively with SME financing, possibly due to exacerbated economic challenges, reduced productivity, and increased operational costs for SMEs. These factors could make SMEs less attractive to Deposit Money Banks (DMBs), potentially affecting their willingness to extend loans. However, this correlation does not imply that rising temperatures directly impact SME financing, and further research is required to establish a causal relationship.

An analysis of commercial bank loans to SMEs, as a percentage of total credit, shows a significant decline over the period studied. In the early 1990s, a substantial portion of loans was directed to SMEs, followed by a sharp and continuous decline until 2015. However, beginning in 2016, there was an uptrend in the absolute value of loans to SMEs, which could be attributed to economic policies and interventions, such as the Market Money Scheme by the Bank of Industry and the Anchor Borrowers Programme. This surge suggests that these initiatives may have improved the creditworthiness of SMEs.

In conclusion, while this study highlights correlations between climate variables and SME financing, further investigation is necessary to establish causality, particularly regarding the relationship between rising temperatures and credit allocations to SMEs.

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Green Orientation and Youth Enterprise Amongst Youths in Bayelsa State, Nigeria

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Abstract
The study examines the impact of green entrepreneurial initiative orientation on youth enterprise creation, using Bayelsa State, Nigeria, as a case study. Green entrepreneurial initiative orientation is measured using green initiative market trend orientation, green initiative orientation of important issues related to customers or the market, and keeping abreast of important things about competitors. On the other hand, enterprise creation is measured using business idea development, and business planning. A sample size of 300 respondents was used for the study. The data was analysed using the logistic regression technique. It was found that green initiative market trend orientation, green initiative orientation of important issues related to customers or the market, and keeping abreast of important things about competitors had positive and significant effects on business idea development and business planning. It was also found that age and education had a positive and significant effect on enterprise creation. In contrast, household size and occupation had a positive and insignificant effect on enterprise creation. It is concluded that green entrepreneurial initiative orientation has a significantly enhanced effect on enterprise creation. Government grants and funding should also be directed towards initiative orientation of market trends and important issues related to customers or the market, and keep youths (beneficiaries) abreast of important things about competitors.

Keywords: Green Entrepreneurship Orientation; Green Entrepreneurial Initiative **Orientation;** Enterprise Creation

JEL Classification: Q5, M13, J13 and C25

1.0 Introduction

Governments, organisations, and the private sector have recently increased their emphasis on the importance of achieving long-term self-reliance, particularly among youths. This is because it is considered that government cannot provide enough work and other means of livelihood for every citizen. Thus, developing countries such as Nigeria must establish means of livelihood, notably through self-employment. To be self-employed, individuals, especially the youth must engage in entrepreneurial activities. Entrepreneurial activity, however, does not occur by chance; it requires a catalyst to bring it about. Depending on the circumstances, media for carrying out entrepreneurial operations are simply referred to as enterprise creation, venture creation, and business creation among others. This implies that, in the pursuit of individuals who are eager to conduct an entrepreneurial activity, either as a means of self-reliance or simply to pursue a career aspiration in life, they will have to develop businesses through enterprise creation that will allow them to actualize their respective business aspirations (Na-Allah and Ahmad, 2022; Neneh, 2020). This, in addition, largely depends on individuals' feelings of risk, creativity capabilities, and proactive traits, which are defined by his or her confidence in acting (Na-Allah and Ahmad, 2022; Bolton and Lane, 2012). In recent years, the existing literature has emphasised the importance of green entrepreneurial orientation as a supporting mechanism in the process, mostly when it concerns enterprise creation.

Green entrepreneurial orientation indicates that venture businesses aim to engage in "ecological" entrepreneurship in addition to seizing market opportunities (Li, Sun and Gao, 2022). Entrepreneurs who adopt green practices from the start may be better prepared to navigate regulatory requirements and avoid potential fines or penalties. A green entrepreneurial mindset allows organisations to be well-positioned to respond to changing market conditions while also positively influencing society and the environment (Idrees, Xu and Ralison, 2023; Musfar, 2023). Green entrepreneurial orientation, therefore, following the views of Idrees, Xu and Ralison (2023), and Musfar (2023), may not only align enterprises with changing market trends and regulatory needs, but could also promote innovation, cost savings, and improve reputation, all of which could contribute to long-term enterprise success and sustainability. Green entrepreneurial orientation could have a positive relationship with enterprise creation because it encourages innovation, differentiation, regulatory compliance, cost savings, and access to capital and support in the growing market for sustainable products and services.

Unemployment, poverty, and low economic growth rates have been underlying issues, and continue to serve as the basis for the continuous interest in the creation and development of micro, small, and medium-sized enterprises. There has been a lot of action throughout the years to encourage enterprise creation and development, both at the federal and state levels. This includes improving access to capital and developing entrepreneurial capacity, among other things. However, as the push for enterprise creation and development among youths grows, increased consumer awareness, as well as a global campaign to reduce environmental effects, have highlighted the necessity for businesses to also address environmental concerns. In this context, the literature identified green entrepreneurial orientation as essential for entrepreneurship, particularly green entrepreneurship.

Despite being identified as a core driver of entrepreneurship, and the benefits of green entrepreneurial orientation –including economic, environmental, and social values have been studied in the literature, the empirical relationship between green entrepreneurial initiative orientation and enterprise creation and development is still unknown. Furthermore, although there is an increasing study interest in enterprise creation and development, a gap exists concerning how enterprises might accomplish sustainable entrepreneurship through green entrepreneurial initiatives. Previous research has noted that enterprises with a green entrepreneurial approach require some level of environmental problem-solving skills to solve challenges. It is unclear whether such a strategic approach will enable businesses to gain a lasting competitive edge. This gap has left the field with insufficient insights into the impact of green entrepreneurial initiative orientation on youth enterprise creation in Nigeria.

The specific objectives of the study, therefore, is to determine the effect of green entrepreneurial initiative orientation on business idea development, and business planning among youths, using Bayelsa state, Nigeria as a case study. The study is a reflection of both the increasing emphasis on sustainability in business practices and the increasing need for innovative approaches to environmental concerns. Therefore, the study would advance current knowledge on entrepreneurial orientation. This study would benefit policymakers and government agencies, Non-Governmental Organizations (NGOs) environmental advocates, and entrepreneurs among others.

2.0 Literature Review

2.1 Conceptual Literature

2.1.1 Green Orientation

Green orientation is a concept based on the idea of green entrepreneurship and entrepreneurial orientation (Guo, Wang & Chen, 2020; Kraus, Burtscher, Vallaster & Angerer, 2018). Green entrepreneurship is a type of entrepreneurship in which the goal is to generate and implement solutions to environmental challenges and promote social change while minimising environmental impact (Appiah, Sam, Twum & Godslove, 2023; Kraus, Burtscher, Vallaster & Angerer, 2018). In contrast, entrepreneurial orientation (EO) refers to senior management's approach to innovation, proactiveness, and risk-taking. Fatoki (2019) and Ameer and Khan (2022) both define green entrepreneurial orientation as an enterprise's tendency to capitalize on opportunities for economic and environmental benefits through the production of eco-friendly products and services, leading to improved financial and environmental performance.

Green entrepreneurial orientation is defined by Asad, Majali, Aledeinat, Almajali, and Akhorshaideh (2023), like Fatoki (2019) and Ameer and Khan (2022) as a desire to start green businesses for economic and environmental benefits, characterized by environmentally responsible innovation, market knowledge, and risk-taking. This concept differs from environmental entrepreneurship, which focuses on transforming sustainable development opportunities into new value creation while considering costs, risks, and uncertainty. Ameer & Khan (2022), and Ameer and Khan (2022), and Li, Sun & Gao (2022) differentiate green entrepreneurial orientation from environmental entrepreneurship, stating that green entrepreneurship refers to an organization's willingness to take creative, proactive, and risky measures for the benefit of both the company and the environment. This distinction highlights the interrelated nature of green entrepreneurship and environmental entrepreneurship.

An aspect of green entrepreneurial orientation is green entrepreneurial initiative orientation (Guo, Wang & Chen, 2020). Green entrepreneurial initiative orientation promotes sustainable practices within an organization (Musfar, 2023). It involves proactive opportunity recognition, risk-taking readiness, and encouraging a green entrepreneurial attitude. Jiang, Chai, Shao, & Feng (2018)

define it as encouraging participation in green innovation, anticipating and seizing opportunities, and managing entrepreneurial risk.

Green entrepreneurial initiative orientation is a business strategy focusing on environmental sustainability, waste reduction, and responsible practices. It aims for financial success and environmental preservation. This approach includes product design, manufacturing techniques, supply chain management, and marketing tactics that prioritize sustainability and environmental impact (Asadi, Pourhashemi, Nilashi, Abdullah, Samad, Yadegaridehkordi, Aljojo & Razali, 2020; Tze, Latif, Assunta & Di Vaio, 2022; Anwar, Clauss & Issah, 2022; Yin, Hughes & Hu, 2021; Yi, Amenuvor & Boateng, 2021). For the purpose of this study, green orientation is described to capture orientation of market trends, orientation of important issues related to customers or the market, and keeping abreast of important things about competitors.

2.1.2 Enterprise

An enterprise is a for-profit business started and run by an entrepreneur. The term comes from the French word entreprendre, which means 'to undertake' and is also derived from the Latin phrase "inter prehendere," which means 'to seize with the hand'. According to the Organisation for Economic Cooperation and Development - OECD (2013), the idea of enterprise birth is more limited than the concept of creation because it refers to a legal entity that appears for the first time, with no other firm participating in the creation process. It excludes enterprises founded as a result of mergers, changes in name, type of company, or ownership structure. An enterprise is a business organisation that offers goods and services, among other things. An enterprise is a business venture that caters to customer needs, involving identifying opportunities, planning, acquiring resources, establishing, and growing the business. Entrepreneurship is the creative process that includes innovation, skills, and obstacles, with the actor being the entrepreneur and the act being entrepreneurship.

The relationship between green orientation and youth enterprise is that it can help drive firm formation amongst youths by encouraging innovation, differentiation, regulatory compliance, cost savings, and access to capital and support in the growing market for sustainable products and services. Green orientation could also boost youth enterprise by improving environmentally friendly products and services that can help solve environmental issues. Green orientation could as well increase social welfare and boost business formation

by improving workplace safety and health and resulting in sustainable youth enterprise.

2.2 Theoretical Review

Joseph Schumpeter's entrepreneurship and innovation theory (1949) suggests that business owners are catalysts for economic change, promoting development and growth. Schumpeter differentiates between invention and innovation, stating that true entrepreneurship involves creating innovations, which can only be achieved through innovation (Dorin & Alexandru, 2014).

Schumpeter's entrepreneurship theory emphasizes innovation and green entrepreneurship, focusing on sustainable economic growth. Frank Knight's risk-bearing theory distinguishes between insurable risk and true uncertainty in entrepreneurship. Entrepreneurship involves producing pure profit amidst uncertainty, and Knight's theory helps green business owners manage risks through commitment, financial management, and strategic planning, fostering innovation and promoting a sustainable economy (Rocha, 2012; Montanye, 2006).

2.2 Empirical literature

The empirical literature includes He, Mo and Zhang (2024) who examined the influence of green entrepreneurship orientation on cooperative performance in China. The data was collected from selected firms. The data was analyzed using the multiple Ordinary Least Squares (OLS) model and an intermediary effect model. It was found that implementing a green entrepreneurship-oriented strategy significantly impacted cooperative performance. Duan (2023) study explores the factors influencing green entrepreneurial orientation in manufacturing enterprises, analyzing data from 219 enterprises. The study found that government regulation, market normative pressure, environmental risk cognition, and environmental benefit cognition were crucial driving factors, with significant positive effects on the orientation. The study by Appiah, Sam, Twum, and Godslove (2023) in Ghana found that green entrepreneurship orientation significantly influences green innovative performance and firm performance, with green innovative capability significantly moderating the relationship between green entrepreneurship orientation and green innovation performance. Khan, Ameer, Bouncken, and Covin (2023) studied green innovation in 197 Pakistani manufacturing firms using multi-level data. They found that technical orientation and environmental collaboration boosted

green entrepreneurial orientation and organizational resilience capacity, thereby supporting green innovation.

There are various studies in the area of research, particularly on green entrepreneurial orientation. However, the majority of the research is foreign studies undertaken for foreign economies. There were only a few studies in Nigeria in the area of study. These studies include Mansi (2021), who investigated the relationship between entrepreneurial orientation and SME performance, and Okoli, Nwosu, and Okechukwu (2021), who investigated the effect of entrepreneurial orientation on the performance of selected small and medium-sized enterprises (SMEs) in Southeast Nigeria. To the best of our knowledge, no previous studies in Nigeria have directly evaluated the impact of green entrepreneurial initiative orientation on youth enterprise creation in Nigeria. This study, therefore, adds value to the literature on green entrepreneurship orientation by examining the impact of green entrepreneurial orientation on business idea development, and business planning among youths, using Bayelsa state, Nigeria as a case study. Previous research, particularly in Nigeria, has not addressed these issues. This study thus attempts to fill a gap in the literature.

3.0 Methodology

3.1 Research Design

We adopt a sample survey research design, in which data is gathered from a sampled part of the study's population, and the findings from the sample are then generalised back to the complete study population to make a conclusion.

3.2 Population of the Study

This study's demographic consists of all Bayelsa state youths, including both entrepreneurs and non-entrepreneurs. According to the National Bureau of Statistics estimates, Bayelsa state's youth population (ages 18-35) is 749,122, with 355,786 males and 393,336 females (National Bureau of Statistics Estimates, 2012).

3.3 Sample Size Determination and Sampling Techniques

The study used a sample size of 300 respondents. The sample size chosen is suitable for a study like ours. The sample size was determined using the Yamane (1967) formula for calculating sample sizes. The formula is presented as follows:

$$\mathrm{n} = \frac{N}{1 - N(e)^2}$$

Where n is the sample size, N is the population size (749,122), and e is the level of precision (0.0577). The values are substituted to obtain the sample size as:

$$\mathrm{n} = \frac{749{,}122}{1 - 749{,}122(0.0577)^2}$$

$$\mathrm{n} = 300.2439 \cong 300$$

The researchers used a mixed sampling technique. Bayelsa state has eight local government areas. First, a simple random sample technique is used to select four local government areas at random from the state's eight local government areas, namely Sagbama, Ekeremo, Yenagoa, and Southern Ijaw. second, 75 respondents were chosen from each of the chosen local government areas. Third, the researchers used the purposive sample technique to choose 5 communities from each of the local governments chosen for the study. Fourth, a sample of 15 respondents is drawn from each of the communities in the four local government areas chosen for the study. The data is collected using a question, distributed by four research assistants who were given orientation (training) by the researchers about the research as well as the instruments.

3.4 Operational Measurement of Variables

Green entrepreneurial initiative orientation is captured using the initiative orientation of market trends, the initiative orientation of important issues related to customers or the market, and keeping abreast of important things about competitors. These are measured through a survey with questions rated on a 5-point Likert scale, indicating "respondents strongly disapprove" to "strongly approve" respectively. Where 1 is strongly disapproved, 2 is disapproved, 3 is neutral, 4 is approved and 5 is strongly approved. On the other hand, enterprise creation for this study is operationally measured using business idea development (measured by business ideas generated, documented, and evaluated within the past 6 months), and business planning (measured by the completion and formal approval of a business plan by stakeholders or mentors). These are also measured through a survey with questions rated on a yes or no scale.

3.5 Method of Data Analysis

The data is analysed using a logit regression technique. The logistic regression model is as follows:

$$Logit(p_i) = \beta_0 + \beta_1 IOMT + \beta_2 IORIRC + \beta_3 KAIC + \beta_4 AGE + \beta_5 EDU + \beta_6 HHSIZE + \beta_7 OCCUP + e_{1i} \quad (1)$$

where p_i is the likelihood of a business idea development by a youth in the ith household, and $p_i/(1-p_i)$ is the odds ratio (OR) for business idea development by a youth occurring. Business idea development by a youth in the **ith** household is measured by business ideas generated, documented, and evaluated within the past 6 months. It is a dummy variable that takes the value of 1 if a youth in the **ith** household has a business idea and 0 otherwise. IOMT is the initiative orientation of market trends, IORIRC is the initiative orientation of important issues related to customers, and KAIC is keeping abreast of important things about competitors. The variables are respectively assigned values of between 1 to 5, on a scale of strongly disapprove to strongly approve. On the other hand, AGE is the age of the respondent. It is a dummy variable that takes the value of 1 if a respondent is a male and 0 otherwise. EDU is the educational attainment of the respondent. It takes the value of 1 if the respondent had no formal education, 2 if the respondent's highest educational attainment is primary education, 3 if the respondent's highest educational attainment is secondary education, and 4 if the respondent's highest educational attainment is tertiary education. HHSIZE is the household size of the respondent. It takes the value of 1 if the respondent's household size is below 5 persons, 2 if between 5 to 10 persons, 3 if 11 to 15 persons, and 4 if the household size is above 15 persons. OCCUP is the respondent's occupation. It takes the value of 1 if no employment, 2 if the respondent is a farmer, 3 if the respondent is a civil servant, 4 if the respondent is an entrepreneur, and 5 if the respondent is into other forms of occupation.

To ensure the robustness of findings, after estimating the regression equation, the dependent variable (business idea development of youth in the ith household) is replaced by another variable (business planning) and the equation will be estimated again with business planning as the dependent variable, business planning is measured by the completion and formal approval of a business plan by stakeholders or mentors. It is a dummy variable that takes the value of 1 if a business is successfully registered and 0 otherwise.

Equation 1 is estimated using the maximum likelihood estimator (MLE). The maximum likelihood estimator is appropriate for estimating the parameters of a

logistic regression model (Febrianti, Widyaningsih, and Soemartojo, 2021). The estimator assumes a normal distribution of the errors and is also assumed to be homoscedastic and could otherwise be inconsistent. The MLE is a technique for estimating a logistic regression model parameter. It is among the most widely used techniques of estimators.

4.0 Results

4.1 Respondents' Demographic Statistics

The demographic characteristics of the respondents are reported in Table 1.

Table 1: Descriptive profiles of the respondents

	Frequency	%
Gender of the Respondent		
Male	154	51.33
Female	146	48.67
Total	**300**	**100.00**
Age of the Respondent		
18 – 22 years	118	39.33
23 – 27 years	91	30.33
28 – 32 years	89	29.67
33 – 37 years	2	0.67
Total	**300**	**100.00**
Marital Status of the Respondent		
Single	164	54.67
Married	128	42.67
Divorced/ Separated	7	2.33
Widowed	1	0.33
Total	**300**	**100.00**
Educational Attainment		
None	5	1.67
Primary	24	8.00
Secondary	93	31.00
Tertiary	178	59.33
Total	**300**	**100**

Household Size		
Below 5	106	35.33
5 - 10	176	58.67
11 - 15	18	6.00
Above 15	-	-
Total	**300**	**100**
Occupation of the Respondent		
None	3	1.00
Farmer	31	10.33
Civil servant	77	25.67
Entrepreneurs	66	22.67
Other forms of occupation	121	40.33
Total	**300**	**100**

Source: Researchers' computation, 2024.

In Table 1, the respondent characteristics for gender showed that those who are males were 154 or 51.33%, while those who are females were 146 or 48.67%. This shows that the majority of the respondents were males.

Concerning the age of the respondents, those between 18 to 22 years were 118 or 39.33%, while those whose ages were between 23 to 27 years were 91 or 30.33%. 89 or 29.63% of the respondents were within the age range of 28 to 32 years, while those whose age range is between 33 to 37 years were 2 or 0.67%. This means that the majority of the respondents were within the age range of 18 to 22 years.

As regards marital status, single respondents were 168 or 54.67%, while those who were married were 128 or 42.67%. 7 or 2.33% of the respondents were either divorced or separated, and 1 or 0.33% of the respondents were widowed. Thus, the majority of the respondents were single.

5 or 1.67% of the respondents had no formal education, 24 or 8.00% of the respondents had primary education, 93 or 31.00% of the respondents had secondary education, while those that had tertiary education were 178 or 59.33%. Therefore, the majority of the respondents have tertiary education.

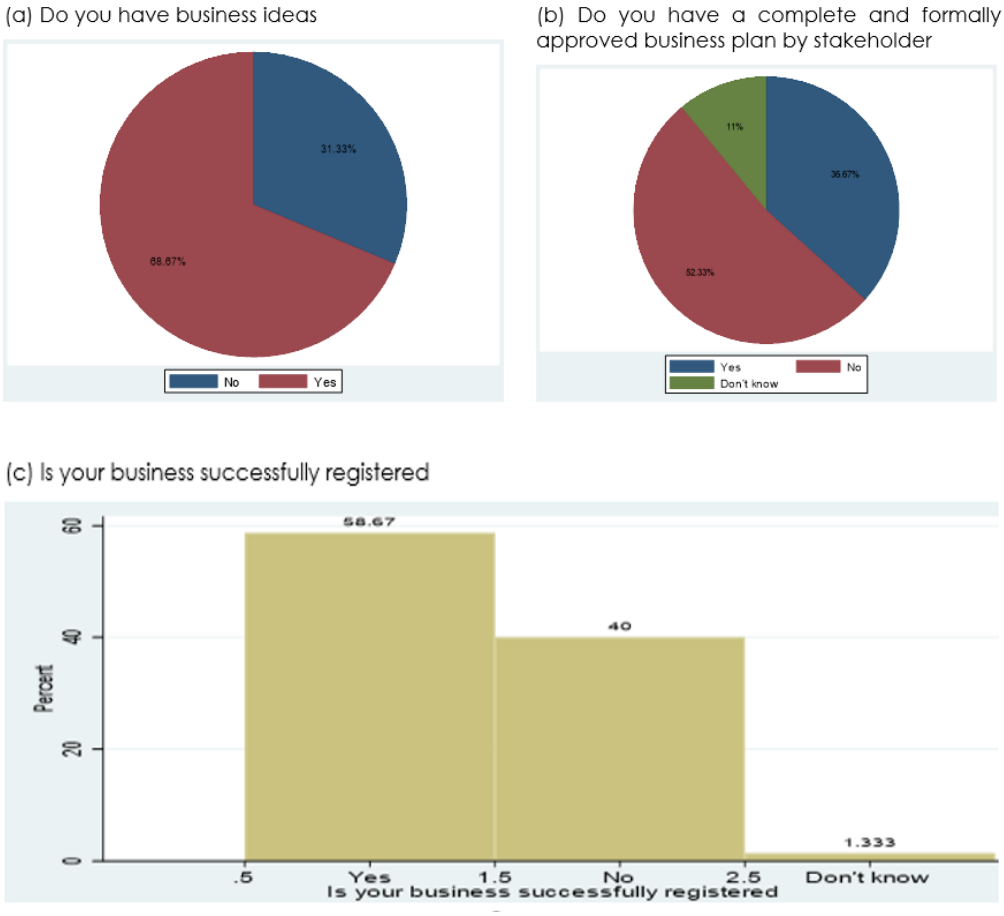
For the household size, 106 or 35.33% of the respondents belong to households of below 5 persons, while 176 or 58.67% of the respondents belong to households of between 5 to 10 members. Those whose household size was 11 to 15 members are 18 or 6.00, and none of the respondents belong to a

household of above 15 members. Therefore, the majority of the respondents belong to a household of 5 to 10 members.

3 or 1.00% of the respondents indicated no occupation, while 31 or 10.33% of the respondents showed that they were farmers. The civil servants comprise 77 or 25.67% of the total respondents, and 66 or 22.67% of the respondents were entrepreneurs. Respondents that had other forms of occupation were 121 or 40.33%. Thus, the majority of the respondents were into other forms of occupation different from farming, civil service and entrepreneurship.

Other characteristics of the respondents such as having a business idea, as well as a complete and formally approved business plan by stakeholders were also examined and presented in Figure 1.

Figure 1: Other characteristics of the respondents



Source: Researchers' Plot, 2024

As shown in Figure 1, 206 or 68.67% of the respondents had business ideas, while the rest 94 or 31.33% of the respondents had no business ideas. Therefore, the majority of the respondents had business ideas.

Respondents who had a complete and formally approved business plan by stakeholders were 110 or 36.67%, while 157 or 52.33% of the respondents had no complete and formally approved business plans by stakeholders. Therefore, the majority of the respondents do not have complete and formally approved business plans by stakeholders.

Respondents whose businesses are registered represent 58.67%, while those whose businesses are not yet registered represent 40.00%. However, 1.33% of the respondents stated that they do not know if their businesses are registered or not.

4.2 Effect of Green Entrepreneurship Initiative Orientation on Enterprise Creation

The effect of green entrepreneurship initiative orientation on enterprise creation was examined using the logistic regression model. Table 2 reports the logistic regression estimates. The table is divided into two columns. The first column reports the odds ratios (with the z-values and p-values in parenthesis) taken business idea development to proxy enterprise creation –the dependent variable. The second column, on the other hand, reports the odds ratios (with the z-values and p-values in parenthesis) taken in business planning to proxy enterprise creation – also a dependent variable.

Table 2: Estimates of the effect of green entrepreneurship initiative orientation on enterprise creation

Enterprise Creation	(1) **Business Idea Development**	(2) **Business Planning**
Initiative orientation of market trends	1.2158 (z = 3.94) (p = 0.000)	1.0175 (z = 2.18) (p = 0.044)
Initiative orientation of important issues related to customers or the market	1.0248 (z = 2.22) (p = 0.039)	0.6875 (z = 3.18) (p = 0.000)
Keep abreast of important things about its competitors	0.9783 (z = 2.23) (p = 0.031)	0.9651 (z = 2.38) (p = 0.024)

Age	1.1148 (z = 2.71) (p = 0.007)	1.2607 (z = 3.57) (p = 0.000)
Education	0.8563 (z = 2.86) (p = 0.004)	1.1669 (z = 2.91) (p = 0.002)
Household size	0.9919 (z = 1.34) (p = 0.181)	0.9493 (z = 0.24) (p = 0.809)
Occupation	1.0839 (z = 0.62) (p = 0.536)	1.4055 (z = 2.60) (p = 0.009)
Constant	1.3577 (z = 0.33) (p = 0.741)	0.7059 (z = 0.40) (p = 0.692)
	Logistic Regression	**Probit Regression**
Pseudo R2	0.6149	0.7429
LR chi2(11)	25.55	17.30
Prob > chi2	0.0017	0.0155
_hat	2.774 (z = 2.43) (p = 0.002)	1.06 (z = 2.51) (p = 0.012)
_hatsq	-1.07 (z = -0.95) (p = 0.344)	-0.05 (p = -0.17) (p = 0.864)

Source: Researchers' computation, 2024.

Column 1 of Table 2 showed a coefficient of 1.2158 with a z-value of 3.94. The significant z-value points to the rejection of the null hypothesis of no significant effect of initiative orientation of market trends on business idea development at the 5% level. Specifically, for each additional initiative orientation of market trends, the odds of developing a business idea increased significantly by about 1.22%. A similar result also showed up in column 2. In specific terms, for any additional initiative orientation of market trends, the odds of planning a business increased significantly by about 1.02%.

Also, initiative orientation of important issues related to customers or the market showed a coefficient of 1.0248 with a z-value of 2.22 in column 1, and 0.6875 with a z-value of 3.18 in column 2. This means that for any additional initiative orientation of important issues related to customers or the market, the odds of developing a business idea and planning a business increased significantly by about 1.02% and 0.69% respectively.

To keep abreast of important things about its competitors, the result in column 1 showed a coefficient of 0.9783 with a z-value of 2.23. In column 2, the coefficient is 0.9651 with a z-value of 2.38. This means that for any additional initiative to stay abreast of important things about its competitors, the odds of

developing a business idea and planning a business increased significantly by about 0.98% and 0.97%.

The coefficient for age is 1.1148 with a z-value of 2.71 in column 1, and 1.2607 with a z-value of 3.57 in column 2. Specifically, for any additional age in years, the odds of developing a business idea, and planning a business increased significantly by about 1.11% and 1.26%.

As regards education, the result showed that for each additional educational attainment, the odds of developing a business idea and planning a business increased significantly by about 0.0.86% and 1.17%.

As regards the household size, the result showed a coefficient of 0.9919 with an insignificant z-value of 1.34 in column 1. Also, in column 2, the coefficient is 0.9493 with an insignificant z-value of 0.24. This means that for any additional member in the household, the odds of developing a business idea and planning a business increased significantly by about 0.99% and 0.95%.

The coefficient for occupation is 1.0839 with an insignificant z-value of 0.62 in column 1. However, in column 2, the coefficient is 1.4055 with a significant z-value of 2.60. In specific terms, for any additional occupation, the odds of developing a business idea increased significantly by about 1.08%, while planning a business increased insignificantly by about 1.41%.

The coefficients of the Pseudo R2 in columns 1 and 2 show that the variables in the model account for more than 60 per cent change in business idea development, and business planning in enterprise creation. The likelihood chi-square values, on the other hand, tell us that the variables jointly significantly affect business idea development, and business planning in enterprise creation. Also, the z-values for hatsq are statistically insignificant in both columns. The non-significant hatsq imply a good fit. This also means a good logistic regression model adequacy.

4.3 Implications of the Findings

The implication is that a systematic focus of green entrepreneurial initiative orientation on market trends, important issues related to customers or the market, and keeping abreast of important things about competitors are valuable drivers of business idea development and business planning, which can lead to enterprise creation as well as sustained innovation and competitive

advantage. This is in line with findings by He, Mo & Zhang (2024), Appiah, Sam, Twum & Godslove (2023), Aurellia & Nuringsih (2023), and Idrees, Xu & Ralison (2023) who also found a that green entrepreneurship-oriented strategy had significant influence on enterprises. Implementing green entrepreneurial initiative orientation policies, based on the findings, can create an environment that supports sustainable enterprise creation and green innovation, promotes competitive advantage, and could derive entrepreneurial growth and economic development, while addressing environmental and market hurdles or issues.

Also, the significant increase in the odds of developing a business idea and planning a business with age implies that older youth-age groups offer valuable attributes to entrepreneurship, making them a more vital part of the entrepreneurial ecosystem. Furthermore, education is crucial in enterprise creation and development. This emphasises the importance of investing in education as a strategy for promoting entrepreneurship and economic development. Youths in larger households have a higher tendency and motivation that enhances the likelihood of developing business ideas and planning a business, which could promote enterprise creation. The insignificant z-value, however, implies that youths in larger households contribute significantly to entrepreneurship in terms of enterprise creation. This is attributable to economic and other challenges associated with larger family sizes such as financial constraints, limited access to education and training, savings limitations, etc., which have to be addressed to instigate a higher rate of enterprise creation. Also, occupations can increase the possibility of enterprise creation by providing broader networks and increased resource availability. This demonstrates the importance of promoting a flexible and multifaceted approach to careers in encouraging entrepreneurial activity.

5.0 Conclusion

This study examined the effect of green entrepreneurial initiative orientation on enterprise creation in Nigeria and came up with several findings. Based on the findings, it is deduced that green entrepreneurial initiative orientation has a significantly enhancing effect on enterprise creation. A systematic emphasis on green entrepreneurial initiative orientation, especially on market trends, important issues related to customers or the market, and keeping abreast of important things about competitors contributes valuably to the advancement of enterprise creation. Also, age and education play a significant role in

advancing enterprise creation, while household size and occupation play an insignificant role.

Government grants and funding should also be directed towards initiative orientation of market trends and important issues related to customers or the market, and keep youths (beneficiaries) abreast of important things about competitors. Policymakers should also consider promoting family-oriented green entrepreneurial programs. Providing resources and training that acknowledge the importance of family support in green entrepreneurship could boost enterprise creation and development efforts.

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Adoption of MSME Islamic Finance Products: Opportunities and Challenges for Development Finance Institutions in Nigeria

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Abstract
The primary aim of establishing Development Finance Institutions (DFIs) is to provide long-term financial support and services for infrastructural, agricultural, and industrial development, of which Micro, Small and Medium Scale Enterprises should not be left out. However, many potential beneficiaries do not apply for the conventional interest-based products of these institutions for religious reasons. This gives credence to this paper to examine the opportunities as well as the challenges for DFIs to adopt MSME Islamic finance products. Thus, a content review research design was employed. The findings from the study revealed that the opportunities DFIs' stands to benefit from adopting MSMEs Islamic finance products include; an increase in customer base, growth in profitability, creation of employment, ensuring bank's stability, attracting FDI flows, increases the bank's income as well as boost MSMEs growth. The study also showed that the DFIs' will encounter challenges such as inadequate public awareness, limited branch spread, and religious issues, among others. The findings of this study is to serve as a roadmap for policy and decision makers to embrace Islamic finance products as additional source of financing to boost economic growth and development. The study recommends that the DFIs' should expressly engage experts in Islamic finance to design plans and strategies for the adoption of the Islamic system of transactions. DFIs' should liaise with MSMEs to explore additional areas so that specific Islamic products can be developed to suit their needs.

Keywords: Islamic Finance Products, Development Finance Institutions, MSMEs, Shariah.

JEL Classification: G2, G20, L26, Z12

1.0 Introduction

Globally, the role of banks in any economy cannot be over-emphasized. In Nigeria, banks play a fundamental role in providing a financing framework for enterprise growth and prosperity. This role is anchored on mobilising funds from the surplus sector or unit and channelling it to the deficit sector which is cogent towards spurring economic growth and development. Banks especially deposit money banks (DMBs) have been at the forefront in the discharge of this role but their activities are mostly focused on short term support which is detrimental to the development of the critical sectors of the economy. Hence, the need for government to set up specialised banks or development finance institutions (DFIs) such as the Bank of Agriculture, Development Bank of Nigeria, Federal Mortgage Bank of Nigeria, Nigeria Export-Import Bank, Infrastructure Bank and the Bank of Industry [Central Bank of Nigeria, 2024).

Generally, DFIs' are aimed at facilitating long-term financial support to industries, businesses, agricultural and infrastructural development. In the Nigerian context, they have assisted in implementing various intervention programmes which include power and aviation intervention funds; Cotton, Textile and Garment Intervention funds, Nigeria Content intervention fund, and Government Enterprise and Empowerment programmes among others but their mode of operations are conventionally based. That is, they operate based on interest which is not Shariah-compliant. Therefore, this interest-based mode of operations has unintentionally excluded a large number of individuals, Muslim entrepreneurs and industrialists from accessing the DFI's financial products and services (Muhammad, et al 2022; Alliance for Financial Inclusion, 2024). This is because interest (riba or usury) is highly prohibited in the Shariah.

There are about 12 verses of the Glorious Quran that prohibit the payment and receipt of interest. For instance, in Quran 2: 278 Allah says "O you who believe! Be afraid of Allah and give up what remains (due to you) from Riba (usury) (from now onward), if you are (really) believers". Likewise, the hadiths narrated by Jabir (may Allah be pleased with him) said: "The Messenger of Allah (peace and blessings of Allah be upon him), caused the one who takes interest, the one who pays interest, the witness to it and the recorder of it. Then he said they are the same" (Sahih Muslim, Book 22, Hadith 132).

Subsequently, based on the fact that these category of populations voluntarily excluded themselves from access to such financial services due to religious

consideration and other factors such as little or irregular income, access to bank institutional exclusion, unemployment and cost of banking (Enhancing Financial Innovative and Access [EFInA] report, 2023), created the need to consider their yearning and aspiration for having an Islamic compliant products so that they can benefit from these financial services with a view of improving their wellbeing and enhancing the livelihood of the society at large.

For instance, the Northern region of Nigeria could be affected because they have the highest number of Muslim population and coupled with the fact that they have leading indicators as thus; highest number of unemployment rate as 9 out of 10 states with the highest unemployment rate are from the North, increased number of poor persons with about 65% which is equivalent to 86 million people are poor. In addition, about 38 and 47per cent from the North East and North West are financially excluded when compared to states in Southern region that recorded below 35 per cent and among others [Nigerian Economic Summit Group, 2021; National Bureau of Statistics, 2023].

However, MSMEs are important to help navigate through these identified issues because according to the NBS report 2017, the total MSMEs stood at 41,543,028 out of which 99.08 per cent are micro-enterprises, 0.2 per cent are SMEs (National Bureau of Statistics, 2017). The sector contributes about 50 per cent to gross domestic product (GDP) and accounts for over 80 per cent of employment in Nigeria. However, the sector is been pulled down with challenges such as obtaining finance, finding customers, infrastructures deficits among others (PwC's MSMEs Survey, 2020).

According to the NBS (2017) report, access to credit by SMEs in Development Banks accounts for one-per cent as against the commercial banks with 99 per cent. This performance, caused for concerns about the DFI's level of patronage by MSMEs. Hence, the need for it to adopt Islamic finance options because it will bridge the gap by creating a level playing ground for MSMEs, deepen the services offered by the DFIs' which will invariably assist in improving the access to finance and patronage by MSMEs. Therefore, MSME Islamic finance products or services, have to do with contracts that are shariah-compliant which are offered by financial institutions to its customers, especially the Micro, Small and Medium Scale Enterprises. In other words, it is an avenue in which financial services are offered to MSMEs in accordance with the dictates of Islamic jurisprudence.

Furthermore, various studies have been carried out on Islamic finance contract or products in Nigeria (i.e., Olayiwale, 2021; Leyeni, Bamiro and Ashafa, 2023) and internationally which capture the works of Larabi and Troubia (2023), Manaseer and Alslehat (2016), Masnah and Hendrawati (2020), Sani et al (2023), Afrizal and Shabri (2023) and Khan & Hussaini (2021) among others. However, a large number of these reviewed studies was skewed towards the nexus between Islamic bank products and bank financial performance, economic growth and development.

Little or few researchers such as Sidlo (2017), and Munawar et al (2023) have documented on the nexus between Islamic finance products and development finance Institutions but few or none has been found specifically on DFIs related to Industry. More so, previous studies were mostly conducted in Middle East and Asian countries, so it would not be fair to generalise the outcome of their studies to Nigeria's context. Thus, the need for this study to examine the opportunities and challenges for DFIs in Nigeria in adopting MSME Islamic finance products.

Consequently, the study is structured in five (5) sections. Section One covers the introduction while the literature review, which captures conceptual and empirical review is covered in Section Two. Section Three and Four comprise of the methodology employed and discussion of the findings while section five encompasses the conclusion and recommendations.

2.0 Literature Review

2.2 Conceptual Review

2.2.1 MSME Islamic Finance Products: These are considered financial instruments or services that are Shariah-compliant offered by Islamic financial Institution to satisfy the needs of its customers specially the Micro, Small and Medium Scale Enterprises. There are different types of Islamic finance products among which include deposit products (Savings, Current and Investment accounts), Financing products (Murabahah, Musharakah, Mudharabah, Ijarah, Bai Salam, Istisna'a etc), Investment products (Sukuk, Islamic funds and real estate), Takaful (Islamic insurance), Treasury services (Currency exchange, Trade finance) etc. However, for the purpose of this study, the Islamic finance products are limited to financing products owing to the fact that they are majorly related to DFIs' whose activities are skewed towards financing. Examples of these Products include the following:

i. Murabahah (Sales Contract): Murabahah is a cost-plus mark-up sale contract often used as working capital to finance goods required (Morsid & Abdullah, 2014). it involves the sale of goods at a price which is factored in the cost price, other costs and profit margin which are disclosed to parties at the time of the agreement. The profit margin can be a lump sum amount or a percentage of the total cost (Atal et.al, 2020). However, this product can be applied by DFIs in the following areas which include home financing, vehicle financing, working capital financing, project financing, trade-LC based financing among others.

ii. Musharakah (Partnership): This is a type of contract in which different individuals pool their resources or funds together purposely for business purposes either or permanent or diminishing basis with the aim of making a profit, which is to be shared based on an agreed ratio. Under such arrangement loss are shared in accordance with capital contributed or capital invested if losses is incurred. More so, parties under this form of contract have the right to participate in the affairs of the business. This instrument is applicable in the following services of DFIs' which include project financing, home financing, trade financing-Musharaka LC and Islamic funds.

iii. Mudarabah (Special or Trustee Partnership): Under this type of contract funds or capital is availed or given by the capital owner ("rabb-ul-mal") to another party called (the "mudarib") for business purposes in which profit will be distributed based on an agreed ratio. However, losses under this setting are borne by the capital provider (Rab al maal) in as far as it is not the negligence on the part of the Mudarib's. But if on the contrary, the Mudarib, will be responsible for the loss (Tjoteng et al, 2022). Under the restricted mudarabah (al- mudaraba al-muqayyadah), the capital owner specifies the type of business which the funds are to be invested whereas the unrestricted mudarabah (al-mudaraba al- mutlaqh), the entrepreneur is at free to invest the funds in any business deem viable in as far as it does not contravene the Shariah (Usmani, 2010). Consequently, DFIs can apply this product in the following areas such as investment account, Islamic funds and project financing.

iv. Ijarah (Rent or Lease): This contract involves the selling the benefit of use or service for a fixed price or wage. Ijarah can be defined as a contract that grants use or occupation of a piece of property during a given

period in exchange for a specific rent. (Usmani, 2010). This type of contract is valid for the use of asset or properties and employment of services. The former is referred to as leasing which has to do the usage of an asset or property for a time period in return for rent. The asset owner is called the lessor or mujir while the user of the asset is called the lessee or musta' ajir while rentals is referred to as ujrah. Also, the latter has to do with the employment of services of a person for a reward called wages/salaries. The employer of labour is called the Musta jir while the employee is called Ajir. Subsequently, Ijarah has the following types which include the following; ijara thumma al bai (Hire Purchase or Lease and Sale) and ijara –wal-iqtina (Lease and Ownership) and Ijara mawsufa bil al thimma (Forward Ijara). Therefore, this product can be applied by DFIs' in the areas of home financing, vehicle financing, and service financing (Marifa, 2014).

v. Istisna'a (Contract of Manufacture): This is exceptional sales contracts which do not comply with the condition of sales generally. Under this contract, the sales deal or transaction is consummated without the existence of the physical commodity or its yet to be manufactured. Payment method may come in 3 different ways. Either in advance, during the manufacturing of the item or when is completed. Istisna'a can be applied by DFIs' in home and project financing (Marifa, 2014).

vi. Bai' Salam (Deferred Sales usually in Agriculture): Under this contract type payment is made for goods in advance which is to be delivered in a future date. Usmani (2010) sees it as a "sale whereby the seller undertakes to supply some specified goods to the buyer at a future date in exchange of an advance price fully paid on the spot". In this instance, the parties involved are called the buyer (rabb-us-salam), the seller (muslam ilaih), the cash price (ra'sul mal) and the purchased commodity (muslam fih). The price, quantity, date and place of delivery should be precisely specified in the contract (Hussain, et al, 2015). Consequently, this type of product can be applied in working capital financing and financing for agricultural production (Marifa, 2014).

However, there are other products which include Bai' al' inah (Sales and Buy-back agreement), Bai'bithaman (Deferred payment Sale), Bai' Muajjal (Credit Sale) and Tawarruq (Overdraft facilities).

2.2.2 Development Finance Institutions: These are specialized Banks in Nigeria charged with the responsibility of providing long-term financial support and services for the purpose of agricultural, infrastructural and industrial or MSMEs development. They offer banking products or services to micro businesses, SMEs, Large entrepreneurs, youths, and women in form of co-financing and syndications, funds management, international trade finance, short Medium- and long-term financing, business advisory among others at a low or single digit interest rate.

These DFIs have obtained various ISO certifications on quality management system, earned various awards, obtained ratings from Augusto & Co, Moody and Fitch rating and have signed different MOUs locally & internationally. However, to operationalise the concept, the study is focused on DFIs vis-à-vis that relates to industrial or MSMEs development.

2.2 Empirical Review

2.2.1 Islamic Finance Products and Banks Performance

Larabi and Troubia (2023) examined the impact of Islamic financing on Islamic banks' profitability while focusing on the Al-Rayan Bank of Qatar. Autoregressive Distributive Lag (ARDL) model was adopted while using quarterly data from 2011-2013 and findings show that there exists a long-run relationship between Islamic financing products and profitability. Specifically, Musharakah has a positive and significant relationship on the bank's profitability whereas Murabahah is on the contrary while Ijarah and Istisna'a have no significant relationship on profitability in the long run. But in the short run, Murabahah and Ijarah have a negative and significant relationship on profitability. Thus, it concluded that Islamic financing has a significant impact on banks profitability.

Munawar et al (2023) in a related study on International Monetary Fund and Islamic Finance concluded that Islamic finance instruments has demonstrated its potentials in terms of mobilising funds through the sukuk in countries like Saudi Arabia, hence, the IMF and Western economist despite operating an interest-based system has key into such a system in order the explore the benefits. Also, Sildo (2017) examined the nexus between Islamic finance and development financial institutions with focus on the Islamic Development Bank Group stress that the bank mobilises funds through sukuk via the bank while the Islamic corporation for the development of private sector focuses on Murabahah,

Wakalah, Ijarah and Istisna'a instruments through the capital markets funds such as unit investment, trade premium, corporate premium and money market fund. The study stresses that these instruments have significantly assist the bank in mobilising resources from Islamic investors with a view of supporting member states especially SMEs in order to reduce poverty unemployment and among others.

In Jordan, Manaseer and Alslehat (2016) assessed the impact of financing revenues of the banks on their profitability with emphasis on local Jordanian Islamic banks while employing the Multiple regression model and secondary data from 2006-2014. Outcome reveals that Murabaha financing has a significant positive impact on local banks. Likewise, Masnah and Hendrawati, (2020) while employing same model carried out a study in Indonesia using secondary data from 2014 to 2019 showing that Musharaka mode of financing has a significant positive impact on profitability while murabaha is no the contrary to profitability.

In Kenya, Aress and Abdul (2023) examined Islamic banking products and the financial performance of Banks in Nairobi by employing primary and secondary data (2017 to 2021) with the aid of descriptive and inferential statistics. A regression model was further used which revealed that profit and loss sharing (Musharakah and Mudarabah) and asset back products (i.e., Ijarah, Murabahah, Salam and Istisna'a) have a positive and significant performance on the Banks performance whereas contract and safety products have positive and insignificant influence on bank performance.

Khan and Hussain (2021) carried out a study across Asian Countries Pakistan, Indonesia, Malaysia, Bangladesh, Oman, Qatar, Bahrain, Saudi Arabia and UAE on the impact of Islamic financial products on financial stability in Islamic banks for a period of 2008 to 2018. Findings revealed that Murabahah and Ijarah has a positive and significant influence on banks stability whereas Istisna, Mudarabah, Musharakah are on the contrary. i.e., there are not statistically significant under the period considered.

Afrizal and Shabri (2023) investigated the effect of Musharakah, Mudharabah, and Murabahah financing on the financial performance of Sharia Commercial Banks in Indonesia while using secondary data from 2010 to 2019 facilitated by panel regression analysis. Findings revealed that Mudharabah and Murabahah have a positive and significant influence on banks' financial performance whereas Musharakah has a negative but insignificant influence on the financial

performance of banks. The study concluded that Islamic products has contributed significantly to the performance of banks during the period considered.

Sari and Maharani (2022) used the Moderated Regression analysis to explore the influence of Murabahah, Musharakah, and Ijarah financing on profitability in Islamic commercial banks between 2016 and 2020, with non-performing finance as a moderation variable. The findings show that Murabahah has a favourable influence on profitability, whereas Musharakah has a negative effect. However, Ijarah has no significant effect on bank profitability.

2.2.2 Islamic Finance Products and MSMEs

Layeni, Bamiro and Ashafa (2023) investigated Islamic banking products and services for socioeconomic enhancement in Nigeria and it revealed that it has spurred SMEs growth, increased foreign direct investment (FDI) flows and created access to financial resources which by extension could serve as an impetus for promoting social welfare and reducing poverty and thus supporting socio-economic development growth.

Likewise, Sani et al. (2023) stressed that Mudarabah, Murabahah, Musharakah, Ijarah, and Bay bi Thamin Ajil (BBA) are beneficial to investment, entrepreneurship, and enterprises, as well as corporate and private firms. More so, Qard al-Hassan and Ijarah have a big impact by providing short-term loans, aiding farmers and companies with their immediate needs, and leasing agricultural equipment while Salam sales also have an impact on small and medium-sized farmers, breeders, fisheries, and poultry producers, as well as those who need Agricultural financing and have the potential to provide Agricultural inputs such as irrigation, fertilisers, seeds, and equipment.

Adam (2020) in another study on the nexus between Islamic financing and SMEs' performance in some selected states of Nigeria like Kano, Kaduna and Sokoto concluded that Islamic financing has a positive influence on SMEs' performance. Ergec and Kaytanci (2017) carried out a study using a quantitative approach and concluded that Islamic banking, through its activities, has created employment. Akhter, et al (2019) in their study examined the nexus between Islamic banking and financial Inclusion, particularly from Asian and African Markets from 2005-2014 through secondary data which was facilitated by random panel regression technique. Findings depicts that Islamic banking has significantly contributed to the demand side of financial Inclusion,

especially on the borrowers' side or the users of bank financing. Hamzat and Nwakwo (2023), while employing qualitative methods, on the nexus between Islamic banking and Women's financial inclusion in Lagos, concluded that the unbanked women are aware of Islamic products and are willing to open accounts with such banks which by implication will spur financial inclusion and by extension lead to the development of SMEs.

2.2.3 Challenges of Islamic Finance Products

Yustiardhi et al (2019) in their study on the issues and challenges of Mudarabah and Musharakah contracts in Islamic banking product decomposed it from a different angle. Employing a library research method reveals that from an Islamic bank view, the issues and challenges captured include high risk, issues relating to asymmetric information, moral hazard, evaluation process, and guarantees. More so, issues with guidelines on the profit/loss sharing (PLS) scheme and capital requirements for mitigating the risks were captured from a regulatory view. But from a customer's view, it includes bank reputation, pricing, religion, awareness and knowledge.

Furthermore, in Afghanistan, Rostan et al. (2021) used a qualitative method to investigate the challenges of Islamic Banking in Least Developed Countries and concluded that the major challenges include uncreative marketing strategies and a lack of public awareness and education about the banking model, which has resulted in a lack of participation and interest among the population. A comparable study found misunderstanding and lack of standardization of Islamic financial concepts as a major challenge, followed by limited market-based financial intermediaries and products, as well as legal issues (Zainordain et al, 2016). Similarly, Otu and Nabiebu (2019) assessed the challenges of Non-interest (Islamic) Banking in Nigeria which reveals that it includes Islamophobia, lack of distinct and comprehensive legal framework, ethno-religious factors, disparity in accounting standards, awareness, inadequate human resources. In addition, Idris (2017), identified lack of knowledge, inadequate legal and regulatory environment, competition, taxation, absence of Islamic insurance and among others as the challenges facing the full establishment of the Islamic banking system in Nigeria.

Therefore, from these reviews, a large dossier of the studies was carried out in Asian and Middle Eastern countries, as few were documented for Nigeria specifically as it relates to MSME Islamic products and development financial institutions vis-à-vis as it pertains to industry.

3.0 Methodology

The study employed a content review research design. This approach was employed taking into consideration the theme in order to make inferences about the antecedents, and characteristics of Islamic finance products and the development finance institutions. Secondary sources of data which includes journal papers from Scopus, Science Direct, Google Scholar database, text from Quran and Hadiths among others, spanning a period from 2010 to 2023 were used.

Subsequently, qualitative content analysis was used, which entails several stages such as selecting relevant texts, familiarization, and coding was done manually. Themes were generated and identified within the coding framework which includes bank income, bank stability, profitability, customer freedom, foreign direct investment, customer base, and employment.

Also, the same processes were employed to analyse the challenges in which the theme generated includes public awareness, branch spread, manpower issues, religious issues and competition. Consequently, the themes identified were then interpreted in the context of the study aided by a deductive approach, specifically conceptual analysis. The findings were compared to the reviewed literature were inferences or conclusions for the study were drawn.

4.0 Discussions of Findings

4.1 Opportunities for DFIs in Adopting MSME Islamic Finance Products

4.1.1 Customer Base: Findings from the study have indicated that Islamic finance products increase the customer base of a bank. This is because it facilitates financial inclusion or access to finance. So, by adopting Islamic finance products by DFIs', those entrepreneurs or industrialists who have excluded themselves from patronizing the DFIs' conventional products because it operates based on interest which contradicts their religious beliefs will be accommodated. This by implication, leads to an increase in the DFIs' number of customers. Accordingly, this outcome corroborates with the works of Akhter, et al (2019) and Hamzat and Nwakwo (2023).

4.1.2 Profitability: The findings for this study have indicated that Islamic finance products have a positive influence on the profitability of banks particularly in the area of return on asset, net income and revenue growth.

Therefore, the adoption of Islamic finance products by the DFIs' which is to be in form of an Islamic window is to bring onboard new category of customers as well as businesses. By implication, it is to have impact on the bank's income lines and thus, resulting to a sustainable profit. This is evident in the works of Larabi and Troubia (2023), Manaseer and Alslehat (2016), Masnah and Hendrawati, (2020) and Aress and Abdul (2023).

4.1.3 Employment: The study reveals that Islamic finance through its products has a positive influence on employment creation. This could be direct or indirect. So, by incorporating Islamic finance products into its existing products, DFIs will require individuals who have the expertise in Islamic finance to be employed especially in the formation of advisory council of experts and other strategic positions. Also, other staff that will manage the services of these products will further be employed. On the other hand, employment will be created Indirectly because, the products are to be used to finance businesses which in turn could lead to business expansion, increased output and employment. This outcome is buttressed in the study by Ergec and Kaytanci (2017).

4.1.4 Bank Stability: The study's findings reveal that Islamic finance products significantly influence or ensure banks' stability and performance in the following areas such as risk management, asset quality and liquidity management. Therefore, adopting Islamic finance products gives DFIs' the opportunity to achieve a high level of stability. This is because these products have peculiar attributes which is mostly equity-based and asset-backed or based, thus making it resilience to shocks. This is buttressed in the works of Khan and Hussain (2021), Aress and Abdul (2023) and Afrizal and Shabri (2023).

4.1.5 Attracts FDI flows: Foreign direct flow is considered cogent in any economy which the DFIs cannot be relegated to the background. DFIs vis-à-vis as it relates to industry has signed various MOUs and received credit lines from various institutions/ countries such as Africa Development Bank, AFRIEXIM, Export-Import Bank of China, Brazil and among others. Therefore, the adoption of Islamic finance products will result or attract Shariah-compliant funds or result to more signing of MOUs with Islamic financial institutions like Islamic Development bank and other members of Organisation of Islamic Cooperation. By implication, it will further boost the capacity of the bank towards realising its corporate objectives as evidenced in the works of Layeni, Bamiro and Ashafa (2023).

4.1.6 Customers Freedom: Findings from the study show that Islamic finance products ensure customers' freedom in key areas such as flexibility, ease of switching products and full disclosure. Therefore, incorporating Islamic finance products by DFIs, give the customers the opportunity to have a wide range of choices to navigate among different products of their choice. More so, the non-Muslim existing customers with DFIs' will also have the opportunity to enjoy the Shariah-compliant products and compare it for proper decision making in the future. This finding is in tandem with the works of Layeni, Bamiro and Ashafa (2023).

4.1.7 Boast MSMEs: The findings revealed that Islamic finance products have a significant positive influence on SMEs' performance especially in the areas of access to credit. However, DFI's as it relates to industries has supported about 4.2 million entrepreneurs out of the 42 million MSMEs (NBS, 2017). Although, there is still a gap in its obligations towards boosting MSMEs and as such incorporating Islamic finance products into the existing bouquets of their products will allow the DFIs to sign more MSMEs into their books. And, by so doing, these MSMEs would benefit from the financing facilities which by extension, will increase their output, profits and create employment. On the other hand, the DFIs will also earn commissions and fees, rental income among others from such services. This finding is in tandem with existing literatures such as the work of Sani et al. (2023) and Layeni, Bamiro & Ashafa (2023).

4.1.8 Banks Income: DFIs generates income from various channels which could be interest income, treasury services, investment income and others but the adoption of Islamic finance products would spur or expand the income lines of DFIs because alternative channels of generating income will emerge which can be through profit sharing from Mudarabah and Musharakah transactions, rental income from properties, gain on sales of asset and properties, commissions and fees and among others. In sum, this will invariably improve the profitability, and growth of the DFIs as well as provide returns to its stakeholders. This finding is in line with the studies of Larabi and Troubia (2023), Masnah and Hendrawati, (2020).

4.2 Challenges for DFIs in Adopting MSME Islamic Finance Products

4.2.1 Public Awareness: Public awareness is cogent in attracting patronage to a particular product or services. This could be considered as a challenge because the awareness of the DFIs is mostly skewed towards urban areas. Therefore, by adopting Islamic products which also requires public awareness

will add more problem to the existing one faced by DFIs. Thus, it will be considered as a double bared challenge. This revelation is consistent with the studies of Olaoye, Dabiri and Kareem (2013), Yustiardhi et al (2019) and Rostan et al (2021). By implication, this will affect the patronage of these products and consequently, DFIs respective key performance indicators.

4.2.2 Branch Spread: DFIs' has limited branches across the country which implies that its coverage in the various state capitals is inadequate and, in each state, only a branch is cited. This could serve as challenge for customers especially at the rural and urban areas with regards having access to financial services in states where such bank is not located. Also, in states where DFIs has its presence, it will be overwhelmed if the demand for the product increases and as such it could lead to service failure.

4.2.3 Manpower Issues: Manpower is considered as a very important tool for the success of any institution be it Islamic or conventional. The adoption of Islamic products by DFIs will result to the demand of new category of staff especially those that have the expertise in the area of Islamic finance. However, the availability of this category of persons is limited owing to the fact that the field is still at its infant stage and it is attracting attention. This finding or outcome is in conformity with the works of Otu and Nabiebu (2019) and Rostan et al (2021) which identified manpower as a critical issue affecting the operations of Islamic financial Institutions.

4.2.4 Religious Issues: Religion is a very sensitive issue especially in the context of Nigeria. By adopting Islamic finance products by the DFIs, it could be viewed in some quotas as an Islamization agenda while neglecting the potential benefits it has on the DFIs' and the society at large. However, this issue stems from the fact that the level of awareness in respect to Islamic financial system among the population is at its low ebb, thus creating misconception and misinterpretation as regards the reality of such banking products or services. This is further buttressed in the works of Otu and Nabiebu (2019) and Yustiardhi et al (2019) which highlights religious issue as a fundamental challenge to Islamic banking.

4.2.5 Competition: The findings shows that competition is considered as a challenge to Islamic banks especially from the conventional banks. Therefore, adopting Islamic finance products by DFIs, will pave the way for a new challenge because they are to face competition from the conventional and Islamic banks despite having a different mandate, especially in the quest to

have a fair share from the pool of over 42 million MSMEs in the country (NBS, 2017). This finding is in accordance with the works of Zainordain et al, (2016), Idris (2017) and Rostan et al. (2021).

5.0 Conclusion and Recommendations

Based on the findings of this study, it can be concluded that the adoption of MSME Islamic finance products will go a long way to further improve the performance of the DFIs which will invariably assist in achieving their set goals and objectives towards driving economic growth and development. This is against the backdrop that exploring these products by these institutions, will increase the customer base, profitability, creates employment, ensure bank stability, attract FDI flows, promotes customer freedom, increase the bank income as well as boast MSMEs. Despite these opportunities, DFIs' will encounter numerous challenges which include lack of public awareness, limited branch spread, religious issues, among others. Consequently, the following recommendations were suggested for implementation:

i. There is need for concerted effort by the DFIs' and its marketing teams to increased awareness through advert, road shows, collaborating with market or trade union leaders and having ambassador so that they can adequately spread the activities of the bank.

ii. DFIs' Management needs to invest in branch expansion across the entire state of the federation and also in rural areas that are strategic as this will go a long way to improve access to finance among the populace.

iii. DFI's should expressly engage experts in Islamic finance to design a plan for the adoption of Islamic system of transaction.

iv. The Management of DFIs should train and re-train the existing personnel on Islamic system of finance to enable them get acquainted and up to date with best practice.

v. DFIs' should liaise with MSMEs to map out areas so that specific Islamic products can be developed to suites their needs.

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Scenario Analysis of PMS Price Adjustment Effect on Inflation in Nigeria

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Abstract

This study conducts scenario analysis of PMS price adjustment effect on headline inflation in Nigeria using monthly data from 2014M01 to 2023m05 to capture the periods of full fuel subsidy intervention with stable PMS price and simulation analysis to capture the periods of zero fuel subsidy employing different scenarios. The study is imperative due to the significant second-round effect of increased PMS price on local business operations as well as key macroeconomic variables like inflation. The effect becomes significant as a result of the recent fuel subsidy removal that causes significant increase in the price of PMS due to exchange rate depreciation. To achieve the objectives of this paper, a Traditional Vector Autoregressive (VAR) model was employed to examine the ex-ante and ex-post of inflation path under the two regimes. Under regime with full subsidy, inflation responds positively to shocks to PMS price up to 11 months period, with about two months lags. Additionally, under the regime with no subsidy, the result shows that subsidy removal (using simulated PMS price) contributes mildly to the rising inflation in Nigeria up to 9 months period of acceleration in the future after the announcement of the policy. Furthermore, the paper simulates different scenarios of PMS price, and its likely impact on inflation rate in Nigeria. Finally, key recommendation emanating from the study is the urgent need for a strengthened policy coordination between the government and the CBN in order to address the instability in the Nigerian Foreign Exchange Market that causes exchange rate volatility leading to rising PMS price which adds to the current inflationary pressure in the country.

***Keywords**: Vector Autoregressive Model, PMS Price, fuel subsidy, inflation rate, simulation analysis, stochastic and dynamic solution.*

***JEL Classification:** F6, O1, O2, O3, O10, & O13*

1.0 Introduction

Nigeria, one of the largest oil producers in Africa and 11th in the world, introduced fuel subsidies in the 1970s with the main aim to stabilise fuel prices and to also make petroleum products accessible to the public. This is because increasing fuel price has significant effect on general prices which also affects local businesses and their operations especially Micro, Small

and Medium Enterprises (MSMEs) (Adeniyi et al., 2011; Bazilian and Onyeji, 2012). Thus, high fuel price has welfare implication in the economy. Moreso, fuel subsidies have been a significant and contentious issue in Nigeria for decades. These subsidies were originally implemented to make petroleum products more affordable to the MSMEs and final consumers. However, the economic, social, and political implications of maintaining such subsidies have led to numerous debates and policy shifts, culminating in several attempts and eventual removal of the subsidies. Over time, the financial burden of fuel subsidies increased significantly as previous governments spent billions of dollars annually to keep fuel prices low. This expenditure strained the national budget and diverted funds from essential sectors like education and healthcare leading to high level of inefficiencies and mismanagement (see, Coady et al., 2017; and Krane & Monaldi, 2017).

In addition, there were various attempts by different administrations to deregulate the oil sector. For instance, between 1999-2007, there were efforts to deregulate the downstream oil sector. Similarly, there was a partial subsidy removal in 2012 which was subsequently reversed. In 2020, amidst the COVID-19 pandemic and falling oil prices, the government announced the deregulation of the downstream oil sector, effectively removing subsidies. This move was positioned as a necessary step to free up resources for critical infrastructure and social programs.

Meanwhile, the decision to fully remove fuel subsidies in 2023 was driven by the need to address fiscal imbalances, reduce public debt, and attract investment in the oil sector. Thus, the policy was part of broader economic reforms aimed at liberalising the economy and promoting sustainable growth. The instantaneous effect of the policy led to an immediate increase in fuel prices, which impacted on MSMEs' operations due to increased transportation costs, among others, thus leading to increase in the prices of goods and services. To cushion the impact especially on MSMEs, the government introduced measures such as targeted social interventions to small businesses, investments in public transportation, and incentives for local refining to stabilise fuel supply and prices. Albeit available data have shown that the policy contributes to the ongoing inflationary pressure in the country as the cost of transportation and businesses operations have increased.

However, the policy is expected to address some fiscal bottlenecks which enable government to save from the subsidies proceeds that can be redirected to critical infrastructure projects and social programs. Also, the

policy aligns with Nigeria's broader goal of diversifying its economy away from oil dependency. By reducing fiscal burdens, the government aims to create a more sustainable economic environment conducive to growth in other sectors. Overall, the removal of fuel subsidies in Nigeria marks a significant shift in economic policy, reflecting the government's commitment to fiscal responsibility and economic reform. While the decision has had immediate socio-economic repercussions, it is positioned as a necessary step towards achieving long-term economic stability and growth. The success of this policy will depend on the effective implementation of mitigating measures and the government's ability to manage the transition period (as noted in Gustavo, et' al, 2022).

Specifically, fuel price increase could affect inflation through direct or indirect channel as argued in the literature. The proponent of direct channel explains that increased fuel price leads to higher transportation cost, increased energy costs exacerbating cost push inflation. This further increase the utility bills for consumers and businesses thus, contributing directly to higher inflation. Meanwhile, the proponent of indirect channel argues that rising fuel price increases wage-price spiral leading to cost-of-living increases, prompting workers to demand higher wages. Thus, firms in turn, may raise prices to cover increased labour costs, creating a feedback loop that further fuels inflation. This is in addition to the imported inflation especially for case where refined petrol is imported. Therefore, an increase in global oil prices or local currency depreciation can lead to imported inflation, as the cost of importing fuel rises leading to increased general price via pass-through channel.

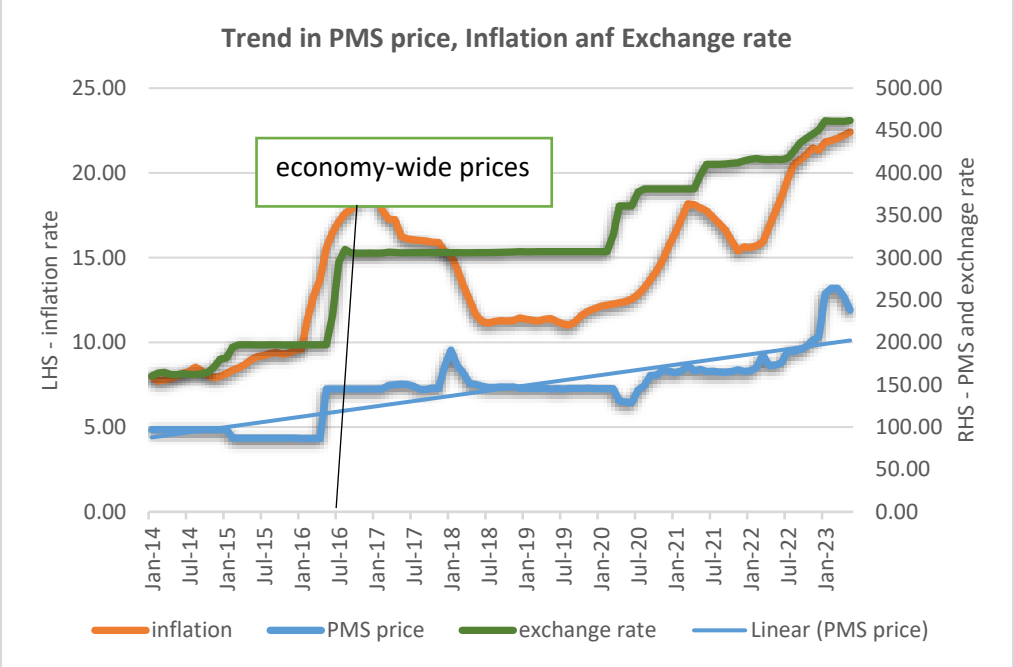
Against this backdrop, the paper aims to effect of rising fuel price on inflation in Nigeria using different scenario to capture fuel price adjustments in the post subsidy removal period. For this purpose, among other variables, inflation is represented by year-on-year headline inflation rate while PMS price from January 2014 to December 2023 represents the subsidized fuel price during the regime of full subsidy. The rest of the paper is organised as follows: Section 2 provides brief stylised facts. Section 3 reviews the literature. Section 4 introduces the methodology employed and section 5 concludes with policy options.

2.0 Stylised Facts

2.1 Trend of fuel price and inflation

In this study, Petroleum Motor Spirit (PMS) price was used to proxy fuel price. The figure below depicts the trend of PMS price and inflation trajectory in Nigeria. It is observed that there exist co-movements between the two variables in the later part of the study period, indicating that, periods when PMS prices increased; inflation rate also trended in the same direction.

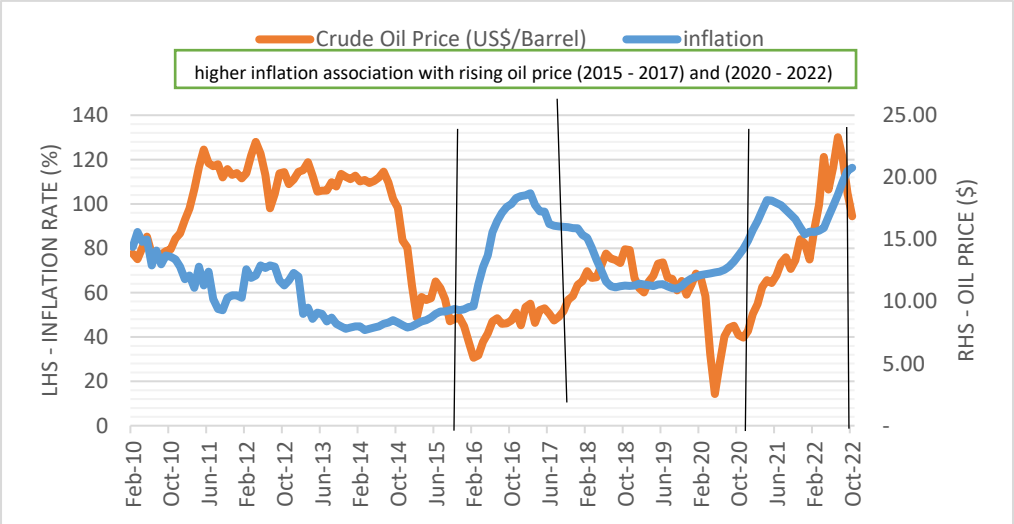
Figure 1: Trend in PSM price, Inflation and Exchange rate.



Source: Author's computation using excel.

For instance, as PMS prices increased from 86.50/litre to 145.00/litre in June 2016, inflation also experienced an upward trend, accelerated from 13.72% in April 2016 to 15.58%, in May 2016 and 17.13% in July 2016. Based on the trends in figure 1, it is obvious that a rise in inflation prior to the full implementation of the subsidy removal policy, could be attributed to other factors such excess liquidity in the economy and other structural issues like insecurity, flood, rainfall, among others (see Coady et al., 2017; and Krane & Monaldi, 2017). Although, it's expected that considering a year-on-year base effect, the pace of inflation may decelerate but overall prices of goods and services will remain elevated.

Figure 2: Trend in global oil price and inflation rate.



Source: Author's computation.

The chart in figure 2 shows the interaction between oil price and inflation in Nigeria from 2010 to 2022. It's evident that global oil prices have a significant impact on inflation in Nigeria due to the country's heavy reliance on both oil exports and fuel imports. This is significantly recorded among other periods, between 2015 to 2017 in the aftermath of economic recession and 2020 – 2022 covering the COVID-19 pandemic period and its spillover effects. These dynamics highlight Nigeria's vulnerability to global oil price fluctuations and the broader impact on the domestic economy. Overall, oil price movement has been argued to be the cause of external shock to impact on the current account balance and fiscal position that has mostly explained the inflationary pressures in Nigeria in recent times.

2.3 Literature Review

The literature establishes that subsidy removal on energy increases fuel price and could have negative impacts on inflation of a country which subsequently affects small businesses that are coming up, this is line with basic economic theory. Thus, any shocks to fuel price have an almost direct and immediate pass-through effect on general prices which could distort effective domestic business operations (see Gustavo, et' al, 2022; Kpodar & Liu, 2021; Omotosho, 2019; and Cukierman, 2016). Consequently, subsidy removal could potentially lead to a significant increase in inflation in the short- to medium-term. Albeit, over the long-term, the policy could result in greater economic stability and

growth (Kpodar & Liu, 2021 and Cukierman, 2016). Meanwhile, when fuel prices are subjected to market forces, the magnitude of pass-through to inflation depends on the extent to which consumers can adjust to the new fuel price level, either by reducing their consumption or switching to alternative energy sources if available (Shang 2021).

In an attempt to analyse the overall economy-wide impact of fuel subsidy and its removal, Omotosho (2019) developed and estimated a New-Keynesian DSGE model that accounts for pass-through effect of international oil price into the retail price of fuel and subsequently to other macroeconomic variables such as inflation. The results show that oil price shocks have significant and persistent impacts on output, accounting for about 22% of its variations up to the fourth year. The benchmark model (i.e. with fuel subsidies), indicate that a negative oil price shock contracts aggregate GDP, boosts non-oil GDP, increases headline inflation, and depreciates the exchange rate. Furthermore, the result generated under the model without fuel subsidies indicates that the contractionary effect of a negative oil price shock on aggregate GDP is moderated, headline inflation decreases, while the exchange rate depreciates more in the short run. This is in tandem with the works of Gustavo, et' al, 2022 and Kpodar & Liu, 2021.

Moreover, Ehinomen and Adeleke (2012) examined the impact of fuel subsidy removal on inflation in Nigeria using Granger causality test and regression analysis. The findings indicate that fuel subsidy removal had a positive and significant long-run effect on inflation, implying that it could lead to a short-term increase in inflation. This corroborates with the findings of Bobai (2012) who found that removal of fuel subsidies in Nigeria increases inflationary pressures. Noting that the policy raises the cost of fuel, leading to higher transportation and production costs.

Similarly, Eregha, (2015) in examining the impact of subsidy on the transportation sector in Nigeria, utilises Johansen Cointegration and Error-Correction Model (ECM) to examine the relationship between subsidised gasoline prices and the transport sector. The result shows that subsidy has positive and significant relationship with transport sector which implies that removing subsidies could increase the operational cost of the transportation sector of domestic businesses. Meanwhile, Umar & Umar (2013); Nwosa & Ajibola (2013) and Siddig et al. (2014) noted that Nigeria's subsidy regime distorts fiscal planning, encourages inefficient consumption, and increases inequality as richer households benefit more.

In another separate study, Umar (2013) examined the impact of fuel subsidy removal on inflation in Nigeria using Autoregressive Distributed Lag (ARDL) model. The study established that the impact of fuel subsidy removal on inflation was significant leading to an increase in inflation rate, which persisted over the short term. This is similar to the findings of Obayelu and Oni (2014) using a Computable General Equilibrium (CGE) model, suggesting that removal of fuel subsidy resulted in a short-term increase in inflation and also led to a decrease in the real GDP. However, this is contrary to the findings of Siddig et al. (2014), which established that fuel subsidy removal does not induce inflationary pressure while exchange rate does.

In summary, most recent empirical studies in this area establish that the pass-through effect from oil prices to general price level is present especially when linked to small businesses operations. Albeit the effect is mild and transitory over time. However, fewer studies provided evidence of no effects of fuel price changes on inflation. It is apparent from the review above that there have not been substantial studies on subsidy removal-induced pricing and inflationary pressures for Nigeria using simulation analysis to calibrate the future path of inflation in the regime of no subsidy. As most studies employed only historical data for the analysis without carrying out conditional forecasts and simulation analysis using counterfactual approach. This paper seeks to bridge the literature gaps by estimating empirically, the pass-through of fuel price changes due to full subsidy removal and its impact on inflation trajectory in Nigeria in the future and how that could affect MSMEs' operations.

2.4 Theoretical Basis

The New Keynesian Framework (NKF) that allows for macroeconomic interactions in a structural system serves as the theoretical foundation for this paper, this has been properly incorporated in the Vector Autoregressive (VAR) approach. Subsequently, the study extends and modifies the works of Blanchard and Gali's (2007) to explain country specific heterogeneity in the response of inflation to domestic fuel price shocks employing the NKF. Using the same theoretical approach, Gelos and Ustyugova (2017) find that commodity price shocks (world food and fuel prices) have stronger effects on domestic inflation in developing countries than in advanced economies, with countries exhibiting certain structural characteristics being subject to larger spill overs (Kpodar & Liu 2021).

This study departs from others that used crude oil price as the variable of interest to proxy domestic fuel price shocks to inflation (see Kilian 2009, Peersman and Van Robays 2012, and Baumeister and Peersman, 2013). The paper follows more recent studies in the literature that use domestic fuel price and how shocks to it affects price level in an economy and its subsequent effects on MSMEs (see Kpodar & Liu 2021 and Kpodar & Abdallah 2020). This becomes more necessary as domestic fuel price shows the true picture of pass-through to inflation, while crude oil price is purely exogenous, thus, could not serve the purpose in the VAR model. Additionally, several other studies found that inflation reacts positively to changes in fuel prices (see for instance for the Euro Area: Álvarez et al. (2011) and Castro and Jiménez-Rodríguez (2017); and Caceres, Poplawski-Ribeiro and Tartari (2013) for Central African countries). Similarly, some studies provide evidence of an asymmetry in the responses of inflation to domestic fuel prices shocks as positive fuel price increase leads to larger effect on inflation than negative price shocks, (such as, Kpodar & Liu, 2021 and Choi et al., 2018, and Kpodar & Abdallah, 2020).

In summary, the NKF connects fuel price or subsidy removal to inflation through cost-push inflation mechanisms, expectations, and aggregate supply and demand dynamics. The pass-through from fuel prices to inflation is a critical concept in this framework, explained by cost-pass-through and exchange rate mechanisms, which are often explored through empirical models such VAR and its variants.

3.0 Methodology

3.1 Data Description

This study utilises time series data from January 2014 to May 2023, representing 112 observations. The period was chosen to accommodate the period of full subsidy intervention without any structural break, since periods prior to 2014 were accompanied by partial subsidy removal and other distortions in the oil sector. Five variables are utilized in the estimation process, these include headline inflation, PMS pump price, exchange rate, money supply and fiscal policy (proxied by government spending). These variables, among others, have been found in several studies (see, for example, Kpodar & Liu, 2021; and Kpodar & Abdallah 2017) to be the main drivers of inflation that affect small businesses when subsidy is removed most emerging economies like Nigeria.

Thus, fuel price was proxied by the average pms price of the 36 states of Nigeria and the FCT, exchange rate was proxied by the official exchange and M3 represents the stock of money in the economy. Government spending is represented by capital and recurrent expenditures; this is done to capture the true dynamic nature of government expenditure and its impact on inflation. All data was sourced from the statistical database of the CBN and the National Bureau of Statistics (NBS).

3.2 The Vector Autoregression Model

There is a large body of literature assessing the macroeconomic impact of domestic fuel price shocks and the role of fuel subsidies (see, Berument et al., 2010), especially in oil producing economies like Nigeria (see, Omotosho, 2019), as well as the implications of subsidy removal across several economies (see, Coady et al., 2017; Krane & Monaldi, 2017; and Omotosho, 2019). In order to assess the impact of subsidy removal on inflation trajectory in both pre and post subsidy removal periods, the vector auto-regression (VAR) methodology, pioneered by Sims (1980) has been widely used in several studies. To address the above objective, the study employs a VAR model to produce two forecasts, namely: in-sample and out- sample forecasts, which were leveraged to identify the differential impacts of the model variables, especially PMS price on inflation. Thus, a ''one-model two-forecasts" approach is used since VAR could address all the objectives earlier highlighted.

Furthermore, this study extends Omotosho, 2019 by considering two broad scenarios, namely; one without subsidy and another with subsidy. This was done to ascertain the relative impact of subsidised and unsubsidised fuel prices on inflation trajectory in Nigeria. However, this paper departs from Omotosho, 2019 by introducing money supply and government spending in our model in order to effectively address the objectives of the study. Specifically, this paper also analyses both pre and post subsidy removal periods, by simulating the pass-through impacts of fuel price shocks before and after the removal of subsidies using different methodologies.

This study also makes the first attempt to evaluate the impact of fuel subsidy on inflation by leveraging simulation analysis in the out-of-sample forecasts. The paper sets out different scenarios of fuel prices since it's now market-driven and evaluated how different pms prices could impact on inflation trajectory in the future. The first run of the VAR model produces in-sample forecasts, along with the impulse response function (IRF), the forecast error variance decomposition

and historical decomposition. While the second run of the VAR model takes care of the out-of-sample forecasts that involve scenario analysis to produce the impact of fuel subsidy removal on inflation trajectory (this is in line with the work of Jorda 2005).

3.3 Model Specification

Following Yusuf et al. (2022) in the VAR estimation and based on the unit root nature of the variables, a differenced VAR model is considered in its AR form with k dimensions as:

$$A_0 y_t = A_1 y_{t-1} + \cdots + A_p y_{t-p} + u_t \quad (1)$$

Where y_t, t =1,…,T and assume that y_t can be estimated by a vector auto-regression of finite order *p which generalises a one-variable AR(p) process to n variables*: Furthermore, equation (1) is simplified and redefined as:

$$\boldsymbol{y_t} = \sum_{i=1}^{p} \boldsymbol{A_p}\, \boldsymbol{y_{t-i}} + u_t \textbf{ thus, } \boldsymbol{E}(\varepsilon_t \varepsilon_t') \equiv \Sigma_\delta \quad (2)$$

The objective is to learn about the parameters, where y_t is an $(n \times 1)$ vector of endogenous variables in the system, $\boldsymbol{u_t}$ is (n x 1) vector of white noise innovations which are assumed to be uncorrelated with their own lagged values and uncorrelated with all the right hand side variables i.e. the lagged $\boldsymbol{y_s}$, $\boldsymbol{B_1}$ represents the (n x n) matrix of coefficients. The essence is to ascertain the impact of fuel price dynamics on inflation trajectory prior to subsidy removal in Nigeria, by considering series of key inflation drivers (including its own lags) in Nigeria with fuel price as the main target in the VAR model. The study, therefore, establishes that:

$$y_t = f\ (inflation, pms\ price, exchange\ rate, money\ supply, govt\ spending) \ldots. \quad (2a)$$

The $(n \times 1)$ vector of u_t in equation (1) above refers to a structural shock or innovation and signifies zero mean with serially uncorrelated error term (zero and finite variance), i.e. the vector of white noise innovations. The error term is assumed to be unconditionally homoscedastic. The matrix is not assumed to be diagonal thus, the error terms of the individual equations can be contemporaneously correlated, while all innovations should be uncorrelated with their own lagged values and uncorrelated with the right-hand side variables (i.e. the lagged y_{ts}). For notational convenience, all deterministic regressors have been suppressed. Accordingly, the paper also assumed that there are no contemporaneous terms on the righthand side of the equation. The model can be written more concisely as:

This implies first, that the number of structural shocks and variables are equivalent. Second, since by definition, structural shocks are mutually uncorrelated, it is implied that Σ_u is diagonal. Third, the variance of all structural

shocks is normalised to unity without a loss of generality given that the diagonal elements of B_0 remain unrestricted. For the in-sample VAR forecasts to be estimated, the reduced-form VAR representation must first be derived. This requires y_t being expressed as a function of lagged y_t only. The reduced form representation is derived by pre-multiplying both sides of the equation 1 (i.e. structural VAR representation) by B_0^{-1}. Hence, the same model can be represented as:

$$\boldsymbol{y_t} = \boldsymbol{A_1}\boldsymbol{y_{t-1}} + \cdots + \boldsymbol{A_p}\boldsymbol{y_{t-p}} + \boldsymbol{\varepsilon_t} \ldots\ldots(3)$$

The ***reduced form VAR*** above is the basis for our in-sample forecasts and the impulse response analysis and would also aid us in setting path to our concerned variable(s) to see the out-of-sample forecast pattern of the model in the simulation process, where $A_i = B_0^{-1}B_i$, i=1, …, ρ, and $\varepsilon_t = B_0^{-1}u_t$. Equivalently, the model can be written more compactly as:

The VAR specification system is simplified using only two variables (i.e. fuel price denoted by ***P*** and inflation rate denoted by $\boldsymbol{\pi}$). Subsequently, the system is extended to accommodate other endogenous variables in the model, which include exchange rate denoted by ***e***, money supply denoted by ***m*** and government spending denoted by ***S***. In doing so, the contemporaneous response coefficients of the targeted variables 'parameter ***A'*** in equation (3) above is further represented in a matrix algebraic form to account for the identity component of the parameter which could be written as:

$$A = \begin{bmatrix} 1 & b12 \\ b21 & 1 \end{bmatrix} \ldots\ldots (4)$$

The two-model equation after modifying equation (3) and (4) above (for $\boldsymbol{y_t}$ to now be π_t and $\boldsymbol{p_t}$) would then appear in the format below, taking into account of inflation and fuel price to be the endogenous variables in the VAR system for now, thus, leading to:

$$\pi_t = \begin{bmatrix} \pi_t \\ \boldsymbol{p_t} \end{bmatrix}, \ \boldsymbol{B} = \begin{bmatrix} \alpha 11 & \alpha 12 \\ \alpha 21 & \alpha 22 \end{bmatrix} \text{ and } \boldsymbol{\varepsilon_t} = \begin{bmatrix} \varepsilon_{1,t} \\ \varepsilon_{2,t} \end{bmatrix} \ldots\ldots (5)$$

Equation (6) is presented below as a summarised and condensed version of equations (4) and (5), this is also conducted for simplicity purpose which yields:

$$\pi_t = g_{11}\pi_{t-1} + g_{12}\boldsymbol{p_{t-1}} + \boldsymbol{\varepsilon_t} \ldots\ldots (\boldsymbol{6})$$

Building from equation (4) on equation (6), it could further be deduced that:

λ (L) =A-1 G(L) , and $\boldsymbol{\varepsilon_t}$= A-1 ut …… (7)

Thus, substituting equations (6) and (7) with their matrix components would turn:

$$\pi_t = \begin{bmatrix} \pi_t \\ \boldsymbol{p_t} \end{bmatrix} = \lambda(g) \times \begin{bmatrix} \pi_{t-1} \\ \boldsymbol{p_{t-1}} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1,t} \\ \varepsilon_{2,t} \end{bmatrix} \ldots\ldots (8)$$

$$\begin{bmatrix} \pi_t \\ \boldsymbol{p_t} \end{bmatrix} = \begin{bmatrix} g_1 \\ g_2 \end{bmatrix} + \begin{bmatrix} g_{11} & g_{12} \\ g_{12} & g_{22} \end{bmatrix} \times \begin{bmatrix} \pi_{t-1} \\ \boldsymbol{p_{t-1}} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1,t} \\ \varepsilon_{2,t} \end{bmatrix} \ldots\ldots (9)$$

Overall, from equations (4) to (9), ***A*** represents contemporaneous response coefficients of the targeted variables.

Finally, the study incorporated other endogenous variables in our VAR system equations to see the interaction of each of the variables in response to its lag, and the lags of other endogenous variables in the VAR model. Thus, the variables pms price, exchange rate, money supply, government spending and inflation to take the following forms:

$$\pi_t = g_{11}\pi_{t-1} + g_{12}\boldsymbol{p}_{t-1} + g_{13}\boldsymbol{e}_{t-1} + g_{14}\boldsymbol{m}_{t-1} + g_{15}\boldsymbol{s}_{t-1} + \boldsymbol{\varepsilon}_{1t} \quad \text{.....(10)}$$

$$\boldsymbol{p}_t = g_{21}\boldsymbol{p}_{t-1} + g_{22}\pi_{t-1} + g_{23}\boldsymbol{e}_{t-1} + g_{24}\boldsymbol{m}_{t-1} + g_{25}\boldsymbol{s}_{t-1} + \boldsymbol{\varepsilon}_{2t} \quad \text{.....(11)}$$

$$\boldsymbol{e}_t = g_{31}\boldsymbol{e}_{t-1} + g_{32}\pi_{t-1} + g_{33}\boldsymbol{p}_{t-1} + g_{34}\boldsymbol{m}_{t-1} + g_{35}\boldsymbol{s}_{t-1} + \boldsymbol{\varepsilon}_{3t} \quad \text{.....(12)}$$

$$\boldsymbol{m}_t = g_{41}\boldsymbol{m}_{t-1} + g_{42}\pi_{t-1} + g_{43}\boldsymbol{p}_{t-1} + g_{44}\boldsymbol{e}_{t-1} + g_{45}\boldsymbol{s}_{t-1} + \boldsymbol{\varepsilon}_{4t} \quad \text{.....(13)}$$

$$\boldsymbol{s}_t = g_{51}\boldsymbol{s}_{t-1} + g_{52}\pi_{t-1} + g_{53}\boldsymbol{p}_{t-1} + g_{54}\boldsymbol{m}_{t-1} + g_{55}\boldsymbol{e}_{t-1} + \boldsymbol{\varepsilon}_{5t} \quad \text{.....(14)}$$

Equations (10) to (14) above represent the VAR system equations with five variables interacting with each other.

4.0 Analysis and Results Discussion

4.1 Unit Root Tests of the Variables

Table 1: Unit-root tests for the variables, using Augmented Dicky-Fuller (ADF) and Phillips-Perron (PP) Methods.

Table 1: Unit Root Tests of the Variables

	ADF		P-P		
Variables	**Level**	**1st Diff**	**Level**	**1st Diff**	***Level of Integration***
Inf	-1.7607	-4.1722***	-1.6200	-4.2500***	*I(1)*
Pms	-1.6352	-9.6190***	-1.7976	-9.5880***	*I(1)*
exro	-2.9978	-5.2380***	-2.3847	-5.9326***	*I(1)*
M3	-0.4377	-9.1778***	-0.1282	-10.8016***	*I(1)*
Gex	-0.9049	-4.7900***	-9.0223***	-	*I(1,0)*

Note: *, **, and *** indicate 10%, 5% and 1% significance levels respectively; 3. ADF is Augmented Dickey-Fuller, and P-P is Phillips-Perron. Source: Author's estimation using E-views 12.

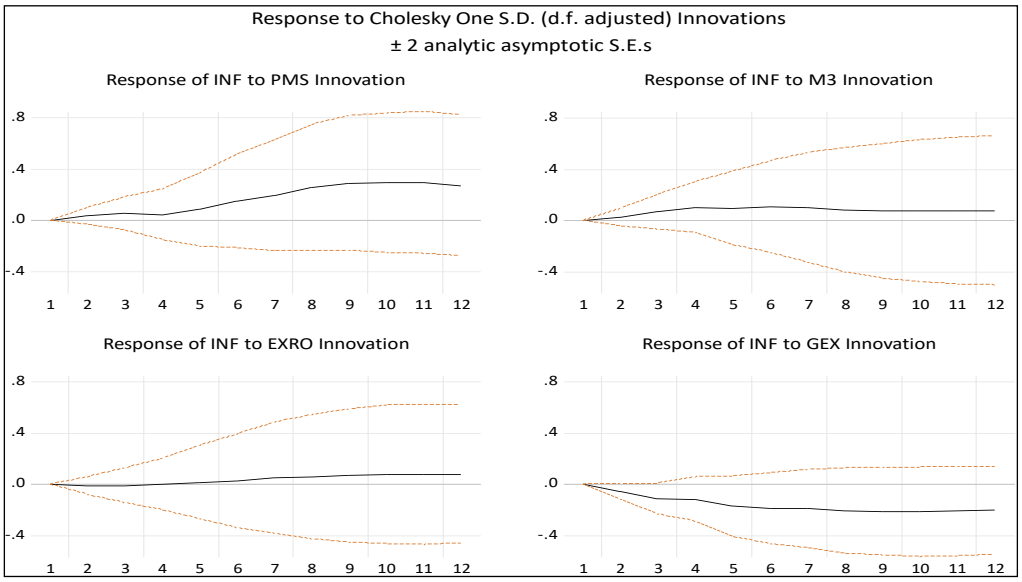
All variables are integrated of order (1) for ADF test except government spending, which is stationary at level. Given the different orders of integration of the variables in the model, with a mixture of I(1) and I(0) variables, it is necessary to transform them before executing the model. VAR process requires

that all model variables must be stationary thus, the variables entered the model as differenced series which is referred as VAR-in-difference approach in the literature. This is consistent with recent argument in the literature (see, Isah, 2024, among others). In addition, for consistency purpose, all the variables are treated in the VAR model in their logged form except inflation rate.

4.2 Impulse Response Function (IRF)

A unit of Cholesky shock is applied to each variable and its effects on other variables are explained below.

Figure 3: Impulse Response output.



Source: Author's estimation using original E-views 12.

The IRF indicates that inflation responds contemporaneously to itself and to other endogenous variables in the model. Our study suggests inflation responds positively to shocks/innovations coming from fuel price, exchange rate and money supply with some lags, while it responds negatively and significantly to shocks coming from innovation in fiscal policy (government spending).

Specifically, shocks to fuel price appears to have stronger positive effects on inflation compared with other variables in the system, with longer memory in the former. An innovation to fuel price increases inflation marginally but steady from month 1 to month 4, suggesting about 4 months lags, after which inflation accelerates significantly throughout end-month 4 to the rest of the period up

to month 11, reflecting the second-round effects of fuel price increase on inflation. Thereafter, inflation begins to moderate marginally, suggesting absence of long run relationship between fuel price and inflation (similar findings are documented in the literature, see for example, Kpodar & Liu, 2021; Omotosho 2019; Obayelu & Oni 2014; Akpan & Udofia 2016; and Ayinde & Adebisi 2016).

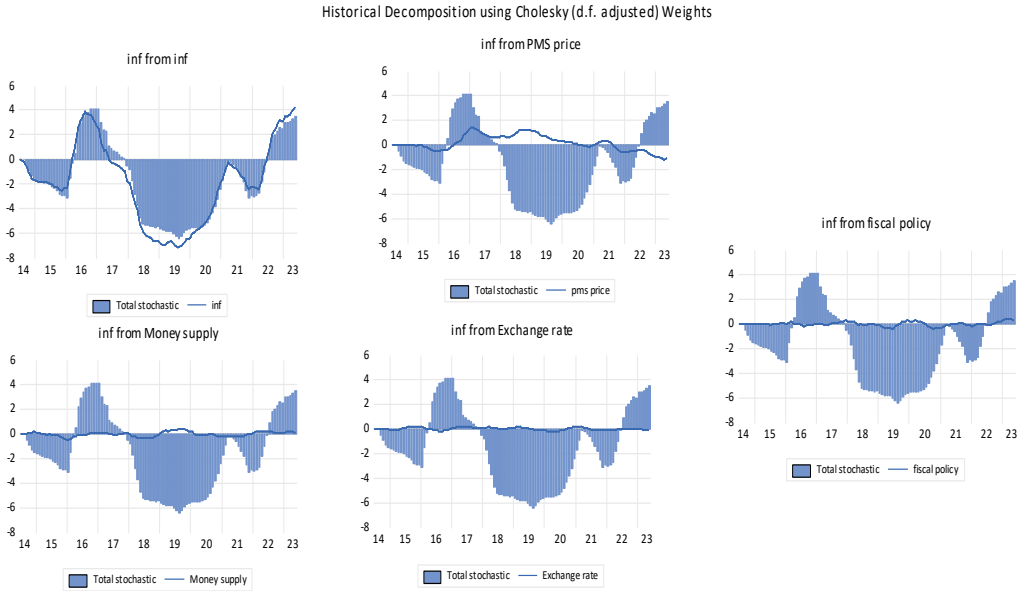
The IRF also suggests that on impact, a one Cholesky standard deviation shock to money supply causes inflation to increase immediately, but marginally, from month 1 to month 7, after which it decelerates marginally throughout the rest of the period, suggesting that increase in money supply increases inflation in line with economic theory, but with a short memory. Thereafter, inflation continues to moderate. The magnitude of the Cholesky deviation direction is higher with money supply than with exchange rate, suggesting exchange rate dynamics has been accounted for in subsidy payment by the government.

Contrary, an innovation to fiscal policy, inflation declines substantially from month 1 to month 6, after which it remains stable up to month 10, and begins to accelerate for the rest of the period, this could be explained from the understanding that capital expenditures component of the government spending drives investment and moderates' inflation.

4.3 Historical Decomposition using Cholesky (d.f. adjusted) Weights.

The historical decomposition suggests that all the variables in the model including the lag of inflation contributed unevenly to the variation in inflation in the past periods. This further suggests that inflation drivers in Nigeria are numerous and dynamic. Although, during the study period fuel price shows moderate contribution to the changes in inflation, this is expected since fuel price was fully subsidized between 2014m01 to 2023m05. Thus, the effect was absorbed by the subsidy payment made by the government during the period to maintain stable pms price and to also cushion the effects on inflation. The outcome shows that exchange rate and money supply and the lag of inflation were the main drivers of inflation in our study horizon, this is not surprising since several studies found significant impact of exchange rate and money supply on inflation in Nigeria (see, for example Yusuf et al. 2022).

Figure 4: Historical Decomposition output.



Source: Author's estimation using original E-views version 12.

4.4 Forecasts Error Variance Decomposition

This shows the proportion of movements of a variable due to shock to itself and to shocks to other endogenous variables in the VAR system into the future. This becomes necessary in this study in order to obtain actual decomposition of each of the variances in the five VAR equations. It gives information about the relative importance of each shock to the variables in the VAR.

Table 2: Forecast Error Variance Decomposition

Shock	***first quarter***	***second quarter***	***third quarter***	***fourth quarter***
Variance decomposition of inflation (% contribution)				
fuel price	*17.86*	*22.01*	*44.28*	*51.26*
money supply	*20.62*	*22.30*	*11.70*	*8.47*
exchange rate	*1.02*	*0.66*	*2.26*	*3.22*
fiscal policy	*60.50*	*55.03*	*41.76*	*37.05*

Source: Author's estimation using E-views 12 version.

For conveniency purposes, the analysis is limited to the forecast error variance decomposition (FEVD) of inflation from shocks to other variables in the system for four quarters, by looking at the contribution of each endogenous variable to the variation of inflation in the future represented in percentage terms. The

paper excluded the contribution of inflation to itself to allow for a holistic analysis among the selected variables in the model. This allows for a specific contribution of each endogenous variable in the model to be analysed while silent on the contribution of inflation to itself. The result shows a non-trivial effect from the angle of exchange rate, which was suppressed by other variables in the model. Fuel price appears to have consistent non-trivial contribution in the variations of inflation from first to fourth quarter of the next period.

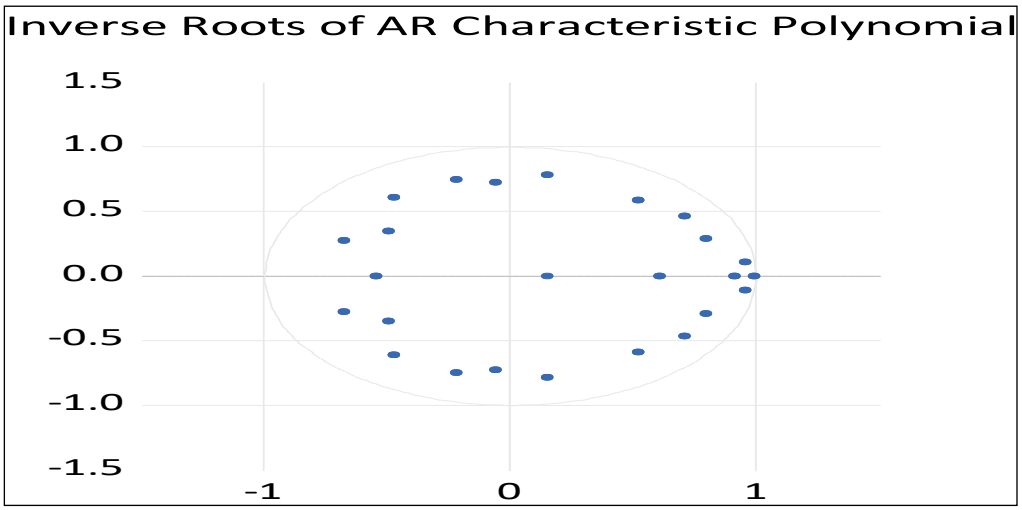
The result also reaffirms that the second-round effects of fuel price shocks to be more severe than the immediate effects. While other variables in the model appear to have an unstable pattern in their individual contribution to the variation in inflation in the future. Specifically, in the out sample forecast of 12 months into the future, the variance decomposition shows changes in inflation within that period.

For example, overall, the FEVD shows that fuel price would contribute about 17.86% in the first quarter, 22.01% in the second quarter, 44.28% in the third quarter and 51.26% in the fourth quarter of the next period, this shows consistent upward contribution of pms to the variation in inflation trajectory in the 12 months simulation period. This reaffirms that, the contribution of fuel prices to the variation in inflation in the future is becoming more significant, considering of the possible hikes in pms price due to subsidy removal, and its resultant contribution on inflation dynamics in Nigeria over the forecast horizon. This is consistent with the current situation in the economy and suggesting the possibility of long run effects of fuel price shocks to inflation trajectory in Nigeria to be more severe.

4.4 Stability of the VAR model: AR ROOT

VAR model is said to be stable if the roots of the matrix $\boldsymbol{A_1}$ in equation (6) are less than 1 in absolute values, for this to happen, the inverse roots of AR characteristic polynomial should lie within the roots circle as shown in the figure below. The points within the inverse roots circle represents the number of lags and the number of equations in our VAR system.

Figure 5: VAR Stability Test.



Source: Author's estimation using original E-views version 12.

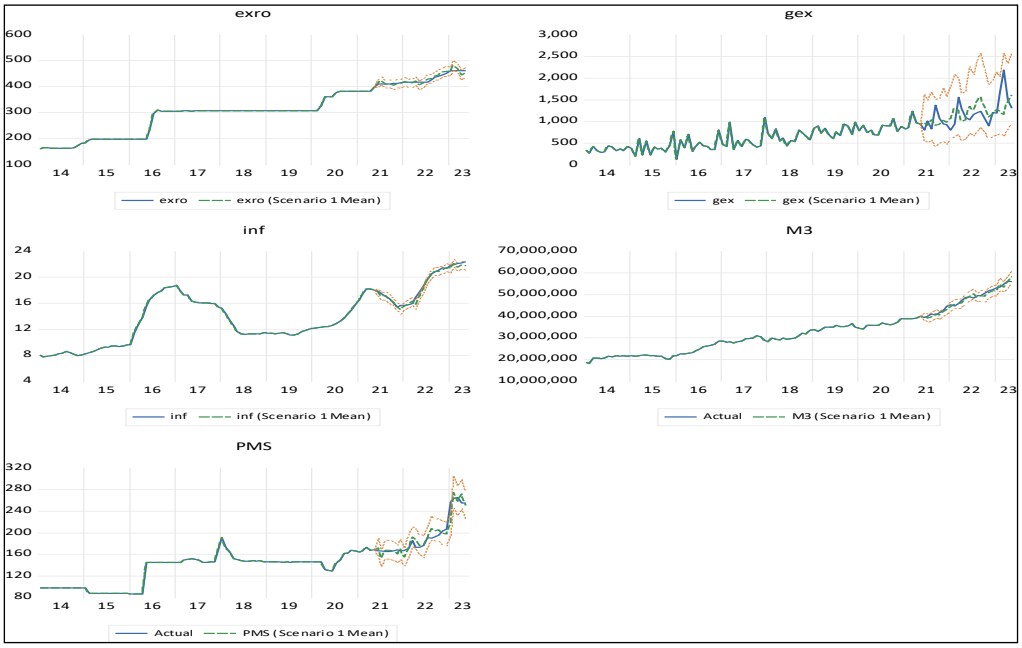
4.5 In sample Forecast Analysis

This is conducted to ascertain the predictive power of our forecast models in the in-sample procedure. This is done to obtain a proper in-sample forecast to have our baseline forecast which would be used to gauge the predictive power of the model compared with the actual values of our variables. The chats below show the in-sample forecast for two years from 2021m05 to 2023m05 (24 months period). In order to be consistent with the literature, there is migration from one method to another to arrive at the best method with less uncertainties, also with the view of capturing the true performance of the model using the best method.

4.6 Stochastic Simulation-Static Solution

The use of stochastic simulation and static solution has received serious attention in the literature over the Deterministic/Stochastic-dynamic solution (see, Oni 2017), especially because the paper evaluates the model using static solution that uses actual values of lagged variables in order to perform the forecast (see chats below), and not forecasted values as in the case of dynamic solution. The charts below represent the most updated in sample forecasts for this study. This is done by using stochastic solution that allows to use actual values of lagged variable unlike the other types in sample forecast highlighted in this paper.

Figure 6: In-sample forecasts results.



Source: Author's estimation using original E-views version 12.

The in-sample forecasts displayed above have upper and lower bounds as well, however, the static forecasts performance seems to be better than dynamic forecasts both in terms of the fits in the model and in terms of smaller standard error bounds interval as could be seen above. This is because the static solution forecast is the factor one period ahead forecast and it uses actual instead of forecasted lagged values over the forecast period like in the stochastic-dynamic solution. Finally, this suggests that our in-sample forecast is fit for the simulation analysis.

4.7 Out of Sample Forecast (conditional forecast)

The study carefully conducts in-sample forecast using three different approaches to show the predictive power of the VAR model before conducting the out of sample simulation using the conditional forecasts. Overall, the results appear plausible which affirms our aim to forecast future shocks on the endogenous variables and how they would impact on inflation trajectory in Nigeria.

4.8 Approach to the simulation analysis

To obtain the desired outcome for this study, simulation analysis developed by Jordà (2005) was used which is consistent with works of Kpodar & Liu 2021, Auerbach and Gorodnichenko (2013); Jordà et al. (2013); Caselli and Roitman (2016); Kpodar and Abdallah (2017, 2020); Ramey and Zubairy (2018); and Alesina et al. (2019). Thus, different scenarios were assumed to ascertain the path of the selected variables (pms, exro, gex, m3) in the VAR system and how shocks to such variables affect inflation trajectory in Nigeria in the future.

The local projection approach basically consists in generating multi-step predictions using direct forecasting models that are re-estimated for each forecast horizon to simulate for the out of sample forecasts scenarios. Jordà (2005) argues that the local projections are robust to misspecification of the lag structure as the impulse responses can be defined without any reference to the unknown data generating process. To reduce potential bias in the estimations of the IRFs, Teulings and Zubanov (2014) proposes to augment the local projections with innovations in the regressors between periods t and t+h when estimating the impulse response at horizon h (see Kpodar and Liu 2021).

The study, however, pays more attention to the future path of fuel price dynamics and how such would affect inflation trajectory in Nigeria over time. Having established that the suit of models in the in-sample forecasts period satisfied the necessary and sufficient conditions, the out of sample forecasts using simulation technique was then introduced from the existing VAR system. Thus, the simulation was divided into two categories, the first is the short term out of sample simulation of 6 months (from July 2023 - December 2023) to observe the path of inflation due to shocks in pms price and other endogenous variables in the model. The second is a 12-month medium-term forecast simulation by extending the path to June 2024. To achieve this seamlessly, a specification of the simulation and the out of sample forecast was set as:

$$y_{i,(t+n)} = \psi_0 + N \sum_{i=1}^{p} X_{i,(t+n)} + \xi_{i,(t+n)} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (15)$$

Equation (15) above represents the simulation of one time ahead forecast of the variables $(X_1, X_2, X_3, X_4, \ldots\ldots X_n)$ depending on the parameters that determine the future values of variable y_i. Where t represents the current time/period, n represents the number of forecasts periods into the future, N represents the number of variables in the model, X_i represents the set of endogenous variables in the VAR system (p, s, m, e) and i represents a set of

numbers from 1 to p where p represents the lagged-order of the VAR model, where ξ_t are the usual innovations, ψ_0 is a constant term. This is the second aspect of the study that considers an economy with zero subsidy, this is done to see the pattern of inflation in a period of market driven economy.

5.0 Discussion of the Results:

5.1 The Simulation Results:

This section produces outcomes of different scenarios of fuel price and its impact on inflation in Nigeria after implementation of the policy. The simulation outcomes tell us the contribution of fuel prices on inflation assuming no other factor affects inflation except fuel price. Thus, the study established six (6) scenarios in the out of sample space and conditional forecast to empirically establish the path of fuel price in a simulation procedure to see the trajectory of inflation in Nigeria for six (6) months into the future since the removal of fuel subsidy. In addition, the forecast horizon was extended to twelve (12) months to analyse different responses of inflation to the dynamics of fuel price in the absence of subsidy (zero subsidy). The outcome of the VAR-Simulation results is carefully discussed in this section. First, the paper analyses the conditions and assumptions of each scenario below where fuel price is in Naira and inflation is in percentage:

Table 3: Simulation Analysis. Source: Author's estimation using E-views 12 version.

	Scenario 1 (with no subsidy)		Scenario 2 (with no subsidy)		Scenario 3 (with no subsidy)		Scenario 4 (with no subsidy)		Scenario 5 (with no subsidy)		Scenario 6 (with full subsidy)	
Period	pms_1	inf_1	pms_2	inf_2	pms_3	inf_3	pms_4	inf_4	pms_5	inf_5	pms_6	inf_6
2023M06	540.00	22.78	540.00	22.78	540.00	22.78	540.00	22.78	540.00	22.78	254.00	22.78
2023M07	617.00	23.65	617.00	23.65	648.00	23.65	432.00	23.48	617.00	23.65	254.00	23.06
2023M08	617.00	24.29	617.00	24.29	648.00	24.32	432.00	23.91	617.00	24.29	254.00	23.25
2023M09	617.00	24.42	617.00	24.42	648.00	24.49	432.00	24.00	617.00	24.42	254.00	23.38
2023M10	617.00	25.03	617.00	25.03	648.00	25.09	432.00	24.39	617.00	25.03	254.00	23.26
2023M11	617.00	25.94	617.00	25.94	648.00	26.05	432.00	24.89	617.00	25.94	254.00	23.08
2023M12	617.00	26.48	617.00	26.48	648.00	26.65	432.00	25.08	617.00	26.48	254.00	22.83
2024M01	617.00	27.32	648.00	27.32	648.00	27.53	432.00	25.49	432.00	27.32	254.00	22.49

2024M02	617.00	27.70	648.00	27.73	648.00	27.97	432.00	25.52	432.00	27.42	254.00	22.16
2024M03	617.00	27.57	648.00	27.63	648.00	27.88	432.00	25.27	432.00	27.13	254.00	21.83
2024M04	617.00	27.44	648.00	27.49	648.00	27.76	432.00	25.07	432.00	27.02	254.00	21.50
2024M05	617.00	26.88	648.00	26.99	648.00	27.21	432.00	24.58	432.00	26.12	254.00	21.24
2024M06	617.00	26.21	648.00	26.38	648.00	26.52	432.00	24.08	432.00	24.99	254.00	21.00

Figure 7: Assumptions of the Scenarios. Source: Author's computation using excel template.

The Assumptions										
	scenario 1		*scenario 2*		*scenario 3*		*scenario 4*		*scenario 5*	
Period	*May as base month*	*June as base month*	*May as base month*	*June as base month*	*May as base month*	*June as base month*	*May as base month*	*June as base month*	*May as base month*	*June as base month*
	% pms	*% pms*	*% pms*	*% pms*	*% pms*	*% pms*	*% pms*	*% pms*	*% pms*	*% pms*
2023M06	112.55	-	112.55	-	112.55	-	112.55	-	112.55	-
2023M07	142.86	14.26	142.86	14.26	155.06	20.00	70.04	- 20.00	142.86	14.26
2023M08	142.86	14.26	142.86	14.26	155.06	20.00	70.04	- 20.00	142.86	14.26
2023M09	142.86	14.26	142.86	14.26	155.06	20.00	70.04	- 20.00	142.86	14.26
2023M10	142.86	14.26	142.86	14.26	155.06	20.00	70.04	- 20.00	142.86	14.26
2023M11	142.86	14.26	142.86	14.26	155.06	20.00	70.04	- 20.00	142.86	14.26
2023M12	142.86	14.26	142.86	14.26	155.06	20.00	70.04	- 20.00	142.86	14.26
2024M01	142.86	14.26	155.06	20.00	155.06	20.00	70.04	- 20.00	70.04	- 20.00
2024M02	142.86	14.26	155.06	20.00	155.06	20.00	70.04	- 20.00	70.04	- 20.00
2024M03	142.86	14.26	155.06	20.00	155.06	20.00	70.04	- 20.00	70.04	- 20.00
2024M04	142.86	14.26	155.06	20.00	155.06	20.00	70.04	- 20.00	70.04	- 20.00
2024M05	142.86	14.26	155.06	20.00	155.06	20.00	70.04	- 20.00	70.04	- 20.00
2024M06	142.86	14.26	155.06	20.00	155.06	20.00	70.04	- 20.00	70.04	- 20.00

(i) Scenario One:

In this scenario, the assumption is that PMS price would remain fixed at N617 throughout the forecast horizon (from July 2023 – June 2024), this represents 14.26 per cent increase in pms price from N540/litre in the month June 2023 which was applied across the forecast horizon. This is done on the basis of government's commitment in ensuring stable fuel price by introducing partial intervention to retain the pms at the current

price as the threshold. The VAR-Simulation outcome shows that this changes in fuel price would cause inflation to accelerate marginally to 24.29 percent in August 2023 from 24.08 percent in the preceding month. Afterwards, inflation would soar to 24.42 percent in September 2023, 25.03 percent in October 2023, 25.94 percent in November 2023 and 26.48 percent in December 2023. The result also suggests that fuel price impact on inflation would reach 27.70 percent in February 2024 which has been established as the highest contribution of PMS price to inflation for this scenario. Subsequently, it begins to decelerate marginally to 27.57 percent, 27.44 percent, 26.88 percent, and 26.21 percent in the months of March 2024, April 2024, May 2024, and June 2024, respectively. The moderation in inflation in the month of March 2024 is based on the assumption that market expectation begins to wane that the fuel price would no longer be increased afterwards.

(ii) Scenario Two:

In the second scenario, its assumed that the PMS price would remain fixed at N617 for the first six months of the forecast horizon (from July – December 2023), this represents 14.26% increase in pms price from N540/litre in the month June 2023 which was applied across the first part of the forecast horizon. This is done on the basis of government's commitment in ensuring stable fuel price and is assumed to last for six months after which the fuel price may increase by 20.00% to N648.00 over the rest of the forecast horizon (From January – June 2024). The VAR-Simulation outcome shows fuel price would cause inflation to increase to 24.29 percent in August 2023 from 24.08 in the preceding month. Afterwards, inflation would soar to 24.42 per cent in September 2023, 25.03 per cent in October 2023, 25.94 per cent in November 2023 and 26.48 per cent in December 2023. For the second part of the forecast horizon, the VAR result reveals that inflation would rise to 27.32 per cent and 27.73 per cent in January and February 2024, respectively, which is the highest contribution of PMS price to inflation for this scenario. However, inflation is expected to decelerate marginally for the rest of the period to about 26.38 per cent in the month of June 2024.

(iii) Scenario Three:

In this scenario, its assumed that the PMS price would remain fixed at N648.00 throughout the forecast horizon (from July 2023 – June 2024), this represents 20.0 per cent increase in pms price from N540/litre in the month June 2023 which was applied across the forecast horizon. This is

done on the fact that the commitment of the government to retain the pms price at N617/litre may not be sustainable, looking at the forces of demand and supply and several distortions in the fiscal space compounded by high deficit and low revenue, which are major factors that could hinder the intervention of the government to ensure price control. The VAR-Simulation outcome shows that fuel price would cause inflation to surge to 26.65 percent in December 2023 from 24.08 in the month of June 2023. Additionally, Inflation would continue to accelerate to its pick figure 27.97 in the month of February 2024, which is the highest contribution of PMS price to inflation for this scenario. Subsequently, it begins to decelerate marginally to 27.88 percent, 27.76 percent, 27.21 percent, and 26.52 percent in the months of March 2024, April 2024, May 2024, and June 2024, respectively. The study has established in this study and across all the scenarios that inflation would begin to moderate from the month of March 2024, i.e. after nine (9) months of consecutive acceleration since the implementation of subsidy removal.

(iv) Scenario Four:

In this scenario, there is optimism in PMS price which was expected to adjust downward by 20 per cent from N540/litre as of June 2023. Thus, it would remain at a fixed price of N432/litre which was applied across the forecast horizon (from July 2023 – June 2024). This is done on the fact that the commitment of the government with the support of CBN in stabilising foreign exchange may partially cushion the effect of subsidy removal on the fuel price, since exchange is one of the major factors that determine the price of pms in Nigeria. The VAR-Simulation outcome shows this fuel price would decelerate inflation rate to about 23.91 percent in the month of August from 24.08 percent in the month of July 2023. The result shows that inflation would begin to accelerate marginally to 25.08 in the month of December 2023 and 25.52 per cent in the month of February 2024, which is the highest contribution of PMS price to inflation for this scenario. Consequently, it begins to decelerate marginally to 25.27 percent, 25.07 percent, 24.58 percent, and 24.08 percent for the months of March 2024, April 2024, May 2024, and June 2024, respectively. This corroborates with the findings in all the scenarios.

(v) Scenario Five:

In scenario 5, its assumed that the fuel price would remain fixed at N617 for the first six months of the forecast horizon (from July – December

2023), this represents 14.26 per cent increase in pms price from N540/litre in the month June 2023 which was applied across the first part of the forecast horizon. This is done on the basis of government's commitment in ensuring stable fuel price, assuming it would last for six months after which the price moderates by 20 per cent from June 2023. Thus, the fuel price would decelerate to N432/litre over the rest of the forecast horizon (From January – June 2024). The VAR-Simulation outcome shows that inflation would increase to 24.29 percent in August 2023 from 24.08 percent in the preceding month. Afterwards, inflation would soar to 24.42 percent in September 2023, 25.03 percent in October 2023, 25.94 percent in November 2023 and 26.48 percent in December 2023. For the second part of the forecast horizon, the VAR result shows that inflation would continue to accelerate marginally to 27.32 per cent and 27.42 per cent in January and February 2024, respectively, which is the highest impact of PMS price to inflation for this scenario. However, inflation is expected to decelerate for the rest of the period from 27.13 percent in the month of March 2024 to about 24.99 percent in the month of June 2024. The last three months dynamics in inflation corroborates with the outcomes in all the scenarios.

(vi) Scenario Six: An economy with full subsidy

In this scenario, the paper assumed an economy with full subsidy and that the fuel price would remain at N254/litre. This is the same as of May 2023 fuel price of N254 when fuel was fully subsidised which was applied across the forecast horizon (from July 2023 – June 2024). This is done with the assumption that government would continue to subside the pms price. The VAR-Simulation outcome shows that inflation is expected to decelerate to 23.25 percent in the month of August from 24.08 percent in the month of July 2023. The result shows that inflation would begin to accelerate marginally to 23.38 percent in the month of September 2023. However, inflation would decelerate for the rest the forecast

horizon to about 22.83 percent in the month of December 2023 and 21.00 percent in the month of June 2024, this suggests that inflation could be moderated significantly if fuel is subsidized.

6.0 Conclusion and Policy Recommendation

The paper employed simulation approach to investigate the effect of PMS price adjustment on inflation path in Nigeria using different scenarios. The study

then estimated the impulse response of inflation to innovation to PMS price within the period of study. The transmission of the PMS price shocks is more protracted in the short run; thus, the findings suggest a pass-through between subsidy reforms/policies and PMS prices. Hence impacting on domestic general prices and subsequently distorting MSMEs operations by default. The paper also provides evidence that other controlled variables such as exchange rate, and money supply also impact inflation in the short and long-run terms. As PMS price increases over time, inflation trends in the same direction as shocks to fuel prices appear to have stronger and more significant effects on inflation as compared with other variables used in the model, especially in the short run. Most importantly, the study establishes the threshold contribution of fuel price to inflation across different domestic prices scenarios which is one of the Nobel contributions in this paper.

Based on the key findings, the study recommends policy measures for both fiscal and monetary authority. For the fiscal authority, there is need for a targeted social safety nets and tax relief to reduce severity of the increased PMS price in Nigeria. Also, as global oil price has been significantly impacting on inflation due to high dependency on refined fuel importation, there is need to intensify energy reform programmes with new focus on renewable energy investment in solar and wind to reduce reliance on fossil fuels and lower energy costs in the long run. These measures have been identified in countries such Iceland, Norway, Germany, Spain, China, Brazil, among others. On the other hand, monetary policy could involve ensuring ease access to credit facilities by households and firms to cushion the severe effect of rising fuel price. Overall, fiscal-monetary policy requires an intensive effort to stabilize the Nigerian Foreign Exchange Market having established the significant impact of exchange rate pass-through on domestic price level through the domestic fuel price.

Finally, implementing these measures requires a coordinated effort between government, the CBN, private sector, and civil society. The focus should be on creating a sustainable and resilient economic environment that can withstand external shocks and ensure the well-being of all citizens while diversifying Nigeria to a renewable energy-driven economy. This by implication, will support MSMEs to grow rapidly while price stability is maintained in the economy.

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Sectoral and Welfare Impact of a Proposed Value-Added Tax Increase on Household Consumption and Economic Growth in Nigeria

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Abstract
The Nigerian government has proposed to increase Value Added Tax to boost internal revenue in the country, but the policy effect on the economy needs empirical investigation. This study therefore, simulated the effects of 33.33% increase VAT on household consumption and economic growth in Nigeria using 2022 data as the base year and applying the Computable General Equilibrium (CGE) model. The results revealed that the increase in VAT would positively affect the consumption of agricultural products in Nigeria. However, increase in VAT will negatively affect the consumption of manufactured goods and services products. Furthermore, the study showed that increase in VAT would not benefit household aggregate consumption and would lead to a decline in Nigeria's economic growth. The study concluded that increasing VAT from 7.5% to 10% would impose excess burden on consumers and negatively affect economic growth. It was recommended that government should reconsider the proposed VAT increase to 10% and instead, expand the VAT base to include some currently VAT exempted products in the county.

***Keywords**: Value added tax, economic growth, household consumption, computable general equilibrium, simulation.*

***JEL Classifications:** H21, O4, E21, C68. C63*

1.0 Introduction

The extent of economic growth observed in a country is partly influenced by the level of revenue generated within that nation by the government. This is why the strategy for revenue mobilization is carefully managed, with the objective of gathering ample funds from diverse channels such as taxes to support government operations. Consequently, tax emerges as a crucial means of revenue generation in nearly all countries, with governments relying on tax income to perform their responsibilities like providing public goods and services, upholding law and order, among others (Odunsi, 2022). Taxes provide an alternative to aid the financial independence of countries, fostering fiscal sustainability and growth. Governments impose taxes to generate revenue; however, an efficient tax system mobilizes financial resources while minimizing

excess burden (Nwaeze et al., 2024). Taxes promote economic growth, ensure equitable income distribution, and maintain economic stability, making them a dependable fiscal policy tool globally (Badiu, et al., 2024).

To enhance internal revenue-earning capacity, many countries have introduced taxes such as Value Added Tax (VAT) (Cole, et al., 2021). VAT has become a central tax reform, adopted in over 130 countries, due to its effectiveness. Countries like France, Germany, Mexico, and Thailand have implemented VAT because of its perceived advantages in the collection process (Aminu, 2019). In Nigeria, Value Added Tax (VAT) was introduced in 1993 through the VAT Act No. 102 of 1993, replacing the previous sales tax system established under Federal Decree No. 7 of 1986 and managed by the Federal Inland Revenue Service (Oto & Wayas, 2024).

The Nigerian government introduced VAT in 1994 to boost and sustain its domestic revenue base (Nomkuha et al., 2021). Initially set at 5% for all VAT-rated goods and services, the VAT rate was increased to 7.5% in 2020 (Oto & Wayas, 2024). Although the standard VAT rate in Nigeria is 7.5%, but some items such as basic food items, medical and pharmaceutical products, financial services and agricultural inputs, among others are VAT exempted or zero rated. In 2024, the Presidential Committee on Fiscal Policy and Tax Reforms proposed increasing the VAT rate from 7.5% to 10% to enhance internal revenue generation (Oyedele, 2024). The proposed VAT rate adjustment is intended to augment government revenue and reduce dependence on oil-related income.

According to Keynes consumption theory, VAT increase can affect household consumption and spending patterns, potentially leading to counterproductive effects from economic sectors. Conversely, Friedman's permanent income hypothesis and Modigliani-Brumberg's life-cycle hypothesis suggest that a tax increase may not adversely affect consumption if it is anticipated rather than unexpected (Kaya & Sen, 2015). Since the VAT burden ultimately falls on consumers, there is a need for empirical analysis to assess the implications of the proposed 33.33% increase in Nigeria. In addition, how household consumption and economic growth would respond to the proposed increase in VAT is an empirical question that needs investigation. Could the policy change impose excessive burdens or maximize consumer welfare? Will the policy trigger or retard economic growth, given the current high inflation rate in Nigeria? Sequel to the above, this study simulates the effect of the proposed 33.33% VAT increase (from 7.5% to 10%) on household consumption of

manufacturing goods, agricultural products, services and economic growth in Nigeria. This policy adjustment analysis provides empirical evidence on how the VAT policy will affect household consumption and economic growth in the country. The study answered the following research questions:

i. What will be the impact of increase in VAT on household consumption across economic sectors?
ii. How will the proposed increase in VAT affect Nigeria's economic growth?

The policy relevance of this study is that, the simulation results provide valuable feedback on the potential success and drawbacks of the proposed 33.33% increase in VAT which allows policymakers to make informed adjustments to the policy design or implementation strategy to achieve desired outcomes while minimizing negative consequences on household and economic growth in Nigeria. Thus, the study will help government policymakers to anticipate potential economic and social consequences, thereby enhancing the overall effectiveness of fiscal policy as well as contributing to existing literature. The other segments of the paper are organized as follows: Section 2 reviews the literature, Section 3 outlines the data and methodology, Section 4 examines the results, and Section 5 concludes, policy implications and recommendations.

2.0 Theoretical Review

General equilibrium theory was founded by neoclassical economist Leon Walras, who lived from 1834 to 1910. According to his theory (Ekanem & Iyoha, 1999), supply and demand determine all prices and quantities in any market. Wilfredo Pareto and Francis Edgeworth enhanced the Walrasian theory in 1881, emphasizing its optimality qualities. Wassily Leontief's input-output table provides evidence for this theory's support of the idea that real-world markets are interdependent, with changes in supply and demand often having a broad impact (Abachi & Iorember, 2017).

When all markets clear at a positive price, tax included, and economic agents maximize profit and happiness while incurring the fewest costs possible, general equilibrium is reached. In order to guarantee that households stay within their means and that the total factors of production do not surpass a nation's endowments, this framework imposes restrictions on income, expenditure, and resource availability. In completely competitive product and factor markets, the theory offers an economy-wide perspective by taking individual decision-

makers and market interactions into account. It functions as a standard by which to measure the importance and ramifications of deviations brought about by fiscal policies such as VAT. Although VAT is an indirect tax that is levied on the consumption of goods and services at each stage of production and distribution. However, when analyzing such a policy, it is pertinent to consider its effects on output decisions and consumer behavior.

3.0 Empirical Review

Oghogho, et al., (2023) investigated the impact of value-added tax (VAT) on economic growth in Nigeria, utilizing time series data from 1999 to 2021. The study employed ARDL regression analysis for estimation and found that VAT had a significant negative effect on Nigeria's economic growth during the period examined. The empirical evidence suggested that economic growth does not improve due to VAT. In a different study, Joseph and Omodero (2020) utilized data spanning from 1981 to 2018 to examine the relationship between value added tax (VAT) and economic growth in Nigeria, employing the Ordinary Least Squares (OLS) technique. The findings indicated that VAT had a moderate and positive correlation with economic growth during the period studied.

Employing Ordinary Least Squares (OLS) method, Ekpe and Wayas (2022) explored the relationship between value-added tax and economic growth in Nigeria over the period from 2003 to 2022. Their findings revealed that VAT significantly contributed to the improvement of economic growth in Nigeria. Thus, VAT determines economic growth during the study period. Similarly, Olarotimi and Alor (2021) examined the dynamic impact of VAT on economic growth in Nigeria by analyzing data from 1994 to 2019 using dynamic OLS. The results indicated a significant positive relationship between VAT and economic growth, implying that VAT triggers economic growth in Nigeria.

Odu (2022) assessed the impact of VAT on revenue generation and economic growth in Nigeria, utilizing time series data from 1994 to 2018 and employing regression analysis. The study found that VAT had a significant effect on total tax revenue and a significant negative effect on economic growth. More relatedly, Oto and Wayas (2022) used data from 2003 to 2022 to objectively investigate the connection between VAT and Nigeria's economic growth. The results of their ordinary least squares regression study showed a strong and favorable relationship between VAT and economic expansion. Orisadare and Fasoye (2022) also looked at the effect of VAT on Nigeria's economic growth from 1994 to 2020. Using the Threshold Vector Autoregressive (TVAR) approach,

they discovered that going over a VAT threshold of 10 percent carries a risk of adverse economic consequences. On the other hand, keeping VAT below 7.5% improves population well-being generally rather than hurting the economy. The effects of raising VAT from 14% to 15% on the South African economy were examined by Erero (2021) using the Dynamic Computable General Equilibrium (CGE) model using 2019 as base years. The Gross Domestic Product (GDP) immediately decreased after the VAT hike, according to the report. Value Added Tax effect on company flows was studied by Benzarti and Tazhitdinova (2021) through a review of all laws pertaining to the European VAT system passed between 1988 and 2016. The study used panel regression for estimation, and the authors discovered that there was no elasticity in business flows even during large VAT changes, with VAT elasticities being significantly lower than those documented in commercial literature. Findings suggested that the likelihood of VAT distorting trade flows was minimal. In China, Guo and Shi (2020) employed 2019 data to analyze the effects of VAT rate reductions on local fiscal pressure using a Computable General Equilibrium (CGE) model. Their findings indicated that reducing VAT rate could alleviate the operational burden on businesses and enhance the vitality of market participants, although it would lead to a decrease in government revenue.

Gourdon et al. (2020) evaluated the effect of VAT changes on China's export performance using export data from 2003 to 2012 and a model with heteroskedasticity-robust standard errors. Their findings suggested that China's export volume decreased compared to an increase in the export VAT tax. Sanjaya and Gretton's (2019) study, which used a computable general equilibrium model with 2011 as the reference year, looked at the effect of VAT on export services in Indonesia. According to their research, there are long-term economic benefits for the country from commercial services having zero-rated VAT. This finding aligns with Benzarti and Tazhitdinova's (2019) study, which analyzed VAT changes and trade flows across all Europian Union Member States from 1988 to 2016 using panel regression. Their results indicated that VAT did not distort import and export trade. Additionally, a recursive dynamic computable general equilibrium model for Nigeria, using 2017 data, explored similar dimensions of VAT impact. However, previous scholars rarely simulate the effect of VAT shift on household consumption as well as economic growth in Nigeria using the proposed 10% VAT rate from 7.5% as considered in the present study. Researchers were silence about the effect of upward review of VAT on household and only considered reduction effect or impact analysis of VAT.

4.0 Methodology

4.1 Kind and Data Sources

The study's data came from Nigeria's 2018 update of the Social Accounting Matrix (SAM), which was restructured and reformatted using 2022 as the base year given that the VAT policy was proposed in 2024. The model was initially run to replicate a base year (initial equilibrium), ensuring that the outcomes (like GDP and household consumption) match the obtained data or the Social Accounting Matrix (SAM) for consistency. Also, the row and column sums of SAM are matched to ensure consistency with the obtained data and output. For reliability, the study used fixed-point iteration to solve the model's equations ensuring that the base year scenario is exactly as the real-world data. The validity of the simulated result was affirmed using Hicksian Equivalent Variation (EV). The National Bureau of Statistics, the Federal Inland Revenue Service (FIRS), and the Central Bank of Nigeria (CBN) Statistical Bulletins provided the 2022 base year data used in the study. Particularly, the CBN Annual Statistical Bulletin provided the consumption, government spending, and investment data, while the FIRS website provided the VAT data. While import and export data were obtained from World Bank database reported in local currency (LUC).

4.2 Estimation Technique

The study utilized a Computable General Equilibrium (CGE) model to simulate the effects of the VAT review policy on consumption and economic growth. This model was chosen for its economy-wide framework, which incorporates interactions and feedback between demand and supply, allowing economic variables to adjust until production and consumption decisions align with price levels. The CGE model assumes that households, firms, and government are rational, optimizing their utility (for households) or profit (for firms). The impact of VAT is expected to be reflected in changes in commodity prices and revenue collection. The methodology employed includes an efficient tracing component, making it relevant for policy analysis. The analysis was conducted using the General Algebraic Modelling System (GAMS) software. The preference for the CGE model over dynamic general equilibrium models is due to its effectiveness in simulating the effects of policy or reform changes within a single scenario, such as the proposed 10% VAT rate applicable to all VAT-rated products.

4.3 Model Specification

The Computable General Equilibrium (CGE) model used in this study is a modified adapted model by Abachi and Iorember (2017). This modification was made to align the model with the objectives of the current study. Consistent with the principles of the CGE framework, the study categorized the economy into four distinct blocks: prices, production and trade, institutions, and system constraints:

Price Block: The model's price system incorporates quality differences among commodities based on their origins and destinations. The price block consists of equations where endogenous model prices are connected to other prices (both endogenous and exogenous) and to non-price variables within the model. The model accounts for different prices for domestically produced goods, reflecting the VAT rates applied to local commodities according to the Nigerian tax system. Given the presence of transaction costs, it is essential to differentiate between the prices paid by consumers and the prices received by suppliers, as specified in Equation 1.

$$PLE_j = SPL_j + \sum P_i X_{j'} \cdot ijdj'j + \alpha VAT_j \quad j \in JD \text{ ----------1}$$

$$\begin{bmatrix} price \\ for \\ domestic \\ demand \end{bmatrix} = \begin{bmatrix} \text{supply} \\ \text{price} \end{bmatrix} + \begin{bmatrix} cost\ of \\ input\ per \\ unit\ of \\ local\ sales \end{bmatrix} + \begin{bmatrix} \text{Re}viewed \\ VAT \\ Rate\,(10\%) \end{bmatrix}$$

Where $j \in JD$ = a set of commodities with domestic sales of domestic output and $ijdj'j$ = quantity of commodity *j* as trade input per unit of *j* produced and sold domestically.

Import Price: The import price is computed in domestic currency units as the price paid by the domestic users for the imported goods. It is calculated as a transformation of the world price of these imports, incorporating both the exchange rate and VAT.

$$MP_j = pwmj \,.\, (1 + vatmj) \cdot EXR + \sum PQj' \cdot ijm_{j'j} \quad j \in JM \text{ -----2}$$

$$\begin{bmatrix} price\ of \\ import \\ for \\ commodity\ j \\ (NGN) \end{bmatrix} = \begin{bmatrix} import \\ price \\ (FCU) \end{bmatrix} . \begin{bmatrix} VAT \\ adjusted \\ rate\ for \\ unit \\ commodity \end{bmatrix} . \begin{bmatrix} exchange \\ rate \\ (NGN\ per \\ FCU) \end{bmatrix} + \begin{bmatrix} cost\ of\ trade \\ inputs\ per \\ import\ unit \end{bmatrix}$$

Price of Product on Sectors: Given that value added tax is levied on the product, then the vector of VAT including sectorial prices is defined in equation 3:

$$PA_a \cdot (1-\alpha) \cdot QA_a = VA_a \cdot QVA_a + PINTA_a \cdot QINTA_a \qquad a \in A \text{----------3}$$

$$\begin{bmatrix} activity\ price \\ (net\ of\ VAT) \\ times \\ activity\ level \end{bmatrix} = \begin{bmatrix} value\ added \\ price \\ times \\ quantity \end{bmatrix} + \begin{bmatrix} aggregate\ input\ price \\ times \\ quantity \end{bmatrix}$$

Where:P = price of product from sector, vat = VAT collected from sectors, $1+\alpha$ = adjusted VAT rate, PA_a = price for an activity, QA_a = quantity (level) of activity, VA_a = value added price, QVA_a = quantity of (aggregate) value-added, $PINTA$ = price of (aggregate) value-added, $QINTA_a$ = quantity of aggregate input.

Absorption: The total domestic expenditure on a commodity at domestic demand prices is referred to as absorption. Absorption, as defined in Equation 4, encompasses the value-added tax. Absorption is expressed as the sum of spending on domestic outputs and imports at the demand prices, DDp and Mp. The prices DDp and Mp include the cost of trade inputs and value added tax. Equation 4 represents the total of all import products and domestic sales of domestic outputs, excluding the entire volume of output allocated for exports. The two terms of the equation on the right-hand side applies JD and JM, respectively (domestic and import demand for commodity j).

$$PQ_j \cdot (1-vatq_j) \cdot QQ_j = DDp_j \cdot QD_j + Mp_j \cdot QM_j \qquad j \in (JD \cup JM) \text{-- ----4}$$

$$\begin{bmatrix} absorption \\ at\ demand \\ prices \\ net\ of\ VAT \\ for \\ commodity \end{bmatrix} = \begin{bmatrix} price\ of \\ domestic \\ demand \\ multiply\ by \\ domestic \\ sales\ quantity \end{bmatrix} + \begin{bmatrix} price\ of \\ import \\ multiply\ by \\ import \\ quantity \end{bmatrix}$$

Production and Trade Block

The production and trade block describes the various activities that are carried out by producers in the country. Production is carried out by activities that are

assumed to maximize profits subject to their technology, taking prices (for their outputs, intermediate inputs, and factors) as given. The activity production function here can be expressed as follows:

$$QA_{\alpha_a^a} = \left(\delta_a^a . QVA_a^{-\rho_a^a} + \left(1-\delta_a^a\right).QINTA_a^{-\rho_a^a}\right)^{\frac{1}{\rho_a^a}} \qquad a \in ACE\left(\subset A\right) \text{----------5}$$

$$\begin{bmatrix} activity \\ level \end{bmatrix} = CES \begin{bmatrix} quantity\ of\ aggregate\ value\ added, \\ quantity\ of\ aggregate\ intermidiate\ input \end{bmatrix}$$

Where $a \in ACE(\subset A)$ = a set of activities with a CES function at the top of the technology nest, α_a^a= efficiency parameter in the CES activity function, δ_a^a= CES activity function share parameter, and ρ_a^a= CES activity function exponent. The Value-Added and Factor Demand function take the form:

$$QVA_{a=\alpha_a^{va}} \left(\sum_{f \in F} \alpha^{va}_{f\,a} . QF_{fa}^{-\rho_a^{va}} \right)^{\frac{1}{\rho_a^{va}}} \quad a \in A \qquad \text{----------6}$$

Demand for Transactions Services

Equation 7 defines how fixed quantities of one or more transactions service inputs are required per unit of the traded commodity.

$$QT_j = \sum_{j \grave{o} J'} \left(icm_{j'j} . QM_{j+} \;\; ice_{j'j} . QE_{j'} + icd_{j'j} . QD_{j'} \right) \quad j \in JT \text{----------7}$$

$$\begin{bmatrix} demand \\ for \\ transactions \\ service \end{bmatrix} = \begin{bmatrix} sum\ of\ demand\ for\ imports, exports \\ and\ domestic\ sales \end{bmatrix}$$

Institution Block

This block comprises equations that trace the flow of income from value-added activities to institutions and subsequently to households. These equations complete the inter-institutional entries in Nigeria's Social Accounting Matrix.

Factor income

Equation 8 defines the total income of each factor.

$$YF_f = \sum_{a \in A} WF_f \cdot \overline{WFDIST_{fa}} \cdot QF_{fa} \qquad f \in F \quad \text{----------} \quad 8$$

$$\begin{bmatrix} income\ of \\ factor\ f \end{bmatrix} = \begin{bmatrix} sum\ of\ activity \\ payement \\ (activity\ specific\ wage \\ times\ employment \\ level) \end{bmatrix}$$

Institutional Factor Incomes

The institutional factor incomes, as defined in Equation 9, are allocated among domestic institutions in fixed proportions after accounting for indirect factor taxes and transfers to the rest of the world.

$$YF_f = shif_{if} \cdot \left[\left(1 - tf_f\right) \cdot YF_f - tsnf_{if} \cdot EXR \right] \qquad \begin{matrix} i \in INSD \\ f \in F \end{matrix} \quad \text{----------} \quad 9$$

Where $i \in INSD$ = a set of institutions (domestic and rest of the world), YF_f = income to domestic institution i from factor f, $shif_{if}$ = share of domestic institution i in income of factor f, tf_f = direct tax rate for factor f, and $tsnf_{if}$ = transfer from factor f to institution i.

Household Consumption Spending on Marketed Commodities

Equation 10 details the consumption of market commodities (purchased at market prices) that include VAT. Consequently, the VAT reform will impact household consumption, which serves as an indicator of welfare. It is assumed that each household aims to maximize its utility function while adhering to a consumption expenditure constraint. It is referred to as LES (linear expenditure system) functions since spending on individual commodities is a linear function of total consumption spending, EH.

$$PQ_j \cdot QH_{jh} = PQ_j \cdot + \beta^m_{jh} \cdot \left(EH_h - \sum_{j' \in j} PQ_{j'} \cdot \gamma^m_h - \sum_{a \in A} \sum_{j' \in j} PXAC_{aj'} \cdot \gamma^h_{aj'h} \right) \quad \text{----------} \quad 10$$

$$\begin{bmatrix} household \\ consumption \\ spending\ on \\ market \\ commodity\ j \end{bmatrix} = f \begin{bmatrix} total\ household\ consumption \\ spending, market\ price\ of\ j \\ and\ other\ commodity\ prices \\ (market\ and\ home) \end{bmatrix}$$

Investment Demand

Equation 11 defines fixed investment demand as the product of the adjusted factor and the base year quantity. Since investment is determined exogenously from the basic model, with the adjusted factor also being exogenous, the investment demand is therefore specified as follows:

$$QID_x = IDF \ .aqif_j, \quad \text{----------11}$$

$$\begin{bmatrix} ivestment \\ demand\ which \\ is\ fixed\ for \\ commodity\ j \end{bmatrix} = \begin{bmatrix} adjusted\ factor \\ multiplied\ by \\ fixed\ investment \\ for\ the\ base\ year \end{bmatrix}$$

Where, QID_x is the fixed investment demand for commodity x, IDF is the adjusted factor for investment, $aqif_j$, is quantity of fixed investment demand for the base year.

Government Consumption Demand

Government consumption demand, primarily consisting of services provided by the government labour force, is defined as the base-year quantity multiplied by an adjustment factor.

$$GDQ_j = \overline{AGDQJ} \ .\overline{qg_j} \quad \text{----------12}$$

Where GDQ_j =government consumption demand for commodity j, $\overline{AGDQJ}$ = government consumption adjustment factor (exogenous variable), and $\overline{qg_j}$ =base-year quantity of government demand.

System Constraint Block

This block outlines the constraints that the entire economy must satisfy. Equation 13 stipulates that, according to the standard CGE model, the total quantity demanded must equal the total quantity supplied for each factor. It is assumed that the supply of these factors is exogenous and specified as parameters.

$$\sum_{a \hat{o} A} QF_{f\,a} = \overline{QFS_f} \qquad f \in F \text{----------13}$$

$$\begin{bmatrix} demad\ for \\ factor\ f \end{bmatrix} = \begin{bmatrix} supply\ for \\ factor\ f \end{bmatrix}$$

Institutional Indirect Tax Rates

Equation 14 defines the indirect tax rates of nongovernment institutions, which is VAT inclusive.

$$TVAS_i = \overline{tvas_i} \cdot \left(1 + \overline{TINSADJ} \cdot tins01_i\right) + \overline{DTINS} \cdot t \quad i \in INSDNG \text{ ----------14}$$

$$\begin{bmatrix} indirect \\ tax(VAT) \\ rate \\ for\ institution\ i \end{bmatrix} = \begin{bmatrix} base\ rate\ adjusted \\ for\ scaling\ \ for\ selected \\ institutions \end{bmatrix} + \begin{bmatrix} point\ changes \\ for\ selected \\ institutions \end{bmatrix}$$

Gross Domestic Product

Equation 15 represents gross domestic product at factor prices as a measure of economic growth. An increase in value-added tax is anticipated to impact aggregate demand, particularly affecting consumption and imports, both inclusive of VAT, in Nigeria.

$$GDP_f = EH_h^{vat} + QID_x + GDQ_j + NE_i^{vat_m} \text{ ----------15}$$

$$\begin{bmatrix} gross \\ domestic \\ product \end{bmatrix} = \begin{bmatrix} consumption \\ demand\ of \\ commodity\ j \end{bmatrix} + \begin{bmatrix} investment \\ demand\ \ for \\ commodity\ j \end{bmatrix} + \begin{bmatrix} government \\ consumption \\ demand\ \ for \\ commodity\ j \end{bmatrix} + \begin{bmatrix} net \\ export \end{bmatrix}$$

Simulation Design and Macroeconomic Closures

To achieve the objectives of this study, a VAT policy scenario was developed involving an increase in VAT from 7.5% to 10%. This scenario was created using a reformatted and updated Social Accounting Matrix (SAM) for Nigeria for the year 2022. The proposed VAT increase aligns with the recommendation of the Presidential Committee on Fiscal Policy and Tax Reforms (PCFPTR) to raise the VAT rate to 10% in 2024. Given that the policy is set to be implemented in 2024, the study utilized 2022 data as the base year due to its availability. The baseline scenario assumes no change in VAT policy. In the CGE model, the closure rules for this scenario are as follows: savings are treated as endogenous, while investment is fixed exogenously, meaning that sectoral investments are not required to vary in accordance with savings. Additionally, the current account balance, budget deficit, and savings are all determined endogenously.

Simulation Result

Table 1: Impact of 33.33% Increase in Value Added Tax on Household Consumption in Nigeria.

Sector Consumption:	Baseline Value (Bil. NGN)	Simulated Value (Bil. NGN)	% Change	Hicksian Equivalent Variation (EV)
Agricultural Goods	4053.701	5607.465	38.33	
Manufactured Goods	8318.413	7235.716	-13.02	
Services Products	6284.740	4463.899	-28.97	
Total Consumption	18656.854	17307.08	-7.23	
Price			19.06	-2203.10

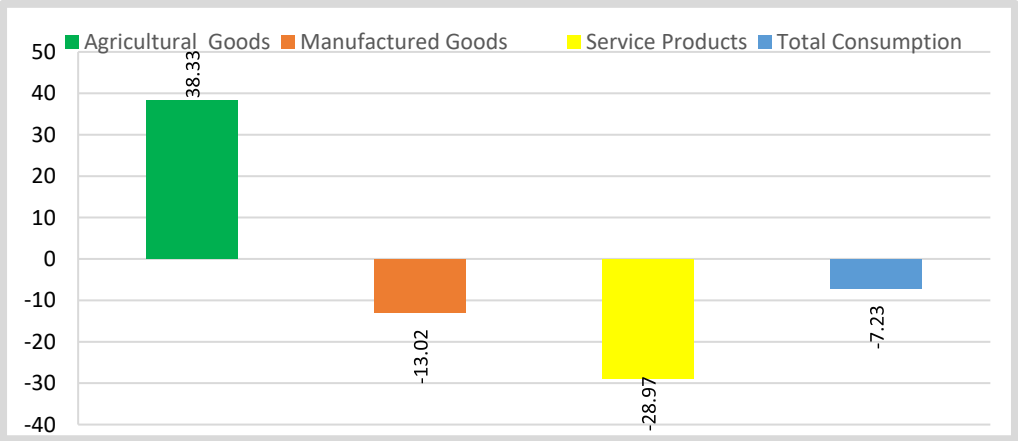
Source: Author's computation using GAMS

The simulation results presented in Table 1 indicate that increasing the VAT rate from 7.5% to 10% (33.33% increase) will positively impact the consumption of agricultural goods in Nigeria. Specifically, this adjustment is projected to result in a 38% increase in the consumption of agricultural products. This suggests that the proposed VAT policy will not adversely affect consumers of agricultural products or unprocessed goods from the traditional agriculture sector in Nigeria. Additionally, it implies that if VAT increases more severely impact other goods compared to agricultural products, the relative price of agricultural goods may become more appealing. Consequently, this relative price shift could lead consumers to allocate a larger portion of their budget to agricultural products to mitigate the VAT burden.

On the contrarily, the outcome revealed that an increase in the VAT rate from 7.5% to 10% will negatively affect the consumption of manufactured goods. Under the proposed policy, consumption of manufactured goods is expected to decline by 13%. This suggests that the proposed 10% VAT increase will be detrimental to the consumption of manufacturing products in Nigeria. Similarly, the study reveals that the VAT increase will reduce the consumption of services by 28% from its base value. Consequently, the proposed VAT increase will adversely impact the service sector, leading to a decrease in output due to reduced demand. Additionally, the simulation results indicate that VAT increase will lead to a 19% rise in the prices of goods and services in the economy. The increase in price due to VAT will erode purchasing power, thereby decreasing consumer spending on both manufacturing and service products, which are predominantly VAT rated.

The Findings further reveal that the VAT policy has a negative impact on the aggregate consumption of products across the three sectors: agriculture, manufacturing, and services. An increase in VAT by 33.33% will be detrimental to aggregate consumption and reduced demand, which could be counterproductive in some economic sectors. The findings suggest that an increase in VAT will likely alter consumer behavior, making individuals more price-sensitive. Consumers may seek cheaper alternatives or reduce their overall consumption in response to higher VAT rates. This increase in VAT will therefore raise the cost of goods and services in the manufacturing and service sectors, reducing consumers' disposable income. The Hicksian Equivalent Variation (EV) value of -2203 indicates that the upward adjustment in VAT will adversely affect household welfare in Nigeria, imposing an excess burden on consumers. A negative EV value signifies a deterioration in household welfare, implying that the VAT policy negatively impacts consumption and does not maintain consumers at their previous level of utility. The discrepancies due to VAT increase is presented in Figure 1.

Figure 1: Percentage (%) change in Sectoral consumption



Source: Author's computation

The bar chart in Figure 1 compared the changes in consumption across sectors (agriculture, manufacturing and services) based on the pre and post-VAT increase. This reflect the composition of household consumption or the distribution of VAT impact across different economic sectors Thus, VAT increase will favours only the consumption of agricultural products, while the unfavourable effect will be from manufacturing and service products consumption.

Policy Effect of Increase in VAT on Nigerian Economic Growth

The simulation effect of increase in VAT on economic growth was based in aggregate demand and in line with Keynes four sector model. Thus, the VAT policy effect was investigated considering total consumption, investment, government, export and import. The simulated result is presented with the base year value.

Table 2: Effect of increase in VAT by 33.33% on Economic Growth (GDP)

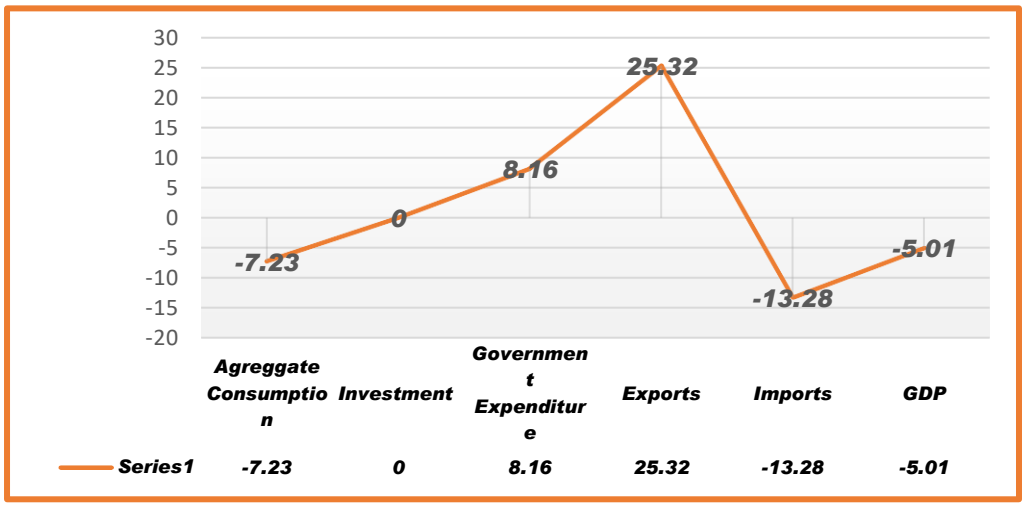
	Baseline Value (Bil. NGN)	**Simulated Value (Bil. NGN**	**% Change**
Aggregate Consumption	18656.854	17307.08	-7.23
Investment Demand	3365.18	3365.18	0.00
Government Expenditure	1918.39	2074.82	8.16
Exports	4111.59	5152.699	25.32
Imports	15,144.51	13132.862	-13.28
GDP (C_p+I_d+Gp+Ne)	43196.524	41032.641	-5.01

Source: Author's computation using GAMS

The results presented in Table 2 indicate that an increase in VAT from 7.5% to 10% will negatively impact aggregate consumption, reducing it from its base year value by 7.23%. This reduction in aggregate consumption, as a result of 33.33% increase in VAT, is theoretically consistent with the findings of Nomkuha et al. (2022). The proposed VAT policy is also expected to adversely affect imports, which are projected to decline by approximately 13.28% due to the VAT increase. Conversely, the upward adjustment in VAT is anticipated to lead to increases in government expenditure and exports of goods and services. Specifically, government expenditure is expected to rise by 8.16%, and exports are projected to increase by 13.28%. This increase in government expenditure implies that the VAT reform will enhance government revenue, while the improvement in exports can be attributed to the fact that exports are zero-rated for VAT in Nigeria (FIRS, 2023). The relative improvement in exports compared to imports may be justified by strong international demand for Nigerian exports, which could mitigate the impact of higher VAT rates on foreign buyers.

However, the VAT policy is projected to negatively affect economic growth, with a decline in Gross Domestic Product (GDP) by 5.01% due to the VAT increase to 10%. This decline in GDP may be attributed to the adverse effect of VAT from the manufacturing and service sector, which could also affects aggregate demand. This finding is consistent with Erero (2021). Given that aggregate consumption and imports are expected to decrease as a result of the VAT increase, and considering that consumption is a component of aggregate demand, the negative impact on consumption and imports is expected to outweigh the positive effects on exports and government expenditure. The line graph in Figure 2 displayed the response of household consumption and growth effect of the VAT policy.

Figure 2: GDP, Aggregate Consumption and Other Macroeconomic Variables Trend



Source: Author's computation

The line graph in figure 2 depicts the trends in GDP, aggregate consumption, and other macroeconomic variables over time due to VAT upward review. It clearly shows that exports and government expenditure will be unaffected due to 33.33% increase in VAT. Conversely, aggregate consumption, economic, investment, imports and economic growth will decline overtime due to increase in VAT in Nigeria to 10%. This implies that even with the increase in government expenditure due to VAT increment, economic growth will not improve after the policy implementation.

5.0 Conclusion and Recommendation

The simulation effect of increase in VAT in showed a negative effect of the VAT policy on aggregate consumption upon policy implementation. This suggests that increase in VAT by 33.33% will be detrimental to total consumption. Result also reveals adverse respond of economic growth by the VAT policy. Thus, the study concluded that increase in VAT from 7.5% to 10% will not favour consumption behaviour and will affect economic growth negatively. The study recommended that Nigerian government should not increase VAT to 10%, given that the policy will constitutes dead weight loss of consumers of manufacturing and service products. Given that economic growth will adversely respond to increase in VAT, government should expand it tax base to cover some zero VAT rate products (such as exports and agricultural inputs) to raise more revenue rather than increasing VAT.

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