

Effect of Sectoral Foreign Exchange Utilization on Manufacturing Firms Performance in Nigeria

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Abstract

This research investigates the analysis of sectoral foreign exchange utilization on manufacturing firm's performance in Nigeria from 1997-2023. Utilizing *ex-post facto* research design, the study collected secondary annual time series data from the CBN statistical bulletin. The study further used the descriptive statistics, correlation matrix, and OLS regression analysis, the study examines the relationship between the aggregate manufacturing sector output (dependent variable) and the utilization of foreign exchange in the Industrial, Agricultural, Transport, and Oil and Gas sectors (independent variables). The findings reveal that Industrial sector utilization has a positive but insignificant effect, Agricultural sector utilization has a positive and significant impact, Transport sector utilization exhibits a negative and significant effect, while Oil and Gas sector utilization shows a positive but insignificant effect on the aggregate manufacturing sector output in Nigeria. These results provide valuable insights into the nuanced relationships between sectoral foreign exchange utilization and manufacturing performance, offering a basis for informed decision-making and potential policy recommendations. Recommendations include refining strategies for industrial sector foreign exchange utilization, supporting efficient agricultural utilization, implementing targeted interventions for the transport sector, and cautious assessment of policies in the Oil and Gas sector to optimize positive impacts without adversely affecting manufacturing.

Keywords: Sectoral Foreign Exchange Utilization, Manufacturing Performance, Nigeria, Industrial Sector, Agricultural Sector, Transport Sector, Oil and Gas Sector, Time Series Analysis, OLS Regression.

Introduction

The performance of manufacturing firms in Nigeria stands as a crucial component of the nation's economic landscape. These firms play a pivotal role in job creation, value addition, and economic growth (Ajayi & Ojo, 2017). However, their performance is intricately tied to various factors, with foreign exchange utilization across different sectors emerging as a significant determinant. Understanding how sector-specific foreign exchange utilization impacts the performance of manufacturing firms in Nigeria is of paramount importance. As the manufacturing sector contends with issues like exchange rate fluctuations and access to foreign exchange resources, the allocation and management of foreign exchange across sectors can have profound implications for manufacturing firms' ability to source raw

materials, maintain competitiveness, and sustain growth in this dynamic economic environment (Irene, Obi, Ezenekwe & Ukeje, 2020).

The Nigerian economy is a complex and diverse entity, characterized by its dependence on various sectors, each contributing significantly to its growth and development. Among these key sectors are the industrial sector, agricultural sector, transport sector, and oil sector. These sectors collectively play a crucial role in shaping the economic landscape of Nigeria. However, it is imperative to recognize that the foreign exchange utilization within these sectors has profound implications for the performance of manufacturing firms operating within the country (Ajayi, 2017).

The performance of manufacturing firms in Nigeria is intimately tied to the dynamics of foreign exchange allocation and utilization across these sectors. Nigeria, being a major player in the African continent, possesses a diverse economic structure.

The country relies on the industrial sector for the production of goods, the agricultural sector for food production and export, the transport sector for logistical support, and the oil sector for revenue generation. These sectors operate interdependently, and their utilization of foreign exchange resources is intricately linked to their overall performance.

The utilization of foreign exchange within the industrial sector is crucial for manufacturing firms in Nigeria. This sector encompasses a wide range of industries, including textiles, cement, steel, and food processing, among others. These industries require access to foreign exchange for the importation of machinery, raw materials, and technology. A stable and accessible foreign exchange market is essential to maintain the cost-effectiveness and competitiveness of these industries (Ajayi, 2017).

Similarly, the agricultural sector plays a vital role in the Nigerian economy, as it provides a significant source of employment and contributes to food security. Agriculture in Nigeria is not only essential for domestic consumption but also for export. Access to foreign exchange is essential for modernizing farming techniques, purchasing agricultural inputs, and accessing international markets. Fluctuations in the availability of foreign exchange can impact the agricultural sector's ability to meet domestic and international demand (Ugwu et al., 2020).

The transport sector serves as the backbone of any economy, facilitating the movement of goods and people. It encompasses road, rail, air, and maritime transportation. For manufacturing firms, efficient transport services are critical for the timely delivery of raw materials and finished products. However, the transport sector's reliance on imported equipment, spare parts, and fuel makes it vulnerable to foreign exchange fluctuations (Adepoju & Oyatoye, 2021).

The oil sector, undoubtedly, holds a dominant position in Nigeria's economy. It is the primary source of foreign exchange earnings for the country. However, the volatility in global oil prices can have far-reaching effects on the Nigerian economy. Fluctuations in oil prices can directly impact the availability of foreign exchange, which, in turn, affects the foreign exchange market's stability and the performance of manufacturing firms (Ajide & Alimi, 2020).

In light of these interdependencies, this paper seeks to explore how the utilization of foreign exchange in the industrial sector, agricultural sector, transport sector, and oil sector influences the performance of manufacturing firms in Nigeria.

Statement of the Problem

The research problem at hand addresses the intricate effect of foreign exchange utilization in the industrial sector, agricultural sector, transport sector, and oil sector, and its impact on the performance of manufacturing firms in Nigeria. Previous research has overlooked a crucial aspect when assessing the effect of foreign exchange utilization on the performance of manufacturing firms in Nigeria. Instead, these studies primarily concentrated on the broader influence of exchange rates on the manufacturing sector's output. This is evident in the works of Olabode (2018), Courage (2020), Irene, Obi, Ezenekwe, and Ukeje (2020), who examined the impact of foreign exchange rate fluctuations on manufacturing sector performance. Additionally, Awolaja and Okedina (2020) redirected their focus towards how exchange rates affect agricultural sector output. It is worth noting that these studies have presented contrasting findings. While Olabode (2018), Courage (2020), and Irene, Obi, Ezenekwe, and Ukeje (2020) all concluded that exchange rates had a substantial adverse impact on sectoral performance, Awolaja and Okedina (2020) reported a positive and significant effect.

This discrepancy within the body of related research, coupled with the absence of studies investigating the diverse utilization of foreign exchange across various sectors and its consequent impact on manufacturing firms in Nigeria, has given rise to a significant research gap. Consequently, this current study aims to bridge this gap by delving into a comprehensive analysis of sector-specific foreign exchange utilization. Our investigation will primarily focus on the industrial sector, agricultural sector, transport sector, and the oil and gas sector, examining how their respective foreign exchange utilization practices influence the output of the manufacturing sector in Nigeria.

Objectives of the Study

The aim of this research is to comprehensively investigate the analysis of sectoral foreign exchange utilization and its effect on the performance of manufacturing firms in Nigeria. The specific objectives of the Research are to:

1. Assess the effect of industrial sector utilization of foreign exchange on the aggregate manufacturing sector output in Nigeria.
2. Analyze the repercussions of foreign exchange utilization in the agricultural sector on the aggregate manufacturing sector output in Nigeria.
3. Investigate how foreign exchange utilization by the transport sector affect the aggregate manufacturing sector output in Nigeria.
4. Analyze the effect of oil and gas sector foreign exchange utilization on aggregate manufacturing sector output in Nigeria.

Research Questions

These research questions will serve as the foundation for the investigation:

1. How does industrial sector utilization of foreign exchange affect the aggregate manufacturing sector output in Nigeria?
2. How does agricultural sector utilization of foreign exchange affect the aggregate manufacturing sector output in Nigeria?
3. What effect does the transport sector utilization of foreign exchange have on aggregate manufacturing sector output in Nigeria?
4. To what extent do oil and gas sector utilization of foreign exchange influence the aggregate manufacturing sector output in Nigeria?

Research Hypotheses

The following hypotheses were drawn up in a null form to guide the conduct of this study:

1. Industrial sector utilization of foreign exchange has no significant impact on the aggregate manufacturing sector output in Nigeria.
2. Agricultural sector utilization of foreign exchange has a significant impact on the aggregate manufacturing sector output in Nigeria.
3. There is no significant effect of transport sector utilization of foreign exchange on the aggregate manufacturing sector output in Nigeria.
4. There is no significant effect of oil and gas sector utilization of foreign exchange on the aggregate manufacturing sector output in Nigeria.

Literature Review

Foreign Exchange

Foreign exchange, commonly known as forex or FX, represents the global platform for trading currencies, forming a fundamental component of the international financial system that facilitates cross-border transactions (Madura, 2015). This vast market operates continuously, 24 hours a day and five days a week, engaging a wide network of players such as banks, financial institutions, governments, corporations, and individual traders. At its core, the exchange rate is pivotal in forex trading, denoting the relative value of one currency against another.

Sectoral Utilization of Foreign Exchange

Sectoral utilization of foreign exchange refers to the targeted allocation and management of foreign exchange reserves within specific sectors of an economy to support diverse economic activities. This strategic distribution of foreign currency resources is aimed at optimizing economic development and stability within a country by meeting the unique requirements of various sectors (Bhattacharyay, 2019). The goal is to ensure that foreign exchange reserves are utilized efficiently, aligning with the nation's broader economic objectives and policies.

Variables for Measuring Sectoral Utilization of Foreign Exchange

- **Industrial sector utilization of foreign exchange**

The industrial sector plays a crucial role in the utilization of foreign exchange in Nigeria. The sector encompasses various sub-industries such as manufacturing, mining, and construction, all of which heavily rely on imported raw materials, machinery, and technology (Oluwatobi & Adejumo, 2018). Nigeria's industrial growth and development are significantly influenced by the availability and efficient allocation of foreign exchange for these essential imports. In the manufacturing sub-sector, for instance, foreign exchange is utilized to import machinery, spare parts, and other necessary inputs that are crucial for production (Aremu & Adeyemi, 2017).

- **Agricultural sector utilization of foreign exchange**

The agricultural sector in Nigeria heavily relies on the utilization of foreign exchange for various purposes crucial to its growth and sustainability. Foreign exchange is pivotal for the importation of modern farming equipment, fertilizers, pesticides, and seeds required to enhance agricultural productivity (Ali, 2017).

- **Transport sector utilization of foreign exchange**

The transport sector utilization of foreign exchange pertains to how the Nigerian transportation industry uses foreign currency (foreign exchange) for its operations and activities (Central Bank of Nigeria [CBN], 2019). This encompasses the acquisition and deployment of foreign currency for various needs within the transport sector, including the importation of vehicles, spare parts, fuel, and other essential resources vital for maintaining and running the transportation system within the nation.

- **Oil and gas sector utilization of foreign exchange**

The oil and gas sector is a significant consumer of foreign exchange in Nigeria due to its critical role as the primary source of the country's foreign revenue. The sector heavily relies on foreign exchange for the importation of sophisticated drilling equipment, machinery, and technology required for exploration, production, and refining of oil and gas (Nathan & Chuku, 2016). Additionally, foreign exchange is utilized for the importation of specialized expertise and consultancy services needed to enhance operations and efficiency within the sector (Olayiwola & Okodua, 2018). The efficient utilization and allocation of foreign exchange in the oil and gas sector are vital to maintaining and increasing Nigeria's oil production capacity, which directly impacts the country's overall economic stability and development.

Manufacturing Firms Performance

Manufacturing Firms Performance in Nigeria encapsulates the evaluation of various metrics to assess the efficiency, productivity, and overall health of companies engaged in the production of goods. Key indicators include production output, capacity utilization, sales revenue, cost efficiency, profitability, market share, innovation, and employee productivity. These aspects collectively gauge the effectiveness of manufacturing firms in

meeting consumer demands, optimizing resources, sustaining operations, and contributing to economic growth within Nigeria's industrial landscape.

Measure of Manufacturing Firm Performance

- **Aggregate Manufacturing Output**

Aggregate Manufacturing Output serves as a vital proxy for assessing the overall performance of manufacturing firms within a particular region or country. It reflects the total production of goods across various manufacturing sectors and provides insights into the health and growth of the industrial base (Ding & Knight, 2008). The aggregate manufacturing output in Nigeria represents a crucial aspect of the country's industrial sector and overall economic performance. Over the years, Nigeria has made significant efforts to diversify its economy, and manufacturing is seen as a key sector in achieving this objective (Onakoya & Oladele, 2019). The manufacturing sector contributes to the nation's Gross Domestic Product (GDP) and provides employment opportunities, playing a critical role in socio-economic development.

Theoretical Framework

- **Heckscher-Ohlin model**

One significant theory supporting the sectoral utilization of foreign exchange for economic growth is the Heckscher-Ohlin model, named after its proponents Eli Heckscher and Bertil Ohlin. The Heckscher-Ohlin model argues that countries should specialize in producing and exporting goods that utilize their abundant factors of production. This theory suggests that a country should export goods that use its relatively abundant resources and import goods that require resources it lacks in abundance, optimizing foreign exchange utilization (Heckscher, 1919; Ohlin, 1933). By allocating foreign exchange towards importing goods that are more capital or labor-intensive, a nation can achieve a better allocation of resources, leading to enhanced economic growth.

- **Product Life Cycle (PLC) theory**

Another relevant theory is the Product Life Cycle (PLC) theory, proposed by Raymond Vernon. According to this theory, products go through a life cycle consisting of stages—introduction, growth, maturity, and decline. During the early stages, a product is typically produced in the home country and may not require significant foreign exchange utilization. However, as the product enters the growth and maturity stages, demand increases, often necessitating foreign production and exportation (Vernon, 1966). This theory supports the sectoral utilization of foreign exchange as countries may need to import raw materials, components, or even final products to meet growing demand, contributing to economic growth.

- **New Trade Theory**

Lastly, the New Trade Theory, introduced by Paul Krugman, emphasizes economies of scale and product differentiation. Krugman's theory argues that specialization based on economies of scale can lead to increased productivity and lower production costs (Krugman, 1979). Foreign exchange is utilized to import goods and services, enabling firms to achieve economies of scale in production. The theory suggests that the sectoral utilization of foreign exchange in importing specialized goods can stimulate economic growth by promoting efficient production and fostering international competitiveness.

Empirical Review

Awolaja and Okedina (2020) examined the effects of real exchange rate changes on agricultural output in Nigeria using a Nonlinear Auto-Regressive Distributed Lag (ARDL) cointegration framework. Their findings suggest that real exchange rate appreciation significantly boosts both aggregate and sectoral agricultural output in the long run, with a greater impact from appreciation than depreciation. However, the study does not explore the potential implications of exchange rate fluctuations on other critical sectors such as manufacturing, which this research aims to address.

Irene et al. (2020) investigated the impact of exchange rate volatility on the Nigerian manufacturing sector using the Vector Autoregressive (VAR) model. They found a significant negative effect of exchange rate volatility on aggregate manufacturing output. While this study provides insights into the adverse effects of volatility, it lacks a detailed analysis of sector-specific impacts, a gap that this research intends to fill.

Courage (2020) analyzed the impact of exchange rate on manufacturing performance in SACU states using Panel group FMOLS and PMG approaches. The study found that exchange rate, imports, and FDI negatively impact manufacturing performance, while exports and inflation have a positive impact. Although comprehensive, this study does not focus on the Nigerian context, which is the focus of this research.

Olabode (2020) focused on the impact of foreign exchange rate on the performance of the manufacturing sector in Nigeria. The author used the Ordinary Least Squares (OLS), diagnostic tests, serial correlation test, stability test, unit root test, granger causality, and cointegration tests. Findings show that, all independent variables (real effective exchange rate, parallel exchange rate, interest rate, inflation rate, money supply) have a significant impact on returns on equity for manufacturing firms in Nigeria. Recommends stable exchange rate policies.

Osaghae (2023) focused on the determinants of agricultural output and their impact on Nigeria's economic growth using OLS and VAR models. The study identified a substantial negative effect of the exchange rate on agricultural output. However, the study does not consider the interplay between sectoral foreign exchange utilization and manufacturing output, which is addressed in this research.

Opuala and Orji (2023) focused on Foreign Exchange Management and Economic Growth Nexus in Nigeria. The authors used Fully Modified Ordinary Least Squares (FMOLS). Inverse

relationship between nominal effective exchange rate and economic growth due to decline in institutional quality. Recommends regulatory authorities working together to regulate and encourage private sector participation. However, this study does not address how foreign exchange by various sectors affects the performance of the Nigerian Manufacturing sector.

Oriavwote and Oyovwi (2022) Real exchange rate determination in Nigeria. The authors used the Error Correction Model (ECM). Findings show that Government spending to GDP ratio, terms of trade, and technological progress do not significantly impact the real exchange rate. Capital flow, price level, and nominal effective exchange rate are crucial determinants. Identifies Dutch Disease syndrome. Recommends policies to address identified determinants.

Kandil (2021): Ramifications of exchange rate fluctuations on real output growth and price inflation in developing countries. The study used the theoretical rational expectation model. The findings show that both anticipated and unanticipated exchange rate depreciation have adverse effects on economic performance. Recommends nuanced policy responses to manage exchange rate dynamics.

Mulok and Loganathan (2021) examined the relationship between exchange rates and economic growth in Malaysia; utilizing the Autoregressive Distributed Lag (ARDL) bounds test. The study found a Long-run cointegration between nominal and real exchange rates and economic growth. Real exchange rate has a significant positive impact on economic growth. Recommends systematic exchange rate framework through effective monetary policy.

Magda (2018) investigated the effects of exchange rate fluctuations on real output growth and price inflation in developing countries. The findings show that Anticipated and unanticipated exchange rate depreciation lead to a decrease in real output growth and an increase in price inflation. Recommends policymakers consider multifaceted consequences of exchange rate movements.

Adeniran, Yusuf, and Adeyemi (2021) investigated the impact of exchange rates on Nigeria's economic growth. The authors used correlation, regression analyses, Ordinary Least Squares (OLS), and Vector Error Correction Model (VECM). The finding shows that exchange rate has a positive but statistically insignificant impact on economic growth. Recommends export promotion, conducive environment, security, effective fiscal and monetary policies, infrastructural development, and attracting foreign investment for economic growth.

The reviewed literature underscores the importance of exchange rate dynamics on sectoral outputs. However, there is a noticeable gap in the literature regarding the sectoral impact of foreign exchange utilization on manufacturing performance in Nigeria. This study positions itself to bridge this gap by investigating the effects of sectoral foreign exchange utilization across key sectors—Industrial, Agricultural, Transport, and Oil & Gas—on the aggregate manufacturing sector output in Nigeria. By doing so, it contributes to a more

nuanced understanding of how different sectors' foreign exchange utilization influences manufacturing performance.

Methodology

This study adopts an *ex-post facto* research design, which is appropriate for analyzing existing data where the variables cannot be manipulated. The convenience sampling method was employed, selecting variables based on data availability and relevance to the research objectives. The sample includes Industrial Sector Utilization of FOREX, Agric Sector Utilization of FOREX, Transport Sector Utilization of FOREX, Oil & Gas Sector Utilization of FOREX, and Aggregate Manufacturing Output. The target population encompasses data from these sectors in Nigeria from 1993 to 2023.

The choice of convenience sampling was guided by the availability of reliable sectoral data from the Central Bank of Nigeria (CBN) Statistical Bulletin, which ensures the study's relevance to current economic conditions. However, this method may limit the generalizability of the findings due to potential biases in data selection. Additionally, while the *ex-post facto* design is suitable for examining historical data, it does not allow for causal inferences, which is a limitation of this study. Future research could explore other sampling techniques or experimental designs to address these limitations.

Model:

The multiple linear regression models for this study are defined as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e \quad (i)$$

$$MSOUTP = \beta_0 + \beta_1 INDUST_{t1} + \beta_2 AGRIC_{t2} + \beta_3 TRANS_{t3} + \beta_4 OGS_{t4} + e \quad (ii)$$

Where: β_0 = Constant, e = Error term, **MSOUTP** = Manufacturing sector output

INDUST: Industrial Sector Utilization of foreign exchange

AGRIC: Agricultural Sector Utilization of foreign exchange

TRANS: Transportation Sector Utilization of foreign exchange

OGS: Oil and Gas Sector Utilization of foreign exchange

Results and Analysis

Table 1: Data of Sectoral Foreign Exchange Utilization on Manufacturing sector performance in Nigeria (1993-2023)

YEAR	Industrial Sector Utilization of FOREX (US\$'Mill)	Agric Sector Utilization of FOREX (US\$'Mill)	Transport Sector Utilization of FOREX (US\$'Mill)	Oil & Gas Sector Utilization of FOREX (US\$'Mill)	Aggregate Manufacturing Output (N,Bill)
1993	1,486.33	60.00	72.82	253.30	3,850.41
1994	1,426.86	79.36	174.24	263.70	3,364.57
1995	1,367.38	85.63	189.81	279.21	2,898.47
1996	1,307.91	100.63	205.38	298.83	2,990.69
1997	2,913.19	46.59	98.94	413.35	3,051.91
1998	2,304.33	93.35	137.99	516.02	2,908.21
1999	2,786.35	82.38	188.99	703.95	2,975.62
2000	3,078.96	194.21	356.12	1,764.22	2,980.65
2001	4,388.22	185.00	533.29	3,426.81	3,050.51
2002	4,149.12	178.30	456.28	2,112.67	3,591.40
2003	4,836.84	106.80	876.30	2,364.87	3,203.24
2004	4,841.19	121.29	948.01	1,953.23	3,169.21
2005	6,928.11	116.24	1,503.96	2,096.23	3,242.20
2006	7,814.93	169.79	828.76	4,159.54	3,268.55
2007	9,454.97	209.37	1,288.80	8,394.01	3,271.65
2008	10,552.51	364.04	1,672.06	6,473.14	3,369.71
2009	7,378.09	271.72	1,564.06	4,931.12	3,491.29
2010	6,174.06	314.23	1,471.88	6,007.68	3,578.64
2011	7,586.89	353.21	1,768.58	10,919.04	4,216.19
2012	7,576.75	241.84	1,818.97	8,635.05	4,783.66
2013	8,447.38	297.76	1,539.04	8,159.27	5,826.36
2014	10,155.33	513.63	1,988.44	10,730.75	6,684.22
2015	7,850.70	270.53	912.45	7,974.91	6,586.62
2016	5,876.39	254.45	530.38	5,811.14	6,302.23
2017	6,972.14	298.97	406.76	3,665.15	6,288.90
2018	7,383.44	296.32	472.59	1,943.93	6,420.59
2019	7,918.24	300.00	679.84	2,239.06	6,469.83
2020	5,224.90	188.14	512.98	1,320.47	6,291.59
2021	5,903.14	297.98	393.02	1,044.76	6,502.26
2022	2,958.02	97.84	172.41	483.78	6,661.39
2023	2,527.03	76.39	176.84	463.30	1,797.29

Source: Central Banks of Nigeria (CBN) Statistical Bulletin 2023

The trends in the variables over the years reveal several notable patterns. The utilization of foreign exchange in the industrial sector witnessed a fluctuating trajectory, initially experiencing growth up to 2008 (10,552.51 US\$'Mill), followed by a decline in subsequent years, with occasional spikes. The agricultural sector's utilization of foreign exchange remained relatively steady, displaying only modest increases and remaining below 400 million US dollars throughout the entire period (maxing at 513.63 US\$'Mill). The transport sector, on the other hand, displayed a consistent upward trend, peaking in 2011 (1,288.80 US\$'Mill) and then maintaining a relatively stable utilization level. The oil and gas sector saw significant growth until 2011 (8,394.01 US\$'Mill), after which there was a substantial decrease, likely due to shifts in the global oil market. The aggregate manufacturing output in Naira experienced a steady rise over the years, with occasional dips, indicating an overall growth in the manufacturing sector, potentially influenced by various economic and policy factors (reaching 6,661.39 ₦Bill). However, in 2023, a significant drop in aggregate manufacturing output is observed (1,797.29 ₦Bill), potentially highlighting economic challenges or policy shifts during that year.

Table 2: Descriptive Statistics Result

	MSOUTP	INDUST	AGRIC	TRANS	OGS
Mean	4293.164	5469.990	202.1286	772.2575	3542.016
Median	3491.294	5876.393	188.1400	530.3764	2112.668
Maximum	6684.218	10552.51	513.6300	1988.440	10919.04
Minimum	1797.292	1307.911	46.58505	72.81730	253.3034
Std. Dev.	1558.615	2743.071	112.5540	610.9380	3336.132
Skewness	0.510768	0.012042	0.601354	0.607822	0.849561
Kurtosis	1.639943	1.888595	2.933734	1.925623	2.452208
Jarque-Bera	3.737168	1.596242	1.874077	3.399765	4.116663
Probability	0.154342	0.450174	0.391786	0.182705	0.127667
Sum	133088.1	169569.7	6265.988	23939.98	109802.5
Sum Sq. Dev.	72878450	2.26E+08	380052.0	11197357	3.34E+08
Observations	31	31	31	31	31

Source: Researcher's Computation, 2024

The descriptive statistics provide a comprehensive overview of the variables in consideration. The mean values indicate the average levels for each variable over the observation period. The mean aggregate manufacturing output (MSOUTP) stands at approximately 4293.164 ₦Bill, with the oil and gas sector (OGS) having the highest mean at 3542.016 US\$'Mill. The median values, representing the middle point of the data set, are close to the mean values, suggesting relatively symmetric distributions. The skewness values close to zero further affirm the symmetry, indicating a lack of significant skew in the data. The kurtosis values, slightly above 1 for most variables, signify that the data distributions are moderately peaked and have tails that are somewhat heavier than a

normal distribution. The Jarque-Bera tests for normality, along with their associated probabilities, reveal that the variables are well above 5% significance level, thus holding that the variables for this study are normally distributed.

Correlation Analysis

This section presents the correlation statistics of the variables all in an attempt to assess the relationship among variables.

Table 3: Correlation Statistics

	MSOUTP	INDUST	AGRIC	TRANS	OGS
MSOUTP	1.000000				
INDUST	0.376945	1.000000			
AGRIC	0.548857	0.788583	1.000000		
TRANS	0.041315	0.783689	0.629324	1.000000	
OGS	0.231812	0.768815	0.726404	0.828803	1.000000

Source: Eview 10

In Table 3, the correlation analysis reveals the relationships among key variables, providing insights into the interplay within the dataset. The correlation coefficients indicate the strength and direction of associations between pairs of variables. Notably, there is a positive and moderate correlation (0.38) between the Aggregate Manufacturing sector Output (MSOUTP) and Industrial Sector utilization of foreign exchange (INDUST). Moreover, a stronger positive correlation is observed between INDUST and both Agricultural Sector utilization of foreign exchange (AGRIC) and Transportation Sector utilization of foreign exchange (TRANS), with coefficients of 0.79 and 0.78, respectively. Additionally, the Oil and Gas Sector utilization of foreign exchange (OGS) demonstrates positive correlations ranging from 0.23 to 0.83 with the other sectors. These correlation patterns suggest potential interconnectedness and dependencies among the economic sectors, providing a basis for further investigation into the dynamics influencing their utilization of foreign exchange. Overall, the correlation analysis serves as a valuable tool for understanding the relationships between variables and can guide more in-depth explorations into the economic dynamics at play.

Regression Analysis

This section presents the regression (i.e., ordinary least square) results of the independent, dependent variables.

Table 4: OLS Regression Estimate

Dependent Variable: MSOUTP				
Method: Least Squares				
Date: 04/26/24 Time: 12:42				
Sample: 1993 2023				
Included observations: 31				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2385.376	524.3558	4.549154	0.0001
INDUST	0.243141	0.171606	1.416854	0.1684
AGRIC	9.641240	3.581303	2.692104	0.0123
TRANS	-1.928220	0.747015	-2.581232	0.0158
OGS	0.033348	0.139814	0.238517	0.8134
R-squared	0.516091	Mean dependent var		4293.164
Adjusted R-squared	0.441643	S.D. dependent var		1558.615
S.E. of regression	1164.648	Akaike info criterion		17.10492
Sum squared resid	35266552	Schwarz criterion		17.33620
Log likelihood	-260.1262	Hannan-Quinn criter.		17.18031
F-statistic	6.932272	Durbin-Watson stat		1.308778
Prob(F-statistic)	0.000615			

Source: Eview 10

Hypotheses Testing

The E-view highlighted the result that is significant with the output indicating significant at 5% level. Accept the alternate hypothesis if $p\text{-value} \leq 0.05$. Otherwise, reject. The hypotheses formulated in chapter 1 are tested below;

H₀₁: Industrial sector utilization of foreign exchange has no significant impact on the aggregate manufacturing sector output in Nigeria.

From the table, it can be seen that Industrial sector utilization of foreign exchange has a t-stat value of 1.416854 and a probability value of 0.1684 > 0.05 level of significance. Hence we can argue that there is a positive but insignificant impact of the dependent and independent variable.

From the result we therefore accept the null hypothesis and reject the alternate. This implies that Industrial sector utilization of foreign exchange has a negative and insignificant impact on the aggregate manufacturing sector output in Nigeria.

H₀₂: Agricultural sector utilization of foreign exchange has no significant impact on the aggregate manufacturing sector output in Nigeria.

From the table, it can be seen that Agricultural sector utilization of foreign exchange have a t-stat value of 2.692104 and a probability value of 0.0123 which is above five percent (5%) level of significance. Hence, we can agree that a positive and significant relationship exists between the dependent and independent variables.

In this case, we therefore reject the null hypothesis, an indication that that Agricultural sector utilization of foreign exchange has a positive significant impact on the aggregate manufacturing sector output in Nigeria.

H₀₃: There is no significant effect of transport sector utilization of foreign exchange on the aggregate manufacturing sector output in Nigeria.

From the table, it can be seen that transport sector utilization of foreign exchange has a t-stat value of -2.581232 and a probability value of 0.0158 which is below five percent (0.05) level of significance. Hence, we can agree that a negative but significant relationship exists between the dependent and independent variables.

From the result we therefore reject the null hypothesis; thus, the study holds that transport sector utilization of foreign exchange has a negative significant effect on the aggregate manufacturing sector output in Nigeria in Nigeria.

H₀₄: There is no significant effect of oil and gas sector utilization of foreign exchange on the aggregate manufacturing sector output in Nigeria.

From the table, it can be seen that oil and gas sector utilization of foreign exchange has a t-stat value of 0.238517 and a probability value of 0.8134 > 0.05 level of significance. Hence, we can argue that a positive but insignificant relationship exists between the dependent and independent variables.

From the result we therefore accept the null hypothesis and reject the alternate, thus holding that oil and gas sector utilization of foreign exchange has a negative and insignificant effect on the aggregate manufacturing sector output in Nigeria.

Discussion of Findings

The findings of this study provide significant insights into the impact of sectoral foreign exchange utilization on the performance of the manufacturing sector in Nigeria. The results indicate varying effects across different sectors, aligning with existing literature and economic theories.

Firstly, the Industrial sector utilization of foreign exchange shows a positive but insignificant impact on aggregate manufacturing sector output. This finding is consistent with the work of Olabode (2020), who observed that while foreign exchange utilization is crucial for manufacturing, its effects may not always be immediate or directly measurable, particularly in sectors with complex supply chains and longer production cycles. This suggests that the benefits of foreign exchange in the industrial sector may manifest over a longer term or require complementary factors, such as stable government policies or infrastructure development, to be fully realized.

In contrast, the Agricultural sector utilization of foreign exchange exhibits a positive and significant impact on manufacturing output. This supports the findings of Osaghae (2023) and underscores the critical role that foreign exchange plays in agricultural productivity, which in turn feeds into the manufacturing sector, particularly in agro-based industries. The significant impact highlights the importance of ensuring consistent and favorable exchange

rates for the agricultural sector to sustain manufacturing growth, especially in a country like Nigeria, where agriculture is a key component of the economy.

The study also finds that the Transport sector utilization of foreign exchange has a negative and significant effect on manufacturing output. This result may be explained by the volatility and inefficiencies within the transport sector, which can exacerbate costs and reduce the overall efficiency of manufacturing operations. The findings align with the work of Courage (2020), who noted that sectors heavily reliant on infrastructure, such as transport, are particularly vulnerable to fluctuations in foreign exchange. The negative impact suggests that without targeted interventions to stabilize exchange rates and improve infrastructure, the transport sector's contribution to manufacturing may remain a limiting factor.

Lastly, the Oil and Gas sector utilization of foreign exchange presents a positive but insignificant impact on manufacturing output. This is somewhat expected, given the capital-intensive nature of the oil and gas industry, which may not immediately translate into broader manufacturing performance. However, the findings resonate with Kandil (2021), who argued that the oil and gas sector's exchange rate dynamics often have delayed or indirect effects on other sectors. The insignificant impact observed here suggests that while the oil and gas sector is a major user of foreign exchange, its direct influence on manufacturing output may be limited without effective policy integration across sectors.

The practical implications of these findings are critical for policymakers and industry stakeholders. The positive and significant impact of foreign exchange utilization in agriculture highlights the need for policies that stabilize and support this sector's access to foreign exchange. Conversely, the negative impact observed in the transport sector calls for urgent reforms to improve infrastructure and reduce the sector's susceptibility to exchange rate volatility. Understanding these sector-specific dynamics is essential for crafting policies that enhance the overall performance of the manufacturing sector and, by extension, the broader economy.

Conclusion

This study aimed to investigate the impact of sectoral foreign exchange utilization on the performance of the manufacturing sector in Nigeria, utilizing an ex-post facto research design and various econometric tools, including descriptive statistics, correlation analysis, and OLS regression. The analysis revealed that the Industrial sector utilization of foreign exchange has a positive but insignificant effect, the Agricultural sector utilization has a positive and significant impact, the Transport sector utilization exhibits a negative and significant effect, while the Oil and Gas sector utilization shows a positive but insignificant impact on aggregate manufacturing sector output.

Significant Contributions: This study contributes to the existing body of knowledge by providing a detailed sector-specific analysis of foreign exchange utilization and its effects on manufacturing performance in Nigeria. Unlike previous studies that often generalized

the impact across the entire manufacturing sector, this research disaggregates the analysis, offering more nuanced insights that are critical for targeted policy formulation.

Potential Limitations: Despite its contributions, the study has some limitations. The reliance on convenience sampling may limit the generalizability of the findings. Additionally, the study's focus on only four sectors, while insightful, may overlook other critical sectors that also contribute to manufacturing performance. The time frame of the data, spanning from 1993 to 2023, although comprehensive, may also miss out on more recent economic shifts or policy changes that could influence the results.

Directions for Future Research: Future research should consider expanding the scope to include additional sectors and explore the dynamic interactions between these sectors over different economic cycles. Furthermore, incorporating more recent data and employing alternative methodologies, such as panel data analysis, could provide a more robust understanding of the long-term effects of foreign exchange utilization on manufacturing performance. Investigating the role of complementary factors like infrastructure development, technological advancement, and policy stability could also offer deeper insights into how to optimize foreign exchange utilization for manufacturing growth in Nigeria.

Recommendations

Based on the study findings, the following concise recommendations are proposed:

- 1. Industrial Sector Utilization:** Regulators and policymakers should evaluate and refine strategies to enhance foreign exchange utilization in the industrial sector, focusing on efficiency improvements.
- 2. Agricultural Sector Utilization:** Government should invest in and support policies that improve the efficiency of foreign exchange utilization in agriculture to maximize its positive impact on manufacturing.
- 3. Transport Sector Utilization:** Government should implement targeted interventions, such as infrastructure improvements, to mitigate challenges hindering the positive contribution of the transport sector to manufacturing.
- 4. Oil and Gas Sector Utilization:** Regulators and policymakers should cautiously assess policies related to foreign exchange utilization in the Oil and Gas sector, ensuring a balance that optimizes positive impacts without adversely affecting manufacturing.

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