

9th Multi-disciplinary
Conference on
**African
Development
Policies**



University of Nigeria,
Nsukka, Nigeria

CONFERENCE PROCEEDINGS

Theme: Addressing Challenges & Development
Administration in Emerging Economies:
Multi-disciplinary Discussion

26TH - 27TH JUNE, 2024

ISBN: 978-978-60998-8-0



9TH MULTI-DISCIPLINARY CONFERENCE ON AFRICAN DEVELOPMENT ANALYSIS

THEME

Addressing Challenges & Development Administration in Emerging Economies: Multi-disciplinary Discussion

DATE: Thursday 27th - Friday 28th June, 2024

TIME: 9:00am

CONFERENCE LOC

Ekekwe, Ezinwanne

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University of Nigeria, Enugu Campus

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Email: policyafrica@gmail.com

Website: www.internationalpolicybrief.org

ISBN: 978-978-60998-8-0

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9TH MULTI-DISCIPLINARY CONFERENCE ON AFRICAN DEVELOPMENT ANALYSIS

CONFERENCE PROGRAMME

DAY ONE: Thursday 27th June, 2024

Conference Briefing via Google Meet - 9:00am - 9:30am

Online Visual Presentation via Google Meet - 9:30am - 1:00pm

WhatsApp Video Presentations - 3:00pm - 4:00pm

DAY TWO: Friday 28th June, 2024

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Online Visual Presentation via Google Meet - 9:30am - 1:00pm

WhatsApp Video Presentations - 3:00pm - 4:00pm

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first assured



EXCHANGE RATE VOLATILITY AND MANUFACTURING SECTOR EXPORTS IN NIGERIA

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Abstract

This study examined the impact of exchange rate volatility on the manufacturing sector export in Nigeria. Data for the study were sourced from the Central Bank of Nigeria Statistical Bulletin and the National Bureau of Statistics over the period 1980 to 2021. The study used the Autoregressive Distributed Lag Model and examined the long run and short run effects of exchange rate volatility on the performance of the manufacturing sector export in Nigeria. The estimated results revealed that exchange rate volatility had positive and statistically significant impact on manufacturing sector export in Nigeria in the long run. Based on the findings of this study, it was concluded that exchange rate volatility had significant impact on manufacturing sector export in Nigeria. The study therefore recommended among others that the government and policy makers should evolve policies that stabilize the naira by reducing or totally removing the arbitrage between the parallel markets and the official markets. More so, the study also recommended that manufacturers who rely heavily on imported raw materials that cannot be easily sourced locally should be made to access the exchange rate at the official rate with ease in order to increase the manufacturing sector output for export.

Keywords: Exchange Rate, Volatility, Manufacturing sector, export, Nigeria

Background to the Study

The Nigerian government has prioritized diversifying the economy beyond its dependence on oil exports. The manufacturing sector plays a crucial role in this strategy, with the potential to create jobs, generate foreign exchange, and stimulate economic growth. However, achieving this goal requires addressing significant challenges. One key obstacle is

the volatility of the exchange rate, which creates uncertainty for businesses and hinders export competitiveness. Exchange rate is a significant macroeconomic variable because its depreciation or appreciation has negative or positive repercussions on all the sectors of the economy especially the manufacturing sector (Odili, 2014; Aizenman & Marion, 1999). Through international trade among countries, economies have experienced periods of exchange rate fluctuations, slower growth among others (Todaro & Smith, 2008) and this has exposed many developing countries to periods of imbalances. Exchange rate fluctuations do not only affect economic growth but also the performance of firms. For instance, exchange rate depreciation increases the cost of imported capital goods for manufacturing firms and this results to a fall in domestic investment among others.

Nigeria's economy has historically been heavily dependent on oil exports, which constitute a substantial portion of government revenue and foreign exchange earnings. This dependency has exposed the economy to global oil price fluctuations, which, in turn, have significantly influenced the exchange rate of the Naira. Periods of high oil prices typically lead to an appreciation of the Naira, while oil price crashes result in depreciation. This volatility has profound implications for other sectors of the economy, particularly manufacturing. Since the mid-1980s, Nigeria has undergone various economic reforms aimed at liberalizing the economy and improving its global competitiveness. Key among these reforms was the Structural Adjustment Program (SAP) of 1986, which aimed to diversify the economy away from oil dependence, deregulate the exchange rate, and promote non-oil exports. Despite these efforts, the exchange rate regime has oscillated between fixed, floating, and managed float systems, contributing to exchange rate instability. The Central Bank of Nigeria (CBN) also has implemented several measures to manage exchange rate volatility, including interventions in the foreign exchange market, adjusting interest rates, and maintaining foreign exchange reserves. However, these measures have met with varying degrees of success, and exchange rate volatility remains a persistent challenge.

Despite the recognized importance of exchange rate stability for economic development, the Nigerian economy has witnessed periods of pronounced volatility, characterized by sharp fluctuations in the value of the naira against major currencies such as the US dollar, euro, and pound sterling. For instance, the naira has kept on depreciating from N 0.54 in 1980 to N 2.02 in 1986, and N7.901 in 1990, all against the one US dollar. The policy of deregulation pegged the naira at N21.886 in 1994, N 86.322 in 1999 and N135.50 in 2004. Thereafter, the exchange rate appreciated to N132.15 in 2005 and N 150.00 in 2009. In 2015 the exchange rate of a US dollar to naira is N165. But after the 2015 general election and the swearing-in of President Muhammadu Buhari, the rate of exchange of Nigeria naira to the United States Dollar has been alarming. For instance, in October 2016, the exchange rate of one US dollar to naira in the parallel market is N 500.00 (George-Anokwuru, Obayori & Oriji, 2018). Similarly, the naira has depreciated against the U.S dollar by more than 113% by the end of 2013 and at the end of 2018 about N363 was exchanged for one U.S dollar; reaching its peak in 2023 and 2024 at N786 and N1,450 respectively exchanged to one U.S dollar

(Gbosi, 2024). Thus, the weak value of the naira to the US dollar distorted the growth of the economy and the manufacturing sector in particular. These fluctuations have been exacerbated by factors such as fiscal imbalances, external debt pressures, inconsistent monetary policies, speculative activities in the foreign exchange market, and limited forex reserves (Stancik, 2007). Each of these factors has varying degrees of influence, depending on the economic situation of the nation in question. Thus, transitioning nations (like Nigeria) are more susceptible to these elements' effects, which in turn have an impact on monetary policy decisions.

Existing research has explored the relationship between exchange rate volatility and manufacturing export in Nigeria (e.g. Umaru, Olutope, David, Annette, Daniel, Yakubu, Amechi & Uyu, 2023; Olufayo & Fagite, 2014; Ndidi & Alaba, 2019; Ishimwe & Ngalawa, 2015). These studies have employed various econometric techniques to analyze the data. However, these studies have yielded mixed findings, reflecting the complex and multifaceted nature of the relationship between exchange rates and manufacturing sector dynamics. This study aims to bridge this gap by analyzing the impact of exchange rate volatility on the manufacturing sector export in Nigeria. By employing an (Autoregressive Distributed Lag Model), we will investigate the impact of exchange rate volatility on manufacturing sector export in Nigeria. The findings will contribute valuable insights for policymakers and industry stakeholders in developing strategies to mitigate the negative impacts of exchange rate volatility and foster the growth of Nigeria's manufacturing exports.

Given the dependence of manufacturing sector on import for intermediate and capital goods, there is need to examine the manner and extent through which fluctuation in exchange rate affects the performance of manufacturing sector export in Nigeria. The study is of particular relevance because a vibrant manufacturing sector is a sinequa-non for sustained economic growth and development in any economy. In addition, the study is of great importance to the Nigeria economy given her quest to diversify the nation's economy base away from crude oil. Furthermore, this study has become necessary given the declining economic growth forecast for Nigeria in recent times as real GDP declined by 4% from 2019 in 2020, and from 3.6% in 2021 to 3.3% in 2022 (AfDB, 2023). It is believed that increase in manufacturing output will lead to increase in manufacturing sector export, employment and household disposable incomes, which will stimulate increase in demand for additional goods and services, which could lead to increased capacity utilisation within the manufacturing sector, and more cheaper goods leveraging on economies of scale, and finally result in overall improvement in the welfare of the populace and stimulate economic growth. The broad objective of this study is to investigate the impact of exchange rate volatility on manufacturing sector export in Nigeria.

Literature Review

Conceptual Review

Exchange Rate

Exchange rate has been defined as the price of one currency in terms of another (Mordi, 2006). Fahrettin (2001) asserts that an exchange rate, as a price of one country's currency in terms of another's, is among the most important prices in an open economy. It influences the flow of goods, services, and capital in a country, and exerts strong pressure on the balance of payments, inflation and other macroeconomic variables. Therefore, the choice and management of an exchange rate regime is a critical aspect of economic management to safeguard competitiveness, macroeconomic stability, and growth

According to O'Sullivan and Sheffrin (2003), exchange rate refers to the rate at which one currency is exchanged for another. Campbell (2010) conceptualizes the exchange rate as the price of one currency in terms of another. Exchange rate could either be nominal or real. The exchange rate of a country is either fixed or floating (Bhawna, 2012). A floating exchange rate refers to an exchange rate regime in which the market forces dictate movements in the exchange rate. On the other hand, a fixed/pegged exchange rate is an exchange rate regime in which the government through the central bank ties or fixed the value of the currency to other currencies (Eduardo & Sturzenegger, 2003).

Aliyu (2011) noted that an appreciation of the exchange rate results in increased imports and reduced export while depreciation would expand export and discourage import. In addition, depreciation of exchange rate tends to cause a shift from foreign goods to domestic goods. Hence, it leads to a diversion of income from importing countries to countries exporting through a shift in terms of trade, and this tends to have impact on the exporting and importing countries' economic balance of payments. Exchange rate plays a key role in international economic transactions because no nation can remain in autarky due to varying factor endowment (Oladipupo & Ogheneov, 2011). Movements in the exchange rate have ripple effects on some of economic variables such as interest rate, inflation rate, unemployment, money supply; economic growth, balance of payment etc. These facts underscore the importance of exchange rate to the economic well-being of every country that opens to international trade in goods and services. Therefore, nations in the pursuit of the macroeconomic goals of healthy internal and external stability of her economy, find it imperative to adopt effective and efficient exchange rate policy.

Furthermore, Hassan (2002) agreed that exchange rate helps to connect the price systems of two different countries by making it possible for international trade and also effects on the volume of imports and exports, as well as country's balance of payments position. AZeeZ, Kolapo and Ajayi, (2012) noted that When there is deviation of this rate over a period of time from the benchmark or equilibrium, exchange rate is called exchange rate volatility. It also indicates that misalignment of exchange rate as occurred where there is multiplicity of markets parallel with the official market.

Arising from the various conceptualizations of exchange rate above, this study conceptualizes exchange rate as the price at which the currency of one country is given in exchange for that of another currency or can be converted to the currency of another country. It is the price of one country's currency expressed in terms of or in relation to some other currencies. It expresses a national currency's quotation with respect to foreign ones.

Exchange Rate Volatility

Volatility of exchange rate has been variously referred to as exchange rate fluctuation or variability. For instance, Agubata and Odubuasi (2018) saw it as “fluctuation in exchange rate” and defined it to entail the volatility and variability in the rate of exchange that affects either positively or negatively the performance of other economic variables. Jongbo (2014) equated it to “erratic fluctuations in exchange rates” and take it to mean periods of domestic currency appreciation or depreciation in an economy. Iyeli and Utting (2017) stated that exchange rate volatility is when there is deviation of exchange rate from the benchmark or equilibrium over a period of time. Adding that, it also indicates misalignment of exchange rate as the case where there exists multiplicity of parallel markets to the official market.

Ozturk (2006) considered exchange rate volatility as the risk associated with unexpected movement in exchange rate. In other words, exchange rate volatility is the risk associated with currency depreciation or appreciation. It is associated factors that induce uncertainty and risk in investment decision with destabilizing impact on the macroeconomic performance (Iyeli and Utting, 2017; Ayobami, 2019). These show unpredicted oscillatory movements that characterize rate at which one currency (in this case, Naira) exchanges for other currencies like dollar.

Exchange rate volatility refers to the degree to which the exchange rate of a country changes over time. The larger the magnitude of the change in exchange rate the more volatile it is. Floating exchange rates are free to change over time and hence more volatile but fixed exchange rates are less volatile because they can only be devalued or revalued by the monetary authority of a country (Steven, 1997). For the purpose of this study however, exchange rate volatility refers to the frequency at which the naira appreciates or depreciates against the U.S dollar.

Manufacturing Sector

Manufacturing sector refers to the numerous industries which are involved in the production/manufacturing and processing of items and indulge in either creation of new commodities or in value addition (Adebayo, 2010). To Dickson (2010), manufacturing sector accounts for a significant share of the industrial sector in developed countries. The final products can either serve as finished goods for sale to customers or as intermediate goods used in the production process. According to Loto (2012), manufacturing sector refers to an avenue for increasing productivity in relation to import replacement and export expansion, creating foreign exchange earning capacity, raising employment and per capita income which causes unrepeatable consumption pattern. Mbelede (2012) opined that

manufacturing sector is involved in the process of adding value to raw materials by turning them into products.

Therefore, manufacturing is the key sector in an economy and it involves the conversion of raw material into finished goods. In the opinion of Charles (2012), manufacturing industries creates employment and also boost agriculture, thus diversifying the economy by making the nation to increase its foreign exchange earnings. Manufacturing industries came into being with the occurrence of technological and socio-economic transformations in the Western countries in the 18th-19th centuries. This period was widely known as industrial revolution. It all began in Britain and replaced the labour intensive textile production with mechanization and use of fuels. Manufacturing sector is categorized into engineering sector, construction sector, electronics sector, chemical sector, energy sector, textile sector, food and beverage sector, metalworking sector, plastic sector, transport and telecommunication sector.

Theoretical Review

The Mundel-Fleming Model

The Mundell–Fleming model, also known as the IS-LM-BoP model was first developed by Robert Mundell and Marcus Fleming in the early 1960s. The model is an extension of the IS–LM model. The Mundell–Fleming model describes the short-run relationship between an open economy's nominal exchange rate, interest rate, and output (in contrast to the closed-economy IS-LM model, which focuses only on the relationship between the interest rate and output). The Mundell–Fleming model has been used to argue that an economy cannot simultaneously maintain a fixed exchange rate, free capital movement, and an independent monetary policy. An economy can only maintain two of the three at the same time. This principle is frequently called the impossible trinity or the Mundell–Fleming trilemma. The model shows that the effectiveness of national macroeconomic policy depends on the exchange rate system. This is because in open economy the real exchange rate influence net export and thus income and output. However, the Mundell-Fleming model works with the assumption that prices are fixed. This means that the aggregate supply curve is flat (horizontal in the extreme) and income is determined by the aggregate demand only.

In the Mundell–Fleming model, the demand side of the economy consists of LM and IS equations as follows:

$$M/P = m(Y, I, Q, e^{md}) \quad (1)$$

$$Q = q(Y, I^*, e^{sb}) \quad (2)$$

Where M is money stock, P is the price level, Y is real output, which is the same as real income in the equilibrium, I is the nominal interest rate, Q is real exchange rate (defined as $S.P^*/P$), S is the nominal exchange rate in naira/US\$, the asterisk (*) denotes foreign (the world) variable, e^{md} is a shock to money demand, and e^{sb} denotes a shock to spending balance. Equation (1) is the money demand, in which it is generally accepted that money

demand is affected by real output positively ($m_Y > 0$) and by nominal domestic interest rate negatively ($m_i < 0$). Moreover, a real depreciation in domestic currency (an increase in Q) would lead to a decrease in the real money holding ($m_Q < 0$). It is also asserted that M/P fluctuations are driven by exogenous shocks to money demand.

Equation (2) is the IS function expressed in terms of the real exchange rate. Output and the real exchange rate could be related in a positive or negative manner (Siregar & Ward, 2000). The direction of this relationship depends on sources of changes in output. An increase in Y could, for example, originate from an increase in investment or from an increase in net exports. Through the former the increased investment leads to a rise in interest rates, which would be followed by an exchange rate appreciation, implying that $q_Y < 0$. Through the latter the increase in net exports would have required the real exchange rate to depreciate, implying that $q_Y > 0$. Furthermore, an increase in the world interest rate reduces investment, leading to an excess supply of the domestic currency (naira), hence causing the real exchange rate to depreciate, i.e., $q_i^* > 0$. Finally, Q is also assumed to be driven by general shocks to spending balance (e^{sb}). These shocks may include unanticipated fiscal policies, which, if contractionary, would lead to real exchange rate depreciation.

The Mundell-Fleming model is significant to this study because of how it explains the behaviour of the exchange rate. In Nigeria, the value of the Naira has fluctuated a great deal over the years. Understanding why exchange rate fluctuates and how the fluctuations affect manufacturing sector performance would help the authorities in their efforts to stabilize the exchange rate.

The Clark Model of Exchange Rate Volatility

The Clark Model of exchange rate volatility was developed by Clark in 1973. The model shows an inverse relationship between exchange rate volatility and trade flows. According to Clark (1973), the uncertainty associated with exchange rate volatility would adversely affect profit, output and hence exports of the manufacturing sector. The simplest case described by Clark (1973), for example, considers a competitive firm with no market power producing only one commodity which is sold entirely to one foreign market and does not import any intermediate inputs. The firm is paid in foreign currency and converts the proceeds of its exports at the current exchange rate, which varies in an unpredictable fashion, as there are assumed to be no hedging possibilities, such as forward sales of the foreign currency export sales. Moreover, because of costs in adjusting the scale of production, the firm makes its production decision in advance of the realization of the exchange rate and therefore cannot alter its output in response to favorable or unfavorable shifts in the profitability of its exports arising from movements in the exchange rate. In this situation, the variability in the firm's profits arises from the exchange rate, and where managers of the firm are adversely affected by the risk, greater volatility in the exchange rate with no change in its average level leads to a reduction in output, and hence in exports in order to reduce the exposure to risk. This conclusion rests on the simplifying assumption that there are no hedging possibilities either through foreign exchange market or through off setting transactions. For advanced

economies where their well-developed forward exchange markets, specific transactions can be easily hedged, thus reducing exposure to unforeseen movements in exchange rates. However, there is need to recognize that such markets do not exist for the currencies of most developing countries (Clark, Tamirisa & Wei, 2004).

This theory is relevant to this study because, it emphasizes the importance of exchange rate considerations in the decision making of firms. That is, the decision to produce or not depends to a large extent on the stability of the exchange rate. A stable exchange rate reduces the risks level and builds investors' confidence in investing in the manufacturing sector. Therefore, the manufacturing sector export is greatly influenced by the stability of the exchange rate as espoused by the Clark model of exchange rate.

Empirical Review

Akinlo and Adejumo (2014) investigated the impact of exchange rate volatility on non-oil exports in Nigeria. The authors employed the Error Correction model and quarterly data from 1986(1) to 2008(4). Finding from the study revealed that exchange rate volatility has positive and significant effects on non-oil exports in the long run while the short run impact of the exchange rate volatility is not significant.

Rasaki and Oyedepo (2023) assessed the symmetric and asymmetric effects of exchange rate volatility on trade flows in Nigeria. The study employs quarterly data and covers the period 1995q1 to 2020q4. The data were sourced from International Financial Statistics (IFS) and Central Bank of Nigeria (CBN) websites. The study employed both linear ARDL and non-linear ARDL (NARDL) models to evaluate the symmetric and asymmetric effects of exchange rate volatility. The findings of the study revealed that exchange rate volatility has only significant short-run effect on export while it has both short-run and long run effects on the imports. The findings from the non-linear ARDL suggest that exchange rate volatility has neither short run nor long run asymmetric effects on exports. However, the non-linear ARDL model revealed short run and long run asymmetric effects of exchange rate volatility on imports. The findings show that increase in volatility reduces imports while decrease in volatility boosts imports.

Umaru, Olutope, David, Annette, Daniel, Yakubu, Amechi and Uyu (2023) examined the impact of exchange rate volatility on export in Nigeria. The study employed the ARDL-Error Correction Model and Bound Test using secondary data sourced from the Statistics Database of the Central Bank of Nigeria. The empirical finding revealed that exchange rate volatility has negative significant impact on export in Nigeria. Olufayo and Fagite (2014) investigated the impact of exchange rate volatility on the performance of Nigeria export sectors from 1980 to 2011. The study employed the GARCH (generalized autoregressive conditional heteroskedasticity and Seemingly Unrelated Regression (SUR). The results revealed a negative relationship between the volatility of exchange rate and export performance of oil and non-oil sectors. Another finding from their study was that the introduction of floating exchange rate system in Nigeria induces instability in the country

exchange rate. Their finding is consistent with previous studies that the shift from fixed exchange rate to floating exchange rate brought about uncertainty in the exchange rate.

Equally, Vo, Vo and Zhang (2019) analyzed the effect of exchange rate volatility on disaggregated manufacturing exports with evidence from an emerging country. The aim was to analyze the link between exchange rate devaluation, volatility, and manufacturing export performance. The analysis focuses on the manufacturing sector and 10 of its subsectors that were engaged in the export of goods between Vietnam and 26 key export partners during the 2000–2015 period. Potential factors that could affect this relationship, such as the global financial crisis, Vietnam's participation in the World Trade Organization, or even the export partners' geographic structures, were also accounted for in the model. The findings confirmed that a strategy that depreciates Vietnam's currency appears to enhance manufacturing exports in the short run, whereas the resulting exchange rate volatility has clear negative effects in the long run. The impact of exchange rate volatility on manufacturing subsectors was found to depend on two factors, namely, (i) the type of export and (ii) the export destination.

Aminu, Bello and Salihu (2013) investigated the impact of exchange rate volatility on export in Nigeria. The paper employed three models, viz: Ordinary Least Square (OLS); Granger causality test; and ARCH and GARCH techniques and also Augmented Dickey-Fuller technique was used in testing the presence of unit root. The results of unit root suggested that all the variables in the model are stationary at first difference, while causality test revealed that there is causation between export and exchange rate in the country, but the causation flows from exchange rate to export. Thus, exchange rate causes export. Furthermore, ARCH and GARCH results suggested that the exchange rate is volatile nevertheless export is found to be non-volatile. The study further showed that exchange rate is impacting positively on export, as shown by the regression results. The elasticity results revealed that, the demand for Nigerian products in the World market is fairly elastic. Therefore, for export to improve and foreign exchange earnings increase, the country should depreciate its currency, thereby reducing the price of its products so as to increase demand, which is changing from import-led to export-led economy.

Tampuri (2018) examined the effect of exchange rate movements on export sector performance in Ghana. The focus is on the real sector of the economy thus, Agricultural, Industrial and Services Sectors. A quantitative research design is employed. It uses data from the World Development Indicators (WDI) and the sample period spans 1984-2016. The Generalized Autoregressive Conditional Heteroskedastic (GARCH) model is employed in calculating exchange rate volatility. This was after an ARCH effect had been established among the exports. Specifically, the GARCH (1, 1) model is employed in establishing and analyzing the dynamic interactions and long-run relationships between variables. Also, the autoregressive distributed lag co-integration technique is adopted. The study finds that, exchange rate volatility impacts negatively on export performance.

Oluyemi and Essi (2017) investigated the effect of exchange rates on imports and exports in Nigeria using monthly data from 1996 - 2015. A three variable vector auto regression (VAR) consisting of imports, exports and exchange rates (US dollar to Naira) is considered to examine the effect of exchange rate on imports and exports in Nigeria. Augmented Dickey Fuller (ADF) test is used to test the stationarity of each of the variables. The VAR result shows that exchange rates have a positive and insignificant effect on imports while it has a negative and insignificant effect on exports at lag 1 but positive and insignificant effect at lag 2. Exports were also found to affect exchange rates negatively while imports affect exchange rates positively. The above result thus shows that exchange rate in Nigeria is not affected by the activities of imports and exports. Neither does an exchange rate affect the volume of imports and exports in Nigeria. Contrary to economic theory that a fall in the exchange rate will cause imports to fall, imports in Nigeria have been on the increase irrespective of the exchange rates. The result of the impulse response function shows that exchange rates responded positively to imports and negatively to exports.

Duru, Eze, Saleh, Uzeouchina, Ebenyi and Chukwuka (2022) investigated the impact of exchange rate volatility on exports in Nigeria utilizing data from 2005Q1 to 2020Q4. The ARCH model and its extensions of GARCH, TARCH and EGARCH models and nominal effective exchange rate were employed to measure exchange rate volatility. The Autoregressive Distributed Lag Bounds test methodology was used to examine the short-run and long-run effects of exchange rate volatility on exports. The findings validated the presence of exchange rate volatility. In addition, the results revealed that exchange rate volatility had a negative and insignificant impact on exports.

Methodology

Research design

Based on the nature of this study, and the variables involved, this study however, employed the causal research design also called the explanatory research design.

Sources of Data

The type of data used in this study was secondary data ranging from 1980 to 2021, sourced from CBN Statistical Bulletin of various years, National Bureau of Statistics (NBS) and the World Development Indicators (WDI).

Techniques of Data Analysis

The Autoregressive Distributive Lag (ARDL) model will be used for the statistical validation of the relationship between dependent variable and independent variables.

Model Specification

To achieve the objectives of this study, the model of Ayobami (2019) was adapted for this study with modifications. The model of Ayobami (2019) which expressed manufacturing output as a function of exchange rate, exchange rate volatility, interest rate, inflation, import and gross capital formation will be modified by first dropping exchange rate variable from

the model. This is because, using exchange rate and exchange rate volatility which is derived from exchange rate in the same model is most likely to lead to the problem of multicollinearity. Further, the study will incorporate government funding of manufacturing sector in the model to account for the several interventions made by the government in the time past to boost manufacturing sector export. Therefore, the mathematical/functional forms of the models for this study are stated as;

$$MANexp = f(EXRV, GFMS, INTR, IMP) \text{-----} (1)$$

Where

- MANexp = manufacturing sector exports
- EXRV = exchange rate volatility
- GFMS = government funding of manufacturing sector
- INTR = interest rate
- IMP = manufacturing import

The stochastic or econometric specifications of equation (1), is expressed as;

$$MANexp_t = \beta_0 + \beta_1 EXRV_t + \beta_2 GFMS_t + \beta_3 INTR_t + \beta_4 IMP_t + \varepsilon_t \text{-----} (2)$$

It is expected on a priori that $\beta_1 < 0$; $\beta_3 < 0$ and $\beta_4 < 0$ while $\beta_2 > 0$. This shows that increase in exchange rate volatility, interest rate and import is expected to have negative impact on manufacturing sector export in Nigeria, assume all things remain equal.

ARDL Model Specification

In order to obtain the long-run and short-run estimates of manufacturing sector export models, the study re-specifies equations 1, 2, and 3 to dynamic Autoregressive Distributed Lag (ARDL) model of Pesaran, Shin and Smith (2001) as shown in equations 3;

$$\begin{aligned} \Delta MANexp_t = & \beta_0 + \beta_1 MANexp_{t-1} + \beta_2 EXRV_{t-1} + \beta_3 GFMS_{t-1} + \beta_4 INTR_{t-1} + \beta_5 IMP_{t-1} \\ & + \sum \beta_6 \Delta MANexp_{t-1} + \sum_{i=0}^q \beta_7 \Delta EXRV_{t-1} + \sum_{i=0}^q \beta_8 \Delta GFMS_{t-1} + \sum_{i=0}^q \beta_9 \Delta INTR_{t-1} \\ & + \sum_{i=0}^q \alpha_{10} \Delta IMP_{t-1} + \lambda ECM_{t-1} + \varepsilon_t \text{-----} (3) \end{aligned}$$

Results and Discussion

Descriptive Statistics and Correlation Matrix

The summary of the descriptive statistics and Correlation Matrix of the variables employed in the study is presented in Table 1.

Table 1: Descriptive Statistics and Correlation Matrix

	MANexp	EXRV	GFMS	INTR	IMP
Panel A: Descriptive Statistics					
Mean	13.81920	3.645559	4.130820	-3.225021	13.50855
Median	14.44035	4.731362	5.302608	1.461006	14.12166
Maximum	16.80676	5.971262	7.005299	2.900322	16.99995
Minimum	8.922992	-0.451143	-0.415515	-65.85715	8.696778
Std. Dev.	2.701910	1.978333	2.380891	11.99658	2.709773
Skewness	-0.614932	-0.811341	-0.645777	-3.937500	-0.486638
Kurtosis	1.943469	2.441680	1.803557	19.90346	1.860804
Jarque-Bera	4.490908	5.030728	5.295131	594.0601	3.835267
Probability	0.105879	0.080833	0.070823	0.000000	0.146954

Panel B: Correlation Matrix

MANexp	0.3024	0.8366	1	0.9674	0.9586	0.3804	0.9913
EXRV	0.2856	0.7800	0.9674	1	0.9233	0.4323	0.9605
GFMS	0.2498	0.7621	0.9586	0.9233	1	0.3346	.9643
INTR	0.03700	0.3813	0.3804	0.4323	0.3346	1	0.3589
IMP	0.3795	0.8183	0.9913	0.9605	.9643	0.3589	1

Source: Author's Computation Using EViews 10.

The descriptive results revealed that except for interest rate, the standard deviation scores of the other variables were relatively minimum indicating less variations in the data spread. The result also showed that all the variables except manufacturing output with the skewness value of 0.652759 were negatively skewed. This implies that all the variables except manufacturing output were not normally distributed. More so, the values of the Kurtosis showed that all the variables except interest rate (INTR) that had 19.90346 were platykurtic, with kurtosis value less than 3. This indicated also a non-normal distribution of the series. Similarly, the p-values of the Jarque Bera statistics clearly showed that all the variables except INTR had a normal distribution. This is expected given the small variances in the variables.

None normal distribution of the series as revealed by the results of the descriptive statistics in this study was due to the fact that the study used high frequency series that has high velocity; high frequency data are usually not normally distributed due to volatility issues that are inherent with shocks variables. The non-normality of the data is however not a problem for this study given the non-usage of Ordinary Least Square (OLS). It can be deduced also from Table 1 that there was no evidence of multicollinearity among the variables used in our model. This is because there were no strongly correlated variables in the model.

Pre-Estimation Tests

This section provides the pre-tests results such as unit root and cointegration tests to examine the statistical properties (stationarity and linear combination) of the variables being examined.

Unit Root Tests

Table 2: Results of Zivot Andrews (ZA) Unit Root Test with Structural Breaks

Variable	<i>ZA Test @ level</i>		<i>ZA Test @ first difference</i>	
	<i>ZA Statistic</i>	<i>Break Point</i>	<i>ZA Statistic</i>	<i>Break Point</i>
<i>MANexp</i>	-2.1342 (2)	2001	-4.9823 (2)**	1998
<i>EXRV</i>	-2.1758 (2)	2005	-5.2745 (2)**	2005
<i>GFMS</i>	-6.1252 (2)**	2004	-7.4864 (2)**	2002
<i>INTR</i>	-11.0997 (2)**	2005	-6.8850 (2)**	1996
<i>IMP</i>	-3.2403 (2)	1993	-6.4099 (2)**	1998
Sig. Level	Crit. Values			
1%			-5.34	
5%			-4.93	
10%			-4.58	

*Note: Values in parenthesis are the lag length of variables, ** denote rejection of null hypothesis 5% level. Reject the null hypotheses of unit root when the test statistics is greater than the critical value in absolute terms.*

In order to avoid spurious results from the estimations, stationary properties of the series used in this study were subjected to test using Zivot Andrews's unit root test approach. The Zivot-Andrews unit root result revealed that all the variables except GFMS and INTR were less than the corresponding critical value of -5.34 and -4.93 (that is at 1% and 5% level of significance). Hence, we do not reject the null hypotheses of unit root at level for those variables. However, after taking the first difference, the test statistics of the ZA unit root test became greater than the corresponding critical value at 5% level of significance in absolute terms for all the variables. Hence, we reject the null hypotheses of unit root at first difference, and conclude that the series were stationary at first difference. The mixed order of integration of the variables further justified the choice of the ARDL technique in estimating the relationships. The structural breaks were identified based on minimum t-statistics where the structural break date for GFMS was identified in 2002. The date for INTR was identified in 1996. The structural break date for IMP was identified in 1998. The period 1998 was identified as the structural break date for MANexp. The date for EXRV was identified in 2005 which coincides or mark the period when the value of naira currency was on free fall as a result of pegging and further deregulation.

Bounds Cointegration Test

Table 3: Cointegration Test using ARDL Bounds Test

ARDL Bounds Test (F-STATISTICS)		
Estimated Model	F-statistic	Conclusion
MAN_{exp}	16.02719**	Cointegrated
Critical Values	Lower Bound	Upper Bound
10%	2.20	3.09
5%	5.56	3.49
1%	3.29	4.37

Source: Author's Computation Using EViews 10.

Note: $I(0)$ and $I(1)$ denote lower and upper bounds of the ARDL bounds test respectively. ** & *** shows statistical significance at 5% level & 10% level, respectively.

The table 4 indicates the outcome of the bound's co-integration test of the ARDL approach. Therefore, because F-statistic (16.02719) exceeds the critical values of the upper bounds of 3.49 at significance level. Hence, we reject the null hypothesis of no cointegration and conclude that there exists cointegration or long-run relationship among the variables.

Model Estimation

Since the variables are co-integrated, the model estimation result provides both long-run and short-run estimates. Table 4 shows the outcome of the short-run and long run form of the ARDL.

ARDL Short-Run and Long-Run Estimates

Table 4: Results of the Short-run and Long ARDL Estimates (Manufacturing Sector Export model)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Long Run Equation				
EXRV	0.328231	0.170829	1.921403	0.0484
GFMS	0.272924	0.106075	2.572924	0.0177
INTR	-0.010786	0.006156	-1.752069	0.0944
IMP	0.549517	0.123482	4.450188	0.0002
C	-0.018985	0.045206	-0.419961	0.6788
Short Run Equation				
D(EXRV)	-0.017777	0.110668	-0.160629	0.8739
D(EXRV(-1))	-0.375073	0.142102	-2.639466	0.0153
D(EXRV(-2))	-0.609462	0.135169	-4.508894	0.0002
D(EXRV(-3))	-0.546242	0.125350	-4.357745	0.0003
D(GFMS)	0.207361	0.060916	3.404058	0.0027
D(GFMS(-1))	-0.218259	0.071870	-3.036880	0.0063
ECM(-1)	-0.703353	0.156107	-4.505583	0.0002
Adjusted R ²	0.883908			

Diagnostics	Statistic	p-value
Heteroscedasticity (ARCH Test)	0.419004	0.9508
Autocorrelation (Breusch-Godfrey LM test)	0.882652	0.4300
Normality Test	1.388139	0.4995
Stability (CUSUM)	Stable	
Stability (CUSUMSQ)	Stable	

Note: ***, ** and * indicate significance at the 1%, 5% and 10% levels respectively.

The results from table 4 showed that EXRV, GFMS and IMP have positive and statistically significant impact on manufacturing sector exports in Nigeria in the long-run. A 1 percent increase in EXRV, GFMS and IMP led to increases in manufacturing sector exports by 0.3282%, 0.2729% and 0.5495% respectively. All the three variables have p-values less than 0.1 (10%) level of significance, suggesting that they are at least statistically significant at 10% level. On the other hand, the result showed that INTR had a negative and statistically significant impact on the manufacturing sector export in Nigeria during the period under study. A 1 percent increase in INTR led to decrease in manufacturing sector exports by 0.0108% in the long-run. The negative impact of interest rate suggests that, high interest rates can discourage businesses from making long-term investments in expanding their manufacturing capabilities. If manufacturers are hesitant to invest in new equipment, technology, or facilities due to higher borrowing costs, it may limit their ability to meet the demand for exports and potentially lead to lower export volumes.

Patterning to the short-run impact, the results of the ARDL in Table 4 reported the estimates for only EXRV and GFMS implying that the estimates of the other variables are so insignificant to be captured. Evidently, the results showed that EXRV in the current period and across lags 1-3 have negative impact on manufacturing sector exports in the short-run. However, the impact became statistically significant from lag 1-3. Focusing on lag one of EXRV, the results revealed that a 1 percent increase in exchange rate volatility led to a decrease in manufacturing sector exports by 0.3750%. Similarly, the results showed that lag one of GFMS had a negative and statistically significant impact on manufacturing sector exports in the short-run. A 1 percent increase in GFMS led to a decrease in manufacturing sector exports by 0.2183%.

The adjusted R² value of 0.883908 implied that, about 88.39% of the variations or changes in the manufacturing sector exports in Nigeria were explained by the independent variables. Furthermore, the Error Correction Model (-ECM (-1)) which indicates the speed of adjustment to the equilibrium in the event of disequilibrium was -0.703353 and negative and statistically significant as required. The implication of this finding is that in the event of disequilibrium, the short run disequilibrium will have a fast speed of adjustment (70%) back to equilibrium.

Diagnostic Tests

Table 5: Results of the Diagnostic Tests

Diagnostic Test	Statistic	p-value		
Heteroscedasticity (ARCH Test)	0.419004	0.9508		
Autocorrelation (Breusch-Godfrey LM test)	0.882652	0.4300		
Normality Test	1.388139	0.4995		
Stability (CUSUM)	Stable			
Stability (CUSUMSQ)	Stable			
Stability (CUSUM)	Stable			
Stability (CUSUMSQ)	Stable			

The results of the several diagnostic tests to evaluate the accuracy and dependability of the estimates showed that the model was free from heteroscedasticity since the p-values of the F-statistics was greater than 0.05. the result also shows that the model was free from the problem of serial correlation or autocorrelation since the p-values of the F-statistic is greater than 0.05. The residuals of the model were normally distributed since the p-values of the test statistic (Jaque-Bera test) was greater than 0.05. Regarding the stability of the estimates, the plots of cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMQ) for the model showed that the estimate was stable (See Figures 1 and 2). This is confirmed if the blue line falls within the 5% confidence interval shown by the red lines.

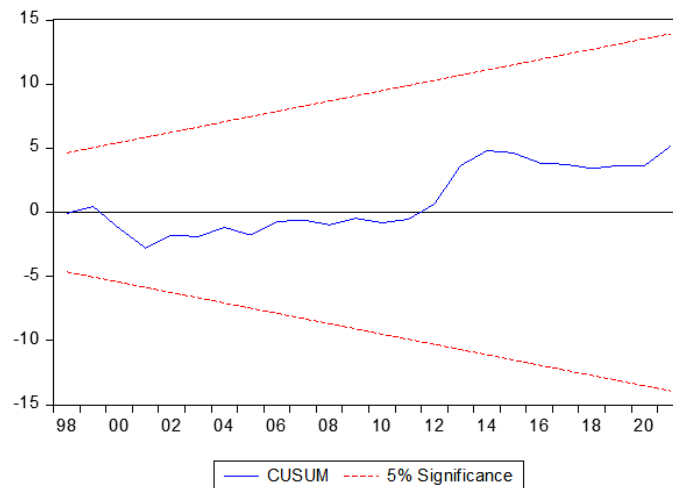


Figure 1: cumulative sum of recursive residuals (CUSUM)

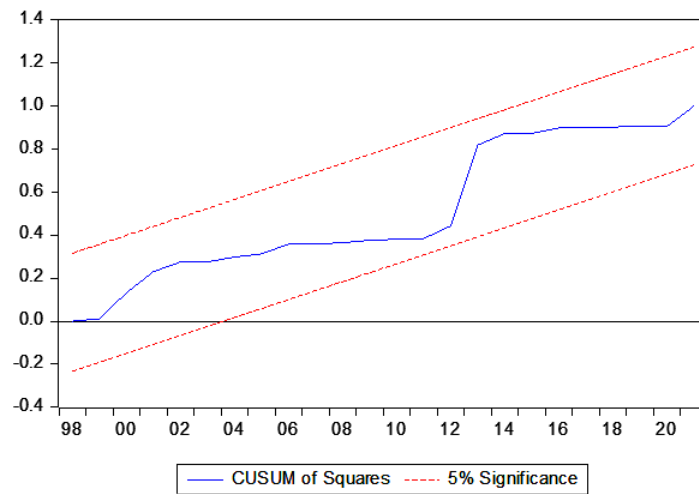
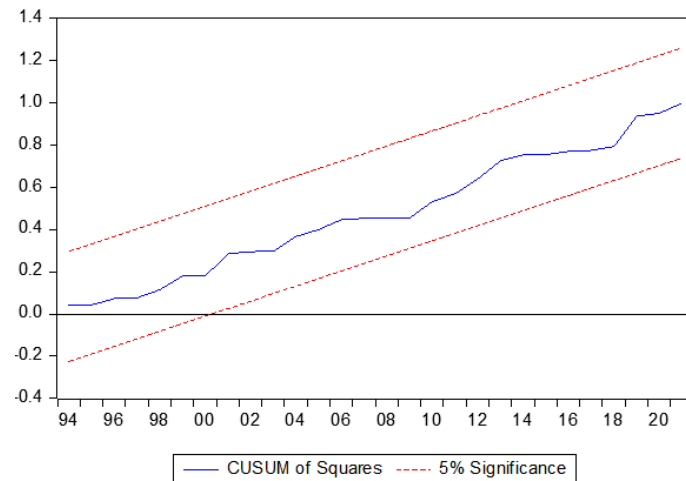


Figure 2: cumulative sum of squares of recursive residuals (CUSUMQ)



The results of the several diagnostic tests to evaluate the accuracy and dependability of the estimates showed the following: (i) the three models were free from heteroscedasticity since the p-values of their F-statistics were greater than 0.05. (ii) The three models were free from the problem of serial correlation or autocorrelation since the p-values of their F-statistics are greater than 0.05. (iii) The residuals of the three models were normally distributed since the p-values of their test statistic (Jaque-Bera test) were greater than 0.05. (iv) Regarding the stability of the estimates, the plots of cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMQ) for the model showed that the estimates was stable (See Figures 20 and 21). This is confirmed if the blue line falls within the 5% confidence interval shown by the red lines.

Discussions of Findings

The objective of the study was to investigate the impact of exchange rate volatility on manufacturing sector export. It was found that exchange rate volatility had positively and

significant impact on manufacturing sector exports in Nigeria in the long-run. The finding conformed with theoretical expectations and agreed with the findings of Ndidi (2019), Ishimwe et al (2015), Vo et al (2019), Tampuri (2018), Olufemi and Essi (2017) and Duru et al (2012) which all showed that exchange rate volatility significantly impacts manufacturing sector exports.

This result conformed to conventional wisdom which suggests that exchange rate devaluations are typically a development strategy. Given the traded environment of the manufacturing industry, a depreciation of a currency is usually seen as a solution that remedies the poor performance of the manufacturing sector through an increase in exports. This may not be the case (as revealed by this study) if the ripple effects (imported inflation and many other problems that may come along with a weak currency) of an exchange rate depreciation are greater than the direct effects (increase in exports). For example, depreciation can cause inflation which may increase the prices of goods and services. This may hurt the manufacturing sector on the domestic market. Exchange rate volatility can influence the cost of production for manufacturers, especially those relying on imported raw materials and components. If the local currency depreciates, the cost of imported inputs increases, leading to higher production costs. This, in turn, can reduce the competitiveness of Nigerian exports in the global market. Also, exchange rate volatility introduces uncertainty for exporters, making it challenging for them to plan and forecast effectively. This uncertainty can affect strategic decision-making, including investment in export capacity and market expansion efforts. Exporters face currency risk when dealing with international transactions. Exchange rate fluctuations can lead to payment and financing risks, especially if contracts are denominated in foreign currencies. Unfavorable exchange rate movements may result in financial losses for exporters. Further, exchange rate volatility can impact the overall demand for Nigerian exports. If the local currency depreciates significantly, it may lead to reduced demand for exports as foreign buyers seek more competitively priced goods from other countries. Government responses to exchange rate volatility, such as monetary policies and interventions, can influence the competitiveness of exports. For example, if the government implements measures to stabilize the currency, it may positively impact exporters by reducing volatility.

Conclusion

The study investigated the impact of exchange rate volatility on manufacturing export, covering the period 1981 to 2021. The exchange rate volatility series was derived using the EGARCH approach. The unit root properties of the variables were tested using the Zivot-Andrews test for stationarity. Two tests of cointegration were applied: the ARDL bounds cointegration test and the Bayer-Hanck cointegration test, and both tests confirmed cointegration among the model variables. Further, the study applied the ADRL model to investigate the long-run and short-run impact of exchange rate on manufacturing sector performance. It was discovered that exchange rate volatility had significant positive impact on manufacturing sector exports in Nigeria in the long-run. This finding suggest that exchange rate volatility can affect the cost structure of exports. A depreciating local currency

makes Nigerian exports more cost-competitive in international markets, potentially leading to increased demand for manufactured goods. Based on the findings of this study, it was concluded that exchange rate volatility had significant impact on manufacturing sector export in Nigeria.

Recommendations

Based on the findings, the study made the following recommendations:

1. The study recommended that the government and policy makers should evolve policies that stabilize the naira. For instance, a situation where there exist multiple windows of exchange rate is not helpful.
2. The arbitrage between the parallel markets and the official markets should be reduced if not totally removed.
3. More so, manufacturers that rely heavily on imported raw materials that cannot be easily sourced locally should be made to access the exchange rate at the official rate with ease. This will go a long way in increasing manufacturing sector output for export.
4. Also, there should be increase in strategic marketing and branding of manufacturing sector products to enhance the visibility and reputation of Nigerian exports. This is because a strong brand can make products more resilient to market fluctuations and support consistent demand.

Reference

- Adebayo, R. I. (2010). Zakat and poverty alleviation: A lesson for the fiscal policy makers in Nigeria, *Journal of Islamic Economics, Banking and Finance*, 7(4), 26-41.
- Agubata, S., & Odubuasi, A. C. (2018). Effect of exchange rate fluctuations on the financial performance of Nigerian manufacturing firms: Evidence from food, beverage and tobacco sector, *International Journal of Commerce and Management Research*, 4 (4), 56-61
- Ajayi, O. D. (2011). The collapse of Nigerian's manufacturing sector, *The Voice News Magazine*, Retrieved June 15, 2019 from <http://www.thevoicenewsmagazine.com>.
- Akinlo, E. A. & Adejumo, V. A. (2014). Exchange rate volatility and non-oil exports in Nigeria: 1986-2008, *International Business and Management*, 9(2), 70 – 79.

- Aliyu, S. R. U. (2011). Impact of oil price shock and exchange rate volatility on economic growth in Nigeria: an empirical investigation, *Research Journal of International Studies*, 11(3), 103
- Aminu, U., Bello, M. S. & Salihu, M. (2013). An empirical analysis of exchange rate volatility on export trade in a developing economy, *Journal of Emerging Trends in Economics and Management Sciences*, 4 (1), 42-53
- Ayobami, O.T. (2019). Exchange rate volatility and the performance of manufacturing sector in Nigeria (1981–2016), *African Journal of Economic Review*, 7(2), 27-41.
- Azeez, B. A., Kolapo, K. T. & Ajayi, L. B. (2012). Effect of exchange rate volatility on macro-economic performance in Nigeria, *Interdisciplinary Journal of Contemporary Research in Business*, 4(1), 149-155.
- Campbell, O. A. (2010). Foreign exchange market and monetary management in Nigeria, *Journal of Emerging Trends in Economics and Management Sciences*, 1(2), 102-106.
- Charles, A. N. B. (2012). Investigating the performance of monetary policy on the manufacturing sector in Nigeria, *Arabian Journal of Business and Management Review*, 2(1), 12-25.
- Dickson, D. A. (2010). The recent trends and patterns in Nigeria's industrial development, *Development of Social Science Research in Africa*, 32(2), 139-155
- Duru, I. U., Eze, M. A., Saleh, A.S., Uzochina, B. I., Ebenyi, G. O. & Chukwuka, E. (2022). Exchange rate volatility and exports: The Nigerian Scenario, *Asian Journal of Empirical Research*, 12(1), 11-28.
- Eduardo, L. Y. & Sturzenegger, F. (2003). To float or to fix: Evidence on the impact of exchange rate regimes on growth, *American Economic Review*, 93(4), 1-49.
- Fahrettin, Y. (2001). Choice of exchange rate regimes and developing countries, *Africa Region Working Paper Series No. 16*, 1-36.
- Gbosi, A. N. (2019). *Managing the Naira (2nd edition)*, Port Harcourt: Sofiata Publishers.
- George-Anokwuru, C. C. Obayori, J. B. & Oriji, C. E. (2018). Exchange rate and manufacturing Sector Output in Nigeria, *International Journal of Education and Social Science Research*, 1(6), 116-126.
- Hassan, V. (2002). Exchange rate volatility in Turkey and its effect on trade flows, *Journal of Economic and Social Research* 4(1)

- Ishimwe, A. & Ngalawa, H. (2015). Exchange rate volatility and manufacturing exports in South Africa, *Banks and Bank Systems*, 10(3), 29-38.
- Jongbo, O. C. (2014). The impact of real exchange rate fluctuation on industrial output in Nigeria, *Journal of Policy and Development Studies*, 9(1), 268-278.
- Loto, M. A. (2012). Global economic downturn and the manufacturing sector performance in the Nigerian economy. *Journal of Emerging Trends in Economics and Management Sciences (JETEMS)*, 3(1), 38-45.
- Mbelede, C. (2012). *Cost engineering in the manufacturing sector of the economy of Nigeria*, Paper presented at the 3rd Annual Technical Conference of Institute of Appraisers and Cost Engineering, Abuja, Nigeria.
- Mordi, M. C. (2006). The challenges of exchange rate volatility in economic management in Nigeria, *CBN Bulletin*, 30(3), 17-25
- Oladipupo, A. O. & Ogheneov, O. F. (2011). Impact of exchange rate on balance of payment in Nigeria, *African Research Review*, 5(4), 73-88.
- Olufayo, M. B. & Fagite, B. A. (2014). Exchange rate volatility and sectoral export of Nigeria: Case of oil and non-oil sectors, *Journal of Economics and Sustainable Development*, 5(10), 66-75
- Oluyemi, O. & Essi, D. I. (2017). The effect of exchange rate on imports and exports in Nigeria from January 1996 to June 2015, *IIARD International Journal of Economics and Business Management*, 3(2), 66-77.
- Rasaki, M. G. & Oyedepo, E. O. (2023). Asymmetric effects of exchange rate volatility on trade flows in Nigeria. *Journal of Enterprise and Development (JED)*, 5(3), 398-413
- Siregar, H., & Ward, D. B, (2000). *Can monetary policy shocks stabilize Indonesian macroeconomy fluctuations?* Paper presented at the 25th Annual Conference of the Federation of ASEAN Economist Associations in Singapore on 7 – 8 September 2000.
- Stancik, J., (2007). Determinants of exchange rate volatility: The case of the New EU members, *Czech Journal of Economics and Finance*, 57(9), 414-432.
- Tampuri, W. (2018). *Exchange rate volatility and export performance: Evidence from the Ghanaian export sectors*, Unpublished Thesis Submitted to The University of Ghana

- Umaru, M., Olutope, O. O., David, W. N., Annette, O. E., Daniel, O. M., Yakubu, M., Amechi, H. I. & Uyu, E. I. (2023). Impact of exchange rate volatility on export in Nigeria: 2008 – 2021, *Economics*, 12(1), 1-14
- Umaru M., Olutope, O. O., David, W. N., Annette, O. E., Daniel, O. M., Yakubu, M., Amechi, H. I. & Uyu, E. I. (2023). Impact of Exchange Rate Volatility on Export in Nigeria: 2008 – 2021. *Economics*, 12(1), 1-14
- Vo, D. H., Vo, A. T., & Zhang, Z. (2019). Exchange rate volatility and disaggregate manufacturing exports: evidence from emerging country, *Journal of Risk Financial Management*, 12(12), 1-25



EFFECTS OF FUEL PRICES ON ECONOMIC ACTIVITY: EVIDENCE FROM NIGERIA

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Abstract

The study examined how fuel prices affected Nigerian economic activity from 1990 to 2023. The variables that impacted Nigeria's economic growth owing to pricing were estimated; using the t-test and the ordinary least square method. The investigation produced some fascinating results. If the p-value of the fuel price is less than 0.05, the null hypothesis is rejected and established that fuel price has a significant effect on all the variables except the exchange rate. The value of the correlation coefficient is 0.263, and it turns out that whenever fuel prices increase by 1%, gross domestic product (GDP) increases by 0.263% in Nigeria. Each time the level of fuel price increases by 1%, the inflation rate increases by 0.227% in Nigeria. When fuel prices increased by 1%, and per capita Income decreased by 0.579% in Nigeria. Consequential policy actions to improve energy efficiency and boost the availability of affordable and cleaner energy sources could help mitigate the inflationary impact of higher fuel prices. Policy decisions aiming at raising fuel prices, particularly in channeling subsidy funds to infrastructural and developmental projects, should also factor in the knock-on influence on inflation, which has significant distributional effects.

Keywords: *Fuel prices, Economic growth, inflation, Economic activity.*

Background to the study

Petrol has become an essential component of our everyday existence, and one cannot imagine living without it. But fuel prices are soaring, which eventually impacts everything we use daily. These educated people will surely become immobile as impoverished folks are already struggling to make ends meet. The cost of fuel has increased threefold in only one year and is still rising. It's only putting more fuel on the fire. The cost of daily necessities that are frequently transported is impacted by the rising cost of fuel. Price hikes will have a big effect because food accounts for more than half of the income of impoverished households,

whereas fuel makes up only 10% of their income. It's a chain reaction, once set off; it will affect everyone. Petrol price increases drive up transportation costs, which in turn drive up product prices, making consumers loosen their purse strings even more, and so on. The ups and downs drive more individuals into poverty and leave those who are already impoverished in a pitiful situation. There's little doubt that this has worried regular people who are having a hard time making ends meet. In contrast to the higher-paid salaried class, price hikes have only affected middle-class families on fixed or low incomes. The current middle class is squeezed, and many of those trying to reach the middle-class standard find it stubbornly out of reach. The wealthy and politically corrupt are unconcerned about it. The business class will transfer the burden so that they too can be safe. When doing business, ordinary people should transfer the burden onto their customers and create a chain reaction. Government employees will also demand an increase in minimum wage, consequently leading to a rise in inflation rate.

Nigeria began producing crude oil in 1956. Based on estimated daily production of 1.5 million barrels per day, it ranked seventh globally in 2023 (OPEC, 2023 and statista, 2023). Nigeria surpassed Angola, Libya, and Algeria to become the continent's top producer of crude oil in May 2023. This information was taken from the most recent revenues information sheet released by the Organization of Petroleum Exporting Countries (OPEC), which also projected that the country's earnings would increase to nearly \$29 billion in the same period of 2024.

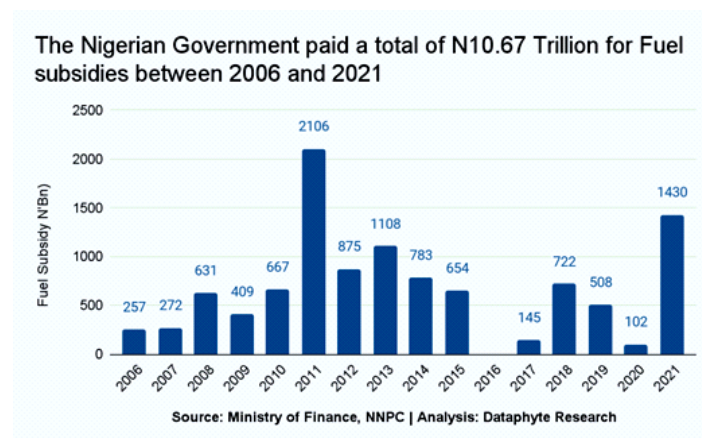
Fuel is only one of the numerous ways that Nigeria's economy has suffered over the years. After the Price Control Act was passed, making it unlawful to sell certain goods—including gasoline—for more than the set price, fuel subsidies started in the 1970s and were formally implemented in 1977. Although the idea of subsidies is admirable in and of itself, there have been numerous, significant accusations of corruption and poor management surrounding their administration in Nigeria. Kerosene subsidies were eliminated in 2016, thirteen years after diesel was deregulated; however, the Petroleum Motor Spirit (PMS) subsidies have proven to be the most difficult for Nigerian economic managers to handle. Each year, a significant amount of the country's income is allocated to the subsidy program. There are several factors contributing to the extraordinary increase in the number of subsidies—the price of crude oil on the global market, the amount of PMS consumed—which is subject to debate (Aniemeke, 2024; Aduloju, 2023).

President Ahmed Bola Tinubu's first inauguration speech on May 29, 2023, stressed the necessity of eliminating fuel subsidies immediately. This has a number of ramifications. "We commend the decision of the outgoing administration in phasing out the petrol subsidy regime which has increasingly favoured the rich more than the poor," he stated on the aforementioned day, to quote. With resources running out, subsidies can no longer be justified at their current rate of increase. Instead, we will reroute the money to support greater investments in healthcare, education, public infrastructure, and employment that will significantly enhance the lives of millions of people. With such words, Nigeria's fuel

subsidies came to an end (Olugbenga Ige, 2023; National Insight, 2023)).

To put it simply, a subsidy is when the government pays a percentage of what consumers should pay in order to ease the burden on them. In other words, the government sets the price of gasoline lower than what it would have been if it had been purchased on the open market. Nigeria first introduced subsidies in the 1970s in response to the 1973 shock to the world oil price. Oil prices spiked worldwide as a result of the shock scenario, forcing the government to impose local price caps on energy-related goods. Previous governments have raised fuel prices in stages for a variety of reasons in the past, albeit with some criticism, rather than taking the fall and going all out. Throughout his tenure, the then-head of state, Ibrahim Babangida, hiked prices from 15.3 kobo to 70 kobo in multiple tranches. This increase occurred particularly in the 1990s. It was raised from 70k to N5 by Ernest Shonekan's temporary administration on its own. However, the Sani Abacha administration first lowered the price to N3.25 before increasing it to N15 and then N20 under Abdulsalami Abubakar. Protests have mostly accompanied these increases (Addeh, 2023).

According to Dataphyte, a subsidy is a sum of money given by the government or a public entity to support a firm or industry in order to keep the price of a good or service low or competitive. Making necessities accessible to the general public is the only goal here. The International Centre for Tax and Development stated in a study brief that Nigeria first implemented subsidies in the 1970s in reaction to the 1973 oil price shock. Specifically, fuel subsidies were implemented in Nigeria in 1977 as a short-term budgetary response to a surge in oil prices that occurred during that time (the 1970s). But what was once meant to be a stopgap has continued to this day. (Amata, 2023). However, there have been numerous discussions about whether or not the government should keep providing fuel subsidies since 1999. Different levels of experts have shared their opinions on this. The World Bank, the International Monetary Fund (IMF), and other organizations have recommended that the government eliminate fuel subsidies. According to the World Bank, rich households were the main beneficiaries of fuel subsidies. Additionally, one of Dataphyte's data dives supported this. The case for eliminating gasoline subsidies has grown as a result of all the issues raised as well as the enormous sums of money that have been spent on fuel subsidies over the years. (Amata, 2023).



Subsidies could not be eliminated despite six significant attempts by six different governments between 2000 and 2022, all of which were thwarted by demonstrations and opposition

In 2020, Nigeria missed the opportunity of the crash in global oil prices to remove all oil subsidies at once			
Price	Target Price Increase	Result	Remarks
2000	From ₦20 to ₦75	Strong political resistance	7 incremental increases spanned the entire 2000 till 2007
2012	From ₦65 to ₦145	Strong political resistance (Occupy Nigeria)	The Government relaxed price back to ₦97
2016	From ₦86.5 to ₦145	Little or no political resistance	The Government succeeded because people had been worn out by long periods of fuel scarcity and long queues for fuel, wherein people were already buying at over the ₦145
2020	From ₦145 to ₦130		Reduction in petrol price was caused by a fall in the global price of crude
2021	From ₦130 to ₦167	Little or no political resistance	Rebound in global oil prices. Price far below the market import price of 233 - occasioning another subsidy regime
2022	From ₦167 to the actual market price	Perceived likely resistance to removing all petrol subsidy	The Government reverted to ₦175, and postponed the possible total fuel subsidy removal till 2023.
2024	From ₦254.06 to ₦700	Regardless of the public's level of resistance, the fuel subsidy was removed	Given the depletion of resources, subsidies can no longer be justified by their escalating costs.

Source: Revised Table; taken from Dataphyte Research, International Monetary Fund (IMF).

Data from the Nigerian National Petroleum Corporation Limited (NNPCL) and the Nigeria Extractive Industries Transparency Initiative (NEITI) show that the government spent ₦2.04 trillion on fuel subsidies between January and July 2022. Starting in 2020, there was an annual increase in the amount spent on fuel subsidies, which reached an all-time high in July 2022. However, evidence indicated that the government has consistently failed to meet its revenue objectives, making this implausible. As a result, the government's revenue in 2023, 2024, and 2025 will be 41.39 percent, 32.21 percent, and 28.91 percent, respectively, if fuel subsidies are paid in full. Therefore, even while the subsidies—if they are kept at all—would devour a significant portion of the nation's resources, they will also force the government to keep borrowing money to pay for gasoline subsidies. Remember how the Federal Government was borrowing money to pay for fuel subsidies last year? According to Ms. Zainab Ahmed, Minister of Finance, Budget, and National Planning, this was an entirely unsustainable position (Amata, 2023).

Uche Nwogwugwu, an economics professor, called fuel subsidies a hoax. He pointed out that Nigeria ought to have eliminated the fuel subsidy in 2012 when former President Goodluck Jonathan had suggested it, saying the money being spent on it could finance regional refineries. Professor Jonathan Aremu, a senior lecturer at Covenant University and a former CBN assistant director, claimed that subsidies frequently skewed the market, making it difficult for goods to realize their true value. But in the event that the next administration decides to do away with the fuel subsidies, he called on them to offer incentives that would lessen the suffering of Nigerians (editor@lifeandtimesnews.com 2022). According to the International Energy Agency, the worldwide fuel subsidy is projected to be worth more than \$1.0325 billion in 2018 for all of 2022. The reported number is far greater than the total government revenue of developing nations, particularly those in Sub-Saharan Africa, and far more than the expected value of worldwide aid, which was projected to be over \$204 billion in 2022. Due to these costs, proposals have been made to end the world's fuel subsidies so that the money saved can be used for other profitable projects in developing nations (Mouhoud and Couharde, 2020).

The main economic sectors in Nigeria are negatively impacted by low earnings that are already being used up by inflated subsidies. In order to increase local production capacity, eliminate reliance on fuel imports, and improve the trade balance, the \$20 million trade deficit that resulted from low crude oil export receipts in November 2022 necessitates the prompt removal of gasoline subsidies (Abayomi, 2023). Corruption, deceit, a lack of transparency, and improper use of public cash marred the fuel subsidies. Between January 2020 and June 2022, N3.92 trillion was set aside for fuel subsidies; this amount is more than the total federal budget for capital infrastructure, healthcare, education, agriculture, and defense combined for the 30-month period. Between 2006 and 2018, Nigeria spent over 10 trillion naira on petroleum subsidies. N5.82 trillion was consumed in 2021–2022 and N3.36 trillion was suggested for the first half of 2023. These numbers point to a substantial financial burden on the government, limiting its capacity to make investments in vital fields that could support economic expansion and improve the lives of citizens. Nigeria did not benefit from the increase in oil prices because of its poor oil production and rising fuel subsidy costs. Fuel subsidies might be eliminated, which would support economic growth and beneficial developmental changes in the macro and local economies (Mountford, 2023).

literature Review

Theoretical Framework

Many theoretical frameworks can be used to assess and comprehend the Nigerian fuel subsidy disagreement. In this paper, I will go over three frameworks that might help clarify various parts of the discussion: political, social, and economic theories

Economic Theories

a. **Market Failure:** According to this viewpoint, Nigeria's fuel subsidies may be a reaction to market failures and inefficiencies in the energy industry. The government claims that in

order to guarantee that fuel prices are reasonable for the general public, especially the impoverished, subsidies are required. Critics counter that subsidies contribute to economic distortions including smuggling and rent-seeking behavior, distorting market forces and creating inefficiencies (World Bank, 2019).

Fiscal Policy: The government may employ fuel subsidies as a means of social welfare or income redistribution. This strategy sees subsidies as a way to lessen economic disparity and poverty. Opponents of subsidies counter that they put a burden on government coffers and take funds away from other vital areas like healthcare and education.

Political Theories

a. **Populism:** Populist politics frequently have an impact on the fuel subsidy discussion in Nigeria. Subsidies are a tactic used by populist politicians to stay in power and increase their appeal. Politicians can portray themselves as champions of the people and appeal to the masses by artificially maintaining low fuel costs. But given that it can result in budgetary imbalances and economic instability, this strategy could not be long-term viable (Oyedemi, 2019).

b. **Rent-seeking:** Rent-seeking theory provides another perspective for understanding the fuel subsidy controversy. Via illegal activity and rent extraction, powerful interest groups such as fuel importers, wholesalers, and dishonest officials may profit from the subsidized regime. As a result, efforts to reform or eliminate subsidies may encounter strong opposition from these rent-seeking individuals, who have a vested interest in keeping things as they are as it enables them to collect economic rents (Transparency International, 2019).

Social Theories

a. **Social Contract:** The controversy around fuel subsidies is an example of how the people and the government interact on a social contract. The public may view subsidies as a type of entitlement or as a privilege that the state ought to grant. If subsidies are eliminated or reduced improperly, social upheaval and public discontent may result. However, proponents of subsidy reform contend that the funds saved can be used to fund social initiatives that serve a greater number of people (Adejumo et al., 2020).

a. **Poverty and Inequality:** In order to alleviate poverty and income inequality, subsidies are frequently justified. It is argued that the poor will be disproportionately affected by the removal of subsidies because they spend a higher percentage of their income on fuel. On the other hand, detractors contend that subsidies are regressive, favoring the wealthier classes of society over the intended recipients. They propose that in order to address poverty and inequality, targeted policies and alternative social safety nets might be more successful (Ogbeide, 2018).

Application of these theories can aid in the analysis and understanding of the motivations, interests, and outcomes associated with fuel subsidies in the Nigerian context. It is

noteworthy that these theoretical frameworks offer various perspectives and interpretations of the actual debate about fuel subsidies in Nigeria, which is complex and multifaceted with economic, political, and social dimensions (Akinwale, et al., 2013).

Empirical Literature

Given that oil is the primary raw resource utilized by all economies, the price of oil and the rate of inflation may positively correlate. This is due to the fact that decreased final product prices will undoubtedly follow higher oil input costs. Studies in this field show a substantial correlation between the two (Bobai, 2012), while other studies contend that the impact varies with the duration of the pricing period under study (Sek et al., 2015). The situation is significantly influenced by the nation's rate of economic growth (Taghizadeh-Hesary et al., 2016).

The post-war economic effect of energy costs, mainly the price of oil, has been the subject of frequent analyses. A number of studies have indicated that an increase in fuel prices has a significant negative impact on GDP, even while energy importers have a net positive impact (Bildirici et al., 2009). According to (Lafakis et al., 2015; Cavallo, 2008; Nusair, 2019; Lioudis, 2023, Galvin, 2023). Chou and Tseng (2011) discovered that oil prices significantly affected CPI inflation in China, India, Indonesia, Jordan, Korea, Malaysia, Pakistan, the Philippines, Singapore, Taiwan, and Turkey over the long run, even if no short-term effect was seen. Research has demonstrated that oil prices had a long-lasting impact on inflation in Europe (Cuñado and de Gracia, 2003, Ozdemir & Akgul, 2015).

Przekota (2022) asked a simple question: How do gas costs affect the growth of businesses and the economy? From 2000 to 2020, the Polish economy served as the study's foundation. Poland imports energy supplies, thus it needs to react quickly to fluctuations in the price of gasoline. For the fuel costs, maritime commerce, GDP, and inflation of the Polish economy, a VAR model was developed. The outcomes show how adaptable the Polish economy is to shifts in the marketplace. While it makes sense to function more easily when fuel prices are lower, high prices do not always signify a problem. The correlation between oil proceeds and the Nigerian economy from 1970 to 2009 was studied by Ogbonna and Ebimobwei (2012). They analyzed primary and secondary data using Pearson correlation and they explained measures and evidence using descriptive statistics. The analysis's findings demonstrate that oil money has a favorable influence on Nigeria's GDP and per capita income. But there was a negative link between the price of fuel and the pace of inflation. They recommended that in order to accomplish the long-term development of the nation, oil proceeds should be well utilized. Olomola (2006) examined the effects of shocks to the oil price on Nigeria's overall economic activity, including output, inflation, the real exchange rate, and the money supply. Using quarterly data from 1970 to 2003, the results showed that, in contrast to earlier empirical findings, oil price shocks have little impact on Nigeria's output and inflation. Shocks to the oil price, however, were found to have a major impact on the real exchange rate. According to the author, shocks to the price of oil might result in a wealth impact that would increase the value of the real exchange rate and could squeeze the tradable sector, which would lead to the Dutch Disease.

Methodology and hypotheses

The World Bank Database is the source of the data used in this study, which was gathered between 1990 and 2023. The method of analysis used in this study is econometric based. Thus, the effect of the correlation between fuel price and a number of economic variables in Nigeria, including GDP growth rate, inflation rate, per capita income, poverty index, and exchange rate are analyzed using Least Square (LS) techniques. The study hybridized on the approach of Abdulrahman (2023) that empirically investigated the impacts of fuel prices on economic activity in Sudan.

The main hypothesis is: There is a statistically significant effect of fuel prices on economic activity.

While the sub-hypotheses are:

- i. There is a statistically significant effect of fuel prices on the economic growth rate.
- ii. There is a statistically significant effect of fuel prices on the inflation rate
- iii. There is a statistically significant effect of fuel prices on the per capita income.
- iv. There is a statistically significant effect of fuel prices on poverty index.
- v. There is a statistically significant effect of fuel prices on exchange rate.

Model Specification

Four sets of equations are estimated for this purpose. The sets of equations tested for the relationship between fuel price rate and other economic variables in the Nigerian economy.

Thus, we have the following:

$$\begin{aligned} \text{GDP} &= f(\text{FPR}, \text{OPN}, \text{UNEP}, \text{DFC}) & (1) \\ \text{INFL} &= f(\text{FRP}, \text{PCY}, \text{OPN}, \text{EXR}) & (2) \\ \text{PCY} &= f(\text{FPR}, \text{INFL}, \text{UNEP}, \text{EXR}) & (3) \\ \text{PI} &= f(\text{FRP}, \text{PCY}, \text{INFL}, \text{UNEP},) & (4) \\ \text{EXR} &= f(\text{FPR}, \text{OPN}, \text{DFC}, \text{INFL}) & (5) \end{aligned}$$

Re-specifying our models empirically based on the equations above, we have:

$$\begin{aligned} \text{GDP} &= a_0 + a_1 \text{FPR} + a_2 \text{OPN} + a_3 \text{UNEP} + a_4 \text{DFC} + U_t & (6) \\ \text{INFL} &= b_0 + b_1 \text{FPR} - b_2 \text{PCY} + b_3 \text{OPN} + b_4 \text{EXR} + U_t & (7) \\ \text{PCY} &= c_0 + c_1 \text{FPR} - c_2 \text{INFL} + c_3 \text{UNEP} + c_4 \text{EXR} + U_t & (8) \\ \text{PI} &= d_0 + d_1 \text{FPR} + d_2 \text{PCY} + d_3 \text{INFL} + d_4 \text{UNEP} + U_t & (9) \\ \text{EXR} &= e_0 + e_1 \text{FPR} + e_2 \text{OPN} + e_3 \text{DFC} + e_4 \text{INFL} + U_t & (10) \end{aligned}$$

The variables in the above models are represented by the following algebraic symbols:

GDP = Gross Domestic Product
 INFL = Inflation Rate
 PCY = Per Capita Income
 PI = Poverty Index
 TRD = Trade Dispute
 UNEP = Unemployment Rate
 EXR = Exchange Rate

FPR = Fuel Price

OPN = Openness (X-M)/GDP

DFC = Domestic Fuel Consumption

Ut = Stochastic error term

a_0, b_0, c_0, d_0, e_0 , are intercepts. $a_1 - a_4, b_1 - b_4, c_1 - c_4, d_1 - d_4$, and $e_1 - e_4$, are the parameters for equations

Results and Discussion of Findings

This section focuses on the empirical analyses of specified models of the study and the interpretation of the model estimation results.

Econometric Methods

This study has six different models that seek to address the impact of specific explanatory variables on different dependent variables

	Observations	Mean	S.D.	Minimum	Maximum
Gross Domestic Product	2,352	56.25	7.25	45.57	3,520.35
Fuel Price	5,149	6.75	17.28	-68.17	70.51
GDP Growth Rate	7,221	3.82	7.91	15.45	42.72
Poverty Index	6,244	54.21	32.72	-74.57	77.63
Trade Dispute	5,716	19.57	18.53	-30.24	94.32
Per Capita Income	4,520	7.92	38.22	0.11	42.75
Openness (X-M)/GDP	4,144	5.75	7.26	-97.69	27.52
Unemployment Rate	6,832	4.76	12.36	-68.12	84.21
Exchange Rate	6,720	17.21	21.23	-5.75	57.23
Inflation Rate	5,253	25.27	5.27	18.73	97.65
Domestic Fuel Consumption	7,282	72.55	5.28	19.97	52.35

Source: Authors' estimation

The results in Table 2 show that the standard deviation values indicate that there is no significant difference between the variable values and their mean.

Table 2: Results for Correlation Matrix.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) GDP	1.000						
(2) INFL	-0.258	1.000					
(3) PI	-0.026	-0.022	1.000				
(4) TRD	0.056	0.522	-0.250	1.000			
(5) PCY	-0.027	0.238	0.168	0.152	1.000		
(6) UNEP	0.291	0.225	-0.251	0.277	-0.065	1.000	
(7) EXR	0.020	-0.352	-0.155	0.005	0.025	0.106	1.000

Source: Authors' estimation

Presentation of the Unit Root Test

Table 3: Summary of the Unit Root Test

Variables	Difference	ADF statistic	Critical Value (5%)	Order of Integration	Remark
GDP	GDP	-2.234751	-3.552973	I(o)	Non-Stationary
FPR	FPR	-2.024734	-3.552973	I(o)	Non-Stationary
	D(FPR)	-5.732953	-3.552973	I(i)	Stationary
PI	PI	-8.532475	-3.552973	I(o)	Stationary
TRD	TRD	-2.232955	-3.552973	I(o)	Non-Stationary
	D(TRD)	-7.583772	-3.552973	I(i)	Stationary
PCY	PCY	-1.935961	-3.552973	I(o)	Non-Stationary
	D(PCY)	-5.408264	-3.552973	I(i)	Stationary
UNEP	UNEP	-6.833682	-3.552973	I(o)	Stationary
INFL	INFL	-2.742855	-3.552973	I(o)	Non-Stationary
	D(INFL)	-6.242689	-3.552973	I(i)	Stationary
EXR	EXR	-5.068771	-3.552973	I(o)	Stationary
DFC	DFC	-7.152752	-3.552973	I(o)	Stationary

Source: Author's Computation from E-views

The findings indicate that while fuel price, poverty index, openness, per capita income, and inflation rate are stationary at first differencing, the gross domestic product, poverty index, unemployment rate, exchange rate, and domestic fuel consumption are stationary at level. In accordance with Harris (1995) and Gujarrati (2003) cointegration, both $I(0)$ and $I(1)$ variables could be carried forward to test for cointegration.

Table 4: Cointegration Test

Hypothesized No. of CE(s)	Eigenvalue	Likelihood Ratio	5% Critical Value	1% Critical Value
None **	0.825670	240.8627	156.00	168.36
At most 1 **	0.825721	166.2761	124.24	133.57
At most 2 **	0.798036	109.5553	94.15	103.18
At most 3 *	0.687214	70.03953	68.52	76.07
At most 4	0.452223	36.58035	47.21	54.46
At most 5	0.266766	16.72412	29.68	35.65
At most 6	0.181763	7.020252	15.41	20.04
At most 7	0.052058	0.400346	3.76	6.65

*(**) indicates four cointegrating equations at the 5% significant level.

Effect of fuel prices on economic indicators in Nigeria (1990-2023)

To examine the influence of the independent variable, namely "Fuel Prices," on various dependent variables such as rate of economic growth, inflation rate, per capita income, poverty index, and exchange rate in Nigeria during the period from 1990 to 2023, a simple regression analysis was conducted. This regression analysis involved calculating the regression equation between the independent variable (Fuel Prices) and each of the dependent variables (economic growth, inflation rate, per capita income, poverty index, and exchange rate) in Nigeria during the specified time period (1990-2023).

a) Impact of the fuel prices on the rate of economic growth in Nigeria (1990-2023):

Variable	Coefficient	Std. Err.	P-value
GDP	0.689	0.038	0.000
FPR	0.263	0.057	0.012
OPN	0.523	0.546	0.052
UNEP	-0.273	0.957	0.026
DFC	0.527	0.284	0.002
Constant	1.504	0.649	0.162
R- square			0.524970
Adjusted R squared			0.512754
Durbin-Watson stat			2.37712
Observation			34

Source: Author's Computation from E-view

The significance of the model was evident as the P- value was statistically significant at 0.012, and there was a statistically significant impact of the (Fuel Prices) level on the (gross domestic product) level at 0.01. This supports the validity of the first sub-hypothesis of the study, which states that there is a statistically significant impact of the (Fuel Prices) level on the (GDP) level. It turns out that the independent variables explain 51.27% of the changes that occur in the dependent variable, while the rest of the changes are due to other variables that were not included in the model. The value of the correlation coefficient is 0.263 and it turns out that whenever the level (Fuel Prices) increased by 1%, (GDP) increased by 0.263% in Nigeria (Table 5). In FPR-based GDP estimation in Equation 1, we added trade openness (OPEN), Unemployment Rate (INFL), and Domestic Fuel Consumption (DFC). The results show that all four variables are statistically significant in estimating the equilibrium level of the GDP.

b) Impact of the fuel prices on the rate of inflation (1990-2023)

Variable	Coefficient	Std. Err.	P-value
INFL	0.856	0.095	C
FPR	0.227	0.751	0.002
PCY	0.594	0.839	0.002
OPN	-0.227	0.372	0.006
EXR	-0.207	0.229	0.022
Constant	1.583	0.677	0.267
R- square			0.484970
Adjusted R squared			0.469540
Durbin-Watson stat			1.734512
Observation			34

Source: Author's Computation from E-view

The significance of the model was evident as the P-value was statistically significant at 0.05. There was a statistically significant impact of the (Fuel Price) level on the (inflation rate) level at 0.05. This indicates the validity of the second sub-hypothesis of the study, which states that there is a statistically significant impact of the (Fuel Price) level on the (rate of economic growth) level. It turns out that the independent variables explain 46.95% of the changes that occur in the dependent variable, while the rest of the changes are due to other variables that were not included in the model. The value of the correlation coefficient is 0.227, and it turns out that whenever the level (Fuel Price) increased by 1%, (inflation rate) increased by 0.227% in Nigeria (Table 6). In FPR-based INFL estimation in Equation 2, we added Per Capita Income (PCY), trade openness (OPN), and Exchange Rate (EXR). The results show that all four variables are statistically significant in estimating the equilibrium level of the Inflation rate.

c) Impact of the fuel prices on the per capita income in Nigeria during the period (1990-2023):

Variable	Coefficient	Std. Err.	P-value
PCY	0.789	0.465	0.000
FPR	-0.579	0.846	0.002
INFL	-0.427	0.744	0.017
UNEP	-0.552	0.382	0.008
EXR	-0.988	0.221	0.003
Constant	1.587	0.532	0.185
R- square			0.635163
Adjusted R squared			0.625920
Durbin-Watson stat			1.725721
Observation			34

Source: Author's Computation from Eview

The significance of the model was evident as the P value was statistically significant at 0.05, and there was a statistically significant impact of the (Fuel Price) level on the (Per Capita Income) level at 0.05. This indicates the validity of the third sub-hypothesis of the study, which states that there is a statistically significant impact of the (Fuel Price) level on the (Per Capita Income) level. It turns out that the independent variable explains 62.59 % of the changes that occur in the dependent variable, while the rest of the changes are due to other variables that were not included in the model. The value of the correlation coefficient is 0.579, and it turns out that whenever the level (Fuel Prices) increased by 1%, (Per Capita Income) decreased by 0.579% in Nigeria (Table 7). In FPR-based PCY estimation in Equation 3, we added Inflation Rate (INFL), Unemployment Rate (UNEP), and Exchange Rate (EXR). The results show that all four variables are statistically significant in estimating the equilibrium level of the Per Capita Income.

d) The fuel prices and their impact on poverty index in Nigeria (1990-2023):

Variable	Coefficient	Std. Err.	P-value
PI	0.789	0.064	0.000
FPR	-0.263	0.163	0.252
PCY	0.533	0.839	0.013
INFL	0.284	0.222	0.009
UNEP	0.556	0.311	0.001
Constant	1.247	0.739	0.156
R- square			0.562753
Adjusted R squared			0.542285
Durbin-Watson stat			2.272355
Observation			34

Source: Author's Computation from Eviews

The significance of the model was evident as the F value was statistically significant at 0.05, and there was a statistically significant impact of the (Fuel Prices) level on the (Poverty Index) level at 0.05. This indicates the validity of the fifth sub-hypothesis of the study, which states that there is a statistically significant impact of the (Fuel Prices) level on the (Poverty Index) level. It turns out that the independent variable explains 54.2% of the changes that occur in the dependent variable, while the rest of the changes are due to other variables that were not included in the model. The value of the correlation coefficient is 0.263, and it turns out that whenever the level (Fuel Prices) increased by 1%, (Poverty Index) increased by 0.263% in Nigeria (Table 4.8).

e) Impact of the fuel prices on the Exchange Rate in Nigeria during the period (1990-2023):

Variable	Coefficient	Std. Err.	P-value
EXR	0.789	0.044	0.000
FPR	-0.263	0.857	0.532
OPN	0.647	0.367	0.001
DFC	-0.528	0.046	0.001
INFL	-0.293	0.086	0.005
Constant	1.247	0.575	0.186
R- square			0.395896
Adjusted R squared			0.379534
Durbin-Watson stat			1.784587
Observation			34

Source: Author's Computation from Eviews

The significance of the model was evident as the F value was statistically significant at 0.05, and there was a statistically significant impact of the (Fuel Prices) level on the (Poverty Index) level at 0.05. This indicates the validity of the fifth sub-hypothesis of the study, which states that there is a statistically significant impact of the (Fuel Prices) level on the (Poverty Index) level. It turns out that the independent variable explains 54.2% of the changes that occur in the dependent variable, while the rest of the changes are due to other variables that were not included in the model. The value of the correlation coefficient is 0.263, and it turns out that whenever the level (Fuel Prices) increased by 1%, (Poverty Index) increased by 0.263% in Nigeria (Table 4.8).

e) Impact of the fuel prices on the Exchange Rate in Nigeria during the period (1990-2023)

Variable	Coefficient	Std. Err.	P-value
EXR	0.789	0.044	0.000
FPR	-0.263	0.857	0.532
OPN	0.647	0.367	0.001
DFC	-0.528	0.046	0.001
INFL	-0.293	0.086	0.005
Constant	1.247	0.575	0.186
R- square			0.395896
Adjusted R squared			0.379534
Durbin-Watson stat			1.784587
Observation			34

Source: Author's Computation from Eviews

It turned out that the model was not significant, as the P-value was not statistically significant at 0.05. This indicates the non-validity of the fourth sub-hypothesis of the study. It was found that there was no statistically significant correlation between (Fuel Prices) and (exchange rate) at 0.05, as well as the absence of a statistically significant impact (Fuel Prices) on (exchange rate) at 0.05 in Nigeria during the period (1990-2023)

Policy Implications and Recommendations

The consequences of our findings for policy objectives are quite clear. The government ought to refrain from implementing measures that could lead to economic instability. Since fuel is a necessary energy product for homes and businesses to use in their daily economic operations, the ongoing increase in the price of petroleum products, particularly fuel, should be avoided in order to lower the level of inflationary trend, unemployment, trade disputes, poverty level, and transportation fare and food prices. Additionally, the government should allow private entities to own refineries under the present petroleum subsector deregulation program in order to decrease the reliance on imported fuel, which in turn causes imported inflation.

The price increase of petroleum goods, particularly fuel, was the cause of the rise in the cost of housing, food, transportation, and other services. In addition to having a detrimental effect on the macroeconomic variables of the country and causing widespread price hikes, the recent increase may make the severe poverty that is now raging throughout the nation much worse. Every increase in fuel prices causes tension in Nigeria because the country's workers are enraged by the numerous price hikes, which have frequently resulted in protests and strikes. However, the government has been profiting billions of naira from the export of crude oil, while Nigerians live in extreme poverty. The 2024 budget's prediction of \$77.96 per barrel indicates a steady increase in the price of crude oil globally. The fundamental social and economic infrastructure, including the water, electricity, telecommunication, roads, health care, and schools, is completely destroyed. Therefore, it is critical that the government establish an appropriate macroeconomic framework in order to fully optimize the benefits of crude oil, both internal and external, for the general welfare of Nigerians. Additionally, the agricultural subsector and other sectors should receive substantial funding. Nigeria's infrastructure should be funded by the surplus from crude oil sales, both domestically and internationally.

The policy implications are straightforward. Policy decisions aiming to increase fuel prices, notably in response to channeling subsidy funds to infrastructural and developmental project, should also factor in the knock-on effect on inflation which has important distributional implications. Concurrent policy actions to improve energy efficiency (e.g. through technological innovations), and boosting availability of affordable and cleaner energy sources, could help mitigate the inflationary impact of higher fuel prices. Further, improving labor market flexibility, strengthening monetary policy credibility as well as limiting price controls could reduce the risk of a protracted pass-through of fuel prices to inflation, and inflation expectations becoming de-anchored to the upside. The progressivity of the distributional impact reinforces calls for streamlining fuel subsidies as they benefit the richest households more than the poorest ones. Nevertheless, as the purchasing power of the poorest households also dips with fuel price increases, targeted mitigating measures could alleviate this impact. While targeting takes time and efforts to implement, it is achievable.

Conclusion

The policy implications are straightforward. Policy decisions aiming to increase fuel prices, notably in response to channeling subsidy funds to infrastructural and developmental project, should also factor in the knock-on effect on inflation which has important distributional implications. Concurrent policy actions to improve energy efficiency (e.g. through technological innovations), and boosting availability of affordable and cleaner energy sources, could help mitigate the inflationary impact of higher fuel prices. Further, improving labor market flexibility, strengthening monetary policy credibility as well as limiting price controls could reduce the risk of a protracted pass-through of fuel prices to inflation, and inflation expectations becoming de-anchored to the upside. The progressivity of the distributional impact reinforces calls for streamlining fuel subsidies as

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References

- Abayomi, O. (2023). Consequences of fuel subsidy removal on Nigeria's balance of trade, *Vanguard News Paper*.
- Abayomi, A., Adam, S. O., & Alumbugu, A. (2015). Oil exportation and economic growth in *Developing Country Studies*, 5(15), 83–92.
- Abdelsalam, M. A. M. (2023), *Oil price fluctuations and economic growth: The case of MENA countries*, *Review of Economics and Political Science*, 8 (5), 353-379. <https://doi.org/10.1108/REPS-12-2019-0162>
- Abdulkareem, A., & Abdulhakeem, K. A. (2016). Analyzing oil price macroeconomic volatility in Nigeria. *CBN Journal of Applied Statistics*, 7(1), 1–22. Central Bank of Nigeria Occasional Paper, (59).
- Abdulrahman, B. A. A., & Abdulrahman, B. M. A. (2023). Effects of fuel prices on economic activity: Evidence from Sudan, *International Journal of Advanced and Applied Sciences* 10(6), 164-179.
- Adejumo, A. V., Salau, O. P., Adeleke, O., Fakoya, M. B. & Oladeji, T. O. (2020). Fuel subsidy removal in Nigeria: An economic and political analysis. In proceedings of *the International Conference on Finance, Business and Economics* 267-277, (2019).
- Adenikinju, A. (2009). Energy pricing and subsidy reforms in Nigeria, in 'OECD Conference Centre, Paris 9-10 June 2009'.
- Adewunmi, M, Remy, H, Iyewumi, T. (2014). Impact of fuel subsidy removal on socioeconomic development in Nigeria: *An econometric Investigation*, *International Journal of Economics, Commerce and Management*, 2(12), 14-30.
- Aduloju, B. (2023). Fact check: Did Buhari's administration remove diesel subsidy as Garba Shehu claimed? <https://factcheck.thecable.ng/fact-check-did-buharis-administration-remove-diesel-subsidy-as-garba-shehu-claimed-2/>

- Akinwale, Y. O., Olaopa O. R., Ogundari, I., Siyanbola, W. O, (2013). Political economy of phasing out fuel subsidy in Nigeria, *Energy and Power*, 3 (4), 37-43. doi: 10.5923/j.ep.20130304.01
- Amata, D. (2023). *Tinubu may spend N14tn on fuel subsidies in first term*, <https://www.dataphyte.com/latest-reports/tinubu-may-spend-n14tn-on-fuel-subsidies-in-first-term/>
- Aniemeke, E. H. (2024). The microeconomic and macroeconomic implications of fuel subsidy removal in Nigeria. *International Journal of Research and Innovation in Social Science (IJRISS)*. <https://rsisinternational.org/journals/ijriss/articles/the-microeconomic-and-macroeconomic-implications-of-fuel-subsidy-removal-in-nigeria/>
- Antimiani, A., Costantini, V., & Paglialunga, E. (2023). Fossil fuels subsidy removal and the EU carbon neutrality policy, *Energy Economics*, 119, 106524.
- Aniemeke, E. H. (2024). The microeconomic and macroeconomic implications of fuel subsidy removal in Nigeria, *International Journal of Research and Innovation in Social Science (IJRISS)*
- Babatunde, S. O. (2019). Oil Price shocks, fuel subsidies and macroeconomic in stability in *CBN Journal of Applied Statistics*, 10(2), 1450-1462,
- Beblawi & Luciani, (1987). *The Rentier State*. Routledge. editor@lifeandtimesnews.com (2022). N4tn petrol subsidy will kill economy, MAN, LCCI, others warn Buhari. <https://lifeandtimesnews.com/> <https://lifeandtimesnews.com/>
- Evans, O. (2023). The socio-economics of the 2023 fuel subsidy removal in Nigeria. Published in: *BizEcons Quarterly*, 17, 12-32. Retrieved from <https://mpa.ub.uni-muenchen.de/118360/>
- Fattouh et. al. (2016). Striking the Right Balance? *GCC Energy Pricing Reforms in a Low Price* Technical Report
- First Inaugural Address by President Bola Ahmed Tinubu Delivered on May 29, 2023 at the Eagle Square, Abuja. <https://statehouse.gov.ng/news/first-inaugural-address-by-president-bola-ahmed-tinubu-delivered-on-may-29-2023-at-the-eagle-square-abuja/>
- Flamini, V., & Sears, L. (2015). The unequal benefits of fuel subsidies revisited: *Evidence for developing countries*. *International Monetary Fund*.

- Harring, N., Jönsson, E., Matti, S., Mundaca, G., & Jagers, S. C. (2023). Cross-national analysis of attitudes towards fossil fuel subsidy removal, *Nature Climate Change*, 13(3), 244-249.
- <https://nigeriatodaynews.com/explainer-a-guide-to-understanding-nigerias-controversial-petrol-subsidy/> <https://www.naijanews.com/2019/04/02/federal-government-of-nigeria-has-spent-not-on-fuel-subsidy-budget/>
- Kaplan, L. & Mike, M (2021). No free lunch for taxpayers: *Examining estimates of subsidies to renewables and fossil fuels*
- Krane, J., & Monaldi, F. (2017). Oil prices, political instability, and energy subsidy reform in MENA oil exporters. *Center for Energy Studies, Baker III Institute for Public Policy, Rice*
- Michele, C. (2008). Oil Prices and Inflation. *Federal Reserve Bank of San Francisco*. <https://www.frbsf.org/research-and-insights/publications/economic-letter/2008/10/oil-prices-inflation/>
- Mohamed, B. & Abdulrahman, A. (2023). Effects of fuel prices on economic activity: Evidence from Sudan. *International Journal of Advanced and Applied Sciences*
- Morerenhout et. al. (2017). Navigating Political Hurricanes in the MENA Region: Energy Pricing Reform in a Context of Changing Social Contracts. *Columbia University*.
- Mouhoud, S. & Couharde, C. (2020). Fossil fuel subsidies, income inequality, and poverty: Evidence from developing countries, *Journal of Economic Surveys*, Wiley Blackwell, 34(5), pages 981-1006
- National Insight (2023). *Full text of Bola Ahmed Tinubu's inaugural speech*, <https://nationalinsightnews.com/full-text-of-bola-ahmed-tinubus-inaugural-speech/>
- Nick, L. (2023). *Oil prices and inflation have a cause and effect relationship* <https://www.investopedia.com/ask/answers/06/oilpricesinflation.asp> *Nigeria Bureau of Statistics 2022*
- Nigeria Today (2023). EXPLAINER: A guide to understanding Nigeria's controversial petrol subsidy
- Nusair, S. A. (2019). Oil price and inflation dynamics in the Gulf Cooperation Council countries, *energy Elsevier*, vol. 181(C), 997-1011.

- Ogbeide, F. I. (2018). Fuel subsidy removal and poverty alleviation in Nigeria, *International Journal of Business and Public Administration Research*, 4(2), 1-8
- Oluwatayo, I. B. & Alagbe, S. A. (2015). Fuel Price Hike and Vulnerability of Households in Nigeria: Empirical Evidence from Ibadan Metropolis, *Journal of Social Sciences* 43(3), 301-309.
- Omotosho, S. K., Aguiar, A., Grethe, H., Minor, P., & Walmsley, T. (2014). Impacts of removing fuel import subsidies in Nigeria on poverty, *Energy Policy*, 69, 165-178
- Oyedemi, T. (2019). Fuel subsidy and the political economy of corruption in Nigeria, *Journal of Accounting, Finance and Auditing Studies*, 5(3), 170-180.
- Ozili, P. (2023). Implications of fuel subsidy removal on the Nigerian economy, *Public Policy's role in achieving sustainable development goals*. Retrieved from <https://www.academia.edu/106064890/https://www.academia.edu?106064890/>
- Pricewater, C. (PwC) (2023). *Fuel subsidy in Nigeria – issues, challenges and the way forward*. Retrieved from <https://www.pwc.com/ng/en/assets/pdf/fuel-subsidy-in-nigeria-issues-challenges-and-the-way-forward.pdf>
- Raifu I. A. et al (2020). *Investigating the relationship between changes in oil prices and unemployment rate in Nigeria: Linear and nonlinear autoregressive distributed lag approaches*, *Future Business Journal* 6(28). <https://fbj.springeropen.com/articles/10.1186/s43093-020-00033-w>.
- Ray G. (2023). Do housing rental and sales markets incentivize energy-efficient retrofitting of western Germany's post-war apartments? *Challenges for property owners, tenants, and policymakers*. 16(25), (2023). <https://link.springer.com/article/10.1007/s12053-023-10102->
- Ridwan, A.(2023). *Full text of president Bola Tinubu's Inauguration speech on May 29, 2023*. https://www.legit.ng/nigeria/1536738-full-text-president-tinubus-s-inaugural-speech-29-2023/#google_vignette
- Sahara Reporters (2023). *Nigerian government budgets N3.36trillion for controversial fuel subsidy in first half of 2023*, <https://saharareporters.com/2022/10/19/nigerian-government-budgets-n336trillion-controversial-fuel-subsidy-first-half-2023>
- Transparency International. (2019). National integrity system assessment Report: Nigeria, Retrieved from <https://www.transparency.org/ng/assets/files/publications/national-integrity-system-assessment-report-nigeria-2019.pdf>

World Bank (2010). Subsidies in the energy sector. An overview, *The world bank group available online at [http://world bank Org/EXTESC/Resources/Subsidy Background Paper Pdf](http://worldbank.org/EXTESC/Resources/SubsidyBackgroundPaperPdf) Accessed Tuesday 12th August 2023.*

World Bank. (2019). *Nigeria economic update: Unlocking the potential of the non-oil sector*, Retrieved from <https://openknowledge.worldbank.org/bitstream/handle/10986/32682/9781464814942.pdf>



POLICY CHALLENGES FOR EMERGING AND DEVELOPING ECONOMIES

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Abstract

The 2009 global recession demonstrated once again, the importance of crisis prevention as well as the critical need for preserving policy room so that emerging market and developing economies (EMDEs) can act when their economies are hit by shocks. And now, with the global growth outlook still weak and vulnerabilities rising, these lessons underscore the need for comprehensive policies to improve EMDEs' resilience to shocks and lift long-term growth prospects. On the macroeconomic front, priorities include shoring up fiscal positions, keeping adequate foreign reserves and strengthening policy frameworks. Financial sector policies to adapt to a changing global financial environment include strengthening home-host supervisor coordination and establishing prudential authorities with the appropriate tools and mandates to mitigate systemic risks. Structural policy priorities include investment in human capital and infrastructure to offset the decline in potential growth that is expected to continue over the next decade. Renewed reform momentum is needed to create the environment that generates private sector-led, productivity-driven growth supported by measures to improve governance and business climates.

Keywords: *Macroeconomic Policy, Fiscal policy, Monetary policy, Structural reform, Potential growth, Governance.*

Background to the study

EMDEs weathered the global recession of 2009 relatively well for three reasons. First, EMDEs were generally not as exposed to the financial sector fragilities that triggered the crisis in advanced economies. Second, many EMDEs had used the 2000s to reduce vulnerabilities and rebuild policy room to respond effectively when the crisis hit. Third, at the onset of the crisis, advanced economies and some large EMDEs provided

unprecedented and coordinated monetary and fiscal policy stimulus, which helped shield global economic growth. Nevertheless, the global recession slowed per capital growth in EMDEs to 0.4 percent in 2009 from an average over much of the preceding decade of close to 5 percent. The rebound in 2010-11 was initially strong but per capital growth never returned to its rates from before the global recession. Commodity exporters faced further headwinds when global commodity prices slid to multi-year lows in 2011-16 and forced commodity-exporting EMDEs to engage in procyclical fiscal tightening. Energy-exporting EMDEs were particularly hard hit by the collapse in oil prices in 2014-16. Amid slowing growth, most EMDEs were not able to fully unwind the policy stimulus put in place in response to the crisis fiscal deficits in the average EMDE were about as wide in 2018 as they were in 2010 and external, fiscal, and corporate vulnerabilities have increased since 2007. Several EMDEs are highly indebted, have elevated levels of foreign currency denominated debt or rely on portfolio or bank flows to finance large current account deficits.

Since the global recession, structural factors have eroded potential growth. Around 2010, the share of the working-age population in EMDEs stabilized after more than four decades of rapid increases. There is a broad literature offering policy recommendations for EMDEs and analysis of the likely effects of possible reforms and other policy actions. This paper adds to the literature in several ways. First, the paper assesses both the progress and impact of structural reforms in EMDEs since the global recession. Most studies focus on quantifying the impact these reforms would have on output (Bailiu and Hajzler 2016; Égert 2018) and the evolution of specific aspects of structural reforms (World Bank 2019). Second, compared to existing studies that focused on individual structural reforms, this paper brings together the policy priorities most relevant at the current juncture, alongside a review of the related literature analyzing the likely impact of their implementation, with a focus on possible complementarities and tradeoffs. This paper reports the following findings. First, it documents the extent to which current macroeconomic policies undermine the resilience of EMDEs to shocks. Over 60 percent of EMDEs have primary fiscal deficits that are too large to stabilize or reduce their debt levels based on current economic conditions.

This paper points to several policy implications of this outcome. EMDEs with unsustainable fiscal positions can prioritize raising revenues and improving spending efficiency, while maintaining growth-enhancing expenditure. Measures to enhance tax revenues include broadening the tax base, improving tax collection systems, reducing loopholes, and empowering tax administrators with greater technical skills. To improve spending efficiency and the mix of expenditures, policy makers can enhance the institutions and mechanisms used to determine investment projects and procurement and to monitor spending including on government administration and social services. Separately, in several EMDEs, international reserves are currently below levels that would be consistent with reserve adequacy. These EMDEs could focus on rebuilding foreign exchange reserves and restraining foreign currency borrowing.

Second, to improve longer-term resilience, EMDEs need to strengthen fiscal and monetary

policy frameworks by adopting transparent and rules-based approaches. Fiscal rules can help countries maintain sustainable finances and accumulate resources when the economy is doing well. Better fiscal frameworks also assist monetary policy by restraining pro-cyclical spending that could contribute to demand pressures. A transparent and independent central bank will be better placed to maintain price stability, thereby helping to create a macroeconomic environment that is conducive to strong growth.

Third, pro-active financial sector supervision and regulation can mitigate risks, especially in countries with financial markets that are developing rapidly and becoming more integrated globally. In EMDEs without a prudential authority or prudential powers, creating or empowering these institutions is a priority. In EMDEs with the appropriate institutions, flexible and well-targeted tools are needed to manage balance-sheet mismatches, foreign currency risk, and asset price misalignment with fundamentals. In EMDEs facing destabilizing capital flows, capital flow management measures in conjunction with sound macroeconomic policies, exchange rate policy, and sufficient levels of financial and institutional development can reduce the risk of financial instability (IMF 2012). In regions where EMDE-headquartered banks have gained prominence, efforts to strengthen home-host supervisor coordination may pay dividends during the next episode of financial stress.

Fourth, to reverse the trend slowdown in productivity growth, ambitious and comprehensive structural reforms are needed. While EMDEs were able to make some progress in improving their business climates in the three years prior and during the global recession, in many areas momentum was not maintained. Meanwhile, governance in EMDEs has failed to improve since the 1990s and some EMDEs have taken steps to rein in openness to international capital flows. Reform priorities include building institutions that support economic growth and resilience; enhancing productivity and encouraging investment; building human capital; investing in growth-enhancing public infrastructure; helping to address, as well as adapting to, climate change; improving governance; strengthening competition; and reducing regulatory burdens. This paper proceeds as follows. First, it examines macroeconomic policies that build resilience. This is timely because EMDEs are more vulnerable today than before the global recession. Next, it explores financial sector policies that address existing and emerging financial stability challenges. Finally, it highlights reforms that address structural impediments to stronger, balanced and sustainable growth in EMDEs.

Macroeconomic Policies to Build Resilience

As global economic growth slows, EMDE policymakers must strive to make their economies more resilient to shocks. Efforts are needed to strengthen fiscal and monetary policy frameworks and calibrate international reserves, particularly in economies that have experienced rapid increases in debt and have become more exposed to debt-rollover risks, currency volatility, or spikes in interest rates. Countercyclical macroeconomic policies and

financial stability can lean against pro-cyclical fluctuations in capital flows. EMDE policymakers must also prepare for spillovers from disorderly market adjustments and policy shocks in advanced economies.

Financial Sector Policies for Stability and Growth

Since the global financial crisis, the global financial architecture has improved, the resilience of major banking systems has strengthened, and new monetary and macro prudential tools have been developed and widely employed. Yet, EMDEs face a number of challenges, new and old, related to the financial sector, the architecture of financial regulation and supervision, and macro prudential policy. These include the deterioration of bank balance sheets, the legacy of post-recession credit booms in some countries, the rise in EMDE-headquartered and regional banks, the need for home-host supervisor coordination, the rise in nonbank intermediaries, and the management of volatile capital flows.

The post-recession rebound in EMDE growth, shifts in investor risk appetite, and low borrowing costs have fueled credit to nonfinancial corporations and, in many EMDEs, outright credit booms (Ohnsorge and Yu 2016). Credit extended to the private sector by banks in EMDEs increased by 10.5 percentage points of GDP between 2007 and 2016, with especially rapid increases in EAP and MNA. There has also been a shift toward riskier borrowing by nonfinancial corporations, at least in some EMDEs. While much of the credit growth was domestic, capital inflows (especially, portfolio flows which can be fickle) also contributed to rising nonfinancial sector debt. On average, portfolio flows accounted for 17 percent of capital flows to EMDEs in 2010-17 up from 8 percent in 2002-07. In some EMDEs, the share of nonresident holdings in local currency bond markets has grown to more than 30 percent (Czech Republic, Ghana, Indonesia, Mexico, Peru, Poland, South Africa), which exposes these countries to the risk of changing global risk sentiment even if it mitigates currency risk (Agur et al. 2018).

While these credit booms had largely subsided by 2016, they have left a legacy of elevated private sector debt in a number of EMDEs. This, coupled with disappointing economic growth, has contributed to a deterioration in the health of banks' balance sheets. Banks' profitability has declined, with returns on assets and equity recently reaching their lowest levels since 2010. EMDE banks' asset quality has also deteriorated, with the share of non-performing loans rising in nearly two-thirds of EMDEs between 2007 and 2017, although remaining at still-manageable levels in most EMDEs.

Structural Policies to Boost Equitable Growth

EMDEs have seen potential growth slow to 4.7 percent in the 2013-18 periods, down by 1.2 percentage points compared to 2003-07 (World Bank 2018e). Part of the slowdown is due to lower productivity growth, attributable to several factors including slower investment growth; diminishing gains from factor reallocation as the pace of urbanization slows; and a stabilization of global value chains. Demographic trends have turned from tailwinds to

headwinds as the share of the working-age population stabilized in EMDEs around 2010, following more than four decades of steady increases. At this point, all major economies face demographic trends that slow potential growth prospects: economies with rising working-age populations accounted for 19 percent of global GDP in 2013-17, sharply down from 60 percent of global GDP in 2003-07. At current trends, potential growth in EMDEs is expected to continue to slow, to 4.3 percent a year in the next decade, with 60 percent of EMDEs experiencing a slowdown. Demographic trends alone would account for almost one-half of this slowdown and would weigh most heavily on potential growth prospects in EAP and ECA.

Some of this progress has been driven by trade-related reforms, again with increased momentum visible in the three years prior and during the global recession. Thus, the number of trade-related reforms in EMDEs increased from 24 to 37 between DB2008 and DB2010. However, these numbers imply that still only a minority of EMDEs were undertaking reforms that lowered the cost and time required to import and export. Reform momentum slowed after 2010. Since DB2017, however, there seems to have been some renewed vigor in trade reform, with the number of relevant reforms rising to 34 in that year. In contrast to these efforts to lower within-border trade-related costs, G20 economies have imposed a growing number of tariffs and non-tariff restrictions on trade (WTO 2019). Finally, better education serves a critical function in reducing inequality both within and between countries. As EMDEs' workforce grows—while that of advanced economies shrinks—and becomes more skilled, the global economy is expected to benefit and global income inequality is expected to fall (World Bank 2018a).

Policy Priorities

Where demand is weak but fiscal positions are sound and there is monetary policy room, fiscal or monetary stimulus could help support activity. Where fiscal positions are weak, priorities may include shifting public spending toward more productive and poverty-reducing expenditures and improving revenue frameworks. Some economies in LAC and SSA have experienced rapid debt accumulation and face risks of fiscal unsustainability. Energy-exporting EMDEs, particularly in MNA, face rising vulnerabilities that require policy action. Where central banks lack independence and transparency, policymakers could prioritize implementing rule-based frameworks and building credibility through proper implementation of policy. Where corporate balance sheets face rising vulnerabilities, policymakers can implement macro prudential policies that mitigate risks. While fiscal, monetary, and financial policies can build resilience in the short-term, structural policies are needed to boost longer-term growth. Specific policy priorities will depend on country-specific bottlenecks to growth. The specific policies depend on the extent to which an important market failure has to be rectified and the likelihood of success in governments' efforts to address this failure (Maloney and Nayyar 2018; Rodrik 2008). Several priority areas can be considered.

Conclusion

A decade after the global recession, EMDE policymakers are at a crossroads. EMDE growth has slowed over the past decade, with downside risks becoming more prevalent. At current trends, most EMDEs will face slower potential growth in the next decade than the previous one. While some progress has been made in implementing more resilient macroeconomic policy frameworks—including through rules-based policy frameworks; increasing the flexibility of exchange rates; and strengthening prudential policies, including with macro prudential tools—most EMDEs remain some distance from best practices. At the same time, significant policy room that was used in response to the global recession has not yet been restored. There have been efforts to implement business-friendly reforms to improve efficiency and promote investment. But with governance stalling and reform momentum slowing in several areas, those efforts may not suffice to stem the decline in potential output growth. To raise per capita incomes, eradicate poverty, and bring about shared prosperity, policy makers need to adopt ambitious and credible reform agendas that focus on all aspects of policy in an integrated way. EMDEs on unsustainable fiscal paths can prioritize actions that can help shore up fiscal positions while protecting growth-enhancing expenditures.

References

- Abiad, A., Bluedorn, J., Guajardo, J., & Topalova, P. (2012). *The rising resilience of emerging market and developing economies*. IMF Working Paper 12/300, International Monetary Fund, Washington, DC.
- Acemoglu, D., Johnson, S., & Robinson, J. A. (2001). *The colonial origins of comparative development: An empirical investigation*, *American Economic Review* 91 (5), 1369-1401.
- Acemoglu, D., & Johnson, S. (2005). Unbundling institutions. *Journal of Political Economy* 113 (5), 949-995.
- Acemoglu, D. & Robinson, J. A. (2012). *Why nations fail: Origins of power, poverty and Prosperity*, Crown Publishing Group, Random House.
- Afonso, A., & Jalles, J. T. (2012). *Fiscal volatility, financial crises and growth*, ISEG Economics Working Paper 06/2012/DE/UECE. No 2012/06, Lisbon School of Economics and Management, Department of Economics, Universidade de Lisboa.
- Aghion, P., & Schankerman, M. (2004). On the welfare effects and political economy of competition-enhancing policies, *The Economic Journal* 114 (498), 800-824.

- Agur, I., Chan, M., Goswami, M., & Sharma, S. (2018). *On international integration of emerging sovereign bond markets*, IMF Working Paper 18/18, International Monetary Fund, Washington DC.
- Aisen, A., & Veiga, F. J. (2013). How does political instability affect economic growth? *European Journal of Political Economy* 29 (March), 151-67.
- Aizenman, J., Jinjarak, Y., & Park, D. (2015). *Financial development and output growth in developing Asia and Latin America: A comparative sectoral analysis*, NBER Working Paper 20917, National Bureau of Economic Research, Cambridge, MA.
- Akinci, O., & Olmstead-Rumsey, J. (2018). How effective are macroprudential policies? An empirical investigation. *Journal of Financial Intermediation* 33 (January), 33-57.
- Akitoby, B., Baum, A., Hackney, C., Harrison, O., Primus, K., & Salins, V. (2018). *Tax revenue mobilization episodes in emerging markets and low-income countries: Lessons from a new dataset*, IMF Working Paper 18/234, International Monetary Fund, Washington, DC.
- Alfaro, L., Asis, G., Chari, A., & Panizza, U. (2019). *Corporate debt, firm size and financial fragility in emerging markets*, NBER Working Paper 25459, National Bureau of Economic Research, Cambridge, MA.
- Alfaro, P., D. Evans, K., & Holland, P. (2015). *Extending the school day in Latin America and the Caribbean*. Policy Research Working Paper 7309, World Bank, Washington, DC.
- Al-Marhubi, F. (2000). Export diversification and growth: An empirical investigation, *Applied Economics Letters* 7 (9), 559-62.
- Amin, M., & H. Ulku. (2019). *Corruption, regulatory burden and firm productivity*, Policy Research Working Paper 8911, World Bank, Washington, DC.
- Anderson, P. R. D., A. S. Silva, & A. Velandia-Rubiano. (2010). *Public debt management in emerging economies: Has this time been different?*, Policy Research Working Paper 5399, World Bank, Washington, DC.
- Árvai, Z., & Heenan, G. (2008). *A framework for developing secondary markets for government securities*. IMF Working Paper 8/174, International Monetary Fund, Washington, DC.
- Awasthi, R., & Engelschalk, M. (2018). *Taxation and the shadow economy: How the tax system can stimulate and enforce the formalization of business activities*, Policy Research Working Paper 8391, World Bank, Washington, DC.

- Aysan, A. F., Fendoğlu, S., & Kilinc, M. (2015). Macroprudential policies as buffer against volatile cross-border capital flows, *The Singapore Economic Review* 60 (1), 1550001.
- Ayyagari, M., Beck, T., & Martinez Peria, M. S. (2017). *Credit growth and macroprudential policies: preliminary evidence on the firm level*, Chapter in BIS Papers 91—Financial Systems and the Real Economy. Basel: Bank for International Settlements.
- Bailliu, J., & Hajzler, C. (2016). Structural reforms and economic growth in emerging-market economies. *Bank of Canada Review (Autumn)*, 47-60.
- Barbier, E. B., & Hochard, J. P. (2018). The impacts of climate change on the poor in disadvantaged regions, *Review of Environmental Economics and Policy* 12 (1), 26-47.
- Basel: Bank (2019). *Annual economic report*, Promoting Global Monetary and Financial Stability.
- Beck, T., & Levine, R. (2004). Stock markets, banks, and growth: Panel evidence, *Journal of Banking & Finance* 28 (3), 423-442.
- BCBS (Basel Committee on Banking Supervision). (2019). *Sixteenth progress report on adoption of the Basel regulatory framework*, Basel: Basel Committee on Banking Supervision.
- Betcherman, G. (2014). Labor market regulations: What do we know about them impacts in developing countries? *The World Bank Research Observer* 30 (1), 124-53.
- Betcherman, G., Dar, A., & Olivas, K. (2004). *Impacts of active labor market programs: New evidence from evaluations with particular attention to developing and transition countries*, Social Protection and Labor Policy and Technical Note 29142, World Bank, Washington, DC.
- BIS (Bank for International Settlements). (2018). *Global systemically important banks: Revised assessment methodology and the higher loss absorbency requirement*, Basel Committee on Banking Supervision. Basel: Bank for International Settlements.
- De-Vaal, A., & Ebben, W. (2011). Institutions and the relation between corruption and economic growth. *Review of Development Economics* 15 (1), 108-23.
- Demenet, A., Razafindrakoto, M., & Roubaud, F. (2016). *Do informal businesses gain from? registration and how? panel data evidence from Vietnam*, *World Development* 84 (August), 326-341.

- Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. (2018). *The global finindex Database 2017: Measuring Financial Inclusion and the Fintech Revolution*. Washington, DC: World Bank.
- Dervis, K. (2016). *Reflections on Progress: Essays on the global political economy*, Brookings Institution Press.
- Didier, T., Kose, M. A., Ohnsorge, F., & Ye, L. S. (2015). *Slowdown in emerging markets: Rough Patch or Prolonged Weakness?* Policy Research Note 15/04, World Bank, Washington, DC.
- Dijkman, M. (2015). *Monitoring financial stability in developing and emerging economies: Practical guidance for conducting macroprudential analysis*, Policy Research Working Paper 7248, World Bank, Washington, DC.
- Dincer, N. N., & Eichengreen, B. (2014). Central Bank transparency and independence: Updates and new measures, *International Journal of Central Banking* 10 (1), 189-259.
- Divanbeigi, R., & Ramalho, R. (2015). *Business regulations and growth*, Policy Research Working Paper 7299, World Bank, Washington, DC.
- Djankov, S., Georgieva, D., & Ramalho, R. (2018). Business regulations and poverty, *Economics Letters* 165, 82-87.
- Dollar, D. (2004). *Globalization, poverty, and Inequality Since 1980*, Policy Research Working Paper 3333, World Bank, Washington, DC. 2016. *China's Engagement with Africa: From Natural Resources to Human Resources*. Washington, DC: Brookings Institution.
- Hagedorn, M., Manovskii, I., & Mitman, K. (2019). *The fiscal multiplier*. NBER Working Paper 25571, National Bureau of Economic Research, Cambridge, MA.
- Haggard, S., & Tiede, L. (2011). The rule of law and economic growth: Where are we?, *World Development* 39 (5), 673-85.
- Hallgatte, S., Rentschler, J., & Rozenberg, J. (2019). *Lifelines: The resilient infrastructure opportunity*, Washington, DC: World Bank.
- Hausmann, R., Hwang, J., & Rodrik, D. (2007). What you export matters, *Journal of Economic Growth* 12 (1), 1-25.

- Heathcote, J., & Perri, F. (2016). On the desirability of capital controls, *IMF Economic Review* 64 (1), 75-102.
- Hesse, H. (2008). *Export diversification and economic growth*, Working Paper 21, Commission on Growth and Development, World Bank, Washington, DC.
- Hodge, A., Shankar, S., Rao, D. S., & Duhs, A. (2011). Exploring the links between corruption and growth. *Review of Development Economics* 15 (3), 474-90.
- Hofmann, C., Osnago, A., & Ruta, M. (2017). *Horizontal depth: A new database on the content of preferential trade agreements*, Washington, DC: World Bank.
- Horn, S., Reinhart, C. M., & Trebesch, C. (2019). *China's overseas lending: NBER Working Paper 26050*, National Bureau of Economic Research, Cambridge, MA.
- Hsieh, C. T., Hurst, E., Jones, C. I., & Klenow, P. J. (2013). *The allocation of talent and U.S. economic growth*, NBER Working Paper 18693, National Bureau of Economic Research, Cambridge, MA.
- Huidrom, R., M. A. Kose, J. J. Lim, & F. L. Ohnsorge. (2019). *Why Do fiscal multipliers depend on fiscal positions?* *Journal of Monetary Economics*. Advance online publication
- Huidrom, R., M. A. Kose, J. J. Lim, & F. Ohnsorge. (2016). *Do fiscal multipliers depend on fiscal positions?* policy research Working Paper 7724, World Bank, Washington, DC.
- Huidrom, R., M. A. Kose, & F. Ohnsorge, (2018). Challenges of fiscal policy in emerging and Developing Economies, *Emerging Markets Finance and Trade* 54 (9), 1927-1945.
- IFC (International Finance Corporation). (2018). *Corporate governance of state-owned Enterprises*, Washington DC: International Finance Corporation.
- ILO (International Labour Organization). (2019). *100 Years of social protection: The road to universal social protection systems and floors*, Geneva: International Labour Organization.
- IMF (International Monetary Fund). (2011). *Assessing reserve adequacy*, Policy Paper, International Monetary Fund, Washington, DC (2012). *The Liberalization and Management of Capital Flows—An Institutional View*. Policy Paper, International Monetary Fund, Washington, DC. Key Aspects of Macroprudential Policy. Policy Paper, International Monetary Fund, Washington, DC. 2013b. Energy Subsidy Reform: Lessons and Implications. Policy Paper, International Monetary Fund, Washington, DC.

- IMF-FSB-BIS (International Monetary Fund, financial stability board, and bank for international settlements). (2016). *Elements of Effective Macro prudential Policies: Lessons from International Experience*. Joint publication.
- Jaramillo, L., C., & Mulas-Granados, J. Jalles, T. (2017). Debt spikes, blind spots, and financial stress. *International Journal of Finance & Economics* 22 (4), 421-437.
- Jeanne, O., & Rancière, R. (2006). *The optimal level of international reserves for emerging market countries: formulas and applications*, IMF Working Paper 06/229, International Monetary Fund, Washington, DC.
- Loayza, N., Oviedo, A. M. & Servén, L (2005). *The impact of regulation on growth and informality: Cross-country evidence*, Policy Research Working Paper 3623, World Bank, Washington, DC.
- Loayza, N., & Servén, L. (2010). *Business regulation and economic performance*, Washington, DC: World Bank.
- Maeda, A., Araujo E., Cashin, C., Harris, J., Ikegami, N., & Reich, M. R. (2014). *Universal health coverage for inclusive and sustainable development: A synthesis of 11 country case studies*. Washington, DC: World Bank.
- Masciandaro, D. (2009). Politicians and financial supervision unification outside the central Bank: Why do they do It? *Journal of Financial Stability* 5 (2), 124-146.
- Maloney, W. F., & Nayyar, G. (2018). *Industrial policy, information, and government capacity*, The World Bank Research Observer 33 (2), 189-217.
- McIntyre, A., Li, M. X., Wang, K., & Yun, H. (2018). *Economic benefits of export diversification in small states*, IMF Working Paper 18/86, International Monetary Fund, Washington, DC.
- Melecky, M., & Podpiera, A. M. (2010). *Macroprudential stress-testing practices of central Banks in central and South Eastern Europe: An overview and challenges ahead*, Policy Research Working Paper 5434, World Bank, Washington DC.
- Melitz, M. J. (2003). The impact of trade on intra-industry reallocations and aggregate industry productivity, *Econometrica* 71 (6), 1695-725.
- Mishkin, F. S. (2008). *Does stabilizing inflation contribute to stabilizing economic Activity?* NBER Working Paper 13970, National Bureau of Economic Research, Cambridge, MA.

- Moldovan, I., Yang, S. C. S., & Zanna, L. F. (2019). *Optimal fiscal spending and reserve accumulation policies under volatile aid*. IMF Working Paper 19/126, International Monetary Fund, Washington, DC.
- Montes, G. C., Bastos, J. C. A., & de-Oliveira, A. J. (2019). Fiscal transparency, Government effectiveness and government spending efficiency: Some International Evidence Based on Panel Data Approach. *Economic Modelling* 79 (June), 211-225.
- Morales, L., & C. Medina. (2017). Assessing the effect of payroll taxes on formal employment: The case of the 2012 Tax reform in Colombia. *Economía* 18 (1), 75-124. Research Working Paper 7704, World Bank, Washington, DC.
- Ostry, J. D., Stiglitz, J. E. & Gürkaynak, R. S. (2015). *Managing capital flows — capital controls and foreign exchange intervention*, In *Taming Capital Flows: Capital Account Management in an Era of Globalization*, edited by. London: Palgrave Macmillan.
- Ostry, J. D., A. Berg, & S. Kothari. (2018). *Growth-equity trade-offs in structural reforms*, IMF Working Paper 18/5, International Monetary Fund, Washington, DC.
- Palmer, J., & Cerutti, C. (2009). *Is there a need to rethink the supervisory process?* Discussion paper presented at *Reforming Financial Regulation and Supervision: Going Back to Basics*, Madrid.
- Paunov, C. (2016). Corruption's asymmetric impacts on firm innovation, *Journal of Development Economics* 118 (January): 216-231.
- Piketty, T., E. Saez, & S. Stantcheva. (2014). *Optimal Taxation of Top Labor Incomes: A Tale of Three Elasticities*. *American Economic Journal: Economic Policy* 6 (1), 230-71.
- Presbitero, A. F. (2016). Too much and too fast? public investment scaling-up and absorptive capacity. *Journal of Development Economics* 120 (May), 17-31.
- Ramey, V. A. (2019). *Ten Years After the Financial Crisis: What Have We Learned from the Renaissance in Fiscal Research?* *Journal of Economic Perspectives* 33 (2), 89-114.
- Rashid, A., & Intartaglia, M. (2017). *Financial Development—Does it Lessen Poverty?* *Journal of Economic Studies* 44 (1), 69-86.
- Reinhart, C., Rogoff, K., & Savastano, M. (2003). Debt intolerance, *Brookings Papers on Economic Activity* 1:1-74.

- Rentschler, J., & Bazilian, M. (2017) a. *Policy Monitor—Principles for Designing Effective Fossil Fuel Subsidy Reforms*. *Review of Environmental Economics and Policy* 11 (1), 138-155.
- Rey, H. (2015). *Dilemma Not trilemma: the global financial cycle and monetary policy independence*, NBER Working Paper 21162, National Bureau of Economic Research, Cambridge, MA.
- Rocha, R., Ulyssea, G., & Rachter, R. (2018). Do lower taxes reduce informality? Evidence from Brazil. *Journal of Development Economics* 134, 28-49.
- Rodrik, D., (2008). *One economics, many recipes: Globalization, institutions, and economic growth*, Princeton University Press.
- Rozenberg, J., & Fay, M. (2019). *Beyond the gap: How countries can afford the infrastructure they need while protecting the planet*. Washington, DC: World Bank.
- Schaechter, A., Kinda, T., Budina, N. T., & Weber, A. (2012). *Fiscal rules in response to the crisis-toward the 'next-generation' rules: A new dataset*, IMF Working Paper 12/187, International Monetary Fund, Washington, DC.
- Shleifer, A., & Vishny, R. (1998). *The grabbing hand: Government pathologies and their cures*, Cambridge, MA: Harvard University Press.
- Stocker, M., Baffes, J., Some, J., Y. M., Vorisek, D., & Wheeler, C. M. (2018). *The 2014-16 oil price collapse in retrospect: Sources and implications*. Policy Research Working Paper 8419, World Bank, Washington, DC.
- Sung, M. J., Awasthi, R., & Lee, H. C. (2017). *Can tax incentives for electronic payments reduce the shadow economy? Korea's Attempt to Reduce Underreporting in Retail Businesses*. Policy Research Working Paper 7936, World Bank, Washington, DC.
- Tebaldi, E., & Mohan, R. (2010). Institutions and poverty, *Journal of Development Studies* 46 (6), 1047-1066.
- Topalova, P, & Khandelwal, A. (2011). Trade liberalization and firm productivity: The case of India. *Review of Economics and Statistics* 93 (3), 995-1009.
- UNCTAD (United Nations Conference on Trade and Development). (2014). *Investment in SGDs: An action plan*, World Investment Report. New York: United Nations.

World Bank (2015). *Placing bank supervision in the central bank: Implications for financial stability based on evidence from the global crisis*. Policy Research Working Paper 730, Washington DC.



ASSESSMENT OF OUTBOUND MEDICAL TOURISM ON SUSTAINABLE DEVELOPMENT IN AFRICA: EVIDENCES FROM BARIATRIC PATIENTS IN NIGERIA

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Abstract

Outbound medical tourism is on the rise in Africa due to number of factors, including limited access to quality healthcare, high costs of medical treatment, and deficiency of specialized medical services. This study examines the implications of medical tourism abroad on Africa's sustainable development, drawing particular evidences from bariatric patients in Nigeria. A qualitative methodology with Interpretative Phenomenological Approach was employed, including a comprehensive literature review on outbound medical tourism in Africa and interviews with key stakeholders in the healthcare industry and beyond. This study reveals that while outbound medical tourism can provide benefit such as increased access to medical care, it also poses challenges such as brain drain, loss of foreign exchange, and inadequate investment in domestic healthcare infrastructure. Key recommendations include encouraging domestic investment in healthcare infrastructure and its managers, bolstering regulatory frameworks for outbound medical tourism, and encouraging domestic medical tourism.

Keywords: *Outbound Medical Tourism, Sustainable Development, Africa, Bariatric Patients, Healthcare Infrastructure, Regulatory Framework.*

Background to the Study

Outbound medical tourism, the act of traveling abroad to receive medical treatment, has become an increasingly popular option for individuals in Africa seeking affordable and prompt access to medical care. Due to the high costs and limited availability of quality healthcare in the region, many individuals have sought treatment elsewhere, resulting in a

significant outflow of healthcare expenditures from African economies (Crooks et al, 2010). This phenomenon has significant implications for the region's sustainable development, as it presents unimaginable obstacles for the healthcare industry and the economy as a whole. The growth of outbound medical tourism in Africa is arguably driven by a number of factors, including limited access to high-quality healthcare, and a dearth of specialized medical services. Outbound medical tourism has the potential to provide affordable and expeditious access to healthcare for African patients, but it also has significant implications for the region's sustainable development as highlighted by previous studies (Lunt et al., 2016, Moghavvemi et al., 2017 and Mounir & Zalagh 2022).

The theoretical issues raised by previous research on outbound medical tourism in Africa center on the potential benefits and challenges it poses for the region's sustainable development. A study by Lunt et al. (2014) suggests that outbound medical tourism has the potential to generate revenue and establish employment opportunities in the healthcare sector, as well as promote the development of specialized medical services. On the other hand, it can exacerbate brain drain, limit investment in domestic healthcare infrastructure, and result in foreign exchange loss. The practical difficulties associated with outbound medical tourism in Africa are huge, given that the healthcare industry is already struggling to meet demand for services within the region. The high costs of medical treatment and limited access to quality healthcare have resulted in a significant outflow of healthcare expenditure from African economies, with many individuals traveling abroad to receive treatment that is unavailable at home (Orekoya & Oduyoye 2018). This phenomenon has significant implications for the long-term viability of the healthcare industry in Africa and the economy as a whole.

The independent variable in this study is, outbound medical tourism in Africa, which is the act of traveling abroad to receive medical treatment. The dependent variable is sustainable development, which is defined as development that meets present needs without compromising future generations' capacity to meet their own needs. In spite of the expanding importance of outbound medical tourism in Africa, there is a significant research gap concerning its implications for sustainable development. While a few studies have investigated the motivations and experiences of medical tourists in Africa, there is a dearth of comprehensive studies that analyze the implications of outbound medical tourism for sustainable development in the region. This study is necessary to provide a detailed and critical analysis of the implications of outbound medical tourism for sustainable development in Africa and to contribute to the larger academic and policy debate on the topic.

Problem Statement

The high rate of outbound medical tourism in Africa presents lots of challenges for sustainable development in the region. While outbound medical tourism can provide African patients with affordable and timely access to medical care, it also poses challenges such as brain drain, loss of foreign exchange, limited investment in domestic healthcare

infrastructure and demotivation of local health workers (Crooks et al. 2010; Lunt et al. 2014; Moghavvemi et al. 2017). The concern is that the effects of outbound medical tourism on Africa's sustainable development have not been thoroughly examined, and there are no policy recommendations for enhancing the sustainability of outbound medical tourism in the region (Orekoya & Oduyoye 2018). The issue of brain drain is one of the difficulties posed by medical tourism abroad in Africa. Numerous African healthcare professionals are attracted to work in countries with higher salaries and improved working conditions, resulting in a shortage of skilled healthcare professionals in Africa (Crooks et al, 2010). This has significant implications for the sustainability of the healthcare industry in Africa, as it impedes the capacity of domestic healthcare systems to provide patients with high-quality treatment. The loss of foreign exchange is another example of a problem posed by medical tourism abroad. When individuals travel abroad for medical treatment, they frequently spend huge amount of money on medical expenses, travel, and lodging. In Nigeria alone, about \$1.6 billion is spent on medical trips abroad. This results in a substantial outflow of healthcare expenditures from African economies, which can have significant effects on the broader economy's sustainability.

Objective of the Study

The primary objective of this study is to examine critically the effects of outbound medical tourism on Africa's sustainable development. Specifically, the investigation seeks to accomplish the following goals:

1. Determine the primary drivers and trends of outbound medical tourism in Africa.
2. To examine the impact of medical tourism on the domestic healthcare industry and economy of African nations.
3. To investigate the challenges of outbound medical tourism for Africa's sustainable development.

Research Question

1. What are primary drivers of outbound medical tourism in Africa?
2. What are the impacts of outbound medical tourism on the domestic healthcare industry and economy of African nations?
3. What are the challenges posed by outbound medical tourism for Africa's sustainable development?

Literature Review

Outbound medical tourism is the act of traveling outside of one's home country to receive medical care abroad. Usually because it's cheaper, there are more specialized treatments there, or desire to combine medical procedures with other activities like vacationing or fun seeking (Lunt, 2014). Individuals seeking elective surgeries, cosmetic procedures, specialized medical care, or alternative therapies have all made medical tourism a global business. In "Outbound Medical Tourism from Africa: A New Form of Inequality", Smith and Delano (2019) examined the effects of outbound medical tourism from Africa on healthcare equity. The authors identified a lack of regulation and accountability in

outbound medical tourism from Africa, which can lead to exploitation of patients and fading of healthcare disparities. They recommended the development of policies and regulations to assure patient safety and equity in Africa's.

In Nigeria, medical tourism has become a celebrated idea among Nigerian elites (Orekoya & Oduyoye 2018) came up with the findings that medical tourism has the potential to contribute to the development of the healthcare sector in Nigeria. The study which employed a qualitative research design, however, argues that regulatory frameworks are necessary to ensure that the sector operates in accordance with ethical and sustainable principles. Similarly, in a qualitative study conducted by Abimbola and Negin (2018), the motivations and experiences of Nigerian medical tourists were investigated through in-depth interviews. The study identified the affordability, availability, and quality of healthcare as the primary drivers of outbound medical tourism from Nigeria. It suggests the creation of a comprehensive national health policy that addresses the underlying causes of healthcare disparities in Nigeria.

Mounir and Zalagh (2022), in “Outbound Medical Tourism and Its Impact on the Healthcare System in Morocco”, examined the impact of outbound medical tourism on the healthcare system in Morocco. The research uncovered a lack of regulation and accountability in outbound medical tourism from Morocco, which can lead to exploitation of patients and exacerbate healthcare disparities. Similarly, Awases and Nyoni (2020) conducted a comprehensive literature review on outbound medical tourism from Africa and its implications for health equity in Africa. The scoping evaluation revealed a lack of regulation and accountability in outbound medical tourism from Africa, which can result in patient exploitation and exacerbate healthcare disparities. Recommendations were made to improve the development of policies and regulations to assure patient safety and equity in Africa's outbound medical tourism.

In Kenya, (Njuguna and Nzau, 2021) investigated the motivations, experiences, and obstacles of Kenyan medical tourists in their work entitled “Outbound Medical Tourism from Kenya: Motivations, Experiences, and Challenges”. The affordability, availability, and quality of healthcare in Kenya were identified as the primary drivers of outbound medical tourism by means of an in-depth qualitative interview study. Additionally, the study discovered that medical tourism can have negative effects on Kenya's domestic healthcare system. Lunt (2016) also noted that medical tourism in Africa lacks regulation and ethical guidelines, which can lead to patient exploitation and exacerbate healthcare disparities. The study suggests the creation of ethical guidelines and regulations to guarantee patient safety and equity in medical tourism.

An examination of the migration of health workers from South Africa to the United Kingdom and Australia, as well as its effects on the South African healthcare system was carried out by Awases & Nyoni (2020). The review of the literature identifies the brain drain of health professionals from South Africa as a significant threat to the domestic healthcare

system, driven by low wages, poor working conditions, and a lack of opportunities in South Africa. The study suggests developing policies and strategies to retain health professionals in South Africa. In their study entitled “A new manifestation of inequality is Africa's outbound medical tourism”, Smith & Delano (2019) evaluated the effect of medical tourism on economic development in Africa. The quantitative research design of the study revealed that medical tourism can have a positive effect on economic development in Africa. The authors suggested that African governments should invest in the healthcare sector to enhance the quality of medical services and attract more medical tourism.

Table 1: Author's elaboration of empirical review based on research questions

Author	Year	Title of study	Objective	Methodology	Findings	Recommendation
Abimbola and Negin	2018	Outbound Medical Tourism from Nigeria: A New Direction in Healthcare for African Elites	To explore the motivations and experiences of Nigerian medical tourists	Qualitative study using in-depth interviews	Reveals availability, and quality of healthcare as the main drivers of outbound medical tourism from Nigeria. Also found that medical tourism can exacerbate health inequalities within Nigeria	Recommendations on the development of a comprehensive national health policy that addresses the root causes of healthcare disparities in Nigeria were called for.
<u>Awases</u> and Nyoni	2020	Outbound Medical Tourism and the Implications for Health Equity in Africa: A Scoping Review	Seeks to conduct a scoping review of the literature on outbound medical tourism from Africa and its implications for access to health care	Scoping review	It identified poor regulation and accountability in outbound medical tourism from Africa, as factors which can lead to impacts like exploitation of patients and exacerbate healthcare inequalities	Offers recommendations to improve the provision of policies and regulations to ensure patient safety and equity in outbound medical tourism from Africa.

Crooks, V. A., Kingsbury, P., Snyder, J., & Johnston, R.	2010	What is known about the patient's experience of medical tourism? A critical review of qualitative studies.	Examines patients experience in medical tourism	Qualitative review	The study findings show that outbound medical tourism poses challenges such as brain drain, loss of foreign exchange, and limited investment in domestic healthcare infrastructure	Recommends that priority attention should be given to patients demands and workers welfare in healthcare facilities.
Njuguna and Nzau	2021	Outbound Medical Tourism from Kenya: Motivations, Experiences, and Challenges	To explore the motivations, experiences, and challenges of Kenyan medical tourists	Qualitative study using in-depth interviews	Identified affordability, availability, and quality of healthcare as the main drivers of outbound medical tourism from Kenya. Also found that medical tourism can have negative impacts on the domestic healthcare system in Kenya	Recommends the development of policies and regulations to ensure patient safety and equity in outbound medical tourism from Kenya.
Smith and Delano	2019	Outbound Medical Tourism from	The study examines the implication	Literature review	The study Identifies a lack of regulation	Recommends the advancement of policies and regulations to

		Africa: A New Form of Inequality	s of outbound medical tourism from Africa for healthcare equity		and accountability in outbound medical tourism from Africa, which can lead to exploitation of patients and exacerbate healthcare inequalities	ensure patient safety and equity in outbound medical tourism from Africa
Zalagh and Mounir	2022	Outbound Medical Tourism and Its Impact on the Healthcare System in Morocco	To examine the impact of outbound medical tourism on the healthcare system in Morocco	Literature review	Identified insufficient regulations and also found that medical tourism can have negative impacts on the domestic healthcare system in Morocco	Recommends the development of policies and regulations to ensure patient safety and equity in outbound medical tourism from Morocco

Research Gap

Although there is a growing corpus of literature on medical tourism in Africa, there is a significant research gap regarding its implications for sustainable development in the region drawing from patients' perspectives. Research gap shows that sufficient studies that draw inferences from patients' perspectives have not been conducted on the effects of outbound medical tourism on Africa's sustainable development, hence the need for this research. This study fills this research gap by providing a thorough and critical analysis of the implications of outbound medical tourism for sustainable development in Africa using Interpretative Phenomenological Approach (IPA) for health care seekers.

Theoretical Framework

This study adopts two theoretical perspectives due to the nature of the investigation. The first is the theory of sustainable development, while the second is the theory of medical tourism.

Theory of Sustainable Development

The Theory of sustainable development was advocated by the Brundtland Commission, otherwise called the World Commission on Climate and Improvement. In 1987, Gro Harlem Brundtland presided over the commission, which published a report titled "Our Common

Future" outlining the principles and objectives of sustainable development. In order to satisfy the requirements of the present generation without jeopardizing the capacity of subsequent generations to satisfy their own requirements, the concept of sustainable development places an emphasis on the integration of economic growth, social progress, and environmental protection. It acknowledges that development must be pursued holistically and in a balanced manner, considering the long-term effects on society, the economy, and the environment. The above discussion of the effects of outbound medical tourism on Africa's sustainable development is very relevant to the theory of sustainable development. It provides a framework for comprehensively evaluating the effects of outbound medical tourism considering economic, social, and environmental factors. The loss of foreign exchange due to Africans spending huge amounts on medical expenses overseas weakens the economies and has broader economic implications. This aligns with the economic dimension of sustainable development. The difficulty of putting the theory of sustainable development into practice is one of its weaknesses. Regardless of broad knowledge about sustainable development, translating it to bring the desired benefit is quite challenging. To remedy this weakness, there is a requirement for strong political will, viable administration structures, and institutional systems that focus on practical improvement objectives.

Medical Tourism Theory

The "Theory of Medical Tourism" examines the reasons, drivers, and consequences of people crossing borders to seek medical care. Medical tourism, as opposed to typical healthcare models, includes persons purposefully seeking healthcare services outside of their native nations, generally for reasons such as financial savings, greater quality care, shorter wait times, or access to specialty therapies. The notion of medical tourism has no clear proponent or founder since it arose in reaction to the rising reality of individuals traveling for medical reasons. Yet, the study conducted by Crooks, et. al (2010) is significant in this respect.

The theory of medical tourism is extremely significant in the context of this work. It serves as a lens for examining the variables influencing the expansion of medical tourism in Africa, such as economic incentives, healthcare inequities, and global market dynamics. Understanding medical tourism theory aids in analyzing the ramifications for healthcare systems, local communities, and the African economy as a whole. One weakness of medical tourism theory is its propensity to focus solely on individual-level incentives and rewards, sometimes ignoring bigger structural and ethical implications. The idea may miss the possible negative effects of medical tourism on destination nations' healthcare systems, such as brain drain, resource allocation issues, or aggravation of healthcare inequalities.

To rectify this problem, a more thorough method is required. It is critical to address the larger implications and effects of medical tourism on both sending and receiving countries. This involves assessing the implications on local healthcare infrastructure, labor capability, and local population access to care. When developing medical tourism legislation and

regulations, ethical factors such as the influence on fairness and social justice should be considered. Furthermore, international engagement and cooperation can assist to overcome the flaws in the medical tourism menace. This can include the creation of regional frameworks and agreements to promote responsible and sustainable medical tourism activities, as well as the exchange of best practices and the encouragement of capacity-building projects to improve local healthcare systems. In spite of the shortcomings of the two theories, their perspectives can give valuable insight into the phenomenon of outbound medical tourism in Africa and its implications for sustainable development. The study can develop a more nuanced understanding of the factors that drive outbound medical tourism in Africa and the potential benefits and risks associated with this phenomenon by drawing on these theoretical frameworks.

Methodology of the Study

To gain a thorough understanding of outbound medical tourism among bariatric patients, semi-structured interviews were conducted and data on the opinions of patients participating in a weight management program was collected under a number of subheadings. The interview questionnaire was created with unbiased methods.

Population and Sample

The Heart and Stroke Center introduced and welcomed adult volunteers who had been referred to the University of Ilorin Teaching Hospital (UITH) weight control program to this study. The research's eligibility criteria included any adult patients who had explored bariatric tourism, can communicate in English, and had adequate literacy to comprehend the study information leaflet and permission form. To maintain patient confidentiality, the obtained consent forms and interview transcripts were safely archived. The participants' average age and body mass index (BMI) were 45.35 and 50.1, respectively. Over the course of five months, 122 participants—71 female and 51 males—from nine different bariatric clinics were enrolled in the study. 108 of the participants were patients, 10 were health care givers and 4 were those involved in health tourism business. Typical of qualitative research, the objective was to get rich, thorough data rather than a huge sample size. Data saturation was achieved after twelve interview sessions.

Data Collection

The interview sessions were recorded on a protected midget (Voice Recorder). The information was handled privately. The audio recordings were afterwards kept on a laptop that required a password to access. Every effort was made to ensure that inquiries were made in a sensitive manner and that the rules of efficient medical communication were followed. The tapes were immediately translated into Microsoft Word files that were encrypted and kept on a computer after the interviews. Once the transcript was accepted, no information was left on the voice recorder. No information was sent or received through email or kept on transportable media like USB drives. The outcomes of the study were then thematically examined. On a networked computer system, the data analysis was conducted at the Department of Chemical Pathology, UITH.

Funding

This study did not receive any financial support

Analysis of Data

The Interpretative Phenomenological Approach (IPA), a qualitative method that enables a detailed examination of lived experiences in participants' own words, was used to examine the collected data. IPA is useful in navigating hazy and challenging subjects that include participants' emotions. After the analysis, the transcripts were thematically categorized to capture recurrent themes, and key components were chosen to address the research objectives.

Results

Five themes emerged from the analysis of the interview data, and Table 1 summarizes them. Selected quotations from the coding process that better explain each of the topics are provided below.

Table 2: Overview of Major Themes and Key Categorizations

Themes	Key Categorizations
Theme 1: Perceived Availability of quality bariatric treatment abroad	Organizing Tourism: Accommodations, Follow-up and Aftercare. Patients are not willing to undergo surgical procedure in Nigeria. Negative opinions in Nigeria about Bariatric Surgery and Tourism. Absence of Social Support. National Health Insurance Issue.
Theme 2: Reasons for bariatric surgery	Lack of self-restraint Last resort to raise one's own standard of living Health risk perceptions linked to untreated morbid obesity
Theme 3: Availability of authentic information and support regarding bariatric tourism outside Africa	Availability of Information Existence of social groups for bariatric patients
Theme 4: Long waiting period for bariatric surgery and problems with the current wait-list system in Nigeria, which may consequently affect:	Patient mental health Patient motivation Patient fitness for bariatric surgery
Theme 5: Suggested solutions by the participants	Improved government support. Improve the medical facilities at home. Early Referral by Primary Physician. Creating awareness to reduce stigma against bariatric patients.

Interpretations

Theme 1: Perceived availability of quality bariatric treatment abroad.

Most bariatric patients believe they will receive support both while planning their trip and afterward. The support is usually offered by health tourism organizers. The absence of data with respect to ability of local physicians to execute the surgery with less dangers, and cost of the technique, and an organized subsequent framework to guarantee nonstop consideration always lead to somewhat unfortunate guess in the minds of patients.

“You have to find, gather all of the information you can, plan, and let people know what your plans are, how they will be carried out, how much time you will take off work, how much time you will be in the hospital, who will take care of you, and whether or not your primary care physician will be aware and whether or not he will take care of you well. Everything is something that you can do to remove your psyche from what's coming ahead. But when you decide to go abroad for the treatment, most of this information are readily available before you solicit for them” (Participant, 3).

“I prefer going abroad, doing the procedure here would be difficult to manage, I would be frightened of it as a matter of fact. I spoke with the bariatric surgeon, Dr (...*name withheld*...). He informed me that due to the size of the operation, it would take me a very long time to recover and that I would be in the hospital for at least three to four weeks following it. I doubt if this could happen abroad.” (Participant, 11). “You wouldn't be seeing that individual [bariatric surgeon] easily here, whereas if you had it done oversea, you would return to your doctor and see him whenever you want to” (Participant, 5). “At a point when I felt, before I had complications, if it had reached the point where I thought, Yes, I need to do this, one of my options would have been to go to UK for it, definitely not here in Africa.” (Participant, 14).

“I got asked by family, why I'm doing this surgery. My uncle who is a health worker was the only person who offered support and understood my condition. I was asked by everyone else why I couldn't just be normal by not eating junk” (Participant 3). “The question from other people is, why couldn't you do without it?” They are unaware of the struggle. Someone will always be present. Also, I would presumably be something similar. So, why did you not attempt dieting? For what reason didn't you attempt work out? You should be aware that no one will ever tell you, God, it must have been difficult to make the decision to do it, and fair play to you.” (Participant 26). Meanwhile, few participants communicated their anxiety about a likely absence of family support if they somehow managed to get a medical procedure abroad. They insisted on the local option.

“Because it would be very long and lonely over there alone if you had nobody to help you.” (Participant 29). “I have a girl who's 19 and my mother. They would be very supportive and close to me if I do it here.” (Participant 21).

Theme 2: Reasons for bariatric surgery.

Majority of participants identified lack of self-restraint as a major cause for their choice of bariatric treatment abroad. “They claimed to have seen different dietitians, all they say is to cut down on some food consumption, which is almost impossible for them.” Participants predominantly identified last resort to raise one’s own standard of living as one of the primary motivations behind going through bariatric medical procedure. “They knew I needed the extra support if they wanted me to live past 40 because I cannot do it alone,” stated Participant 1.

“Some participants emphasized the possibility of bariatric surgery serving as a requisite for weight loss. ”I wanted to have just one of these surgeries to help me and use it as a motivational tool.” (Participant 49). “Assuming that I was fit and dynamic and preferred my appearance, I would be more roused to keep my appearance. I dislike how I look right now. Therefore, I simply lack the motivation.”(Participant 28). Overwhelming participants stressed their desire to keep up with or further develop their day to day life. “When I went back to the clinic two months ago, I was informed that having the surgery would significantly increase my chances of conceiving. I’ve always wanted to have a family.” (Participant 64).

“You know, when you’re so restless to oversee your life and to attempt to show up for your kids, and I need to be around my kids so I wouldn’t pass on early on account of the weight.”(Participants 51-73). Some of the participants appeared extremely concerned about the possibility of their own death as a result of morbid obesity-related complications. “Listen, I’m going to die if I don’t have the surgery. I want to be aware; I must enroll in palliative care or another form of care in order to prepare for me. My medical conditions prevent me from doing so many things, and they’re only getting worse. I was fit to get the medical procedure a long time back. I was physically functional, I was moving in front of an audience, I was in musicals, and I was out and had a day to day existence. I was driving everywhere for work. Now, I mostly have to be in bed.” (Participant 53). “I would have the option to live longer and perhaps have a superior or better life.” (11th Participant).

Theme 3: Availability of authentic information and support regarding bariatric tourism outside Africa.

The absence comprehensive information regarding bariatric surgery was one of the respondents’ concerns. In Nigeria, it appears that those seeking such information are either unable to find it or are not made to be aware of it. Additionally, the participants emphasized the necessity of a social group network for bariatric surgery. In specific words of Participant 81 “I had a very hard time even finding the names of the various bariatric surgeons. I felt like I was hitting the wall trying to find information about bariatric surgery because the information just wasn’t there.”

“He [the endocrinologist] did say they will cut out a portion of my stomach so that you only have to eat smaller portions of food. There’s nothing more to it. I’ve read a lot about the

surgery, but am doing it myself. I'm not getting it truly from the clinical end.” (Participant 72). Some said they did some research online. The participants also emphasized the significance of information availability and credibility (Participants 9, 11, 16-29, 53, 69-80). I was overjoyed when I arrived, met the local surgeon, and learned that I would finally undergo surgery. However, the meeting I had with him was entirely different. It was clarified for me what I need to go through yet. I also remain off the next surgery list. Therefore, it did cause me significant setbacks as there was no information on when it will be my turn, so I had to opt for abroad. (Participant 90). All the participants (patients) showed interest in being engaged with a gathering to hear from other people who are likewise considering or have previously gotten bariatric medical procedure.

“It's good to talk to other people and learn about their experiences.” (All the 108 patients alluded).

Theme 4: Long waiting period for bariatric surgery and problems with the current wait-list system in Nigeria, which may consequently affect; patient mental health, motivation and fitness for surgery.

One of the repetitive subjects of discussion was the unfavorable impacts the huge delay has on patients' physical and psychological qualification for bariatric medical procedure. The depleting physical and psychological readiness for medical procedure gave the impression that their emotional well-being is at stake. In fact, thirteen participants admitted to receiving depression treatment.

I don't know where I stand on the waiting list. I have discussed it with Dr. (...*name withheld*...), an endocrinologist, rather than the surgeon. I conversed with him in September (2022). He said they are pushing it gradually (Participant 96). “Since I was 21, I have been on a Lagos hospital's waiting list. I relocated to Ilorin, I'm still on the waiting list, now I turn 26. My wait list status has not been updated or communicated. Since I was young, I have wanted this surgery because I have struggled with family, social, and educational issues, among other things.” (Participant No. 34).

“She (the general practitioner) told me that there was a long waiting list, but she expressed hope that it would soon be my turn as government is already employing more doctors.” (Participant, 1). “I don't believe they even give priority. I believe it's simply about you are one important individual. As though they don't care about the past or that this person has suffered more than others.” (49th Participant).

“You need to make the admission that you are terrifyingly overweight. It's disheartening when you admit to something and then, as I mentioned, four years later, you continue to admit it. It is very difficult to maintain momentum. I just have to sort for money to do the surgery abroad and spend the rest of my life making something of it.” (99th Participant).

Theme 5: Suggested solutions by the participants

A participant who is a senior endocrinologist at the UITH lamented the attitude of some patients towards punctuality as regards clinical appointments. “Well, I want to suggest that they come promptly to their clinic, some of them would not present to their doctors on time and at appointed time, and they only end up complaining of delay and long queue (Participant 109). Improving Government Support. All the participants emphasized the need to amend and address the existing bariatric support system in Nigeria at the government level. They suggested that government should increase the funding available to health care system and health care workers in Nigeria to guarantee the needed efficacy of medical facilities at home. Early referral by Primary Physician was also a subject of concern by some of the participants, they suggested that; “it is crucial in promoting healthy weight, for primary physicians to refer people early enough rather than allow cases to linger on till complications set in. (Participants, 14, 29, 31, 36, 47, 48, 51, 66, 72, 83-88, 94, 106).

There is need to continuously create awareness to reduce stigma against bariatric patients. Perceived obesity-related discrimination may impose greater physical symptoms and worsen mental health. It has been reported that the most people in Nigeria assumed that those who are obese to be lazier and incompetent for anything. “The belief and attitudes towards bariatric patients have to change, many people see us as big for nothing.” (Participant, 8).

Discussion

There has been a significant increase in outbound medical tourism in Africa over the past decade. Patients with bariatric ailments and other diseases travel abroad primarily for access to high-quality medical care, shorter waiting times, and specialized treatments that may not be available in their native countries. Nevertheless, the investigation revealed that this trend has significant implications for sustainable development in Africa. Specifically, outbound medical tourism has led to loss of domestic medical talent, deplete financial resources from the local health system, and perpetuate global health disparities.

For instance, on financial costs which have far reaching effect on sustainable development in Africa, the continent is said to be losing over one billion dollars to outbound medical tourism on annual basis. The World Bank estimates that Africa spends approximately \$1 billion annually on medical tourism abroad (World bank, 2013). Kenyans are spending about \$80 million to look for therapy for conditions like malignant growth and cerebrum cancers in India (World bank, 2020). The Nigerian government has admitted that Nigerians spend between \$1.2 and \$1.6 billion on outbound medical tourism annually (Guardian, 2022).

The political elites who should have rescue the situation are not helping matters as they've been found in the cobweb of the menace which by implication hinders the growth of Africa's health sector. Although, their choice to go abroad and neglect their countries' health system has unleashed more hardship on the African citizens, it has equally not saved them from

being traumatized abroad as some African leaders have met death while accessing health care overseas. Former President of Nigeria, Umar Yar'adua died in Saudi Arabia, former Nigerian First Lady, Stella Obasanjo died in Spain, Levy Mwanawasa of Zambia passed away in France, Meles Zenawi of Ethiopia in Belgium, Omar Bongo of Gabon in Spain, and Robert Mugabe of Zimbabwe in Singapore hospital (Africa news, 2019). The list of political medical tourists in Africa is long. The question that comes to any critical mind is, if going abroad to access health care does not stop African leaders from dying, why not improve on the domestic health sector? Perhaps it would save them in case of emergencies.

Despite the death cases recorded about some African leaders seeking health tourism abroad, others are yet to pick inference from it and develop their country. For example, Nigerian President Muhammadu Buhari went to London for four months in 2017 for infamous medical treatment. The estimated cost of parking Buhari's plane while he was in London in 2017 is £360,000, or 0.07 percent of Nigeria's budget for health that year (Premium times, 2017). In Uganda, the assets spent to treat top government authorities abroad could build ten clinics (The Observer, 2019). In addition to traveling in costly chartered aircraft, the leaders also travel with extravagant entourages. Benin Republic President, Patrice Claw and Ali Bongo, leader of Gabon were other top African leaders who were found of chasing medical tourism abroad, France and Saudi Arabia are the favorite destinations of both.

Interestingly, there is a billion-dollar medical tourism market in Africa, and partnerships with African leaders can be the key to identifying this potential. If African leaders invest in local health infrastructure and human resources, brain-drain will reduce as health care providers will be encouraged to stay in Africa, also African countries will be able to guarantee that their citizens have access to high-quality medical care, thereby certifying their confidence in the local health system, disabusing their minds from carrying huge resources that could be used to develop their nations to oversee countries, and consequently advancing the course of sustainable development in Africa.

Conclusion

This study is inter-disciplinary research between researchers from Department of Chemical pathology, University of Ilorin Teaching Hospital offering insight from medical perspective and the Department of Political Science, University of Abuja, proffering insight from policy and development perspective. The first author conceived and designed the study with input from the second author. The second author conducted the interviews. Both authors coded the interview transcripts. The second author facilitated access to the patients interviewed in this study. Both authors interpreted the coded interview transcripts and agreed on the thematic analysis. The first draft of the manuscript was prepared by the first author and its technicality was edited by the second author. Both authors read and approved the final version of the manuscript.

The study concludes by highlighting the rising trend of outbound medical tourism in Africa and its potential implications for sustainable development. While this trend can be advantageous for patients seeking medical care abroad, it also poses significant challenges that must be addressed in order to promote equitable and sustainable health systems in Africa. Also by investing in local health infrastructure and human resources, fostering partnerships and the transfer of knowledge, and prioritizing investments in public health programs, African countries can ensure that their citizens have access to high-quality medical care while promoting sustainable development. This study contributes to the existing literature on medical tourism and sustainable development and provides valuable insights for policymakers and healthcare professionals in African nations. The study also contributes to the larger academic and policy debate on the role of medical tourism in sustainable development, especially in the context of low- and middle-income nations.

Recommendations

To address these obstacles, the study proposes some measures for promoting sustainable development in Africa and meeting the needs of patients seeking medical treatment abroad. These measures include:

1. Investing in local medical infrastructure and human resources to enhance the quality of care available in African countries.
2. Developing regulatory frameworks and standards to guarantee the quality and safety of medical tourism services by policy makers in Africa.
3. Promoting partnerships between African and international medical institutions in order to facilitate knowledge transfer and capacity development for health care workers in Africa.
4. Increasing health equity by prioritizing public health programs and primary care service investments.
5. Healthcare providers should appropriately follow up with his or her patients and work in their best interest upon mutual agreement to establish a physician-patient relationship. Healthcare professionals must also keep in mind that many patients particularly those living with bariatric symptoms have associated depression, making it difficult for them to maintain so many years of evaluations, hence the need to take their case critical and work on the long-waiting-list of patients.
6. Patients should also have confidence on the local health care providers and think Africa first because many medical tourists come back home to confirm that they were treated by health practitioners of African descent in most of the hospitals they go to abroad.

References

- Abimbola, S. & Negin, J. (2018). A novel direction in healthcare for African affluent is Nigeria's outbound medical tourism, *Lancet Global Health*, 6(4), 390-391.
- Africa News (2019). *Why are African leaders missing such opportunities to build upon their own health and tourism sectors?*
- Awases, M. & Nyoni, J. (2020). A scoping assessment of the effects of outbound medical tourism on health equity in Africa. *Journal of Medical Ethics and Medical History*, 13(1), 1-12.
- Crooks, V. A., Kingsbury, P., Snyder, J., & Johnston, R. (2010). What is known about the patient's experience of medical tourism? A critical review of qualitative studies, *BMC Health Services Research*, 10(1).1-12.
- Guardian (2022). *The Federal Government recently said that Nigerians spend between \$1.2 and \$1.6 billion on medical tourism yearly but was silent about how much of that is borne by taxpayers on behalf of political elite,*
- Lunt, N., Smith, R., Exworthy, M., Green, S. T., Horsfall, D., & Mannion, R. (2014). *Medical tourism: Treatments, markets and health system implications: A scoping review, Paris: OECD.*
- Moghavvemi, S., Ormond, M., Musa, G., Isa, C. R. M., Thirumoorthi, T., Mukhtar, F., & Chandy, J. J. (2017). Connecting with prospective medical tourists online: A cross-sectional analysis of private hospital websites promoting medical tourism in India Malaysia and Thailand, *Tourism Management*, 58. 154-163.
- Mounir. A. & Zalagh. M. (2022). Morocco's healthcare system and the effects of medical tourism abroad, *Journal of Public Health and Epidemiology* 14(1), pages 1-8.
- Njuguna, R. & Nzau, J. (2021). Motivations, experiences, and obstacles in Kenya's outbound medical tourism. *Journal of African Studies and Development*, 13(1), 1-10.
- Orekoya, I. & Oduyoye, O. O. (2018). Implications of outbound medical tourism on public health care development in Nigeria, *Public Health Journal*. Retrieved from <https://api.semanticscholar.org/CorpusID:169123646>.
- Premium Times (2017). *Buhari's London medical trip: Nigeria spent £360,000 on parking his plane,* <https://www.premiumtimesng.com/news/headlines/240688-buharis-london-medical-trip-nigeria-spent-360000-parking-plane.html>. August 7.

Smith, R. & Delano, M. (2019). A new manifestation of inequality is Africa's outbound medical tourism, *The Lancet Global Health*, 7(10), 1298 to 1299.

The Observer (2019). *Funds spent on treating Ugandan officials abroad could build 10 clinics - report*, <https://observer.ug/news/headlines/61141-funds-spent-on-treating-ugandan-officials-abroad-could-build-10-clinics-report>. June 12.

World Bank (2013). *World bank document available at*, <https://documents1.worldbank.org/curated/pt/723511468102894381/pdf/814680WPOp13260Box0379837BooPUBLIco.pdf>

World Bank (2020). *Healthy partnerships: How governments can engage the private sector to improve health in Africa*. <https://openknowledge.worldbank.org/handle>

World Commission on Environment and Development. (1987). *Our common future*, Oxford University Press.



RESEARCH ON DEVELOPMENT ADMINISTRATION AND THE CHALLENGES OF INTERNATIONAL DEVELOPMENT

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Abstract

The article addresses in greater depth some of the central issues of the contemporary international development discourse. The focus of my article is the perspective of 'development administration', a research area in administrative science'. The central issues of the article include the conceptual issues concerning development administration in administrative science and the challenges developing countries are facing in: (a.) coping with modernization and economic globalization; (b.) promoting good governance by ensuring administrative decentralization and local development; and (c.) ensuring the sustainability of Non-Governmental Organisations (NGO)-led development initiatives. The article argues that there exists very little scientific research, neither conceptual nor empirical, on development administration in Nigeria. Therefore, academic study on issues related to 'development administration' and 'international development' has vital importance for the current development discourse in Nigeria and abroad.

Keywords: *Development administration, Development assistance, Economic globalisation, Social capital, Good governance, NGOs.*

Background to the Study

Since the 1950s, the study of 'development administration' has been viewed as part of the study of public administration. (Siffin 1991,7) Development administration refers to the administration of development programmes; to the methods used by large-scale organizations, notably governments, to implement policies; and plans designed to meet their development objectives .A second meaning associated with the term 'development administration' also involves the strengthening of administrative capabilities.(Riggs 1977, 6) Thus the term 'development administration' refers to organized efforts to carry out

programmes or projects thought by those involved to serve developmental objectives. (Riggs 1977, 73) Siffin seems escapist about development administration, as in his view it focuses on matters outside the boundaries of conventional public administration. (Siffin 1991, 11-12) He comments on the problem of development administration (1991, 8), arguing that there really isn't much of a problem, in as much as there isn't much of a field. Development administration is a term that implies question: How can the ideas and mechanisms of public administration be used as instruments of social and economic development? Riggs states: 'how does the study of development administration differ from the study of public administration in general, or even from the study of comparative administration? No dear answer to this question can be given. (1977, 3).

Jreisat (1991, 19-20) is more optimistic about the concept than Sillin. He says that comparative and development administration offers a rich heritage of scholarly contributions that include studies of numerous countries, cultures, organizations, and groups. Katz has, rather, identified the borders between development administration and public administration (1977, 120-121). In his opinion, development administration differs from traditional public administration in its objectives, scope, and complexity. According to him, 'the terms 'administrative science' and 'public administration' have been used interchangeably in this article. Development administration is innovative, since it is concerned with the societal changes involved in achieving developmental objectives. In its quest for change, the government becomes concerned with a wide scope of activities. No longer is it limited to the maintenance of law and order, the provision of some limited public services, and the collection of taxes; rather, it is specifically involved in the mobilization of resources and their application to a great variety of development activities on a massive scale.' (Katz 1977, 120).

Despite all these analyses and arguments, it is obvious that the context and scope of development administration is very central to administrative science, the subject widely known as public administration. The concept emerged in the post-World War II era of nation-building and administrative reforms in post-colonial states in the developing world. The concept often refers to 'the two fields of public administration and Development, which can be combined under the heading of "development administration" or administrative aspects of development.' (Riggs 1978, 1, italics added) Since its inception, the concept of development administration has mainly been employed in studying 'administration' and 'development' in developing countries. Development administration is most often treated as a facet of comparative public administration. In his most widely used book 'Public Administration: A Comparative Perspective' Ferrell Heady (1966) focused on public bureaucracy as it exists within different types of political systems. He sketched five general features of public administration in developing countries, and carefully examined the interplay of bureaucracy and politics. (Siffin 1991, 8).

Riggs (1977, 3) provides the insight that the Comparative Administration Group (CAG) of the American Society for Public Administration (ASPA) played a significant role in the

emergence of the concept of development administration in the 1960s. Administrative problems in the developing countries were a significant concern of their comparative study of public administration. Riggs and his CAG were supported by the Ford Foundation (Henderson 1971, 234). Thus, under the auspices of comparative studies of national public administration, development administration became more prominent as an independent concept in public administration studies in developing countries. One significant change in the 1967 version of US Agency for International Development (USAID) administrative doctrine, as embodied in the agency manual, is the emphasis on 'development administration', curiously without once using that popular term at all. (Abueva 1969, 554) Despite its growth as an independent area in public administration since the 1950s, academic studies in development administration was losing its momentum throughout the 1980s in the industrialized countries (See e.g. Hossain 2001, 37) and again started to regain in the turnoff the century (See e.g. Collins 2000, 3).

Public Administration and Development administration: The Theoretical Gap of the 1980s

Despite the above discussion, throughout the 1980s the mission of public administration in developed countries reached a different stage. During the 1970s, administrative reform in developing countries was an influential catchword (Siffin 1991, 9) which was usually understood as a subject matter of development administration.

However, Hussain (1994, 11) argues that developing the capacity of bureaucracy did not help much. Training imparted to bureaucracy did not correspond to the needs of the developing countries because training techniques and contents remained Western or American. Reflection of Hussain's view also could be founding the recent American literature on public administration. After several decades of scholarly contribution to the field of comparative and development administration, Professor Fred W. Riggs in his recent (2001, 1) writing concluded that American public administration is truly exceptional and has limited relevance to the solution of administrative problems in other countries. Nevertheless, it is so widely imitated and viewed as a model that anyone studying Public Administration needs to understand whether American system is exceptional and why its practices are so often irrelevant in other countries. Such an understanding requires a comparative analysis of different regimes based on the same constitutional principles -- i.e. the separation of executive, legislative and judicial powers -- and the identification of the peculiarly American structure of a hybrid bureaucracy. In the 1980s 'privatization' got labeled as the subject matter of public administration (Siffin 1991, 9) which covers a limited sphere of the organizational landscape in developing countries, as compared to the developed world.

The best-known forums of public administration like the Minnow brook 1 (in 1968) and 11 (in 1988) concentrated their theoretical focus on US administration and suggested reforms in that system. The 1968 theoretical discussion was mainly on 'ethics, social equality, human relations, reconciling public administration and democracy, and concern for the state of the field. However, several 1988 themes were not as prominent in 1968, notably leadership,

constitutional and legal perspectives, technology, policy and economic perspectives.' (Frederickson 1989,100) Thus the discussion in both of the Minnow brook forums naturally was far from the central concerns of public administration in developing countries. Due to the widening gap between the economies of rich and poor countries, over the decades the operational landscape of organizations had become complex internationally. As a result, 'development administration' was left behind on the journey of public administration sometime in the 1980s - although the subject matter of development administration is not a separate discipline from public administration.

However, like Paul Collins (2000, 3), many scholars in public administration feel that the turn of the century is an appropriate time to reflect on the impact of public administration on development and in turn, the impact of facets of development on administration. The issues confronting us are serious and include the failure of existing systems to cope with growing gaps between rich and poor within and between Countries with environmental degradation with frequent conflict between and within states and growing distrust of government generally.

The Absence of Development Administration in Development Assistance

Much has already been said about development administration and its relevance to public administration studies. World Bank has found that some 51 per cent of its rural development area projects during the period 1965 to 1985 failed to achieve the Bank's minimum acceptable rate of return of 10 percent (Turner and Hulme 1985 failed to achieve the Bank's minimum acceptable rate of return of 10 percent (Turner and Hulme 1997, 140). Samuel Paul (1986, 1) argued that administration or management has always been identified as a neglected factor in development project activities. Even in recent days, in practice, theories of development administration have very little been used or applied in planning and implementation of development projects and programmes in developing and transitional countries. Therefore, there is a general concern that most of the failed development programmes could not reach their developmental goals only because the stakeholders focused too little attention on the administration of development programmes. Scholars (Turner and Hulme 1997,141-144) also claim that the challenges of development, particularly in rural areas, are not 'well structured' problems, as project planning methodologies assume but are 'ill structured 'or simply 'a mess'. Orthodox project planning methodologies demand large amounts of reliable data.

In most developing countries such data is not available and so planners have to make assumptions. Another feature of project management in developing countries is uncertainty and instability. separation of planning from management causes serious problems belatedly in the 1980s, project planners have begun to recognize the problems of implementation. The lack of beneficiary participation also causes serious problems. All these factors make the development projects vulnerable to the long political processes in which aid agencies, political parties, local élites, politicians, bureaucrats, and other interest groups act. As a result, the extent of rural poverty has not been reduced or may have worsened in recent years. (Quibña 1994, Hossain 2001).

Theoretically, the study of development from the administrative science perspective has been weakening since the 1980s because public administration in developed democracies, i.e., in the richer parts of the world has dealt with some other aspects relevant to their everyday business. Therefore, advancing scientific studies on development administration has vital importance for fostering better understanding both academically in higher educational institutions and practically in the field, where development programmes are basically carried out. In order to address these issues, there is a great need to advance academic understanding regarding the existing theories.

Development Administration and International Development: The Contemporary Research Agendas

Theoretically, the research on development administration should be carried out with a broader perspective with the intention to make conceptual contribution to the study of administrative science. Scholarly, research should try to bridge the theoretical gap between development administration and public administration studies which has developed during the 1980s and 1990s between developing and industrialized countries. (Hossain 2001, 37) Due to its strong roots in development studies, development administration itself is a multi-disciplinary area of study. Therefore, with any single research approach, not all areas of development and their administration could be focused on in a limited time span. That is why the research agenda should be thematically very in depth and designed to cover the very central issues of the contemporary international development discourse (See also e.g. Collins 2000, 3-14). Multi-disciplinary orientation of development studies should no way be lost in the study of development administration. However, the aim should be to make theoretical contribution in the area of administrative science and practical contribution in the area of development management.

For example, scholarly work on the following thematic issues has vital importance in the contemporary development administration and international development discourse:

1. Development aid in the context modernization: the harmony and/or tension between social capital and economic globalization.
2. Challenges in good governance: administrative decentralization and local development in the South
3. Donors, NGOs, and the states in the developing world: the sustainability of NGO led development programmes.

Each of the above topics is very large in scope and requires deep understanding of these issues and themes reflected in each of the topics. Thus, careful selections of theoretical approaches in addressing these research topics are of vital importance in carrying out any study on the above topics. The thematic discussion of the above topics is further discussed below with theoretical references.

Economic Globalization and Social Capital

Economic globalization has mostly been studied specially by the scholars in development

economics, history, sociology and anthropology. Despite the economic advances (World Bank 2000) in many parts of the developing world, David Korten (1996, 127) argues that globalization has rendered many of the political roles of government obsolete as well. Companies with globalized operations routinely and effortlessly side step governmental restrictions based on old assumptions about national economies and foreign policy. Renato Ruggiero, ex-Director of the World Trade Organisation stated: "We are creating a single global economy". Embedded within this new single global economy is a set of liberal European epistemologies which define human beings as economic units and the free market as a rationally operating framework within which perfect competition exists which has its roots in the mercantilism of the earliest forms of imperialism and which is deeply flawed ideologically.

Economic liberalism and free trade are the linchpins [sic] of the new economic order designed to carry humankind on a wave of economic triumph into the new millennium.' (Harawira 1999) The recent protests against economic globalization in many parts of the world make us re-think its dynamics and drawbacks. However, the study of economic globalization is largely lacking in the public administration literature. 'Social capital' refers to stocks of cultural elements such as social trust, norms and values that people can draw upon to solve common problems for mutual benefits. (Li 2001, 130). Analogous to notions of physical capital and human capital--tools and training that enhance individual productivity--social capital refers to features of social organization such as networks, norms and social trust that facilitate coordination and cooperation for mutual benefit. (Putnam 1995, 67) Studies on social capital have been addressed by the scholars of administrative science (e.g., Harisalo and Miettinen 1997, Putnam 2000). Putnam's study reveals a competing scenario between social capital and modernization in the US and reveals America's declining social capital over the last three decades or so. Economic globalization and modernization contribute each other in order to survive. Development aid promotes modernization in the developing world. The mission of most of the development projects is to modernize traditional societies through a process called 'transition'; such societies are also referred to as 'prismatic societies' by Riggs (1978). Professor Dor Bahadur Bista (1994) has empirically presented the consequences of modernization and development aid and his study on fatalism and development bears commenting on at some length in this regard. A well-planned research agenda addresses the findings presented by Korten (1996) on economic globalization and Putnam (2000) on social capital could contribute an in-depth theoretical contribution to the study of international development by examining the inter linkages between these two influential concepts in social science.

Good Governance and Decentralization

The notion of 'good governance' was introduced to international development cooperation in the late 1980's following discussions in mainly World Bank circles on the results of structural adjustment policies. It developed into a somewhat confusing and controversial term. (Kruiter 1996) Theoretically the scope of governance is wide and covers larger issues

such as administrative reform, national development policies, democratization, decentralization, corruption, partnerships between the public, private and the third sector, and other areas of public affairs (see, e.g., Turner and Hulme 1997). Among the above, research on administrative decentralization has got a tradition and direct relevance to the study of comparative and development administration. Including administrative decentralisation, the other issues of good governance mentioned above (Turner and Hulme 1997) have also got a growing importance in the contemporary international development discourse and covers the central aspects of development administration.

A major obstacle to the effective performance of public bureaucracies in most developing countries is the excessive concentration of decision-making and authority within central government. Decentralisation within the state involves a transfer of authority to perform some service to the public from an individual or an agency in central government to some other individual or agency which is closer to the public to be served. However, in practice, the challenges of good governance through decentralisation are many. In most developing countries, there has been a tendency for independent governments to prefer delegating power within the public service rather than to locally elected authorities. There has been much rhetoric about participation and local autonomy but central governments have jealously guarded their power. (See, e.g., Turner and Hulme 1997, 151-174; Seppälä 2000, 48-57). Thus, in practice, governance has remained far from being able to be called 'good'.

It is true that academic research in public administration and international development covers the central issues cutting across traditional subfields of international relations, political science and public administration. However, research on good governance and administrative decentralisation is more central to public administration than any other fields in social sciences. Therefore, there are scopes for scholars in administrative science to make scholarly contribution in the areas of the challenges in good governance and search for a possibility for local capacity building in developing countries.

NGOS And the Sustainability of Ngo-Led Development Projects

The role of Non-Governmental Organizations (NGOs) in managing development initiatives in developing countries has been very central in contemporary development aid discourse. Development projects run by NGOs are assumed to be flexible, innovative, participatory, cost effective and directed to the poor. Several social, economic, political and cultural arguments exist to justify the advantages of NGOs (for details see e.g., Hulme 1994, Tvedt 1995 and 1998b, Vartola et al 2000, Hossain 2001, and others). 'Market failure' and 'government failure' are considered the leading reasons for the growth of NGOs. (Asheier and Seibel 1990, 1) Scholars argue that this growth of NGOs reflects dissatisfaction with both the state and the market. On the other hand, the use of NGOs has been consistent with both the New Right aid policies of governments in the USA and UK and the 'alternative' aid policies of the donor community in the Nordic countries and the Netherlands. (Hulme 1994, 251 and 265) The restructuring policies of the World Bank and other influential donor institutions (e.g., in OECD countries) led to a planned reduction of the role of the state in developing countries and increased space for development NGOs.

However, the sustainability of NGO-led development initiatives is questioned in the social science literature from different angles. A development programme is considered sustainable when it is able to deliver an appropriate level of benefits for an extended period of time after major financial, managerial, and technical assistance from an external donor terminated. (OECD 1989, 7) Among others, a recent study (Hossain 2001, 11) argues that despite the said comparative advantages of NGOs, their development projects remain unsustainable in many developing countries. Research also suggests, the idea, for example, that NGOs have the comparative advantage that they are generally assumed to have in the literature on NGOs in development, has been falsified. (Tvedt 1997, 1) Despite these arguments, since the 1970s NGOs have rapidly been growing over the OECD and developing countries. Due to the lack of reliable data the number of development NGOs, their total aid volume and the number of beneficiaries cannot exactly be stated (see, e.g., Tvedt 1998b,10). It is also difficult to estimate because the distinction between the traditional welfare organizations and the modern development NGOs, connected to international aid system is not clear. However, it is estimated that about 4,000 development NGOs in OECD member countries, dispersing billions of dollars a year, were working with about 10,000 to 20,000 'Southern' NGOs (based in developing countries) who assisted, it has been estimated, between 100 and 250 million people (Tvedt 1998b, 1). Therefore, in-depth and thematic empirical studies on the topic should examine the sustainability and the comparative advantage of NGOs in developing countries. Such studies on the topic definitely will enrich the literature of development administration and will bring valuable insight to the actors involved in international development in carrying out their development assistance to developing countries.

Concluding Remarks

Theoretically, it is not easy to solve all the challenges development administration is facing today as a sub-field of public administration. Development aid in the development process of the least developed countries has been playing an important role in recent decades. Bilateral, multilateral and other international donors are also facing new challenges in their development efforts in developing countries. It is misleading to generalize the merits of development aid.

Generalizing the drawbacks of development aid and efforts could also be misleading. Compared to other European Union and Nordic countries, development administration has been less studied in Nigeria in general and in Finnish administrative science studies in particular. There exists very little scientific research, neither conceptual nor empirical on development administration in Nigeria.

Research on social capital, modernization and economic globalization can bring valuable insight and can make significant contribution to the administrative challenges of development management and international development. The socio-economic development of developing countries directly depends on how these countries are governed. Therefore, by ignoring the present day's challenges of good governance and

administrative decentralization, no development initiatives will be able to ensure a sustainable progress in developing countries. Since the 1970s, the performance of development NGOs as alternative development organizations has been generally appreciated by the aid donors despite the fact that most of their development initiatives are heavily dependent on foreign aid and the projects are not sustainable. Sustainability of NGOs led development projects can be ensured by improving the managerial capacity of the NGOs. The above topics are very central to the contemporary international development discourse and needs to be researched. Therefore, academic studies on the above issues related to "Development Administration" and "International Development" has vital importance for the current development discourse in Nigeria and abroad.

In addition to the economic community, the main user group of the information produced by academic research on these topics could definitely be the stakeholders (e.g authorities, political decision-makers) involved in international development both in the South and North. Theoretically, identifying the dynamics and drawbacks of development administration and practically, searching for better ways to carry out international development effectively, largely depends on the future interest and ability of academics and practitioners to study the subject properly.

References

- Abueva, J. V. (1969). *Administrative doctrines diffused in emerging states: The Filipino response*, In: Braibanti, Ralph (1969, Ed.) *Political and Administrative Development*. Durham: Duke University Press. 536-587.
- Anheier, H. K. & Seibel, W. (Eds.; 1990). *The third sector, Comparative studies of nonprofit organizations*, Berlin: Walter de Gruyter.
- Bista, D. B. (1994). *Fatalism and development. Nepal's struggle for modernization*, Calcutta: Orient Longman. Collins, Paul (Ed. 2000):
- Collins, P. (Ed. 2000). *The last fifty years and the next fifty years: A century of public administration and development*, In: Collins, Paul (Ed. 2000): *Applying Public Administration in Development - Guideposts to the future*. Chichester: John Wiley and Sons Ltd, 3-14
- Development World Bank (2000). *Global economic prospects and the developing countries 2000*, Washington D.C.: The World Bank.
- Frederickson, H. G. (1989). *Minnowbrook 11: Changing Epochs of public administration*. In: *Public Administration Review*. March/April 1989, 49(2). 95-100

- Handerson, K. M. (1971). *New comparative public administration?* In: Marini, Frank (1971, Ed.): *toward a new public administration, The Minnow Brook Perspective*. New York: Chandler Publishing Company, 234-250.
- Harawira, M. (1999). *Economic globalisation, indigenous peoples, and the role of Indigenous women*, Paper presented at the Hague Appeal for Peace Conference, May 1999, The Hague, Netherlands. Also available at (November 5, 2002): <http://lwww.converge.org.nz/lpmallak.htm>.
- Harisalo, R. & Miettinen, E. (1997). *Trust capital. the third force of entrepreneurship*, Tampere: University of Tampere, Department of Administrative Science.
- Heady, F. (1979). *Public administration, A comparative perspective*. New York: Marcel Dekker
- Hossain, F. (2001). *Administration of development initiatives by non-governmental organizations. A study of their sustainability in Bangladesh and Nepal*, Academic Dissertation. Acta Universitatis Tamperensis 822. Tampere: University of Tampere.
- Hulme, D. (1994). *Social development research and the third sector*. NGOs as Users and Subjects of Social Inquiry. In: Booth, David (Ed.): *Rethinking Social Development. Theory, Research and Practice*. Essex: Longman. 251-275.
- Hussain, M. (1994). *Development administration in Bangladesh*, Dhaka: Hasan Publishers.
- Jreisat, J. E. (1991). *The organizational perspective in comparative and development administration*. In: Farazmand, Ali (1991, Ed.), *Handbook of Comparative and Development Public administration*. New York: Marcel Dekker, Inc. 15-23
- Katz, S. M. (1977). *Exploring a systems approach to development administration*. In: Riggs, Fred W. (1977, Ed.), *Frontiers of Development Administration*. Durham: Duke University Press, 109-138
- Korten, D. C. (1996). *When corporations rule the world*, London: Earthscan Publications Ltd.
- Kruiter, A. (1996). *Good governance for Africa: Whose governance?* Maastricht: ECDPM. Available at <http://www.oneworld.org/ecdpm/pubs/govahk.htm#int> (Accessed on November 5, 2002)
- Li, N. (2001). *Social capital and international R&D collaboration*. In: Hallinon Tutkimus-Administrative Studies. 20(2), 130-143

- OECD (1989). *Sustainability in development Programmes: A compendium of evaluation experience*, Selected Issues in Aid Evaluation - 1. Paris: OECD.
- Paul, S. (1986). *Strategic management of development programmes*, Geneva: International Labour Office (ILO)
- Putnam, R. (1995). Bowling Alone: America's declining social capital. In *Journal of democracy* 6(1), Jan 1995, 65-78. Available at use.jhu.edu/demo/journal_of_democracy006/putnam.html (Accessed on November 5, 2002)
- Putnam, R. (2000). *Bowling alone: The collapse and revival of American community*, New York: Simon & Schuster.
- Quibria, M. G. (Ed. 1994). *Rural poverty in developing Asia*. 1. Manila: Asian Development Bank.
- Riggs, F. W. (1977). Introduction. In: Riggs, Fred W. (1977, Ed.): *frontiers of development administration*, Durham: Duke University Press 3-37
- Riggs, F. W. (1977). *The context of development administration*. In: Riggs, Fred W. (1977, Ed.): *Frontiers of development administration*, Durham: Duke University Press. 72-108
- Riggs, F. W. (1978). *Applied prisms – A development perspective*. Kathmandu: Center for economic development and administration, Tribhuvan University.
- Riggs, F. W. (2001). *Public administration in America: The exceptionalism of a hybrid bureaucracy*, Available at <http://www2.hawaii.edu/~freddampa.htm> and at <http://webdata.soc.hawaii.edu/fredr/welcome.htm#pa> (accessed on June, 18, 2002)
- Seppälä, P. (2000). *Towards local Partnerships: The social interfaces of aid in rural Tanzania*, Helsinki: Ministry for Foreign Affairs of Nigeria.
- Siffin, W. J. (1991). *The problem of development administration*. In: Farazmand, Ali (1991, Ed.): *Handbook of comparative and development public administration*, New York: Marcel Dekker, Inc. 5-13
- Turner, M. & Hulme, D. (1997). *Governance, administration & development: Making the state work*, London: Macmillan Press Ltd.
- Tvedt, T. (1995). *Non-governmental organizations as channel in development assistance: The Norwegian system*, Oslo: Royal Ministry of Foreign Affairs.

- Tvedt, T. (1998a). *NGOs' role at the end of history: Norwegian policy and the new paradigm*. In: Hossain, Farhad and Myllylä, Susanna (Eds.:1998), *NGOs Under Challenge: Dynamics and Drawbacks in Development*. Helsinki: Ministry for Foreign Affairs of Nigeria. pp. 60-83
- Tvedt, T. (1998b). *Angels of Mercy or development diplomats? NGOs and foreign aid*, Oxford: James



UNRAVELING THE CHALLENGES OF WASTE -TO-ENERGY TRANSITION IN EMERGING ECONOMIES: IMPLICATION FOR SUSTAINABILITY

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Abstract

The recent geopolitical events, such as the conflict between Russia and Ukraine have strained the available resources worldwide. In emerging economies like Bangladesh which is heavily reliant on imported gas, oil and coal, this has created a severe energy crisis. In response to the energy crisis and to support eco-friendly waste management, converting waste into energy is being recognized as a promising solution. However, introducing waste-to-energy systems in developing economies faces many intricate challenges that require careful examination. This study therefore, aims to explore and evaluate the challenges associated with adopting a waste to energy (WtE) conversion system in emerging economies like Bangladesh. The research methodology involves identifying challenges from an extensive review of existing literature and expert feedback and then combining Bayesian theory with Best Worst Method (BMW) to evaluate the challenges. Among the 21 challenges analyzed, the “need for well-developed planning and incentivized policy making”, ‘ineffectiveness in waste segregation at the source’, and “high cost for installation, maintenance and infrastructure development appear to be the most significant challenges with weight values 0.071, 0.067 and 0.066 respectively. The study can enhance managers’ understanding of the challenges faced by this sector and thus facilitate informed decision-making. The outcomes of this study are expected to enrich the existing body of knowledge, promote the diffusion of WtE technology in emerging economies, reduce dependency on the international energy market and achieve global sustainable development goals (SDGs) such as affordable and clean energy (SDG7), sustainable cities and communities (SDG11) and climate action (SDG13).

Keywords: *Waste-to-energy, Renewable energy, Emerging economy, Sustainable development, Bayesian best worst method.*

Background to the Study

Waste generation is a significant environmental challenge that is rapidly increasing globally. As the global population is anticipated to increase in the coming decades, there is a projected surge in waste generation at an unprecedented pace. In recent years, the acceleration of urbanization, industrialization, and economic growth has led to an intensified pace of waste generation. Municipal solid waste (MSW) among various waste types has emerged as the most substantial contributor (). MSW includes waste originating from residential, institutional, and industrial sources and comprises a vast array of substances, including food and vegetable waste, paper, plastics, metals, glass, textiles, wood, grass, leaves, and various organic and inorganic substances (). The amount of waste generated globally is truly astounding, with the World Bank estimating an annual production of almost 1.3 billion tons of MSW, and this figure is predicted to rise to 2.2 billion tons by 2025 and further escalate to 2.59 billion tons per year by 2030 (). By 2050, it is predicted that the annual MSW generation will reach a staggering billion tons, presenting a formidable environmental challenge ().

The inadequate management of MSW has significant detrimental effects on both the natural environment and biodiversity and the well-being of people, particularly in the least developed and developing nations like India, China, Bangladesh, Thailand, and Malaysia (). The swift expansion of the population, along with speedy industrialization and urbanization, has resulted in the generation of large quantities of waste that pose significant challenges in terms of proper handling and disposal. A substantial portion of MSW is disposed of through open dumping in landfills, leading to soil and water contamination and air pollution caused by waste incineration. These activities harm the local environment and human health, leading to respiratory problems and other diseases (). Furthermore, landfills produce significant methane, a potent greenhouse gas contributing to climate change. Worldwide, MSW generation has resulted in the release of 550 million metric tons of methane emissions each year, exacerbating the effects of climate change ().

Historically, MSW management relied on open landfills and burning, causing environmental issues, but contemporary approaches emphasize sustainability through practices like recycling and incineration (). The efficient management and disposal of MSW pose substantial challenges for municipal and city corporations' authorities in many developing nations like Bangladesh, primarily due to the continuous waste generation and the associated huge costs of handling it (;).

In Bangladesh's urban areas, the annual waste production is estimated to be around 633,129 tons, which is equivalent. MSW is recognized as a renewable energy source alongside hydro, solar, wind, and other clean energy forms by The United States Environmental Protection

Agency (EPA) (). In addition to the challenges in waste management, Bangladesh also faces energy shortages due to its heavy reliance on imported fuels. The ongoing Russia-Ukraine conflict and rising oil prices have resulted in an energy crisis in the country, with frequent power outages and load shedding affecting households and businesses. Considering the prevailing circumstances, the conversion of MSW into energy holds promise as a potential solution to address both the waste management and energy challenges in Bangladesh. The government has acknowledged the significance of the Paris Agreement, 2015 and Sustainable Development Goals (SDGs) (;).

Even though Bangladesh has recently advanced from a least developed country to a developing one, its energy sector is still very reliant on the international energy market, especially for fossil fuels (). According to the most recent Bangladesh Power Development Board report, 53.02% of electricity in Bangladesh is generated by natural gas-based power plants, with the remaining 46.97% coming from a combination of HFO, high-speed diesel (HSD), imported power, hydropower, coal, and solar power, accounting for 25.51%, 6.14%, 5.54%, 1.1%, 8.06%, and 0.62% respectively (). However, the country is now trying to move away from the fossil fuel intensive electricity generation mix to comply with the global decarbonization initiatives (). Embracing decarbonization technologies in the energy sector is very important to curtail CO₂ emissions and move toward a low-carbon future (). Among various sources of clean energy, waste to energy (WtE) is recognized as a renewable energy source that efficiently converts discarded municipal solid waste (MSW) into electricity and heating steam, making it a more sustainable alternative to land filling with reduced land requirements and solid waste volume (). Proper handling of MSW poses a significant challenge for a developing nation like Bangladesh. Adopting WtE can be a good solution to both the MSW management problem and the ongoing energy crisis.

The successful WtE conversion can significantly contribute to the achievement of multiple SDGs. Firstly, by ensuring a green energy source at a lower cost, WtE technologies contribute to SDG 7 (Affordable and Clean Energy). Furthermore, implementing WtE requires infrastructure and capital, thereby promoting innovation and the development of industries, aligning with SDG 9 (Industry, Innovation, and Infrastructure). Moreover, WtE technologies help reduce waste in land-fills and the environment, thereby promoting the practice of consuming and producing goods and services that minimize negative impacts on the environment and society and support SDG 12 (Responsible Consumption and Production). Additionally, by capturing methane produced from organic waste in landfills and reducing waste that would otherwise be burned or left to decay, WtE conversion aids in reducing greenhouse gas emissions, aligning with SDG 13 (Climate Action) and SDG 15 (Life on Land).

While transitioning to WtE, numerous challenges and complexities encompassing environmental, technological, economic, regulatory, and societal aspects arise that necessitate careful consideration and strategic planning. Numerous studies have focused on different aspects of WtE, such as environmental impact assessment (), technological

evaluation such as biological treatment, thermal treatment, landfill gas utilization and bio-refinery technologies, among others () and potential scenarios for enhancing climate co benefits. Within the vast and diversified field of WtE research, our study redirects the spotlight towards the critical but often overlooked aspect of barriers and limitations that impede the successful implementation of waste-to-energy solutions in emerging economies like Bangladesh. By doing so, this study aims to contribute to the body of knowledge that can lead to formulating policies and strategies for a more sustainable and efficient WtE transition. Therefore, this study aims to fill the knowledge gap by answering the following research questions (RQs).

RQ1: What are the challenges that need to be addressed to implement the WtE transition in an emerging economy like Bangladesh?

RQ2: How can we evaluate the challenges involved in achieving energy sustainability?

RQ3: How can each challenge's relative importance impact the successful WtE transition in an emerging economy like Bangladesh?

RQ4: How can the study's findings be effectively appraised to guide decision-makers in implementing strategic measures to promote energy sustainability?

To answer the questions raised earlier, this study will attempt to fulfill the following research objectives (ROs):

RO1: To apply an integrated approach consisting of an extensive literature review and expert feedback to identify the challenges impeding the successful WtE transition from an emerging economy perspective.

RO2: To evaluate the identified challenges using an integrated multi-criteria decision-making framework.

RO3: To assess the potential impact of the challenges on the successful WtE transition based on their relative importance obtained from the evaluation.

RO4: To provide crucial insights to decision-makers and policy makers based on the obtained results for efficient strategic planning to facilitate the successful WtE transition and promote energy sustainability.

To accomplish the previously stated ROs, this study proposes a structured framework to identify, prioritize and assess the challenges associated with implementing WtE conversion in Bangladesh. This framework involves the following steps; -

- i. Conducting a comprehensive literature review to identify the challenges associated with WtE implementation in emerging economies like Bangladesh
- ii. Conducting interviews with pertinent stakeholders in Bangladesh to obtain a comprehensive understanding of the challenges involved and seek their feedback to verify the challenges identified in this literature review
- iii. Conducting a survey for analyzing challenges to collect data from experts in the field regarding the identified challenges
- iv. Analyzing the collected data using a multi-criteria decision making (MCDM) approach named the Bayesian BWM technique, which relies on pairwise comparisons to prioritize the identified challenges effectively

v. Prioritizing the challenges based on the Bayesian BWM analysis

This study intends to address current hurdles and establish a trajectory for future researchers in the domain of WtE transition, thereby presenting a comprehensive roadmap for scholars and practitioners. Examining and understanding the challenges can facilitate the implementation of WtE technologies and the formulation of relevant long-term policies. The tangible outcomes of this study hold the potential to directly and substantially benefit the energy sector stakeholders. The study can also say that policy makers, offering critical insights that can contribute to formulating effective and sustainable energy policies in the context of emerging economies. This work can also encourage the industry stakeholders to explore deeper and contribute further to the evolving landscape of WtE. The research therefore, can emerge as a valuable bridge between theoretical insights and practical applications, fostering a more informed and collaborative approach towards a sustainable future. The rest of the paper is structured as follows: section 2 presents the literature review, section 3 describes the methodological approach of Bayesian BWM including the study context and data collection; section 4 exhibits the results; section 5 discusses the findings of the study and the study implications from theoretical, practical and sustainability context while section 6 concludes the study.

Literature Review

Currently, Bangladesh has a combined installed capacity of 26,550 MW for captive and renewable energy sources according to . However, there are plans outlined in Vision 2041 () and the power system master plan () to increase this capacity to 40,000 MW by 2030 and 60,000 MW by 2041. According to the Integrated Energy and Power Master Plan (IEPMP) developed by the Japan International Cooperation Agency (JICA), it is anticipated that at least 40% of the 60,000 MW of electricity generated by 2041 in Bangladesh will come from clean energy sources. This aligns with Bangladesh's objective of achieving carbon neutrality by 2070 as stated in . The power sector is crucial for socio-economic development, fostering industrial growth and poverty reduction and renewable energy sources such as waste-to-electricity will play a significant role in achieving these targets ().

The government of Bangladesh established the Sustainable and Renewable Energy Development Authority (SREDA) to tackle concerns related to global warming, environmental risks and energy security. SREDA works towards achieving these goals by reducing reliance on fossil fuels and promoting the adoption and expansion of various renewable energy sources. Additionally, SREDA focuses on reducing energy waste in residential and different industrial sectors through energy conservation and efficient utilization (). In Bangladesh, utilizing organic waste components such as plant residues, agricultural waste, organic fertilizer, food waste, animal manure, green waste, and other MSW for biogas production has emerged as an effective waste management system. Biogas serves multiple purposes such as cooking and organic fertilizer for fishponds and crops. As of June 2020, 76,771 biogas plants have been established in Bangladesh and several programs and projects are being implemented to develop biogas plants further (). Poultry

waste-based biogas plants have been the most successful in generating gas for electricity production and the remaining residue is a high-quality organic fertilizer for crops.

Despite the many benefits of biogas production, managing the waste (slurry) generated after biogas production remains a significant challenge in Bangladesh, as highlighted in the biogas guidelines (). Bangladesh has launched initiatives to develop projects that utilize appropriate technology to generate energy from waste and introducing the national 3R strategy, emphasizing the principles of 'Reduce', 'Reuse', and 'Recycle' to manage solid waste effectively, according to the United Nations Department of Economic and Social Affairs (). The Bangladeshi government has started programs targeting using the right technology for WtE conversion, considering the rising volume of waste being produced and its potential as an energy source. presents the ongoing development of WtE plants in Bangladesh.

Currently, Bangladesh's installed capacity of 26,550 MW includes 1169.73 MW () from different renewable energy sources, mainly solar energy. presents the percentage of power production using renewable energy sources in Bangladesh. With rising energy consumption, Bangladesh produced a total of 80,423 million kWh of net electricity during the fiscal year 2020–21 ().

The Power Division is directing SREDA'S efforts to grow the waste-to-electricity industry,

Table 1: WtE plants (processing) in Bangladesh.

Plant Area	Technology	Capacity (MW)	Required Waste (Tons/Day)	Stakeholders	Sources
Aminbazar	Incineration	42.5	3000	Dhaka North City Corporation, Bangladesh Power Development Board, and China Machinery Engineering Corp.	Daily Sun (2021)
Jalkuri	Incineration	6	600	Narayanganj City Corporation, Bangladesh Power Development Board, and Chinese Firm U and D.	The Financial Express (2022)
Matuail	Incineration	50	3000	Dhaka South City Corporation, Bangladesh Power Development Board, and Canvas Environmental Invest International Company Limited (China).	Daily sun (2021)

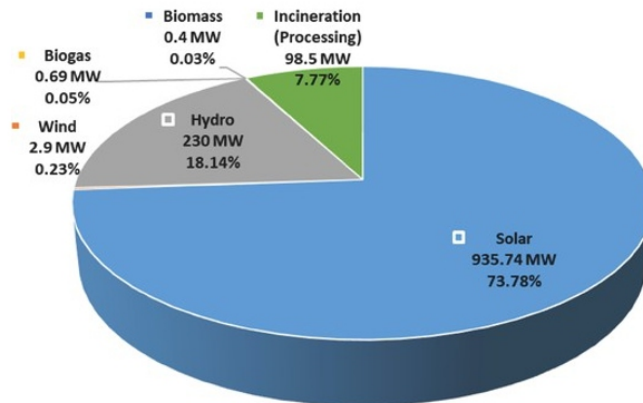


Fig 1. Renewable energy sources in Bangladesh (SREDA, 2023)

The Power Division is directing SREDA'S efforts to grow the waste-to-electricity industry, and city corporations and municipalities have embraced the strategy's guiding principles to improve their waste management procedures. In Bangladesh, WtE projects have been reviewed in six municipalities, including Mymensingh, Cox's Bazar, Dinajpur, Habiganj, Jashore, and Sirajganj to increase electricity production (;). These locations can potentially use 300,504 tons of waste and generate 23,472 kWh in Modular Design 1, including indirect revenues, and 62,403 kWh in Modular Design 2 by energy reuse in a large-scale scenario. Implementing these projects can significantly contribute to national energy generation ().

In that feasibility study report, the proposal for Modular Design 1 involves combining anaerobic digestion, recycling, and composting to create a biogas plant that handles organic municipal solid waste and can incorporate other waste treatment modules. The objective is to convert waste into useful and profitable end-products, including organic fertilizer and various forms of energy such as heat, gas, and electricity. Modular Design 2 incorporates anaerobic digestion, gasification and composting, specifically including a gasification module. The design involves pretreating the mixed solid waste stream to ensure it meets the technical specifications required for a downdraft gasifier. Like the first modular design, additional modules can be added to the site to treat other types of waste, maximizing the value of the products resulting from municipal solid waste treatment.

Related Works, Research Gap and Study Contributions

With a combined capacity of 37 and 50 million metric tons of waste respectively, there is potential to build 248 new WtE facilities within the European Union countries and 330 throughout Europe (). The larger portion of the MSW in the US is sent to landfills that are fitted with gas recovery which is then used for electricity generation or supplied to homes and there are 86 WtE facilities in the US, primarily using incineration and refuse-derived fuel technologies (). A considerable increase in interest in using WtE technology in

emerging economies has become important due to environmental and economic issues in recent years (). Numerous facets of the implementation of WtE projects in nations like Malaysia, Serbia, Nepal, and Bangladesh have been studied. In Malaysia for instance, investigated the environmental, monetary, and social difficulties related to energy recovery from MSW, while Serbia was used as an example in 's analysis of the challenges connected with implementing WtE in emerging and transitioning nations. presented 'Energy', 'Exergy', 'Exergoeconomic', and 'Environmental' (4E) analyses of thermal power plants for WtE applications in the Dhaka and Chattogram cities of Bangladesh. examined potential technologies for harnessing energy from waste produced in Bangladesh.

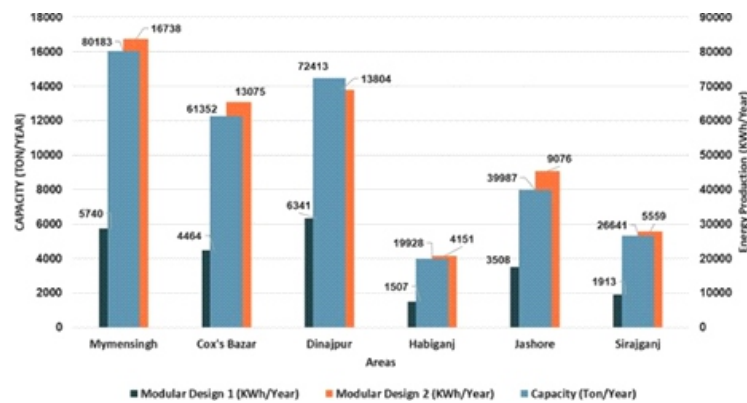


Fig 2: Possible energy production in six municipalities of Bangladesh (United Nations Development Programme 2018)

This study offers four contributions. First, this study contributes to the existing literature by recognizing and analyzing the challenges for WtE in an emerging economy. By doing this, it is expected to make it easier for emerging economies to obtain sustainable and renewable energy. Second, it prioritizes the challenges by incorporating Bayesian theory and BWM, a more current and sophisticated method. To our current understanding, this is the first endeavor that combines Bayesian BWM, the developing economy, and challenges associated with the WtE transition under a single platform. Third, the study offers solutions to these problems, which might be useful information for researchers, industry participants, and governments who are trying to promote renewable and sustainable energy in developing nations. Finally, this framework's contribution to attaining some of the SDGs, including SDG 7 (Affordable and Clean Energy), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), SDG 15 (Life on Land), etc., are numerous.

Key Challenges for WtE Implementation

An extensive literature search was conducted to identify the challenges to the WtE transition from the perspective of Bangladesh as a developing country. A systematic literature search protocol was used to identify the crucial challenges. Primarily, seventeen challenges were identified from the literature search.

Methods

This study aimed to comprehensively identify and prioritize challenges associated with Bangladesh's WtE transition. To achieve the study objective, this research employs a mixed methodological approach combining qualitative interviews with quantitative data analysis. First, after the initial identification of the challenges through an extensive literature review, systematic feedback from the expert was solicited to validate and refine the identified challenges. The combination of these methodologies allowed for integrating established knowledge and expert insights ensuring a comprehensive identification of the challenges. Numerous other studies have previously employed similar methodologies to identify relevant factors (Ali et al, 2022; Khan, Singh, et al.,2022; Siraj, Debnath, Payel, et al.,2023; Zalvand et al.,2022). Subsequently, the Bayesian BMW was utilized to analyze the finalized challenges. The selection of the Bayesian BMW was motivated by its capacity to handle subjective judgement and uncertainties effectively. This method facilitated the aggregation of expert opinions and provided a structured approach for quantifying the relative importance of each identified challenge. Such a methodological choice aligns with the intricacies of the research objectives, particularly given the multidimensional aspects of the challenges (operational, economic, organizational and technical).

Study Context and Data Collection

As energy demand continues to increase globally, countries are turning to sustainable and renewable energy sources to address climate change and resource scarcity. WtE technology is one such renewable energy source that involves converting waste materials into useable forms of energy. WtE has the potential to address various operational, technical, managerial and economic challenges faced by emerging economies such as waste management, energy security, reducing reliance on fossil fuel and achieving the SDGs. Waste is a crucial focus of study's goal and objectives, thereby enhancing its accuracy and dependability. Purposive sampling is a purposeful, non-random approach that relies on the researcher's judgment regarding the pertinent information and their ability to identify experts capable of furnishing that information effectively (Siraj, Debnath, Kumar et al., 2023). The experts excluded no challenge. However, they added four more challenges: "Ineffectiveness in waste segregation at the source", "Heterogeneous mixture of waste at the dump site", "Insufficient financial backing from the government and investors" and "Complexity in the process of procurement". Additionally, they divided all the challenges into four clusters. Following the literature review and expert validation assessment, 21 challenges were finally selected. The following stage involved contacting the same 12 experts to conduct semi-structured interviews to create the Best-to-Others and Others to Worst matrices. Semi-structured interviews are qualitative research techniques that combine pre-set open-ended questions with the freedom to probe further and cover new ground. The decision to employ semi-structured interviews with the experts was driven by the need for in-depth insights into the challenges associated with Bangladesh's waste-to-energy transition. A semi-structured interview process was chosen to allow a flexible yet systematic exploration of expert opinions, experiences and impressions. This method was considered appropriate for capturing nuanced information and facilitating a comprehensive understanding of the

identified challenges (). Semi-structured interviews unlike unstructured ones, involve a guided interview process designed to address research objectives and focus on the conversation's natural flow rather than being strictly followed verbatim in the same order for each interview (). Moreover, the importance of ethical considerations in research is recognized in this process especially when involving expert participants. Informed consent was obtained from each expert before the commencement of the interviews. The participants were briefed on the purpose of the study, the voluntary nature of their participation and the confidentiality of their responses. The option to participate in either in-person interviews or via email was presented to respect the preferences and comfort levels of the experts. For email interviews, the questionnaire was provided through Google Forms. Participants were provided with a clear introduction outlining the study's objectives, the expected commitment and a statement ensuring the confidentiality of their responses. They were also informed that their insights would be aggregated and anonymized to maintain individual privacy.

Bayesian Best-Worst Method Approach

With the Bayesian BWM, a variation of the BWM, a group of elements (such as problems, requirements

and alternatives) can be prioritized according to their perceived value or relevance. In the Bayesian BWM experts are asked to identify the “best” and “worst” criteria from a given set. These selected elements are then used as reference points for making pairwise comparisons during the analysis. It incorporates uncertainty into the model and increases the precision of the results by using Bayesian statistical approaches to estimate the relative weights of the items based on expert feedback (). The method has been widely applied in various fields, including marketing, environmental management and healthcare due to numerous advantages including flexibility in handling large-scale problems and incomplete data, probabilistic outputs and computational efficiency. The following steps are adopted for applying the Bayesian BWM approach, given as follows ().

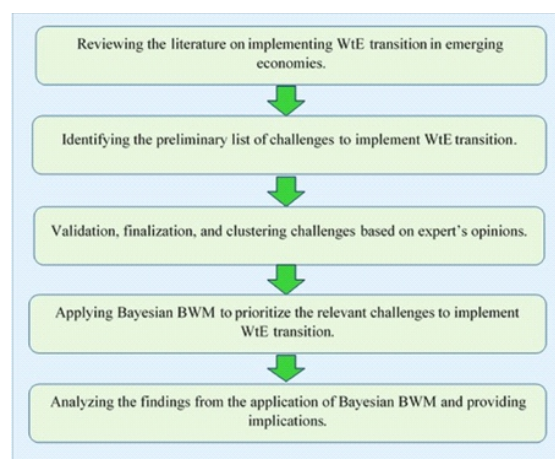


Fig 3. Flower Chart of the research methodology

This section presents the outcomes of the ranking process applied to assess the challenges associated with the WtE transition in Bangladesh. Following the established steps of the Bayesian BWM experts identify the most significant (best) and least significant (worst) challenges from the given set. Subsequently, they formulate the “Best-to-Others” and “Others-to-Worst” vectors for both the main clusters and sub-clusters. By utilizing these vectors, the Bayesian BWM is employed to compute the overall weights assigned to each challenge. In this visualization, the nodes correspond to the criteria and their average weights. These average weights are calculated as the mean of the aggregated weight distribution derived from the input of all 12 experts. This consistent approach ensures a comprehensive and representative assessment of the challenges throughout the evaluation process.

The graph's edges indicate credal orderings, which show that with a given degree of confidence, one criterion is more important than another. Furthermore, the managerial challenges are found to be more important than the other clusters with a higher level of weight. Specifically, the managerial challenges are implemented with a 0.9 confidence level compared to economic challenges (0.81 confidence), technical challenges (0.54 confidence) and operational challenges (0.54 confidence).

The most significant managerial challenge is the 'need for well-developed planning and incentivized policy making' with a weight of 0.2472. The second most significant challenge is the 'communication gap between the researchers and the government' with a weight of 0.1523 followed by the “inadequate engagement and collaboration from stake holders” with a weight of 0.1482. Other managerial challenges such as the 'inadequate engagement and collaboration from stake holders and the 'lack of comprehensive legislation and proper implementation' also have significant weight. Overall, the ranking of managerial challenges at the local level reveals which issues must be resolved to accomplish the WtE transition in emerging economies. It also presents the local ranking for the cluster of the operational challenges for the WtE transition in developing economies. According to the results, the most significant operational challenge is the 'ineffectiveness in waste segregation at the source' with a score of 0.2398. This is followed by 'proper site selection' with a score of 0.2297 and 'difficulty in swiftly managing waste collection and transportation' with a score of 0.1880. The remaining operational challenges, including 'Heterogeneous mixture of waste at dump site' (0.1719) and 'inappropriate methods for waste recovery and disposal' (0.1706), are found to be less significant.

The most significant technical challenge with a weight of 0.2392, is the 'lower calorific value compared to conventional fuels'. The second and third most significant challenges are the 'scarcity of integrated information on waste' (0.2141) and 'atmospheric damage in the plant areas' (0.1967), respectively. The local ranking provides valuable insights into the relative importance of technical challenges, which can be used to prioritize efforts and resources toward addressing the most significant technical challenges in the WtE transition process.

Discussion

According to the proposed Bayesian BWM framework, the main challenge in implementing WtE transition in emerging economies like Bangladesh is the “need for well-developed planning and incentivized policymaking (MC5)”. identified this challenge as one of the most crucial challenges for successful conversion for WtE. This involves creating a comprehensive plan considering specific waste and energy needs and environmental and social impacts. Incentivized policymaking can support this planning process by offering financial incentives for sustainable WtE technologies, promoting job creation, reducing greenhouse gas emissions and attracting private sector investment (). Therefore, encouraging technology transfer and knowledge sharing is also important.

The “ineffectiveness in waste segregation at the source (OC1)” is the second significant issue noted in the report. evaluated the Ga West municipality's (Accra, Ghana) readiness to integrate waste segregation at source into its solid waste management in neighbourhood markets. Waste segregation is crucial for WtE technologies as different types of waste require different treatment processes. Failure to segregate waste properly can lead to contaminants, harmful emissions and the loss of valuable materials. Educating citizens about waste segregation and providing the necessary infrastructure and tools, such as separate waste bins, can effectively address this challenge (). The third important challenge is the “high cost associated with installation, maintenance, and infrastructure development (EC2)” of WtE plants. Due to the significant operational expenses of running these plants, developing countries still have trouble implementing this technology (, pp. 147–184). The operating costs of these plants are often prohibitively expensive for many communities in emerging economies. A lack of specialized equipment and skilled labor can further increase maintenance and repair costs. Policymakers can address this challenge by exploring alternative financing models, such as public private partnerships and community-based financing, to reduce the financial burden on the community.

Lastly, challenges such as the “shortage of proper amount of waste on time (EC4)”, “Lack of comprehensive legislation and proper implementation (MC7)”, “absence of operational personnel's knowledge and awareness (TC2)”, “insufficient financial backing from the government and investors (MC3)”, “complexity in the process of procurement (MC6)”, and “inadequate training and continual support (MC1)” are considered to be the least important challenges but should not be over-looked in the transition to WtE.

Theoretical Implication

The study broadens our understanding of WtE by investigating the connection between emerging economies, sustainable, and energy the MCDM approach. This MCDM framework, utilized in this study serves as a practical approach for assessing the main challenges associated with WtE conversion. This framework can be used by decision-makers in the energy sector to prioritize the challenges they need to address when implementing WtE projects. The study's identification of the most significant challenge to WtE conversion in emerging nations also emphasizes the necessity of considering the socio-

economic and cultural aspects that may impact the success of WtE initiatives in these economic environments. The study's focus on exploring the connection between the WtE transition and emerging economies is especially relevant as these economies are experiencing rapid industrialization and urbanization increasing waste generation and energy demand. Overall, the study's theoretical contributions have implications for both academics and practitioners who are interested in the transition to sustainable and renewable energy in the energy sector. The study's findings can inform future researchers on WtE in emerging economies and guide the development of more effective policies and strategies for sustainable waste management.

Practical Implications

The study has significant practical implications for decision-makers, policymakers and stakeholders particularly in emerging economies where conventional energy sources are still dominant. By ranking the significant challenges and showing their hierarchical relationships, the framework can help decision-makers identify the most critical challenges to focus on when implementing WtE projects. This will enable them to develop effective strategies and policies to overcome these challenges and facilitate the transition to sustainable and renewable energy. For instance, the study's finding that the 'need for well-developed planning and incentivized policy making' is ranked first among all challenges suggests that policymakers should focus on this challenge at the early stage of the WtE transition process. This can help ensure that the necessary policies and regulations are in place to support adopting WtE technologies. Subsequently, policymakers can address other challenges identified by the framework to facilitate the WtE transition further. By promoting sustainable technological development and advancement policies, policymakers and city planners/managers can ensure a low carbon energy sector and achieve sustainability while effectively managing waste.

Implications for Achieving SDGs

The results of this study have important ramifications for advancing the adoption of WtE technology which will help the achievement of various United Nations' SDGs. This study's global ranking of challenges includes the 'need for well-developed planning and incentivized policy-making,' 'Ineffectiveness in waste segregation at the source,' and 'high costs for installation, maintenance, and infrastructure development'. Tackling these challenges is of utmost importance to foster sustainable waste management practices, mitigate greenhouse gas (GHG) emissions during energy generation and lower the cost of energy generation which can help in achieving SDG 7 (affordable and clean energy). The 'need for well-developed planning and incentivized policymaking' can contribute to achieving several SDGs, such as SDG 9 (Industry, innovation, and infrastructure), SDG 11 (Sustainable cities and communities) and SDG 17 (Partnership for the goals). By promoting collaboration and partnerships throughout the WtE projects, policymakers can facilitate sustainable economic, social, and environmental development. Similarly, "Ineffectiveness in waste segregation at the source (OC₁)" can contribute to achieving SDG 6 (Clean water and sanitation) and SDG 13 (Climate action) by promoting proper waste management

practices, recycling and reuse of waste to reduce greenhouse gas emissions. By addressing the identified challenges, policymakers can create operational strategies to achieve the SDGs and contribute to creating a sustainable future for all.

Conclusion

Rapid population growth has created enormous challenges for waste management and the demand for green energy supplies to support clean urbanization especially in developing nations like Bangladesh. Implementing WtE conversion using municipal solid waste can be a promising solution as it addresses the energy deficit and promotes clean and sustainable waste management practices, providing benefits such as reducing greenhouse gas emissions, decreasing waste volume in landfills and responding to several SDGs.

However, implementing WtE conversion in emerging economies like Bangladesh poses several operational, technical, managerial, and economic challenges that require special attention. The methodology employed for this study encompasses a comprehensive literature review, expert consultations and the application of the Bayesian BWM framework to evaluate the challenges. The study findings indicate that the most prominent cluster of challenges is related to managerial aspects, followed by operational, technical, and economic challenges.

The study's contributions are substantial and far-reaching. This study emphasizes the imperative for a broad and transformative strategy to effectively confront the multifaceted challenges inherent in implementing WtE initiatives particularly in the context of emerging economies like Bangladesh. This proposed framework empowers energy sector decision-makers in efficiently prioritizing challenges for a successful WtE transition. The study's focus on WtE's role in meeting escalating energy demands amid growing waste generation holds paramount importance. In practical terms, the framework assists policy makers and stakeholders in emerging economies in navigating the challenges and transitioning towards a sustainable future. Policymakers are urged to proactively design and implement comprehensive, incentive driven plans that go beyond regulatory frameworks to support WtE projects. This involves considering innovative financing mechanisms, incentivized partnerships and long-term sustainability commitments. Simultaneously, industry stakeholders are encouraged to adopt a holistic approach by strategically investing in managerial training programs and research and development initiatives that foster technological innovation. Collaborative partnerships should extend beyond sectoral boundaries involving academia, civil society and international organizations to create a synergistic platform for addressing the diverse operational, technical, and economic challenges. The outcomes of this study are also expected to facilitate the achievement of various key SDGs such as affordable and clean energy (SDG 7), sustainable cities and communities (SDG 11) and climate action (SDG 13) which can help us to stride towards a sustainable future.

This study has some limitations which can be overcome in future research attempts. For instance, future research can broaden its scope by including various other economic perspectives not just restricting the context to emerging economies. Additionally, weighing expert opinions in accordance with their level of knowledge and pertinent experience might improve the precision of the findings. Additionally, this study relied on feedback from a limited number of experts due to the embryonic stage of WtE conversion in Bangladesh. Future researchers can gather more expert opinions to obtain more comprehensive and bias-free results. Another limitation of this study is that it does not show how the challenges influence each other. Future studies can explore this issue by using techniques like Interpretive Structural Modeling (ISM) or Total Interpretive Structural Modeling (TISM). They can also statistically validate those relationships by using methods like partial least squares with structural equation modeling (PLS-SEM).

References

- Adeleke, O., Akinlabi, S., Jen, T. C., & Dunmade, I. (2021). Towards sustainability in municipal solid waste management in South Africa: A survey of challenges and prospects. *Transactions of the Royal Society of South Africa*, 76(1), 53–66.
- Adenuga, O. T., Mpofu, K., & Modise, K. R. (2020). An approach for enhancing optimal resource recovery from different classes of waste in South Africa: Selection of appropriate waste to energy technology. *Sustainable Futures*, 2, 100033.
- Adeoye-Olatunde, O. A., & Olenik, N. L. (2021). Research and scholarly methods: Semi-structured interviews. *Journal of the American college of clinical pharmacy*, 4(10), 1358–1367.
- Adnan, A., Mahmud, S., Uddin, M., Modi, A., Ehsan, M. M., & Salehin, S. (2021). Energy, Exergy, Exergoeconomic, and environmental (4E) analyses of thermal power plants for municipal solid waste to energy application in Bangladesh. *Waste Management*, 134, 136–148.
- Agbefe, L. E., Lawson, E. T., & Yirenya-Tawiah, D. (2019). Awareness on waste segregation at source and willingness to pay for collection service in selected markets in Ga West Municipality, Accra, Ghana. *Journal of Material Cycles and Waste Management*, 21(4), 905–914.
- Ahmed, S., Hossian, A., & Alam, F. (2022). *Energy security evaluation through solid waste management in Dhaka city, Bangladesh*. AIP conference proceedings. American Institute of Physics.

- Akkalatham, W., Taghipour, A., Yongsiri, P., & Ali, S. M. (2023). *Circular economy in materials to decarbonize mobility*. Renewable energy in circular economy (pp. 89–112). Cham: Springer International Publishing.
- Akter, H., Howlader, H. O. R., Nakadomari, A., Islam, M. R., Saber, A. Y., & Senjyu, T. (2022). A short assessment of renewable energy for optimal sizing of 100% renewable energy based microgrids in remote islands of developing countries: A case study in Bangladesh. *Energies*, *15*(3), 1084.
- Ali, S.M., Hoq, S.N., Bari, A.M., Kabir, G., & Paul, S.K. (2022). Evaluating factors contributing to the failure of information system in the banking industry. *PLoS One*, *17*(3), e0265674.
- Ali, J., Rasheed, T., Afreen, M., Anwar, M., Nawaz, Z., Anwar, H., & Rizwan, K. (2020). Modalities for conversion of waste to energy — challenges and perspectives. *Science of the Total Environment*, *727*, 138610.
- Awasthi, S. K., Sarsaiya, S., Kumar, V., Chaturvedi, P., Sindhu, R., Binod, P. & Awasthi, M. K. (2022). Processing of municipal solid waste resources for a circular economy in China: An overview. *Fuel*, *317*, 123478.
- Bag, S., Mondal, N. K., & Dubey, R. S. (2016). Modeling barriers of solid waste to energy practices: An Indian perspective. *Global Journal of Environmental Science and Management*, *2*(1), 39–48.
- Barma, M., Biniyamin, H. K., Modibbo, U. M., & Gaya, H. M. A. (2022a). Mathematical model for the optimization of municipal solid waste management, *Frontiers in Sustainability*, *3*, 880409.
- Barma, M., & Modibbo, U.M. (2022b). Multiobjective mathematical optimization model for municipal solid waste management with economic analysis of reuse/recycling recovered waste materials. *Journal of Computational and Cognitive Engineering*, *1*(3), 122–137.
- Bosmans, A., Vanderreydt, I., Geysen, D., & Helsen, L. (2013). The crucial role of waste-to-energy technologies in enhanced landfill mining: A technology review. *Journal of Cleaner Production*, *55*, 10–23.
- Bui, T., Tseng, J., Tseng, M., & Lim, M. K. (2022). Opportunities and challenges for solid waste reuse and recycling in emerging economies: A hybrid analysis. *Resources, Conservation and Recycling*, *177*, 105968.

- Chand Malav, L., Yadav, K. K., Gupta, N., Kumar, S., Sharma, G. K., Krishnan, S., & Bach, Q.V. (2020). A review on municipal solid waste as a renewable source for waste-to-energy project in India: Current practices, challenges, and future opportunities. *Journal of Cleaner Production*, 277, 123227.
- Cucchiella, F., D'Adamo, I., & Gastaldi, M. (2017). Sustainable waste management: Waste to energy plant as an alternative to landfill. *Energy Conversion and Management*, 131, 18–31.
- Cui, C., Liu, Y., Xia, B., Jiang, X., & Skitmore, M. (2020). Overview of public-private partnerships in the waste-to-energy incineration industry in China: Status, opportunities, and challenges. *Energy Strategy Reviews*, 32, 100584.
- Damayanti, P., Moersidik, S. S., & Haryanto, J. T. (2021). Waste to energy in sunter, jakarta, Indonesia: Plans and challenges. IOP conference series. *Earth and Environmental Science*, 940(1), 012033.
- Dastjerdi, B., Strezov, V., Rajaeifar, M.A., Kumar, R., & Behnia, M. (2021). A systematic review on life cycle assessment of different waste to energy valorization technologies. *Journal of Cleaner Production*, 290, 125747.
- Debnath, B., Bari, A. M., de Jesus Pacheco, D. A., & Karmaker, C. L. (2023a). An integrated Best–Worst Method and Interpretive Structural Modeling approach for assessing the barriers to circular economy implementation. *Decision Analytics Journal*, 7, 100250.
- Debnath, B., Shakur, M. S., Bari, A. M., & Karmaker, C. L. (2022). A Bayesian Best-Worst approach for assessing the critical success factors in sustainable lean manufacturing. *Decision Analytics Journal*, 100157.
- Debnath, B., Shakur, M. S., Bari, A. M., Saha, J., Porna, W. A., Mishu, M. J., & Rahman, M. A. (2023b). Assessing the critical success factors for implementing industry 4.0 in the pharmaceutical industry: Implications for supply chain sustainability in emerging economies. *PLoS One*, 18(6), e0287149.
- Debnath, B., Shakur, M. S., Siraj, M. T., Bari, A. M., & Islam, A. R. M. T. (2023c). Analyzing the factors influencing the wind energy adoption in Bangladesh: A pathway to sustainability for emerging economies. *Energy Strategy Reviews*, 50, 101265.
- Debnath, B., Siraj, M. T., Rashid, K. H. O., Bari, A. M., Karmaker, C. L., & Al Aziz, R. (2023d). Analyzing the critical success factors to implement green supply chain management in the apparel manufacturing industry: Implications for sustainable development goals in the emerging economies. *Sustainable Manufacturing and Service Economics*, 2, 100013.

Esmailian, B., Wang, B., Lewis, K., Duarte, F., Ratti, C., & Behdad, S. (2018). The future of waste management in smart and sustainable cities: A review and concept paper. *Waste Management*, *81*, 177–195.



THE DYNAMIC RELATIONSHIP BETWEEN FOREIGN DIRECT INVESTMENT AND INDUSTRIAL OUTPUT IN NIGERIA: EVIDENCE FROM TIME SERIES ANALYSIS

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Abstract

This study investigates the impact of Foreign Direct Investment (FDI) on industrial output in Nigeria from 1989 to 2022, using the Vector Error Correction Model (VECM) to analyse both long-run and short-run dynamics. The Johansen co-integration test confirms a long-term relationship between FDI, industrial output (IDO), exchange rate (EXC), and gross capital formation (GFN). The long-run results show that FDI has a significant negative effect on industrial output, with a 1% increase in FDI leading to a 4.26% decrease in IDO. In the short run, a 1% increase in FDI results in a 0.37% increase in IDO. The findings suggest inefficiencies in the utilization of FDI in Nigeria's industrial sector, possibly due to mismanagement or crowding out of domestic investments. The study recommends policy reforms to improve the absorptive capacity of FDI and optimize its contributions to industrial development and economic growth.

Keywords: *Dynamic Relationship, Foreign Direct Investment, Industrial Output, Evidence, Time Series Analysis*

Introduction

Global economic integration is a common trend among nations as they engage in mutually beneficial trade and investment activities. In this context, Foreign Direct Investment (FDI) plays a pivotal role in the economic development of many countries, particularly emerging economies like Nigeria. FDI, defined as the cross-border investment through the establishment or acquisition of businesses, has been a key driver of industrial output in various economies. Investments can either be horizontal, involving similar businesses in different countries, or vertical, consisting of diverse investments across multiple sectors. In

Nigeria, FDI is seen as a critical tool to complement domestic investments, driving industrial output and boosting overall economic growth.

In many developing nations, industrial output is a core component of economic progress, and Nigeria is no exception. The industrial sector, which includes manufacturing, mining, and construction, is vital for the nation's productivity. It serves as a catalyst for employment generation and technological advancement. However, despite its importance, the industrial sector in Nigeria has faced several challenges, particularly regarding growth and competitiveness. According to researchers like Ozuzu and Isukul (2021), Nigeria's industrial sector holds the potential to drive economic prosperity if adequate investments, especially through FDI, are channelled toward its development.

Historically, Nigeria has seen fluctuating levels of FDI, particularly in the oil sector, which has attracted the majority of foreign investments due to its profitability. However, this concentration on the oil industry has stunted the growth of other sectors, particularly manufacturing and other non-oil industries. Efforts by policymakers to diversify the economy through various initiatives, such as tax holidays and the Structural Adjustment Program (SAP) of 1986, have attempted to reduce this dependence on oil and enhance industrial productivity. Yet, industrial output remains below expected levels, raising questions about the effectiveness of FDI in driving Nigeria's industrial growth.

This study explores the dynamic relationship between FDI and industrial output in Nigeria from 1989 to 2022. By focusing on this time frame, the research aims to examine the extent to which FDI has contributed to industrial growth and identify the factors impeding the sector's progress. It also seeks to address the apparent disconnect between increasing FDI inflows and Nigeria's underwhelming industrial performance, shedding light on potential policy gaps and offering recommendations for fostering a more robust industrial sector.

Empirical Review

Empirical studies on the relationship between Foreign Direct Investment (FDI) and industrial output in Nigeria, as well as in other regions, reveal diverse perspectives. Chandran and Krishnan (2008) found that FDI positively influences Malaysian manufacturing performance in both the short and long run, suggesting the importance of strategic foreign relations. Similarly, Patience (2011) showed that FDI significantly enhances manufacturing output growth in West Africa. Ebekozi et al. (2015) highlighted a decline in FDI into Nigeria's construction sector compared to other industries, while Orji et al. (2015) identified a negative impact of FDI on Nigeria's manufacturing sector, calling for increased investment in productive industries.

Other studies provide mixed results regarding FDI's impact on Nigeria's industrial output. Idoko and Taiga (2018) observed a positive but insignificant effect of FDI on Nigeria's manufacturing sector, whereas Okoli and Agu (2015) reported significant long-term benefits for manufacturing firms, emphasizing the need for supportive government

policies. Bank-Ola et al. (2020) found that FDI positively influences Nigerian manufacturing output, and Osabohien et al. (2020) established a strong positive link between FDI and employment in Nigeria. Similarly, Oyegoke and Aras (2021) concluded that FDI significantly drives economic growth in Nigeria, reinforcing the view that FDI plays a crucial role in boosting industrial output and overall economic performance.

Methodological Notes

The theoretical foundation of this study is supported by the neoclassical growth model, particularly the Cobb–Douglas production function, as developed by Solow and Swan in 1956. This model emphasizes capital accumulation, labour growth, and technological progress as the primary drivers of long-run output growth (Solow, 1956; Swan, 1956). The Cobb–Douglas production function mathematically expresses the relationship between output, capital, and labour, and it is often employed to explain productivity dynamics in an open economy context (Akinola & Mbonigaba, 2019). Foreign Direct Investment (FDI) plays a vital role in facilitating technological transfers, which enhance capital accumulation and improve industrial output (Bokana & Akinola, 2017). In the model, capital deepening through FDI can boost output growth, especially when technological transfers are involved. However, the model also acknowledges diminishing returns to capital, which underscores the necessity for technological innovations to sustain long-term productivity gains (Akinola & Mbonigaba, 2019).

Model Specification

To achieve the broad objective of this study, the model of Keji (2023) was adapted as follows:

$$IDO = f(FDI, EXC, GFN) \quad 1$$

So that we have the model in its transformed state as:

$$IDO_t = \beta_0 + \beta_1 FDI_t + \beta_2 EXC_t + \beta_3 GFN_t + \mu_t \quad 2$$

Where:

IDO = Industrial Output

FDI = Foreign Direct

EXC = Exchange Rate GFN = Gross Capital Formation

μ = Stochastic error term, $\beta_0, \beta_1, \beta_2, \beta_3$ = slope of the regression equation.

$$\ln IDO_t = \beta_0 + \beta_1 \ln FDI_t + \beta_2 \ln EXC_t + \beta_3 \ln GFN_t + \mu_t \quad 3$$

Estimation Technique

The study utilised Johansen Co-integration and Vector Error Correction Model (VECM) which are subject to the outcome of the stationarity Tests.

Results and Discussion

This study applies the Augmented Dickey-Fuller test (ADF Unit root test) developed by Dickey and Fuller (1978) to determine the stationarity status of the variables used in the

study. However, considering the study period chosen. The results of the unit root tests indicate that all variables are non-stationary at the level. These results are given in Table 1.

Table 1: The Results of the Stationarity Test for Variables

	Level		1st Difference		Order
	ADF	Prob.	ADF	Prob.	
IDO	-0.804393	0.9543	-6.89113	0.0000	I(1)
FDI	-2.797872	0.2088	-5.479571	0.0005	I(1)
EXC	-2.114296	0.5193	-5.449250	0.0005	I(1)
GFN	-0.095935	0.9928	-5.549478	0.0004	I(1)

Notes: NS = Non-stationary; S = Stationary

Source: Authors Computation using Eviews-10, 2023

From the result all the variables are non-stationary at level - they all have p-values greater than the 0.05 significant level, but they became stationary after differencing once (p-values equal to or less than 5 percent significant level). This indicated that the variables were all integrated in the order I(1). Consequently, it can be confidently concluded that all variables are integrated of order one, I(1), and therefore, co-integrated. This observation allows for the implementation of co-integration tests among the variables.

Co-integration Test:

The Johansen co-integration test is essential for identifying long-term relationships among multiple non-stationary time series. It uses two methods: the Trace test and Max Eigenvalue test, to determine if the series are co-integrated, meaning they share a stable, long-run equilibrium. Co-integration supports the use of the Vector Error Correction Model (VECM) to account for both short- and long-term dynamics. The test's accuracy depends on selecting the optimal lag length using VAR lag order selection criteria, which ensures the reliability of the co-integration results and the robustness of further analyses.

The trace and max-Eigen statistics in Table 2 reveal one co-integrating equation at the 5% level, indicating a long-run relationship among the variables. The Johansen procedure shows co-integration by comparing the trace test and max-Eigenvalue statistics with their critical values at 0.05. When these test statistics exceed the critical values, it confirms the presence of co-integration. Therefore, the null hypothesis of no co-integration is rejected, and the alternative hypothesis is accepted, confirming co-integration in the sample data. This outcome allows for the use of the Vector Error Correction Model (VECM) to estimate the long-term and short-term dynamics in the study.

Table 2: Johansen Co-integration Results

$IDO = f(FDI, EXC, GFN)$				
Lags interval (in first differences): 1 to 2				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.648867	63.15827	47.85613	0.0010
At most 1	0.476019	29.66734	29.79707	0.0517
At most 2	0.220779	8.985755	15.49471	0.3667
At most 3	0.030859	1.003034	3.841466	0.3166
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.648867	33.49092	27.58434	0.0077
At most 1	0.476019	20.68159	21.13162	0.0577
At most 2	0.220779	7.982720	14.26460	0.3805
At most 3	0.030859	1.003034	3.841466	0.3166

Source: Author Computation using Eviews-10, 2023

The long-run results reveal that Foreign Direct Investment (FDI) exerts a significant negative effect on industrial output (IDO) in Nigeria. The coefficient of -4.2555 suggests that a 1% increase in FDI corresponds to a 4.26% reduction in industrial output, with a statistically significant t-statistic of -5.17. This counterintuitive outcome may indicate that FDI inflows are not being efficiently utilized in the industrial sector, potentially due to structural inefficiencies or the displacement of domestic investments, as noted by Orji et al. (2015). Such findings echo concerns from previous studies, highlighting the need for improved policy frameworks to harness FDI more effectively for industrial growth (Okoli & Agu, 2015). Optimizing FDI through better governance and investment strategies could help reverse this trend.

Table 3: Long Run Estimation

Cointegrating Eq:	CointEq
IDO(-1)	1.000000
FDI(-1)	-4.255501 (0.82289) [-5.17143]
LNEXC(-1)	-1.215433 (1.50506) [-0.80757]
GFN(-1)	-0.376317 (0.14139) [-2.66154]
C	-5.222398

Source: Author's Computation using eviews-10, 2023

Table 4: Vector Error Correction Technique Result (SHORT-RUN)

Error Correction:	D(IDO)	D(FDI)	D(LNEXC)	D(GFN)
CointEq1	-0.366145 (0.09344) [-3.91845]	0.124934 (0.03781) [3.30392]	0.014963 (0.00933) [1.60347]	0.252892 (0.10301) [2.45512]
D(IDO(-1))	0.278436 (0.16655) [1.67183]	-0.087643 (0.06740) [-1.30038]	-0.043129 (0.01663) [-2.59314]	0.117048 (0.18359) [0.63754]
D(FDI(-1))	-1.168761 (0.45274) [-2.58150]	0.101471 (0.18322) [0.55383]	-0.008029 (0.04521) [-0.17759]	0.939589 (0.49909) [1.88261]
D(LXEXC(-1))	3.899574 (1.83323) [2.12717]	0.804410 (0.74187) [1.08430]	0.083909 (0.18307) [0.45833]	-2.667436 (2.02087) [-1.31994]
D(GFN(-1))	0.255109 (0.15665) [1.62858]	-0.067744 (0.06339) [-1.06866]	0.004904 (0.01564) [0.31348]	0.09021 (0.17268) [0.52241]
C	-0.577562 (0.52211) [-1.10621]	-0.174921 (0.21129) [-0.82788]	0.110188 (0.05214) [2.11330]	-0.199718 (0.57555) [-0.34700]

Source: Author's Computation Using E-views 10, 2023

The Vector Error Correction Model (VECM) reveals the short-run dynamics between FDI and industrial output (IDO) in Nigeria. The error correction term indicates that deviations from the long-run equilibrium are adjusted at a modest rate of 3.5% annually, suggesting a gradual alignment towards equilibrium. In the short run, a 1% change in FDI is linked to a 0.37% rise in industrial output (IDO), signifying a positive but relatively small impact of FDI on industrial growth, consistent with studies by Ebekozen et al. (2015) and Okoli & Agu (2015). Conversely, a 1% change in exchange rate (LNEXC) correlates with a 0.03% decrease in IDO, reflecting the sensitivity of the industrial sector to exchange rate fluctuations. Gross capital formation (GFN) also shows a negative short-run impact, with a 1% change resulting in a 0.012% decline in IDO, possibly due to underutilization or inefficiencies in capital allocation (Orji et al., 2015).

Diagnostic Test

The diagnostic tests confirm the robustness of the regression model. The Breusch-Godfrey test for serial correlation indicates no evidence of serial correlation, as the probability value is above the conventional significance level. The normality test shows that most variables, including industrial output, foreign direct investment (FDI), and gross capital formation, have normally distributed residuals, except for the exchange rate. Additionally, the heteroskedasticity test reveals no presence of heteroskedasticity. Overall, these results suggest that the model is well-specified, with no major assumption violations, reinforcing the validity of the conclusions regarding FDI's impact on industrial output in Nigeria.

Conclusion

The research highlights that between 1989 and 2022, increases in FDI contributed positively to the growth of the industrial sector. However, the findings also note potential challenges, such as the negative influence of exchange rate fluctuations and gross capital formation on the industrial sector. Despite this, the historical trend of FDI in Nigeria shows an upward trajectory, largely due to the country's focus on national security, which, while essential, has broader economic consequences.

Based on these findings, several recommendations are proposed to enhance the role of FDI in supporting industrial growth. Small and Medium Enterprises (SMEs) should focus on understanding Nigeria's regulatory environment, conducting thorough market analyses, and forming strategic partnerships with local businesses. Infrastructural development is also essential to improving operational efficiency, while risk management strategies should be developed to mitigate economic and political risks. Furthermore, businesses are advised to invest in local workforce development, adopt sustainable practices, and leverage government incentives. Embracing technological advancements and fostering community engagement are key strategies for ensuring long-term industrial growth and positive FDI outcomes in Nigeria.

References

- Akinmulegun, S. O., Oluwole, F. O. (2013). An assessment of the Nigerian manufacturing sector in the era of globalization. *Am J Soc Manag Sci* 5(1):27–32
- Ayanwale, A. B. (2007). FDI and economic growth: evidence from Nigeria. AERC Research Paper 165, *African Economic Research Consortium*, Nairobi.
- Barro, R.J. & Sala-I-Martin, X. (1995). Convergence. *Journal of Political Economy*, 100, 223–251.
- Central Bank of Nigeria (2020). *Central Bank of Nigeria Statistical Bulletin*, Vol. 31.
- Chandran, V. G. R., & Krishnan, G. (2008). Foreign direct investment and economic growth: the Malaysian experience. *Int Bus Res* 1(3):32–38
- Ebekozien, A., Ugochukwu, S. C., & Okoye, P. U. (2015). An analysis of the trends of foreign direct investment inflows in the Nigerian construction sector. *Am Int J Contemp Res* 5(1):53–69
- Eboh, M. (2011). Systematic planning, marketing will attract FDI to Nigeria. *Vanguard*, p.14.

- Idoko, C. U., & Taiga, U. U. (2018). Effect of Foreign Direct Investment (FDI) On manufacturing output In Nigeria (1981–2016). *Adv Soc Sci Res J* 5(5):181–197. <https://doi.org/10.14738/assrj.55.4319>
- Lucas, R. (1988). On the Mechanics of Economic Development, *Journal of Monetary Economics*, 22(3), 3-42.
- Maji, A., & Achegbulu, J. O. (2011). An investigation of the impact of foreign direct investment on economic growth in Nigeria. *Int Bus Manag* 3(1):232–238
- Ndako, U. B. (2010). Stock markets, banks and economic growth: Time series evidence from South Africa. *The African Finance Journal* 12 (2), 72–92.
- Okoli, T. T., & Agu, O. C. (2015). Foreign direct investment flow and manufacturing sector performance in Nigeria. *Int J Econom, Commerce and Manag* 3(7):412–428
- Omankhanlen, A.E. (2011). The effect of exchange rate and inflation on foreign direct investment and its relationship with economic growth in Nigeria. *Economics and Applied Informatics*, 1, 5-16
- Osabohien, R., Awolola, O. D., Matthew, O., Itua, O. Q., & Elomien, E. (2020). Foreign direct investment inflow and employment in Nigeria. *Invest Manag Financial Innovat* 17(1):77–84. [https://doi.org/10.21511/info.17\(1\).2020.07](https://doi.org/10.21511/info.17(1).2020.07)
- Otalu, J. A., & Keji, S. A. (2015). An assessment of the determinants of industrial sector growth in Nigeria. *J Res Bus Manag* 3(7):01–09
- Otto, G. (2004). *International Business Monograph*, Unpublished Port Harcourt.
- OzuzuIsukul, S. A. (2021). Government expenditure and its effect on the industrial sector in Nigeria. *Asian J Econom, Bus Account* 21(7):81–92
- Patience, G. (2011) Impact of foreign direct investment on manufacturing output growth of West Africa. *Africa J Manag Bus* 6(21):67–77
- Todaro, M.P. and Smith, S. (2003). *Economic Development*. Pearson Education 8th ed. India.
- Udoh, E. & Udeaja, E. (2011). Ten years of Industrial policies under democratic governance in Nigeria: “New Wine in Old Bottle”. *European Journal of Social Sciences*, 20 (2): 248- 258.

