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Macroeconomic Disturbances and the Nigeria Oil Economy: Are Monetary and Fiscal Policy Tools Relevant?

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Abstract: This paper examines the connection between the consumer price index (CPI) and crude oil price volatility. Due to her hazardous reliance on a single commodity (crude oil), the Nigerian economy frequently suffers shocks as a result of commodity price volatility. The paper explores the path taken by oil price shocks from the global commodities market to domestic Nigerian macroeconomic to impact variables like the CPI. The researcher also incorporates imported gasoline, foreign reserves, the domestic interest rate, and other variables that are thought to be responsible for macroeconomic distortions within the country in its study. We discovered that the variables in the study had a weak long-run cointegration connection using the Autoregressive Distributed Lag (ARDL) approach. However, the domestic consumer price index (CPI), oil volatility, foreign reserves, and gasoline import are all strongly correlated over the short term. Oil price volatility is not directly transferred to the domestic economy through exchange rate. Other factors such as grants, transfers, and remittances from the diaspora also influence how it behaves. We came to the conclusion that domestic consumer behavior, or the consumer price index (index), is largely a function of the volatility of crude oil prices, but that the same behavior is also influenced by factors like external reserves and the cost of imported gasoline. The pathway for imported inflation is not determined by exchange rates.

Keywords: Oil Price Volatile; Consumer Price Index; Gross National Product; Exchange Rate; Gasoline.

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Introduction

Significant macroeconomic disruptions are currently occurring in Nigeria, including a relatively high inflation rate, a declining GNI, fluctuating import prices for refined gasoline products (petrol), a declining exchange rate, and an inverted national yield curve (Business Day, September 6, 2016). These macroeconomic instabilities are typically attributed to the too frequent variations in crude oil prices that affect the macroeconomy of Nigeria. Crude oil, as well as products like coffee, cocoa, and rare metals, are some examples of the commodities that make up the bulk of the Nigerian economy. It is well recognized that economies reliant on them are prone to the periodic uneven income flow and pricing. These commodities' swings have an unintended effect on the macroeconomic health of the countries that supply them. Budina and van Wijnbergen (2011) highlighted, *"Commodity price and revenues from natural resources tend to be volatile and they may translate into macroeconomic instability and highly volatile real exchange rate"* Budina and van Wijnbergen's claim or thesis about commodity economies is supported by a historical analysis of Nigeria's economic history.

Variations in commodity prices, or volatility, have been conceptualized in a variety of ways. According to Wilson et al. (2014), it is "percent change." The daily price change percentage's annualized standard deviation. According to Itotenaan et al. (2013), it is "a measure of the tendency of the price of crude oil to rise or fall sharply within a period of time such as a day, a month, or a year." Wilson and Itotenaan's formulations fail to adequately reflect the core of commodity price variations or a workable conception. As mentioned by the second term, "tendency" will be rather challenging to assess or quantify.

Since such a lengthy timeframe could qualify for change rather than fluctuation in the price of the commodity, it is impossible to understand commodity price swings in timescales as short as a day or as long as a year. There are three channels for trading commodities: spot, forward, and future markets. The spot market, when transactions are anticipated to be completed in a month or less, is the market where price swings are observed most frequently among these three (Investopedia). We define commodity price fluctuation as the average monthly changes in a commodity's price on the spot market for that specific commodity. This reflects the monthly average variation in crude oil prices. Forward and possessing Markets for crude oil have little to no price volatility, only price fluctuations.

The transport mechanisms (channels) via which price changes affect the domestic economy of producing nations, however, have not yet been scientifically identified, studied, or documented. The behavior of domestic economic factors such as gross national income (GNI), inflation, interest rates, consumer price index (CPI), gross domestic product (GDP), unemployment, etc. is reflected in the variations in crude oil prices, as has been demonstrated by prior studies. Only decimal attempts: (Emmanuel, 2015, Nkomo 2006, Akinlo 2012, Ogiri et al 2013, Wilson et al, Budina and van Wijnbergen 2011) have been made at identifying the channels through which these impacts are felt in the economy of producer nations. Which macroeconomic factors actually cause the unfavorable effects of crude oil price changes to affect the domestic economy is still something we cannot state with certainty.

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The interest rate before taking inflation into account is referred to as the "nominal interest rate". The nominal interest rate is quite different from both the real interest rate, which is adjusted for inflation, and the effective interest rate, which is adjusted for compounding. The lack of domestic fiscal and monetary policy tools to manage macroeconomic disruptions caused by changes in commodity prices is another issue of concern. We need to understand why domestically produced Keynesian fiscal and monetary policy tools fall short in addressing macroeconomic shocks caused by shifting commodity prices. There are few, if any, solutions to these unmet research needs in the body of existing literature and active research projects.

Both domestic inflation and the currency rate have an influence on consumer behaviour. How does the shifting price of crude oil affect domestic consumer behaviour or even a nation's gross national income? How might the worsening exchange rate be connected to the dropping price of crude oil, or even the declining GDP (-0.6, -2.6, and -2.24 in the first, second, and third quarters of 2016), and the high rate of unemployment in a commodity-dependent economy? The Nigerian economy is still in trouble despite efforts by the monetary and fiscal authorities to address these problems. These efforts have resulted in the use of well-considered, traditional monetary and fiscal policy instruments. The Federal Government of Nigeria's (FGN) Keynesian-styled fiscal infusion of about seven hundred and fifty-three plus (753.6) and even more billion naira has not yet succeeded in reviving the economy (BusinessDay Monday, November 7, 2016).

Why for instance, lowering long term interest rate, a monetary policy tool, not ginger domestic firms into a frenzy of borrowing and investing which could possibly increase productivity and generate needed employment opportunities (currently the risk-free rate at 7.51 % far lower than the 18 percent monetary policy –MPR rate)? Further, the Nigeria Central Bank (CBN) has until recently, left unchanged the monetary policy rate (MPR) to keep down inflation, yet inflation currently is at all-time high of 21.9% and unemployment remains at an intractable percent. Not even the reduction in the cash reserve requirement *(CRR)* 22 percent has generated any much of private sector activities. Inflation spikes notwithstanding a contracting (GDP) currently – 2.06% in the second and -2.24 % third quarter of 2016.

Background to the study

Naturally, crude oil and related several economic activities to its exploration and sales would definitely interest the average Nigerian scholar, especially an economist, and researchers generally. Crude oil is the mainstay of the Nigeria economy, implying that revenue accruing from it exports and sales very largely supports the Nigeria economy much more than the other economic activities such as agriculture, mining, forestry etc. It's pricing, market movements, its price fluctuations and the entire future of the crude oil industry as a fossil fuel are relevant to the research interest of the average Nigeria economist. This reasoning forms the fulcrum for this research effort.

There is a sizable body of existing literature on various topics linked to the study of crude oil and its numerous auxiliary economic activities. The focus of this study, however, is on the volatility of crude oil prices and how it affects the domestic macroeconomies of producer countries. The primary focus is on determining how fluctuations in the price of crude oil and imported gasoline

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(PMS) may affect domestic consumer behaviour as measured by the consumer price index (CIP), interest rates, the provision of quality services, and even investment patterns. In a research by the Council on Foreign Relations, Greenberg (2016) writes: "Sharp, rapid swings in the price of crude oil can have outsize effects on companies, economies, and global geopolitics." This suggests that macroeconomic factors like domestic consumption patterns (CIP), gross domestic product (GDP), and gross national income (GNI) may all be affected by the continuous swings in crude oil prices. According to Greenberg (ibid), the consequences of changes in crude oil prices on corporate entities have "outsized effects on companies, economies..." This is true to the extent that it supports Nigeria's economic development, interest rates, and investment decisions.

According to the report, "oil price surges can impede economic growth" and "a precipitous price collapse" can devastate cash-strapped oil corporations." Nigeria's economy is heavily dependent on money from the sales of crude oil and related products, making oil multinational corporations vital, fundamental parts of the country's economy. Given that Nigeria's economy is predominantly supported by revenue from crude oil and its associated industries, the bulk of business organizations here depend on the oil industry for their existence. This could either be the byproducts of crude oil; example the petrol chemical industry or are directly into crude oil production as exemplified by presence of the many huge multinational oil corporations like: Chevron, ExxonMobil, Nigeria Agip oil company ltd., Total Energy Nig. Ltd. Conoco Phillips or into its export and sales example Nigeria National Petroleum Company (NNPC) Plc. Any "cash-strapped" occasioned by a "sudden price plunge" in oil price, could cause server havoc in the Nigeria crude oil industry nay economy. For instance, oil servicing firms, and even small-scale oil enterprises could possibly go into liquidation due to reduced contract patronage from clients *(big oil firms*) trying to survive the price plunge. In this scenario, ripples from an oil price spike could spark sudden loss of jobs (unemployment) in the oil industry, reduced tax revenue and possible defaults of corporate debts above all economic recession which will generate server hardship.

The Nigerian economic managers frequently face difficult macroeconomic issues due to the slowing of economic development brought on by oil price rises. Numerous Nigerian economic downturns, if not all of them, had been induced by sharp increases in oil prices. For instance, the decline in crude oil prices contributed to the collapse of the Nigerian stock market, which occurred in the fourth quarter of 2008 and continued into the first quarter of 2009 as a result of the global financial crisis. In his list of potential causes for the global financial crisis, Njiforti (2015) included "rising fuel prices," which is another factor we have identified as having a negative impact on the Nigerian oil sector.

The Nigeria banking and ancillary financial services subsector are therefore heavily dependent on the crude oil and gas industry. Glitches in the oil industry could very well impact the Nigeria banking industry. Large percentage of credit facilities granted by Nigeria banks go to firms in the oil and gas industry, either for direct production, processing (refining) or even to ancillary servicing oil firms. The risk premium of these facilities are unusually high, so are the expected returns to the banks. Thus, Nigeria deposit money banks owe a disproportionate percentage of their liquidity and long-term investments decision to firms in the oil and gas

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industry. A crucial web relationship thus exists between these two important industries that are central to the functioning and economic growth of Nigeria.

Millions of people worldwide, including both Nigerians and people from other countries, are employed directly or indirectly by the crude oil and oil-related sectors in Nigeria. Every time there are severe global macroeconomic hiccups that affect the oil sector or its auxiliary markets, these jobs are in danger. Everyone, from the gas station attendant to the worker on an offshore oil rig to the CEO of a multinational oil company, is at danger from a spike in the price of oil that might potentially cost them their jobs. Greenberg (2016), "oil price volatility can be hard for the low-income households because they do not have access to financial hedging instruments that could smooth the shocks from ups and downs in prices."

Crude oil price volatility is one of the many variables that push the people of oil-producing countries like Nigeria into poverty in addition to the potential loss of jobs. Foreign inflations are partially brought home by oil price volatility. Being "hard" means that it has a disproportionately negative influence on the consumer price index (CPI), which further erodes the value of the local currency and increases difficulties for local consumers of imported goods and services.

In major crude oil producing and exporting countries that subsides fuel consumption as it is the case in Nigeria, crude oil price volatility ends up wreaking havoc on fiscal planning *(ibid)*. Davis et al. (2003) noted, "such sharp price swings often end up distorting national budgets, thus fueling deficits, and reducing imports", a situation Nigeria have severally witnessed in Nigeria. That crude price swings distorts fiscal policy testifies to it is the inability tools and those of monetary policy to address the fallout of oil price swings in the producer nations.

With this background information, it is prudent for the logical academician to attempt to comprehend some of the profound repercussions of changes in the price of crude oil on an economy that is so critically dependent on the oil sector and its erratic cash flow. Crude oil revenue is unpredictable because of the fluctuating oil price and the risky nature of its production owing to terrorism, geopolitical unrest, and other factors.

Statement of Problem

Against backdrops of all these, our focus in this paper would be to examine the relationship between the consumer price index (CPI) and fluctuating crude oil price (COP), the price of imported gasoline (PMS), foreign reserve (FRS), exchange rate (EXH). We raise questions –is the behaviour of domestic consumption of goods and services proxy by the consumer price index (CPI) in the domestic economy dependent on externalities as crude oil price fluctuation, foreign reserves, exchange rate, fluctuating price of imported refined gasoline product (PMS) and domestic interest rate. Davis et al. (2003) noted, *"oil revenue largely originates from abroad, its fiscal use can have significant effects on the domestic economy."* Exchange rate is one channel through which crude oil revenue pass through to the domestic economy. We use the domestic interest rate and foreign reserve as controls. The exchange rate is a monetary and fiscal instrument for managing a country's economy.

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This suggests that any interruptions to its smooth flow might lead to turbulence that could have an impact on consumer behaviour in the domestic economy.

Further, we ask the question; is the exchange rates of crude oil dependent economies such as Nigeria, Libya, Iran etc. related to the fluctuating oil price, foreign reserve base and perhaps net cash transfer. Finally, is the changing price of crude oil connected to domestic inflation in countries that depend on it? These inquiries would serve as the foundation for our theories and analyses. According to the 2015 Global Economic Prospect, Crude oil pricing flows into growth and inflation. Once these problems are handled, we will be able to determine the precise pathways and even the magnitude (based on the coefficient of the variables) of the effects of changing crude oil prices felt by the domestic economy. We will also be able to discuss the effectiveness, if any, of fiscal and monetary policy instruments in addressing macroeconomic issues in Nigeria's economy, which is heavily dependent on crude oil.

This paper is structured as follows; section two reviews extant literatures. Section three handles the methodology where we introduce the methodology of autoregressive distributed lag (ARDL) econometrics to measure the theorised relationships and address the issues raised. Section four presents the data, analyses, and discusses our findings. We conclude this study in section five by theorizing a policy position and make recommendations.

Literature Review

Current literature on crude oil price fluctuations, and its possible impacts on the macro-economies of producer nations are mostly externally orientated. Therefore, theories of crude oil price fluctuations are "externally" developed – arguments postulated by scholars of non–producing nations. These arguments bear little or no relevance to producer nations such as Nigeria. For instance (the storable commodity argument) proposed by the World Bank (Global Economic Prospects Jan. 2015). This viewpoint, contends that crude oil being a storable commodity, the "underlying demand and supply conditions for oil determine the long run trend in price." This argument flies in the face of fact. North America (USA) has a large stockpile of crude oil, yet she continuously demands fresh stock even at higher prices (over $100 as recent as 2012 – to the first quarter of 2014). Currently Nigeria produces far less barrels of crude a day yet suffers from severe fluctuating crude oil price.

There is also the market speculation theory postulated by Professor Kilian (2009. Here the learned Professor laid the blame squarely on, "speculation in the futures market." He contends that speculation in the oil futures contracts market fueled by the entrant of huge number of nonfinancial investors drove up crude oil prices in the spot market. "There is evidence that after 2003, financial investors with no ties to the oil market entered the oil futures market in large numbers in searcher of higher returns". Higher prices due to excessive demand in the future contracts market spilled over causing crude oil price fluctuations in the spot market. Professor Kilian's arguments could hold sway back in 2003. The crude oil future market almost has collapsed when investment bankers Morgan Stanly and others recently cut back on their crude oil holding stock. This might mean current price fluctuations are not likely in anyway related to events way back 2003. Thus, the same argument could not be advanced to explain today's fluctuating crude oil price.

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The market protectionist theory appears plausible, given that in the face of continue declining crude oil price; the twelve OPEC member countries including Nigeria frequently exceeded allocated production quotas (not strictly, though), but only by relatively small percentages though. Table 1 below shows OPEC member countries allocated production quotas and percentages underproduction/over-production of allocated production quotas as of April 2011. Along this argument, each announcement by OPEC to cut supply often send crude oil price higher than the previous dollar per barrel and still rising. Kim and Vera (2022), posited that irrespective of the; "model specifications, crude oil supply shocks have a negative effect on the U.S. real GDP, albeit difference "in the magnitude of responses …." These authors concluded, "aggregate demand shocks and oil-market specific shocks appear to have a positive effect on CPI, while there is little evidence of inflationary impact from the oil supply shocks." In other words, the consumer price index is impacted by crude oil price volatility.

Table 1: OPEC Production vs Quota Allocation 1,000 Barrels/Day

	Production	Quota	Above/Below Quota	
	Apr-2011		Barrels	Percent
Algeria	1,200	1,200	0	0.0%
Angola	1,780	1,506	274	18.2%
Ecuador	500	429	71	16.7%
Iran	2,800	3,334	-534	-16.0%
Kuwait	2,600	2,221	379	17.1%
Libya	1,400	1,472	-72	-4.9%
Nigeria	1,950	1,704	246	14.4%
Qatar	730	730	0	0.0%
Saudi Arabia	9,200	8,014	1,186	14.8%
UAE	2,700	2,226	474	21.3%
Venezuela	2,200	2,010	190	9.4%
OPEC ex Iraq	27,060	24,846	2,214	8.9%
Iraq	3,150			
OPEC	30,210			

Source: *http://www.energyeconomist.com/a6257783p/opec/quota.html*
(Copyright © 2009 – 2013 J.T Williams WTRG Economics)

The oversupply (supply glut) theory contends that supply expansion from producers is the cause of crude oil price fluctuations. For instance, using horizontal drilling and multistage hydraulic fracturing, crude oil and natural gas resources deposits hitherto either technically inaccessible, or

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uneconomical to produce, are accessed from sands oil and Shale rocks in the Canada and the United States of America. *"These new supplies which are available to meet US domestic petroleum product demand have substantially reduced US dependence upon crude oil imports from overseas"* (Levine, S. et al 214). They sighted the period between 1985 – 1986, a period of strong expansion of supply from non – OPEC countries and the sudden change in OPEC policy (Baffes, J. et al. 2015). Extending the argument of supply and demand, Kolaczkowski and White (2022) noted that "changes in supply and demand and geopolitical tension causes crude oil price fluctuation."

But the oversupply theory fails to account for earlier price fluctuations when there were no supply expansions. For instance, in the 1960s crude oil price averaged $1.63 per barrel and the next year, that is 1961, it sold for $1.57 and thereafter it progressively declined to $1.21 by 1970. But in 1972 it sold for $1.87 *(ibid)* yet there was neither oversupplies from OPEC nor non- OPEC producers. North America Shale oil was not in the global crude oil market then. Again, during Post – World War II, 1948 through the end of the 1960s, crude oil prices trended between $2.50 and $3.00. The price of crude oil rose from $2.50 in 1948 to about $3.0 in 1957. (http://www.wtrg.com/prices.htm). OPEC was formed in 1960, so there was no oversupply from either OPEC countries or non-OPEC producers, there were no North America Shale producers, yet crude oil price fluctuated so widely year on year.

Still along this line of reasoning, a number of economic studies have drawn the conclusion that the "*fundamentals of supply and demand in the oil market"* are important to understanding short and long run oil price fluctuations. These fundamental changes enable investors to access more pricing information which eventually help entrepreneurs decided which investment is more profitable (Ginn, 2012). He concluded, stating, "the primary sources of oil price fluctuations are not financial speculations but from oil supply, oil demand, or precautionary oil demand—expected oil supply disruptions…." Ginn *(ibid*) then developed a factual computational relationship between the prices of an ounce of gold relative to the price of barrel of crude oil.

According to Ginn, given the price of gold on a given day, simply multiply that price by 0.0602 and the resulting figure will be the price of a barrel of crude oil that same day. For instance, if the price of an ounce of *gold on a given day is $326.30, multiply this by 0.0602 and the resulting figure $19.643 is the price of a barrel of crude oil on that day. This appears to establish some quantitative correlation between gold price and crude oil price fluctuations. But Ginn (ibid) pointed that these prices do not always move in tandem, "*correlation does not prove causation. Therefore, it is also possible that the reverse, the price of crude oil could cause movements in the price of gold. Though there is a relationship between the two, but there are many times when this link is not as strong."

Besides these, there are other empirical studies by scholars attempting to explain crude oil price fluctuations as it relates to economic growth in the supplier economies (Ebele 2015, Akinlo 2012, Wilson et al 2014, Etotenaan 2015, and Nkomo 2016). Wilson et al concluded, "initial analysis shows that there is a positive, but insignificant relationship between oil price and the Nigeria gross domestic product (GDP).'' This finding appears spurious. Neither the Nigeria GDP, nor that of any other commodity economy, can ever be wholesomely correlated with price of a commodity. The

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GDP of a nation is a portfolio of several productive national assets. These productive assets will necessarily react differently to various externalities inputted in crude oil price volatility.

World oil demand supply balances	Table 2												
World Demand	**2017**	**2018**	**2019**	**1Q20**	**2Q20**	**3Q20**	**4Q20**	**2020**	**1Q21**	**2Q21**	**3Q21**	**4Q21**	**2021**
Americas	25.11	25.73	25.70	24.34	20.03	22.91	24.30	22.90	24.30	24.88	23.94	24.77	24.48
of which US	*20.27*	*20.82*	*20.86*	*19.66*	*16.38*	*18.79*	*19.98*	*18.70*	*19.85*	*20.26*	*19.46*	*20.32*	*19.97*
Europe	14.41	14.32	14.25	13.35	10.98	12.84	12.03	12.30	12.35	13.46	13.44	12.71	13.00
Asia Pacific	8.15	7.95	7.79	7.75	6.54	6.74	7.23	7.06	7.60	7.28	7.21	7.45	7.38
Total OECD	**47.67**	**47.99**	**47.75**	**45.44**	**37.56**	**42.49**	**43.56**	**42.27**	**44.26**	**45.61**	**44.59**	**44.93**	**44.86**
China	12.32	12.86	13.30	10.70	12.85	13.67	13.98	12.81	12.31	13.87	14.71	14.73	13.91
India	4.53	4.73	4.84	4.77	3.51	3.94	4.34	4.14	4.89	4.19	4.75	4.99	4.71
Other Asia	8.69	8.91	9.02	8.23	7.79	8.11	8.70	8.21	8.33	8.96	8.57	8.84	8.68
Latin America	6.51	6.53	6.59	6.11	5.61	6.20	6.08	6.00	6.21	6.27	6.41	6.31	6.30
Middle East	8.23	8.13	8.20	7.88	6.91	7.94	7.50	7.56	8.07	7.64	8.25	7.75	7.93
Africa	4.20	4.33	4.45	4.37	3.77	3.95	4.20	4.07	4.46	3.95	4.16	4.39	4.24
Eurasia	5.36	5.50	5.61	5.21	4.58	4.85	5.11	4.94	5.43	5.17	5.14	5.35	5.28
of which Russia	*3.48*	*3.55*	*3.61*	*3.44*	*3.04*	*3.20*	*3.24*	*3.23*	*3.57*	*3.37*	*3.37*	*3.38*	*3.42*
of which other	*1.88*	*1.95*	*2.00*	*1.78*	*1.54*	*1.65*	*1.87*	*1.71*	*1.86*	*1.81*	*1.77*	*1.97*	*1.85*

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Eurasia													
Total Non-OECD	**49.84**	**50.99**	**52.02**	**47.27**	**45.02**	**48.67**	**49.91**	**47.73**	**49.71**	**50.06**	**51.98**	**52.36**	**51.04**
(a) Total world demand	**97.52**	**98.98**	**99.76**	**92.71**	**82.57**	**91.16**	**93.47**	**89.99**	**93.97**	**95.68**	**96.57**	**97.29**	**95.89**

Sources: *OPEC*

Madaki (2020) enumerates a long list of what she considers could possibly be the cause of crude oil price fluctuations. In her opinion, "new cycle, policy changes, fluctuation in world trades and several years of upwards production of unconventional crude oil, upliftment of the US dollar and unwinding of some geopolitical risks." The production of *unconventional* oil such the Shale Oil in the US certainly added volume to world crude oil output and increased supply. The resolution of some geopolitical risks as the case of American successful interceding in the Iraqi invasion of Kuwait and the eventual demise of her leader Saddam Hussein, the overthrown of the tyrant Libyan Momma Gaddafi all these freed access to the Middle East and enhance more oil production. Decisions by the organization of petroleum exporting countries (OPEC) regarding production quota allocations to member countries and setting oil price ceilings have been known to drastically induce unanticipated oil price swings.

Market sentiments, following Madaki *(ibid)*, is another factor that impinges sharp changes in oil price. "The mere belief that the demand for oil will increase dramatically in the future can result in a drastic increase in oil price at the present." The reverse is the same when the market sentiment is that oil demand could decrease at some point in the future, oil price would fall currently. This explains how oil price osculates following market sentiments. Unplanned outages, due to natural disaster, weather, conflicts, and civil unrests in oil producing regions and countries are the other explanations for oil price swings *(ibid).*

Kolaczkowski and White (2022), stated, "crude oil is one of the most important commodities in the world" and it is present in virtually every product. "– petroleum products can be found in everything from personal protective equipment, plastics, chemicals and fertilizers through to aspirin, clothing, fuel for transportation and even solar panel." This perhaps explains its price volatility since its demand extends across different industries and usage.

Budina and van Tinbergen (2011) stated "…oil abundant countries' output as well as government revenue and expenditure experience higher volatility due to highly volatile commodity price combined with undiversified revenue and export bases.'' This assertion is correct, but Budina and van Wijnbergen provided no further explanations, nor mentioned the channels through which oil price related volatility is transmitted to the domestic macroeconomy of a nation. Akinlo (2012) in a sectorial analysis of the relationship between crude oil and Nigeria economic growth found no

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evidence of any relationship between agriculture production and crude oil mining, a large component of the Nigeria gross domestic product (GDP). Akinlo though found a "bidirectional causality'' between manufacturing, building and construction and crude oil behaviour.

Itotenaan et al. (2013), in their study attributed fluctuating crude oil price to, "the emergency of various militant groups in oil producing countries of the world and political crises have also caused increase in oil price.'' Itotenaan's position is inconsistent with the findings of the World Bank Global Economic Prospect (2015). The publication by the World Bank noted, "in the second half of 2014, it became apparent that supply disturbances arising from conflicts in the Middle East has either unwound or did not materialize as expected. For instance, in Libya despite the internal conflict there, oil production recovered by 0.05 million barrels per day (about 2 percent of global production) in the third quarter of 2014." Crude oil production facilities in Nigeria have till date been under attack by so call militants, yet the reduction of the Nigeria allocated production quarter has not significantly affect global spot market supply. See Table 2.

The International Energy Agency (IEA 2021) observed that, "rapid changes in behavior from the pandemic and a stronger drive by governments towards a low-carbon future have caused a dramatic downward shift in *expectations for oil demand over the next six years*." The IEA assertion supposedly implies some constraint, and perhaps lessen crude oil price volatility in the next six years. Should this prediction be correct, then the effect of crude oil price volatility in producer nations could be smoothen out and thus reduce the harsh realities it generates in the macroeconomy of oil producing countries. Already the mere likelihood of this reality occurring, according to IEA, "is forcing hard decisions on oil-producing countries and companies that are reluctant to leave resources untapped or to install new capacity that would only site idle."

Asaleye et al. (2019) in their study; "*Oil shocks and macroeconomic performance in Nigeria…"* tried to establish some long run relationship between variables as employment, aggregate output, exchange rate and oil price. With the aid of Structural Vector Autoregression and normalized equation (SVAR), these authors found that employment has a negative relationship with aggregate demand, exchange rate and oil price.

Greenberg (2016), stated unequivocally, "A sharp rise in oil prices, as it happened in 2007–2008, can push economies into recession, but historically a sharp fall in oil prices has acted as a stimulus, freeing up income to spend on things other than oil and gasoline." He asserted that oil price volatility "can be particularly hard for low-income households to manage, because they do not have access to financial hedging instruments that could smooth the shocks from ups and downs in prices." Empirically we assume from Greenberg assertion that, crude oil price volatility has the possibility of divining down large fraction of the population into poverty as it in Nigeria. Gylych et al. (not dated, chapter 4), concluded from empirical analysis that "oil price is a strong determining factor of exchange rate, cost of borrowing and directly influences inflationary or deflationary tendencies in Nigeria."

Extant literature reviewed this far have identified a plethora of variables considered to be possible causes of oil price fluctuations. In all of these, none mentioned the transporting channels of how the impact of fluctuating crude oil price gets to the domestic economy of producer nations.

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Random mention of inflation and exchange rate is commonplace in the literature, but these variables are not related as the channels of transportation of crude oil price volatility to the domestic economy. Additionally, current literature has also not adequately explained how oil price volatility passes through to impact domestic consumer behavior.

How this is aided by imported petroleum (PMS) product into Nigeria is not explained. We believe it is through imported gasoline (PMS) that foreign inflation is directly transported into the Nigeria domestic macroeconomy economy. This could explain the failure of domestic monetary and fiscal policy tools to address domestic macroeconomic distortions often expressed in consumer price index (inflation). Though oil price volatility is blamed for the several macroeconomic instabilities, imported gasoline is another major source of instability in the domestic economy. These are some of the issues we have slated for and explanation and discussion in this paper.

Conceptual Framework

Crude Oil Price Volatility - this describes the unscheduled sharp price movements in the international crude oil market. Extant economic literature has a litany of: geopolitical tensions, production of unconventional crude oil such as shale oil from North America, hostility in oil producing regions or state and lot more as factors that drive oil price volatility. Oil price volatility has several implications in the macroeconomies of producer nations. Greenberg (2016) stated that it generates hardship, impact corporate activities and drives a large fraction of the

local population into poverty in the producer nations.

Consumer Price Index (CPI) – Consumer price index tracks price increases for a variety of domestically produced products and services. Naturally, the base year used for the CPI measurement is the year that the price changes are measured against. The cost of living is referred to by the basket of goods and services, which includes things like housing, transportation, food, and healthcare. The main indicator of inflation or deflation is this metric.

Nominal Interest Rate – The term "nominal interest rate" describes the interest rate before accounting for inflation. The real interest rate, which is adjusted for inflation, and the effective interest rate, which is adjusted for compounding, are very different from the nominal interest rate.

Foreign Reserve – A country's foreign reserves "are the amount of money it has in reserves, including gold or other precious metals, that it can use to buy goods and services from other countries" https://authne.com/what-is-foreign-reserve/. Generally foreign reserves are assets for every country, and forms part of a country's foreign exchange reserves. Foreign reserves are assets held in trust by the central bank or a monetary authority of a given country. It is used to facilitate international trades, investments, and to maintain financial stability. Sources for the accumulation of foreign reserves differ amongst countries depending on the means of earning it. Nigeria, like the other oil exporting countries: Iraq, Iran, Libya Kuwait etc. earn a large percentage of her foreign reserves from the export and sales of crude oil. Other sources of foreign reserve include gold and borrowing. Countries with high foreign reserves are usually considered to be stable as they have enough money to pay their debts and pay their import bills.

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Commodity Price Fluctuation – "refers to the changes in price of a *financial* asset over a given period of time." https://www.ablison.com/what-is-price-fluctuation/. Generally, commodities: crude oil, tin, copper, coffee, cocoa, soya beans etc. are traded (bought and sold). They are therefore referred to as *financial assets*. Commodity price fluctuations "can be significant or minor, and can occur in any financial market, including stocks, bonds, commodities, and currencies." Price fluctuations is an integral part of any financial market and can be caused by a variety of factors. Vasishtha (2022) noted that since "1996, global macroeconomic shocks have been the main source of commodity price volatility." According to Vasishtha *(ibid)*, "global demand shocks have accounted for 50 percent of the variance of global commodity price growth, while global supply shocks have accounted for 20 percent of the variance."

Imported gasoline product (PMS) – Sasu (2022), noted that during the first quarter (January - March), of 2021 alone, Nigeria imported petrol up to 688 trillion Naira. The highest value was recorded in the third quarter of 2018 though, when roughly 855 billion Naira of petrol were exported to Nigeria. Karmer (2022), reported that Nigeria lead in the importation of petrol amongst African countries with an import volume of 466 thousand barrels per day.

Theoretical Framework

The Resource Curse

The resource curse, also known as the paradox of plenty or the poverty paradox tries to explain why countries that are richer in natural resources are poorer, have less economic growth and have less democratic institutions (Sachs & Warner, 1995). This concept is similar to the Dutch disease. This theory suggests that countries that are heavily reliant on oil exports are more vulnerable to economic shocks resulting from oil price fluctuations. It argues that oil exporting countries tend to experience a decline in economic growth when oil prices fall, as their revenues from oil exports decrease. This is a contradictory situation where countries having abundant non-renewable natural resources experience sluggish or even adverse economic growth. In 1993 Richard M. Auty first used the term resource curse to describe this situation. (Murrey et al., 2019). This phenomenon can arise due to various reasons, but the primary cause is when a country starts focusing all its resources on a single industry such as mining or oil production and disregards investing in other critical sectors. It may also arise because of corruption. If a significant portion of the nation's wealth is concentrated in a small number of industries, the government can influence a lot in those industries to vested interest and bribery without regarding the public. A surplus of manpower and money that go to just a few industries might damage the rest of the economy and hurt the whole nation (Fernando, 2022).

This kind of issue is frequently seen in emerging economies that find significant natural resource resources. The industry tends to attract available investment money once a natural resource is found. With its appealing earnings and potential for economic development, this new industry attracts people to put their money into it and grows to be a relatively prosperous sector of the economy. Long-term, this dynamic may cause countries to become heavily dependent on the price of that commodity, which will make it challenging to sustain the development of the economy.

Diversification and Modern Portfolio Theory

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Harry Max Markowitz an American economist and Nobel laureate for economics propounded the theory of portfolio, which is a subcategory of the capital market theory. This theory deals with the behavior of investors in capital market for example; large insurance, hedge funds and asset managers base their investments decisions on this theory. Harry provided an empirical evidence in the 1950s that a diversified investment portfolio is superior to any individual investment in terms of its risk-return ratio, no matter how well the individual investment is selected. Every investment has an impact on the portfolio's overall returns and risk. Identifying the expected value of future returns on the investment is the first stage. Since investment developments sometimes deviate from predictions, the second step focuses on the yield's range of fluctuation. Looking at the standard deviation of the expected yields, helps determine outliers in both directions.

Hypothesis

From amongst this plethora of causal and dependent variables, we hypothesis that:

(i) ***Consumer price index (CIP) is one domestic variable most impacted by crude oil price volatility, imported petrol, level of foreign reserve and exchange rate.***

Methodology and Data Construction

All included data are annual and are sourced from the Central Bank of Nigeria (CBN). Our hypotheses will be tested first using simple descriptive statistics for test of normality-checking the behavior of the variables in confirming to the assumptions of the classical regression model (CLM) model. Further, we use the Autoregressive distributed lag (ARDL the Bond test) model to detect for both short and long run relationship amongst these variables.

Data Presentation, Analysis, and Discussion of Findings

The data for this study is presented in Table 3 (not included) sourced from the Central Bank of Nigeria (CBN). All the data are from secondary sources and time series. They are first tested for conformity with normality assumptions. Next, they are tested for stationarity (unit root test), using the *EViews software*. The consumer price index (CPI) is in percentage, and it is transformed using the natural log *(logCPI).* The same is done to crude oil price (CROP - *Log CROP*). All the other variables: external reserve (EXRS – *log EXRS*), excchang rate *(logEXCH)* and gasoline import also in US dollar are transformed to (log*GSOL*).

We do a descriptive analysis of the variables in the study starting with a sight evaluation of the behaviour of the variables. Figure 4.1 below presents a line graph of the five different variables as they appear. From the graph, we can see, LogCPI, LogCrop & logExch appear to bond together on the long run. LogGasol and logExrs both are trending up faraway from crude oil price, consumer price index and exchange rate. From Table 3, we observe that logCPI has a skewness of 0.883107 and logGASOL -0.842343 indicating that the tail of the distribution is on the left side. Most of the values are less than zero indicating variables symmetric around their means.

Kurtosis of the variables are either 2.997 as for logCPI or 1.950 for log GASOL. These approximate either 3 as the case in log CPI or 2 as the case in logCROP. Theory has it that these

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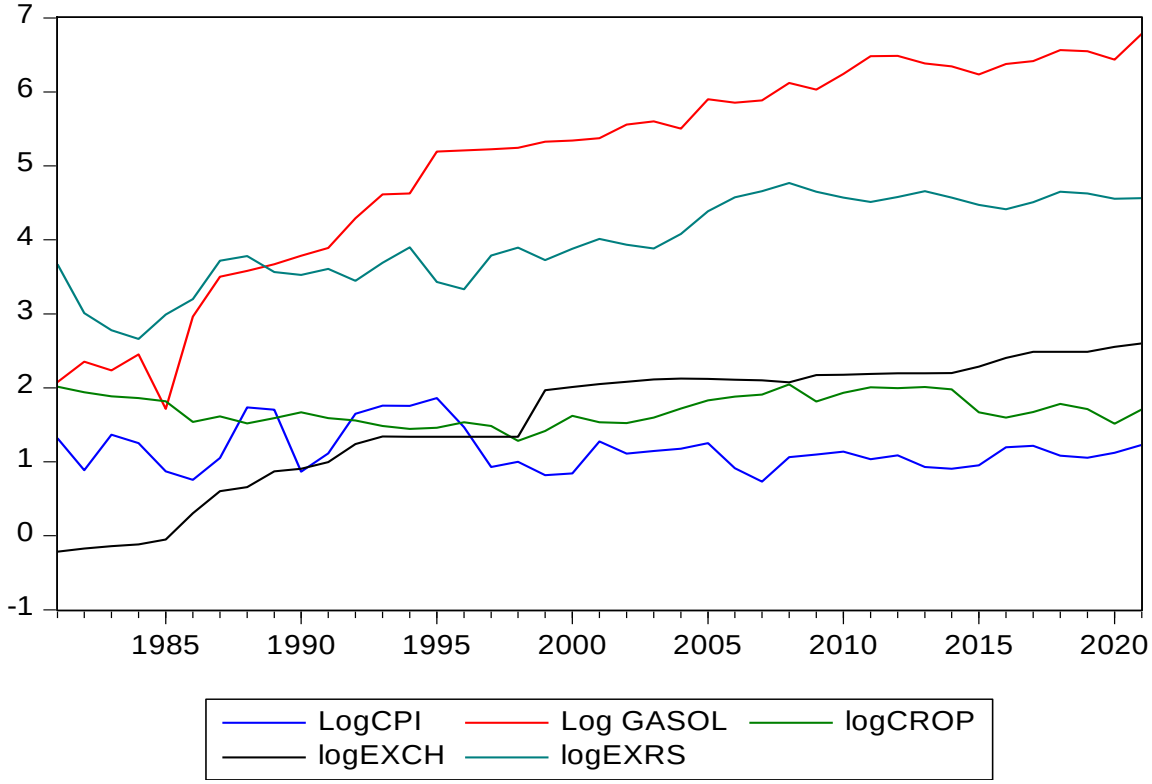
values are for asymmetry and kurtosis between -2 and +2 are considered acceptable in order to prove normal univariate distribution (George & Mallery, 2010).

Fig. 1 Line graph of the variables: logCPI, log_Esol, LogCrop & logExch log Exrs



Source. Eviews software output

Table 3

	LOGCPI	LOG_GASOL	LOGCROP	LOGEXCH	LOGEXRS
Mean	1.164139	5.034719	1.701669	1.563710	3.980925
Median	1.109801	5.374944	1.667920	2.048998	3.900044
Maximum	1.862343	6.784464	2.046846	2.602021	4.766955
Minimum	0.731428	1.714330	1.283753	-0.214652	2.659576
Std. Dev.	0.293514	1.461660	0.200383	0.870253	0.586882
Skewness	0.883107	-0.842343	0.141660	-0.806775	-0.446986
Kurtosis	2.997206	2.507158	1.950466	2.391293	2.206091
Jarque-Bera	5.329178	5.263481	2.018897	5.080695	2.442024
Probability	0.069628	0.071953	0.364420	0.078839	0.294932
Sum	47.72968	206.4235	69.76844	64.11210	163.2179
Sum Sq. Dev.	3.446027	85.45797	1.606139	30.29359	13.77724
Observations	41	41	41	41	41

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Source. Eviews software output

The mean of the variable are positive. It implies that they have the tendency to increase over time. We saw this tendency physically from the line graph in fig 1. The Standard deviation simply measures the degree of dispersion of the variable from its mean. Gasoline import *(logGASOL)* appears to have the largest dispersion value of 1.461660 and thus the most volatile of all the variables. The standard deviation of consumer price index *(log CPI)* with a volatility value of 0.29351 is the most volatile of all the variables. Crude oil price *(logCROP)* 0.200383, exchange rate *(logEXCH)* 0.870253 and external reserves *(logEXRS)* 0.586882. All these are less volatile.

Test of Constant and Trend in the Variables

To conduct the unit root test of the variables specified for this study, we first examine them to determine in each variable either trend, constant, both or none. The test equation is formulated as:

Y = c + @trend ………………………………… 1

Where:

Y = is the variable

C = is the Constant

@trend = determines the presence of trend

We use this equation to determine the presence of either constant, trend, both or none in the unit root testing process.

a. Constant
b. Constant and trend or
c. No constant and trend

Table 4: Test of Constant, Trend, Both or None in the Variables

Dependent Variable: LOGCPI
Method: Least Squares
Date: 03/26/23 Time: 10:39
Sample: 1981 2021
Included observations: 41

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.285974	0.088311	14.56195	0.0000
@TREND	-0.006092	0.003800	-1.602976	0.1170

R-squared	0.061813	Mean dependent var	1.164139
Adjusted R-squared	0.037757	S.D. dependent var	0.293514
S.E. of regression	0.287920	Akaike info criterion	0.395282
Sum squared resid	3.233018	Schwarz criterion	0.478871
Log likelihood	-6.103281	Hannan-Quinn criter.	0.425720

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F-statistic	2.569533	Durbin-Watson stat	1.024472
Prob(F-statistic)	0.117009		

In the test of constant or trend in Table 4 above, we find constant or intercept being significant with a *p-value* = 0.0000, but trend is not. Therefore, only constant will be included in the unit root test. The other three variables: ***LogCROP, LOGEXRS, log EXCH and logGSOL*** were equally examined for the inclusion of either constant, both constant and trend or none. The result is reported Table 4.4 below.

Loggsol – this variable when regressed on its constant and trend, the outcome indicated both constant and trend are significant and should be included in the unit root test.

Logcrop - the regression of this variable on its constant and trend shows that only constant is significant and will included in the unit root test. Trend is not significant.

Logexch- in this variable, only trend is significant to be included in the unit root test.

Logexrs - the test shows that both intercept and trend are significant and should be included in the test statistics.

The unit root test results allowing for either constant, both constant and trend or neither for all four variables are as reported on Table 5 below.

Table 5: Unit Root Test

Variable	**ADF statistics**	**Critical Value (5%)**	**P-value**	***d*(level/1)**
Log CPI @level	-7.090945	-2.941145	0.0000	stationary
Loggasol	-2.995990	-8.933153	0.0000	*d(1)*
Logcrop	-5.364110	-2.941145	0.0001	*d(1)*
Logexch	-5.745823	-3.529758	0.0002	*d(1)*

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Logexrs	-4.172947	-3.540328	0.0137	*d(1)*

Source: Constructed by the Authors

In Table 5 above we report the Augmented Dickey Fuller (ADF) unit root test statistics for the different variables in the study. The results report the (ADF) statistics together with the critical values at 5% significant and the *P-values*. The result shows consumer price index *(logcpi)* is *d(0*) stationary at level. Gasoline import *(Log_gasol*), crude oil price *(Logcrop,* exchange *rate (Logexch)* and external reserve *(logexrs)* are all *d(1)* integrated at first difference.

Autoregressive Distributed Lag Model (ARDL) Cointegraiton Test

The ARDF model works on the major assumption that all the variables included in the model must either be stationary at *d(0)* or *d(1),* otherwise ARDL does not apply or the particular variable be removed from the model. From the unit root test results reported in Table 5 above, we can correctly conclude that all the variables are stationary either at *d(1)* or *d(0).* The data shows that the ARDL model is appropriate for model to determine whether there is a short and long run association between the variables.

ARDL Model Specifications for Short and Long Run

$LogCPI = \alpha_{1+} \sum\beta_1 logCPI_{t-1} + \sum\beta_1 logCROP_{t-1+} \sum\beta_1 logEXCH_{t-1} + \sum\beta_1 logEXRS_{t-1} + \sum\beta_1 logGSOL + \mu_{ti}$ 2

(Equation for the short run includes difference and lags).

$\delta_1 logCPI_{t-1} + \delta_2 logCROP_{t-1+} \delta_3 logEXCH_{t-1} + \delta_4 logEXRS_{t-1} + \delta_5 logGSOL_{t-1} + Ɛ_{it}$……3

(Equation for the long run excludes but include lags)

Table 6: The F- Bounds Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic : n=1000	
F-statistic	7.390318	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87

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		1%	3.29	4.37
			Finite Sample: n=40	
Actual Sample Size	37			
		10%	2.427	3.395
		5%	2.893	4
		1%	3.967	5.455
			Finite Sample: n=35	
		10%	2.46	3.46
		5%	2.947	4.088
		1%	4.093	5.532

Source: Eviews software output of F-Bond test statistics

The decision rule of the Bounds Test: reject the null hypothesis of no long run cointegration if the computed F- statistics is greater than the lower and upper bounds of the critical value. The F-bound test *Eviews output* and reported in Table 6 above shows long run cointegration amongst the variable since the coefficient ***(7.390318)*** of the computed Bounds Test is greater than both the lower *(2.56)* and upper *(3.*49*)* bounds at the critical level of 5%.

Table 7: Long Run Coefficient of the Dependent Variables

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG_GSOL	**-4.322380**	**7.079406**	**-0.610557**	**0.552 0**
LOGCROP	**4.3004 52**	**8.354569**	**0.5147424**	**0.615**
LOGEXCH	**9.1450 24**	**15.13950**	**0.6040502**	**0.556**
LOGEXRS	**-2.042706**	**3.534472**	**-0.577938**	**0.573 2**
C	**8.3724 11**	**9.521614**	**0.8793062**	**0.395**

EC = LOGCPI - (-4.3224*LOG_GSOL + 4.3005*LOGCROP + 9.1450

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***LOGEXCH -2.0427*LOGEXRS + 8.3724)**

Source. Eviews software output

The long run coefficient (-4.388110) for gasoline import *(logGSOL)* carries a negative sign, and it is not significant in the model. The negative sign interprets that gasoline import bears little or no long run relationship with domestic consumer price (CPI). Consumer price reacts negatively to gasoline import – a unit increase in imported gasoline is likely to reduce consumption by as much as 432%, in other words, on the long run, imported gasoline inflames inflation in the domestic economy of oil producer nation - Nigeria. This finding confirms our a-priori expectation – that imported gasoline will negatively impact domestic consumption.

Exchange rate *(logEXCH)* and crude oil price *(logCROP)* both have coefficients (***9.145024)*** and ***(4.300452)*** carrying positive signs, but are not significant following their *p-value*s, in the long run model. A-priori we had believed exchange rate is the vehicle through which foreign inflation (from change in oil price) is conveyed into the domestic economy of producer nations. Contrary, in the long run model, exchange rate does not follow oil price volatility.

External reserves with negative sign, though not significant could mean that on the long run, it impacts domestic consumption negatively. When foreign reserves go down on the long run, such downward trend could affect domestic economy by reducing the consumption as Nigeria will be unable to bill her import bills.

Table 8: Short Run Coefficients and Long Run Adjustment

ECM Regression

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Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGCPI(-1))	-0.498413	0.111004	-4.490025	0.0006
D(LOGCPI(-2))	-0.585187	0.077139	-7.586146	0.0000
D(LOGCPI(-3))	-0.505432	0.104661	-4.829244	0.0003
D(LOG_GSOL)	0.115334	0.075959	1.518381	0.1529
D(LOG_GSOL(-1))	0.941808	0.140761	6.690834	0.0000
D(LOG_GSOL(-2))	0.710613	0.115853	6.133747	0.0000
D(LOG_GSOL(-3))	0.488018	0.103691	4.706470	0.0004
D(LOGCROP)	-0.224216	0.155054	-1.446051	0.1718
D(LOGCROP(-1))	-1.335321	0.182044	-7.335145	0.0000
D(LOGCROP(-2))	-0.624560	0.231283	-2.700420	0.0182
D(LOGCROP(-3))	-0.622757	0.170061	-3.661966	0.0029
D(LOGEXRS)	-1.043789	0.172629	-6.046433	0.0000
D(LOGEXRS(-1))	0.284545	0.118826	2.394630	0.0324
D(LOGEXRS(-2))	-0.484257	0.160604	-3.015230	0.0099
D(LOGEXCH)	0.061922	0.231940	0.266973	0.7937
D(LOGEXCH(-1))	-0.435877	0.228224	-1.909869	0.0785
D(LOGEXCH(-2))	0.357120	0.199428	1.790717	0.0966
D(LOGEXCH(-3))	-0.489035	0.182410	-2.680965	0.0189
CointEq(-1)*	-0.187734	0.023959	-7.835591	0.0000

R-squared	0.945843	Mean dependent var	-0.000586
Adjusted R-squared	0.891687	S.D. dependent var	0.282949
S.E. of regression	0.093121	Akaike info criterion	-1.603347
Sum squared resid	0.156088	Schwarz criterion	-0.776119
Log likelihood	48.66192	Hannan-Quinn criter.	-1.311711
Durbin-Watson stat	2.262197		

*** p-value incompatible with t-Bounds distribution.**

Source: *Eview Output*

Short run coefficients show all the variable as significant and having the right signs. For instance, crude oil price *(logCROP)* is significant at all lags and carries a negative sign relative to the domestic consumption (CPI). This interprets that oil price has an inverse relationship with domestic consumption – as the oil price goes up and generate more revenue for the oil producing nation, domestic consumption increases thereby inflaming domestic inflation and vice-versa.

The long run adjustment (*CointEq (-1)* showing the speed of adjustment fulfills all necessary three conditions: it is significant, negative and less than one (1). This shows that the model will adjust monotonically should disequilibrium occur in the short run.

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Conclusion

Quite a number of issues have arisen following the findings in this study. First is the finding that long run cointegration exist between domestic consumption, that is consumer price index (CPI) crude oil price, exchange rate and external reserves. Though domestic consumption is impacted by oil price changes, external reserves, exchange rate, and gasoline import, their effect on CPI are only minimally felt in the short run. Possible explanations could be due some intervening confounding variables in the long run. For instance, the effect of a particular oil price volatility wears away as time passes. External reserves could positively adjust reducing pressure on exchange rate and improving domestic consumption. Nigeria diaspora remittances estimated to be in the region of several millions of dollars each year is known to impact exchange rate behavior on the long run (Nwiado et al. 2021). Confounding variable as this, could distort long run cointegration within the model. Besides, fiscal and monetary tools policies such as exchange rate control is unable to address domestic macroeconomic disturbances occurring from because crude oil revenue is external to the domestic macroeconomy.

Conclusively, we find the model as having a good fit especially with the short run coefficients and speed of adjust to equilibrium. Except for exchange rate, all the other variables are significant and having the right signs. Gylych et al. (not dated, chapter 4), concluded from an empirical analysis that "oil price is a strong determining factor of exchange rate, cost of borrowing and directly influences inflationary or deflationary tendencies in Nigeria." We do not disregard Gylych et al findings, but exchange rate is not entirely determined by oil price volatility – factors as diaspora remittances, grants and money transfers are other confounding variables that impact exchange behavior. Exchange rate does not necessarily impinge on consumer price index (CPI) and not directly responsible for domestic inflation.

From our findings, we recommend fiscal policies measures designed to bolster constant external reserve built-up and reduction in gasoline import bills. This could cushion the impact of oil price volatility. Export *(economic base)* diversification is an example often cited that bolster external reserve built up. Davis et al. (2003) concluded that countries that subsides fuel consumption, and experience crude oil price volatility end up wreaking havoc on fiscal planning. We recommend fuel subsidy removal as a fiscal policy tool to prevent distortionary effects on budgetary allocations.

List of Abbreviations

1) CPI Consumer price index
2) GNI Gross national income
3) GDP Gross domestic product
4) IEA International energy agency
5) OPEC Organization of petroleum exporting countries
6) PMS Premium motor spirit

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under Volume: 6 Issue: 9 in Sep-2023 https://www.globalresearchnetwork.us/index.php/AJEBM

References

1. Akinlo, A.E (2012). How important is oil in Nigeria economic growth**?** Journal of Sustainable Development; 5, 4 http;//dx.doi.org/10.5539/jsd.v5n4p165
2. Asaleye, J. A et al. (2019). Oil price shock and macroeconomic performance in Nigeria: implication on employment; *International Journal of Energy Economics and Policy, 2019, 9(5), 451-457*
3. Baffies, J et al (2015). Understanding the plunge in oil prices; sources and implications, World Bank Policy research note also 94725; Global economic prospect chapter 4.
4. Budina, N. and van Wijnbergen (2011). Managing oil revenue volatility in Nigeria; the roll of Fiscal policy.
5. Chen, J. (2021, October 1). What Is The Dutch Disease? Origin of Term and Examples. Investopedia. https://www.investopedia.com/terms/d/dutchdisease.asp, https://www.wallstreetoasis.com/resources/skills/economics/dutch-disease
6. Davis, J.M, Ossowski R., and Fedelino (2003 Ed.)**.** Fiscal policy formulation and implementation in oil – producing countries. *International Monetary Fund.*
7. Etornam, D.K (2015). The Impact of Oil Price Shocks on the Macroeconomy of Ghana; *Journal of poverty, investment and development 9,*
8. Fernando, J. (2022, September 29). Resource Curse: Definition, Overview and Examples. Investopedia. https://www.investopedia.com/terms/r/resource-curse.asp
9. George, D. and Mallery, P. (2010) SPSS for windows step by step: A Simple Guide and Reference 17.0 Update. 10th Edition, Pearson, Boston.
10. Greenberg, M.R (2016). Oil price volatility: causes, effects, and policy implications, *Center for Geoeconomcs Studies Council on Foreign Relation.*
11. Ginn, V. (2012).The underlying causes of oil price fluctuations, Master Resources https://oilprice.com/Energy/Oil-Prices/The-Underlying-Causes-of-Oil-Price-*Fluctuations.html.*
12. Gylych, J. Jibrin, A. A.; Celik, B.; & Isik, A (not dated). Impact of oil price fluctuation on the economy of Nigeria, the core analysis for energy producing countries, *Global trade in the Emerging Business Environment.*
13. International Energy Agency (2021). Analysis and forecast to 2026 International energy agency. www.iea.org/t&c.
14. Jawaid, T. (2023). Econometrics # 51: Autoregressive Distributed Lag (ARDL) Cointegration with Eviews. *J.T Academy.*
15. Kamer, L. (2022). Import volume of petroleum products into Africa from 2010 to 2020 Petrol, *Statista https://www.statista.com/statistics/1165962/petrol-import-in-nigeria.*
16. Kolaczkowski, M.; and White, M. (2022) Why do prices matter to the global economy? An expert explains. *https://www.weforum.org/agenda/2022/02/why-oil-prices-matter-to-global-economy-expert-explains.*
17. Kilian, L. (2009). Oil Price Volatility: Origins and effects, *background paper prepared for the WTO's World Trade Report 2010.*
18. Kim, G.; & Vera, D. (2022). The effect of oil price fluctuation on the economy: what can we learn? from alternative models? *Journal of applied economics; 25 (1), 856–877.*

ISSN 2576-5973 (online), Published by "Global Research Network LLC"
under Volume: 6 Issue: 9 in Sep-2023 https://www.globalresearchnetwork.us/index.php/AJEBM

19. Levine, S. et al. (note dated). Understanding crude oil and product markets premiers
20. Luiz Carlos Bresser-Pereira (2009) Globalization and Competition Why Some Emergent Countries Succeed while Others Fall Behind. *Cambridge University Press* pp. 148 – 181 doi: https://doi.org/10.1017/CBO9780511691928.006.
21. Madki, V. (2020). Causes of fluctuations in oil prices and its impact on the economy. https://www.startuptalky.com/causes-of-fluctuations-in-oil-prices-and-its-impact-on-economy.
22. Murrey, A. & Jackson, N. (2019). Africa and the Resource Curse Idea. Routledge Encyclopedia of African Studies.
23. Njiforti, P. (2015) Impact of the 2007/2008 global financial crisis on the stock market in Nigeria *CBN Journal of Applied Statistics 6 (1(a).*
24. Nkomo J.C (2006). Crude oil price movements and their impacts on South Africa. *Journal of Energy in South Africa, 17(4).*
25. Nwiado, D. et al (2021). Migrant remittances and naira price of the dollar, *Global Journal of Arts, Humanities and Social Sciences* 9 (4), pp.15-45.
26. Ogiri, I. H. et al (2013). Oil Price and the Stock Market Performance in Nigeria; An Empirical Analysis. *American Journal of Social and Management Sciences*
27. Oil Price Volatility: Causes, Effects, and Policy Implications https://www.cfr.org/report/oil-price-volatility-causes-effects-and-policy-implications.
28. Pettinger, T. (2017, November 15). Dutch disease – Economics Help. https://www.economicshelp.org/blog/11977/oil/dutch-disease/
29. Sachs, J. & Warner, A. (1995). "Natural Resource Abundance and Economic Growth." National Bureau of Economic Research (NBER), Cambridge. https://www.nber.org/papers/w5398
30. Sasu, D. D. (2022). Petrol import into Nigeria between the 1st quarter of 2018 and the 1st quarter of 2021, *Statista https://www.statista.com/statistics/1165962/petrol-import-in-nigeria,*
31. Sinha, A. (2023, January 13). Dutch Disease - Definition, Disadvantages, and How to Avoid Wall Street Oasis. Wallstreetoasis.
32. Vasishtha, V. (2022). Commodity price cycles: Causes *and consequences https://blogs.worldbank.org/developmenttalk/commodity-price*.
33. Wilson, A. et al (2014). Oil price volatility and economic development: Stylized evidence in *Nigeria*." Journal of Economics and International Finance 6.6 (2014): 125-133.

ISSN 2576-5973 (online), Published by "Global Research Network LLC"
under Volume: 6 Issue: 9 in Sep-2023 https://www.globalresearchnetwork.us/index.php/AJEBM