

GSJ: Volume 8, Issue 6, June 2020, Online: ISSN 2320-9186 www.globalscientificjournal.com

## NEXUS BETWEEN MONETARY POLICY INSTRUMENTS AND PRIVATE CONSUMPTION SPENDING IN NIGERIA

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#### Abstract

The study investigated the nexus between monetary policy instruments and private consumption spending in Nigeria from 1981 to 2016. The research adopts multiple regression analysis in which Vector Error Correction Model and Granger causality test were utilized in the analysis. Data on private consumption expenditure (PCE), broad money supply (M2), government consumption spending (GCE), interest rate (INTR), Bank reserve (BR), exchange rate (EXCGR) and inflation rate (INFR) were analyzed in the study. The results showed that apart from exchange rate, all other monetary policy variables employed in this study were revealed to be significant in the determination of consumption spending in Nigeria. The insignificance of exchange rate may have resulted from the fall in the demand for domestically produced goods and services in spite of the increased campaign by several government agencies to change peoples' preferences in favor of domestically produces goods and services. The Granger causality test which revealed a unidirectional causality running from CPI to PCE is a pointer to the fact that government policies towards moderating the price level such as inflation targeting will positively impact on consumer spending, and through the multiplier effect increase economic growth and the general standard of living. Therefore, the study recommends that the monetary authority should formulate and implement monetary policies that would ensure optimal money stock which will in turn reduce interest rates without creating excess liquidity. The effort of CBN towards inflation targeting is a step in the right direction and should be pursued more vigorously. This will reduce inflation in the price level whereby consumption spending will rise, and through the multiplier effects, economic activities, individual and national income will rise.

Keywords: Multiple Regression, Monetary Policy, Pairwise Granger causality, Unidirectional Causality, Multiplier Effects, Bank Reserve, Inflation, Vector Error Correction Model.

# 1. Introduction

Monetary policy is expected to play very crucial roles in economic management, among which is the achievement of sustainable increase in the rate of economic growth by ensuring: Price stability, optimal exchange rate, stable long term interest rates, and healthy balance of payments. Increase in economic growth reflects an improvement in economic activities which will translate into increase in aggregate demand of which consumption spending forms a major component. Further increases in consumption spending will, through the multiplier effects, give rise to further increases in economic growth and living standards of the people. Over the years, Nigeria has adopted several monetary policy measures, yet there has not been any observed appreciable improvement in the living standard of the people.

In all the studies reviewed, the author is unaware of any one involved in the investigation of the impact of monetary policy variables on consumption spending. Bearing in mind the impact of consumption spending on the economics activity of any nation through its multiplier effects, it is necessary to quantitatively investigate the impact of monetary policy variables on consumption spending in Nigeria. Determine the existence or not of any significant long run steady-state or equilibrium relationship between private consumption spending and monetary policy variable in Nigeria within the period under review

The efficacy of monetary police in economic management in both developing and advanced economies of the world has continued to receive prominent attention by the policy makers. The remarkable roles monetary policy tools play as always identified include: sustainable increase in the rate of economic growth by ensuring price stability, enthronement of optimal exchange rate regime, pursuit of stable long term interest rates, and promotion of a healthy balance of payments etc.

Interestingly, increase in economic growth reflects an improvement in economic activities. Increase in economic activities will translate into increases in aggregate demand of which consumption spending forms the major component. As stated by Agu (2007), "further increases in consumption spending (coupled with increases in other components of aggregate demand), will in turn, through its multiplier effects, give rise to further increases in economic growth and the living standard of the people".

Over the years, precisely, since the structural adjustment programme (SAP) in 1986, Nigeria has adopted several monetary policy measures, yet there has not been any appreciable improvement in the living standard of greater majority of the people. Most of the monetary policy measures, especially expansionary policy through increased advance of credit to the private sector aimed at the ultimate target of increasing consumer spending and hence, the general welfare of the people. Available statistics indicate that on average, while credit to private sector in Nigeria decreased from 98.89 million naira in 1980 to -85.63 million in 1985 and further declined to -50.93 million in 1990.

Available statistics indicate that government expenditure has continued to rise side by side exports (especially in the non-oil sector) and foreign exchange reserves, leading to a less than satisfactory movements in consumer spending and the overall living standards. It is therefore, not clear, whether appropriate monetary policy instruments to target the right variables have been adopted to address the problem. In all the studies reviewed, the author is unaware of any one involved in the investigation of the impact of monetary policy variables on consumption spending. Bearing in mind the impact of consumption spending on the economics activity of any nation through its multiplier effects, it is necessary to quantitatively investigate the impact of monetary policy variables on consumption spending. Find out whether credit to the private sector significantly predicts private consumer spending in Nigeria.

# 2. Review of Theoretical Literature

## The Absolute Income Hypothesis:

The basic theory underlying the idea of consumption function has remained largely unchanged since Keynes pioneering analysis of aggregate consumer behaviour. Popularly known as the Absolute Income Hypothesis (AIH), the Keynesian consumption function postulates, among other propositions that "the fundamental psychological law upon which we are entitled to depend with great confidence both a priori from our knowledge of human nature and from detailed facts of experience is that men are disposed, as a rule and on the average, to increase their consumption as their income increases but not as much as the increase in income" (Keynes, 1936). The implications are that current real consumption is a fairly stable function of real current income and that the marginal propensity to consume (MPC) lies between zero and unity. Thus, for Keynes C = f(Yd)

Such that 
$$O < \frac{dc}{dy} < 1$$
 (2.1)

Where: Yd = current disposable income

 $\frac{dc}{dy}$  = Marginal propensity to consume

Unexpectedly, both cross-sectional budget studies and short run time-series studies did square with the facts or were consistent with Keynesian postulations of non-proportional consumption-income relations. But, long run time series data between 1969 and 1929 generated by Simon Kutnets showed a proportional income-consumption linkage which was not consistent with Keynesian belief.

However, several efforts have been made at different times to reconcile the apparent inconsistency between the Keynesian short run-proportional consumption-income

relationships indicated by long run data. Since the 1940s, analytical research into the consumption function has proceeded along two main lines. At one level, there emerge a number of rival hypotheses, which focused attention on different theoretical notions of income as more plausible determinant of aggregate consumption behavior. These hypotheses include the relative income hypothesis (Duesenberry, (1949); and Modiglani, (1949), the life cycle hypothesis (Modigliani & Brumberg, (1954); Hall, (1978); Flavin (1981), and the permanent income hypothesis (Friedman, (1957), Mankiv & Shapiro, (1985). At another level, there are numerous empirical researches that extend the argument of the basic consumption model purportedly to make the theory mirror the data set more closely. Such studies have included additional explanatory variable of consumption behavior such as inflation (Davidson et al, 1978), liquid assets (Zellner et al (1965); Bernanks, (1984), and wealth in general (Deaton, 1972).

### The Relative Income Hypothesis

This formulation is dubbed the "relative income" hypothesis because the relative income distribution of the population plays a critical role in the theory. Deusenberry (1949) began by attempting to explain why the short-run consumption functions shifted upwards overtime. The question he sought to answer was what makes people with a given income increase their consumption spending overtime? His two major assumptions were that utility functions are interdependent, and that consumption relations are irreversible. This involves a skillful combination of two hypotheses about human consumption spending behavior, namely, the relative and past income hypotheses. The relative income hypothesis treats man as social animal. As such, his behavior, including the economic behavior of consumption is assumed to depend heavily on the actions of other members of the society, his peer group, his neighbors, business associates, etc. Duesenberry (1949) applied the past income hypothesis to show that cyclical movements in consumption expenditure depend not only on current income but also on the highest level of income attained in the past. As an illustration, Pondexter (1981) argued that a family with high income, given time for adjustment, will become accustomed to an accordingly elevated standard of living, that, if income moves cyclically, in response to a fall in income, such a family would attempt to maintain its standard of living at the expense of saving. Thus, "past income" is an important determinant of consumption spending as well as current income.

Duesenberry's consumption model has enjoyed prominence in the development of macroeconomic analysis as one of the first to systematically reconcile the observed longrun and short-run income-consumption relations. The theory satisfactorily reconciles the short-run non-proportional income-consumption spending relations with the long-run proportional income-consumption spending relation. The basic point made by Duesenberry is that consumption spending is a function not only of ones income but also of a relative income, that is, of one's percentile position in the income distribution.

### **Permanent Income Theory of Consumption**

The permanent income theory by Friedman (1957) argued that consumption spending is related not only to current income but to longer-term estimates of income. According to

Friedman, permanent income is the value of spendable income that an individual counts on as being available for consumption use, based on expected future income. An income observed at any point in time can be divided into two components namely, the permanent and transitory components.

The idea that consumption spending is geared to long-run, or average permanent income is the steady rate of expenditure a person could maintain for the rest of his or her life, given the present level of wealth and the income earned now and in the future. In its simplest form, the theory argues that consumption spending is proportional to permanent income. Thus:

$$Cp = K(i, w, u). \quad Yp \tag{2.2}$$

Where Cp = permanent consumption

K = marginal propensity to consume out of permanent income

i = rate of interest

W = a proxy variable that measures resources, the relative importance of property and non-property income.

U = a variable to capture the impact on k of such factors as tastes, the size and age of consumer units etc.

To make the hypothesis testable, Friedman assumes that the transitory components of income and consumption are uncorrelated with one another and with the corresponding permanent components. The substantive implication of the formal hypothesis is that a change in observed income would systematically affect consumption spending (if at all) only to the extents that it affects the value of permanent income.

# The Life-Cycle Hypothesis

While the absolute income hypothesis assumes that individual's consumption-spending behavior in a given period is related to his income in that period, the life cycle hypothesis views individuals, instead, as planning their consumption behavior over long periods with the intention of allocating their consumption in the best possible way over their entire life times (Modighani 1954). Instead of relying on a single value for the marginal propensity to consume, life cycle theory implies different marginal propensities to consume out of permanent income, transitory income, and wealth. The key assumption is that people choose stable lifestyles – not in general, saving furiously in one period to have a huge spending spree in the next but, rather, consuming at about the same level in every period. The central theme of this hypothesis is that men are "forward looking" animals. Accordingly, there need not be any close and simple relation between consumption spending in any given short period and income in the same period. The rate of consumption in any given period is a facet of a plan, which extends over the balance of the individual's life, while the income accruing within the same period is but an element, which contributes to the shaping of such a plan. The life cycle hypothesis indicates that an individual's consumption spending in any period depends on the total resources he has to spend over his remaining life.

This is a hypothesis similar in implications to the permanent income hypothesis, that with current income only a relative minor determinant of current consumption spending, an individual spreads his consumption spending in such a pattern that is much smoother than that of his income stream.

There is overwhelming evidence to show that monetary policy exerts significant influence on national output through aggregate demand. It is also well known in literature that the transmission channels of monetary policy are the credit channel, the interest rate channel, the exchange rate channel, and the wealth channel. As observed by Bernanke and Blinder (1992) and Christiano et al (1996), while the first three channels have been extensively examined, what has not received adequate attention is the entire pass-through of monetary policy changes on consumption expenditure through movement in asset prices and household wealth, and that the theoretical roots of this consumption-wealth channel can be traced back to as early as the works of Modigliani (1963) and Ando and Modigliani (1963). The lifecycle theory and permanent income theories have been silent or totally underestimated the impact of monetary policy on consumption through interest rate shocks. Monetary actions, according to Ajavi and Ojo (1981) originated from the monetary sector, while the variables the central Bank of Nigeria (CBN) wants to influence are in the real sector of the economy, and that such variables are fullemployment, output, prices, consumption, investment etc. The way or channel through which the actions of the monetary sector influence the real sector is called the transmission mechanism. In other words, the transmission mechanism is the link between the monetary policy and real sector of the economy.

However, recent work such as Flario (2004) has raised concerns about the strong comovements exhibited by asset prices and consumption. Such correlations have strong bearings on the conduct of monetary policy to the extent that monetary policy shocks impact on asset prices and thereby household wealth. While this sensitivity of consumption to wealth changes does not appear to be consistent with the traditional views on consumption, policy makers have been taking increasing cognizance of the importance of these phenomena. The consumption-wealth channel of monetary policy traces the impact of interest rate changes on aggregate consumption through changes in the market value of assets.

Modigliani (1971) is one of the earliest works to demonstrate that consumer spending plays a critical role in transmitting the effects of monetary policy changes to the real economy through the wealth channel. In reality, the changes in wealth could arise due to changes in the value of either financial assets (investment) or housing. Consequently, consumption may be affected by housing and wealth holding, directly rather than indirectly, say, through pension fund. Interest rate can affect consumption through the wealth channel in three ways; first, lower interest rates would lead to higher house prices which increase the asset wealth of existing house owners. Such house owners can then convert the capital gains from the property into liquid spending power. The enhanced liquidity can then be used for financing consumption of durables and non-durables. Second, lower interest rates leads to rise in the value of housing collateral which implies increase in the household's capacity to borrow and willingness of banks to lend. Third, lower interest rates can also boost the market value of financial assets (shares and bonds).

Thus, higher financial wealth can also reduce the need to save and hence release liquidity for consumption spending.

Stressing the importance of monetary policy, Ajayi and Ojo (1981), stated that there are two main contrasting views about the transmission mechanism of monetary policy, namely, the Keynesian position, which views the mechanism as working through the financial system to the real sector, and the monetarist view, which postulates that changes in the money supply and directly, without working through the financial markets to changes in real magnitudes such as investments, output and consumptions.

The Keynesian transmission mechanism starts from the premise that money and certain marketable fixed income securities (bonds) are close substitutes, and in the wake of discrepancy between desired and actual money balances, individuals try to rid themselves of excess money balances by buying these bonds, and this desire sets in motion the process of adjustment which ultimately stimulates investment, aggregate output, and consumption. A discrepancy between aggregate demand and money supply can be brought about in one or two ways. The Central Bank can resort to the direct minting of more money or use any other instrument of monetary policy. Direct minting of more money has the immediate effect of increasing the money supply, but the use of weapons of control will first have effect on the volume of commercial bank reserve. The change in the volume of bank reserves calls for portfolio adjustment on the part of the banks with regards to their credit creating ability, thereby increasing the volume of money supply. An increase in money supply will in turn produce portfolio and credit effects. The portfolio effects work through the substitution of other financial effects for money. The attempt to buy other financial assets raises their prices and depresses their yields (the rate of interest). The credit effect on the other hand, works through the attempt of commercial banks to readjust their lending policy in the light of changes in reserves. With increased reserves, they tend to create more credit and as additional credit flows into the market, it depresses the rate of interest. The summary is that both the portfolio and credit effects work to decrease the rate of interest.

The decrease in the rate of interest generates three effects, namely, the wealth effect, the cost of capital effect, and the credit-rationing effect. As for the wealth effect, the fall in the rate of interest increases the market value of individual's wealth, stimulates consumption spending and through the multiplier effect, stimulates investment and aggregate output. According to Friedman and Schwartz (1963), the monetarist transmission mechanism is based on the hypothesis that money is not just a close substitute for a small class of financial assets but rather a substitute for a large spectrum of financial and real assets. If money supply increases as a result of, for example, central Bank open operation purchases of government security, sellers will want to rid themselves of the excess money balance, now that desired and actual money balance are no longer equal. If the seller is an individual, he will probably deposit his proceeds in his bank account. This will increase bank reserves and their ability to create credit. If the seller is a commercial bank, its reserve will increase, with it, its loan and credit creating ability. The monetary impulse is, in this way, spread from the financial markets to the markets for goods and services, thereby increasing consumption spending.

The transmission mechanism of monetary policy has always been the focus of theoretical and practical research. The transmission mechanism of monetary policy is a process in which the Central bank, according to Robinson (1997), sets certain goals and uses certain tools to transmit its monetary policy to enterprises and households through financial institutions and markets with the aim of influencing production, investment and consumption. Generally speaking, to a large degree, whether the transmission mechanism of monetary policy is smooth or not determines whether the goals of monetary policy can be achieved and hence it's vital importance for macro financial regulation. In the transmission process of monetary policy, the Central Bank chooses a variable aim such as interest rate, money supply etc, which is called the intermediate target of monetary policy. The transmission mechanism describes the channels through which changes in monetary policy affect the objective target. It describes how private sector agents respond to the policy actions of the monetary authorities. The channels through which monetary policy are transmitted are varied and complex, depending on the financial structure, expectations, openness of the economy, and production functions. In the long-run, the price level is determined solely by the actions of the monetary authorities. This stems from the fact that the central bank alone creates the ultimate means of payment, base money, on which a monetary authority depends. By altering the terms at which this means of payment are provided, the authorities are able to determine the nominal value of transactions in the economy and hence the price level in the long-run.

As noted by Macintosh (1984) and Brown (1985), the schema of the transmission process of monetary policy in an economy begins with the discretionary actions of the monetary authorities and the response of financial aggregates (money and interest rate). The second stage involves the link between changes in the financial variables, aggregate demand (including consumption spending) and prices. According Robinson and Robinson (1997), monetary policy generally operates directly through the monetary base, reserve requirements, discount rate and social deposit. This second stage of the transmission process is classified into two broad channels.

Given the stickiness of prices and nominal wages, higher nominal rates imply in the short-run, higher real rates. Higher real rates in turn reduce the demand for money and credit. This affects aggregate demand, including consumption spending in three ways. First is the widely accepted Keynesian effect on private investment, which was later extended by Economists to household behavior. According to Modigliani (1971), and Patinkin (1985), the change in interest rate alters the inter-temporal consumption pattern of economic agents. A higher real rate induces a switch from a current consumption of both consumer and capital goods towards savings. The reserve occurs in a context of lower real rates. The components of consumer spending (housing), consumer durables and non-durables, and even business fixed and inventory investment) which is affected will depend on the response of the term structure of interest rates. Second, higher real rate will lower assets prices and hence real wealth. Changes in the price of equities and other asset prices affect future income stream and hence overall wealth. Relative price effects therefore, affect both consumer spending and private investment. The magnitude of their impact on aggregate demand, however, depends on the relative strengths of the income and substitution effects.

The credit channel which is an alternative to the monetary channel is important when there are no alternatives for what Robbinson (1997) describes as smoothing desired consumption and investment spending. The effectiveness of the credit channel depends on the inter-temporal elasticity of substitution. Dane and Heldone (1993) showed that the credit channel could increase the potency of monetary policy if bank lending rates move more than one for one with changes in market interest rates. The credit channel amplifies the effect of monetary policy induced changes in lending rates affecting the external finance premium (EFP) which is the difference between the cost of external and internal finance. Bermanke and Gertler (1995) suggest that the complementary movement in lending rates and efp, as against pure interest rate changes, better explains the strength, timing and composition of monetary policy effects. Indirectly, monetary policy affects the net cash flow of firms to the extent that it affects consumer spending throughout the money channel. This mechanism, Bermanke (1995) notes, may explain why the impact on consumer spending may persist even long after a monetary impulse.

Shapiro (1974) outlines other factors, apart from income, which influence consumption spending namely, the rate of interest, price level and price expectations, distribution of income, the value of financial assets already acquired by a family, easy consumer credit terms, and changes in the characteristics of the population. Watchel (1989) stressed wealth as an important factor affecting consumer spending and contends that events and policies that change household wealth will also affect consumption spending. Such episodes, according to him were the accumulation of liquid financial assets, and changes in stock prices since equities are a major part of wealth. Furthermore, Watchel (1989) observed that inflation affects real purchasing power of financial assets which is particularly important with respect to assets whose nominal rates of return do not adjust quickly or at all. As far as changes in inflation rate create enormous changes in the distribution of real wealth, it in turn affects consumption spending.

Sgherri (2000) contends that empirical evidence suggests that interest rate changes affect consumer's spending both directly and indirectly. The direct channel capture the intertemporal substitution effect of a change in interest rates on private consumption, and empirically the real interest rate effect on consumption is likely to be unstable and may even have an indeterminate sign.

A recent stand of the monetary policy literature examines asymmetric effects of policy changes. However, as Flario (2004) points out, most of the work related to asymmetric effects of monetary policy has been empirical in nature and the theoretical underpinning of the phenomenon has been less discussed. Flario conducted a survey of the asymmetric price adjustments and credit market imperfections. The purpose of the survey is to examine the role of consumption wealth channel as a possible factor in explaining asymmetric effects of monetary policy changes, concluding that in liberalized economy with easy access to consumer credit, monetary tightening is expected to have weaker impact on spending than interest rates.

Kaheeman and Tursky (1979) in their influential work on what is to be known as behavioral finance offer the concept of prospect theory. According to this theory, individuals loath losses more than he likes gains. This is manifested in a utility function that is concave in gains but convex in the region of losses. It is reasonable to expect that such preferences would suggest consumption behavior of the Duesenberry type where the consumption function is steeper for increases in wealth but flatter for wealth reductions. This is the well known ratchet effect in consumption. Following from this rationale, it is reasonable to expect that increases in wealth may lead to higher consumption but a fall in wealth may lead to a smaller reduction in consumption.

Consumers may take recourse to past savings or other sources of credit to migrate the adverse impact of wealth reduction on consumption. Thus, this argument introduces the possibility of asymmetry in, the consumption-wealth-channel of monetary transmission. In other words, the pass through is as follows: Lower interest rates lead to higher wealth which can be used by households to finance higher consumption through equity withdrawals, higher mortgages or increased willingness to spend in general. On the other hand, higher interest rates lead to lower wealth which may not proportionately reduce consumption due to the prospect theory and ratchet effects arguments. In sum, interest rate changes inversely affect asset value which may have asymmetric effects on consumption. Two issues are being dealt with, and that is whether consumption-wealth channel explain the asymmetric effects of interest rate changes.

Previous studies such as Apergis and Miller (2004) have explored asymmetries in the response of household consumption to changes in financial and non-financial wealth. Apergis and Miller (2004) argued that positive stock market wealth shocks affect consumption more than negative shocks.

### 2.1 Empirical Literature

Empirical literature review highlights related studies and investigations already done in this subject area. For instance, Hursit et al (2009) examined the determinants of consumption in developing country. The Methodology employed was the bound testing of Peseran et al (2001) which omits the integration order of the series. Bound test is an autoregressive Distributed lag based co-integration procedure which, according to them, seemed to be most appropriate econometric method to observe the structural relationship instead of co-integration, and which facilitates those problems created by unit root tests as inexplicable correlation coefficients due to regression analysis of first differences. The study showed that there was a strong relationship between the current income and consumption; but that when the level of consumption is lagged for longer periods for the approximation of the unanticipated level of permanent income, such a close relationship diminishes. In other words, it was current income rather than permanent income which was more influential on consumption spending. On the other hand, when the short run dynamics of the model was tested, the level of change in the level of interest rates raised consumption spending through the income effect. However, when the long run estimates of the consumption level were tested, the level of real interest rates seemed to be very effective in an adverse direction. The conclusion were that monetary policy generates or induces consumption spending even in a developed economy such as Turkey, and that expectations could not be disregarded as important factors that affect consumption spending in developing countries. But if the level of income was nearer subsistence, neither interest rates nor the level of expectations could have a substantial role in affecting consumption spending.

Kosuke and Gertjan (2002) in a study of the relationship between house prices, consumption spending and monetary policy adopted a financial accelerator approach. This target the interest rate elasticity of private consumption as it varies directly with the level of financial development. The empirical result provided no support for the argument that inflation targeting was unlikely to be successful because the traditional Keynesian interest rate channel was weak or did not operate effectively. Secondly, the results show that the interest rate elasticity of private consumption and private investment vary with the level of development of the domestic financial sector. The result suggests that the financial sector development has a statistically significant negative direct effect on private consumption, and that the interest rate elasticity of private consumption decreases with the level of development of the domestic financial sector.

Jose and Luis (2002) in a study entitled "asset prices and monetary policy, Wealth effects on consumption" tested a model explaining private consumption as a function of income and wealth, with data from European Union (EU) countries. After determining the stationarity properties of the variables, they estimated the model with a common error correction formulation, with the long-run relationship having terms in the equation. The empirical results revealed an implied elasticity of consumption with respect to real equity prices. The weak effect of stock prices on consumer spending was broadly consistent with lifecycle saving in a model wealth effect.

The theory of inter-temporal consumption choice makes sharp predictions about the evolution of the distribution of household consumption, and not just on the conditional mean. Tullio and Luigi (2006) studied the empirical transition matrix of consumption using a panel data from the Bank of Italy survey of Household Income and wealth. They estimated the parameters that minimized the distance between the empirical and the theoretical transition matrix of the consumption distribution. The transition matrix generated by the estimates matched remarkably well with the empirical matrix, both in the aggregate and in samples stratified by education. The estimates strongly rejected the consumption insurance model and suggested that households smooth income shocks to a lesser extent than implied by the permanent income hypothesis.

In another related study, Khan, King and Wolman (2003) did a study to test the controversy that optimal monetary policy maximizes the welfare of a representative agent, given frictions in the economic environment. Constructing a model with two sets of friction-costly price adjustment by imperfectly competitive firms and costly exchange of wealth for goods, the result indicates that optimal monetary policy is governed by two familiar principles. First, that the average level of the nominal interest rate should be sufficiently low, as suggested by Friedman, that there should be deflation on average. Second, as various shocks occur to the real and monetary sector, the price level should be largely stabilized. The estimated parameters provided a quantitative assessment of the importance of the Lucas critique for such regime shifts. The estimates were calculated by

stochastically simulating an estimated multi-country economic model with rational expectations under a fixed exchange rate regime and a flexible exchange rate regime. In both regimes, it was shown that interest rates were primary instrument of monetary policy. Shifts were seen to occur in most of the macroeconomic relationships, especially in the consumption function and the Phillip curve, and these shifts were observed to have simple economic interpretations based on the changes in the variance and the serial correlation of income and prices in the two regimes. However, in most cases, Taylor observed that shifts were not large quantitatively.

# 3. Methodology

# 3.1 Model Specification

Model specification involves the expression of the maintained hypothesis about a relationship into mathematical forms in order to express empirically the phenomenon being studied. Koutsoyiannis (2003) emphasized that the specification of model presupposes the knowledge of economic theory as well as familiarity with the particular phenomenon being studied. Furthermore, that economic theory does not however indicate the precise mathematical form of a relationship. The specification of a model to a large extent is based on economic theory as well as studies already published in the subject area.

In order to analyze the effects of monetary policy variables and proximate factors on consumption spending in Nigeria, it is considered relevant to disaggregate consumption spending into private consumption expenditure (PCE), government consumption expenditure (GCE) and gross or aggregate consumption expenditure (ACE), so as to ascertain the relative impact of each variable on each category of consumption spending. Thus, we have the following models:

$$PCE_{t} = bo + biINTR_{t} + b_{2}M_{2t} + b_{3}BR_{t} + b_{4}EXCHR_{t} + b_{5}INFR_{t} + U_{1t}$$
(3.1)

 $GCE_t = \alpha_o + \alpha_1 INTR_t + \alpha_2 M_{2t} + \alpha_3 BR_t + \alpha_4 EXCHR_t + \alpha_S INFR_t + U_{2t}$ (3.2)

 $ACE_{t} = a_{o} + aiINTR_{t} + a_{2}M_{2t} + b_{3}BR_{t} + a_{4}EXCHR_{t} + a_{5}INFR_{t} + U_{3t}$ (3.3)

Where:

PCE <sub>t</sub>	=	Current level of private consumption spending			
GCE <sub>t</sub>	=	Current level of government consumption spending			
ACE <sub>t</sub>	=	Current level of aggregate consumption spending			
$INTR_t =$	Real in	terest rates			
BR <sub>t</sub>	=	Bank Reserves			
EXCHR <sub>t</sub>	=	Exchange Rate			
INFR <sub>t</sub>	=	Inflation rate			
$M_2$	=	Money supply			
$(b_o, b_1, b_2, b_3)$	$, b_4, b_5,$	$\alpha_o$			
$\left\{\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_o, a_1, \alpha_2\right\}$ = parameters to be estimated and tested, and					
$\alpha_3, \alpha_4, \alpha_5$					
$U_{1t}, U$	$_{2t}$ , and	$U_{3t}$ = stochastic error terms			

The consideration for these equations is predicated also on the belief that any change in monetary policy alters both households' and governments' constraints and expectations and its impact is reflected in aggregate consumption and saving. Changes in monetary policy variables can affect household wealth by changing interest rates and the market value of securities (investment) and other assets. The impact of such asset revaluations is a very important component of the power of monetary policy over aggregate demand.

In view of the value of economic variables, any realistic formulation of economic models should involve some lagged variables among the regressors. As observed by Koutsoyiannis (2003), it has been accepted that lagged values of variables significantly affect their current values or current values of other variables. Inclusion of lagged variables in a regression model is a way of taking into account the length of time in the adjustment process of economic behaviour and perhaps the most efficient way of rendering them dynamic.

In view of the above, the impact of monetary policy variables on consumption spending will also be specified as a distributed lag model whose coefficients will be estimated and tested:

$$\begin{aligned} PCE_{t} &= b_{o} + b_{1}INTR_{t-i} + b_{2}M_{2t-i} + b_{3}BR_{t-i} + b_{4}EXCHR_{t-i} + b_{5}INFR_{t-i} + U_{1t-i} \quad \textbf{(3.4)} \\ GCE_{t} &= \alpha_{o} + \alpha_{1}INTR_{t-i} + b_{2}M_{2t-i} + b_{3}BR_{t-i} + b_{4}EXCHR_{t-i} + b_{5}INFR_{t-i} + U_{2t-i} \quad \textbf{(3.5)} \\ ACE_{t} &= a_{o} + a_{1}INTR_{t-i} + b_{2}M_{2t-i} + b_{3}BR_{t-i} + b_{4}EXCHR_{t-i} + b_{5}INFR_{t-i} + U_{3t} - i \quad \textbf{(3.6)} \end{aligned}$$

The choice of the lag length for the variables will be strictly guided by the R-squared  $(R^2)$  value, the Akaike and Schwarz information criteria.

# 3.2 Estimation Procedure

The investigation into the relationships between consumption spending and monetary policy in Nigeria will begin with the examination of the time series properties of the selected macroeconomic variables. This is because a good number of macroeconomic time series variables are random walk processes. This means that they are non-stationary series in which direct regression of one non-stationary variable on another non-stationary variable may lead to what Yule (1926) and Granger and Newbold (1974) described as nonsense or spurious regression, respectively. Gujarati (2003) and Philips (1986) have shown that regressions between non-stationary series would always yield high significant estimates of the parameters when in fact there is no relationship among the variables. Thus, for economic time series data, unit root tests (that is, tests for stationarity or non-stationarity) must be conducted before any correlative analysis. And subsequent tests such as cointegration tests cannot be conducted until the series are integrated of the same order. Therefore, identifying the time series properties of variables in a model enables a researcher to avoid the problem of spurious estimates. (Harris, 1995; Engle & Granger, 1987).

Using the Dickey-Fuller and Augmented Dickey-Fuller test statistic for establishing the existence or non-existence of unit roots among the variables, the test equation will be of the form:

$$\Delta X_t = \beta_1 + \beta_2 t + \delta X_{t-i} + \alpha i \sum_{i=1}^m \Delta X_{t-i} + \Sigma_t$$
(3.7)

This is on the assumption that the error terms may be correlated. If at a chosen level of significance and degrees of freedom, the computed ADF test statistic is smaller in absolute terms than the critical or theoretical value, we accept the null hypothesis that the series is non-stationary or contains a unit root, and vice versa. This test uses the tau statistic on the coefficient of the lagged  $X_{t-i}$  variable, and the result obtained is compared with the critical ADF values in the tables. It is necessary to note that the acceptance or rejection of the null hypothesis is a function of the sample size and the functional form of the equation. Each of the variables must be tested for unit roots in order to determine their order of integration.

Once the order of integration is established, variables that are integrated of the same order are said to be cointegrated. When two or more variables are cointegrated the implication is that there exists a long-run relationship among the variables, and a long-run regression analysis based on ordinary least squares (OLS) technique can be conducted among the variables without running the risk of spurious estimates. Running OLS regressions among cointegrated variables enables the researcher to draw robust conclusions concerning the estimated parameters.

Also, when variables are found to be cointegrated, the next stage is the error correction representation or error correction modeling (ECM). Error correction model like the speed of Adjustment in distributed lag models tells us how rapidly the endogenous variables moves back to equilibrium after any shock or disturbance.

Based on the cointegration of the same order, causality tests will be conducted before any correlative analysis. Granger causality tests will be used to examine whether a cause and effect relationship exists between the selected variables of monetary policy and consumption spending, thereby establishing which variables is the cause (or effect) of changes in the other variable (Granger, 1981 & 1986).

To ensure that variables are stationary and integrated of the same order, the variables can be differenced if they are not stationary at level forms. The Akaike and/or Schwarz information criteria will be useful in the determination of the number of lags, in which case, the direction of causality, according to Gujarati (2003) may depend critically on the number of lagged terms involved.

### 4. RESULT AND DISCUSSIONS

The empirical results revealed the following:

All the variables were non-stationary at their levels and became stationary after first differencing as shown in table 4.1 below:

Level			First Difference			
Variables	ADF	5%	ADF	5% Critical Value	Order	Remarks
	Statistic	Critical	Statistic			
		Value				
GPCE	-	-3.557759	-	-3.562882	1(1)	Stationary
	2.552396		8.031645			-
GMS	-	-3.557759	-	-3.562882	1(1)	Stationary
	3.321507		6.853109			
GCPI	-	-3.557759	-	-3.562882	1(1)	Stationary

# Table 4.1: Unit Root Test of the Variables

	3.042435		7.883067			
GEXR	-	-3.557759	-	-3.562882	1(1)	Stationary
	3.155135		8.770980			
GCPS	-	-3.557759	-	-3.562882	1(1)	Stationary
	3.436000		7.529826			
<b>a b</b>			<b>.</b> .			

Source: Researcher's compilation from E-view version 9

They were therefore integrated of order one 1(1). The aim of taking the differences is to eliminate the autoregressive components. Since they were not integrated at their levels, there was need for cointegrated test as shown in table 4.2 below:

#### Table 4.4: Unresticted Cointegration Rank (Trace) test

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.588560	76.69917	69.81889	0.0127
At most 1 *	0.529348	49.16836	47.85613	0.0374
At most 2	0.423208	35.80564	29.79707	0.0346
At most 3	0.169599	18.74716	15.49471	0.0389
At most 4	0.091826	2.985902	3.841466	0.0840
Trace test indi * denotes rejec **MacKinnon	cates 4 cointegra ction of the hypo 1-Haug-Michelis	ting eqn(s) at the thesis at the 0.05 (1999) p-values	0.05 level level	Si

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0 500560	27 52082	22 97697	0.0226
None *	0.588500	57.55085	33.8/08/	0.0236
At most 1 *	0.529348	33.36271	27.58434	0.0158
At most 2	0.423208	27.05848	21.13162	0.0169
At most 3	0.169599	15.76125	14.26460	0.0344
At most 4	0.091820	2.985902	3.841466	0.0.0840

Max-eigenvalue test indicates 4 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

Source: Researcher's compilation from E-view version 9

Series: GPCE, GM2, GCPI, GEXR, GCPS

Lag: No lags

The cointegration trace test indicated the existence of 4 cointegrating equations at 5% levels of significance. The co-integration Maximum-Eigen value test also indicated the existence of 4 co-integrating equations at 5% levels of significance. The normalized co-integration equation and the vector error correction showed that all the variables appeared with the correct a priori signs. While M2, CPS, and CPI were positively related to PCE, the result showed an inverse relationship between EXR and PCE, both in the short-run and in the long-run. Apart from EXR, all the other variables appeared to exert significant influence on PCE, both in the short and long-runs as shown in table 4.3 below:

# Table 4.6: Test of Hypotheses Using VECM Result

Vector Error Correction Estimates Date: 01/16/16 Time: 03:27 Sample (adjusted): 1983 2018 Included observations: 43 after adjustments Standard errors in ( ) & t-statistics in [ ]



### SOURCE: Author's computation using E-views version 9.0 computer software

The joint influence of the monetary policy variables as indicated by the F-statistic was highly significant. The explanatory power of the model as measured by the adjusted R-squared was considerably high both in the short-run and in the long-run. The Granger causality test revealed that causality runs significantly from consumer price index (CPI) to private consumer spending and not the other way round.

## **CONCLUSION:**

The results and findings from this work have gone a long way in quantitatively lending support to previous works on monetary transmission mechanism that the effect of all monetary policies are ultimately transmitted through interest rates, investment, the price level to consumption spending and economic growth. Apart from exchange rate, all other monetary policy variables employed in this study were revealed to be significant in the determination of consumption spending in Nigeria. The insignificance of exchange rate may have resulted from the fall in the demand for domestically produced goods and services in spite of the increased campaign by several government agencies to change peoples' preferences in favor of domestically produces goods and services. The Granger causality test which revealed a unidirectional causality running from CPI to PCE is a pointer to the fact that government policies towards moderating the price level such as inflation targeting will positively impact on consumer spending, and through the multiplier effect increase economic growth and the general standard of living.

### RECOMMENDATIONS

The study recommends that the monetary authority should formulate and implement monetary policies that would ensure optimal money stock which will in turn reduce interest rates without creating excess liquidity. The effort of CBN towards inflation targeting is a step in the right direction and should be pursued more vigorously. This will reduce inflation in the price level whereby consumption spending will rise, and through the multiplier effects, economic activities, individual and national income will rise. The government should continue to provide funds and ensure that such funds are easily accessible to the private sector. Funds to small and medium scale enterprises, etc, are steps in the right direction.

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