







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 Modigliani, (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). Some of these other hypotheses are hereby reviewed:

### **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. Duesenberry (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 long-run 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:

$$C_p = K(i, w, u) \cdot Y_p \quad (2.2)$$

Where  $C_p$  = 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 extent 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 Ajayi 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 full-employment, 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 co-movements 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 Robinson (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 inter-temporal 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:

$$PCE_t = b_0 + b_1 INTR_t + b_2 M_{2t} + b_3 BR_t + b_4 EXCHR_t + b_5 INFR_t + U_{1t} \quad (3.1)$$

$$GCE_t = \alpha_0 + \alpha_1 INTR_t + \alpha_2 M_{2t} + \alpha_3 BR_t + \alpha_4 EXCHR_t + \alpha_5 INFR_t + U_{2t} \quad (3.2)$$

$$ACE_t = a_0 + a_1 INTR_t + a_2 M_{2t} + a_3 BR_t + a_4 EXCHR_t + a_5 INFR_t + U_{3t} \quad (3.3)$$

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<sub>t</sub> = Real interest rates
- BR<sub>t</sub> = Bank Reserves
- EXCHR<sub>t</sub> = Exchange Rate
- INFR<sub>t</sub> = Inflation rate
- M<sub>2</sub> = Money supply

$$\left\{ \begin{matrix} b_0, b_1, b_2, b_3, b_4, b_5, \alpha_0 \\ \alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_0, a_1, a_2 \\ \alpha_3, \alpha_4, \alpha_5 \end{matrix} \right\} = \text{parameters to be estimated and tested, and}$$

$$U_{1t}, U_{2t}, \text{ and } U_{3t} = \text{stochastic error terms}$$

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:

$$PCE_t = b_o + b_1 INTR_{t-i} + b_2 M_{2t-i} + b_3 BR_{t-i} + b_4 EXCHR_{t-i} + b_5 INFR_{t-i} + U_{1t-i} \quad (3.4)$$

$$GCE_t = \alpha_o + \alpha_1 INTR_{t-i} + b_2 M_{2t-i} + b_3 BR_{t-i} + b_4 EXCHR_{t-i} + b_5 INFR_{t-i} + U_{2t-i} \quad (3.5)$$

$$ACE_t = a_o + a_1 INTR_{t-i} + b_2 M_{2t-i} + b_3 BR_{t-i} + b_4 EXCHR_{t-i} + b_5 INFR_{t-i} + U_{3t-i} \quad (3.6)$$

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:

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

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:

**Table 4.1: Unit Root Test of the Variables**

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

	3.042435		7.883067			
GEXR	- 3.155135	-3.557759	- 8.770980	-3.562882	1(1)	Stationary
GCPS	- 3.436000	-3.557759	- 7.529826	-3.562882	1(1)	Stationary

**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: Unrestricted 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 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

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.588560	37.53083	33.87687	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	0.0840

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 [ ]

Cointegrating Eq:	CointEq1
GPCE(-1)	1.000000
GM2(-1)	-1.162709 (0.28696) [4.05180]
GCPI(-1)	1.689905 (0.43165) [ 3.91499]
GEXR(-1)	-0.119275 (0.07648) [-1.55956]
GCPS(-1)	0.203932 (0.02933) [6.95372]
C	-62.45188
CoinEq 1 =	-0.867750 (0.09937) [-8.17279]
	$R^2 = 0.659936$ F-stat = 12.08210

**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.

## References

Agu Chukwuma (2007). What does the Central Bank of Nigeria target? An analysis of monetary policy reaction functions in Nigeria. *A Draft Final Report Presented at the Biannual Research Consortium, Arusha, Tanzania.*

Ajayi, S.I. & Ojo, O.O. (1981) *Money and banking: Analysis and Policy in the Nigerian context.* London. George Allen and Urwin Ltd.

Ando, A & Modigliani F. (1963) The life cycle hypothesis of saving: Aggregate implications and tests: *American Economic Review* 53:55-84.

Apergis, N & Miller, S.M. (2004). Consumption asymmetry and stock market: Empirical evidence. *Working Papers, Department of Economics: University of Connecticut.* No.43

Bernanke, B & Blinder, A (1992). The federal funds rate and channels of monetary transmission... *American Economic Review: Vol. 82*

Bernanke, B.S & Gertler, M.(1995). Inside the black box: The credit channel of monetary policy transmission. *Journal of Economic Perspectives: Vol. 9, No. 4.*

Bernanke, B.S (1984). Permanent income, liquidity and expenditure on automobiles: Evidence from panel data: *Quarterly Journal of Economics* No. 99.

Bernanke, B.S & M. Gertler (1995). Inside the black box: The credit channel of monetary policy transmission: *Journal of Economic Perspectives*. Vol. 9, No. 4.

Brown G.A. (1985). The transition from direct to indirect instruments of monetary policy: *Mimeograph. Bank of Jamaica*

Chrisshano, L.J; Eichenbaum, M; & Evans, C (1996). The effects of monetary policy shocks: Evidence from the flow of funds: *Review of Economics and Statistics*, Vol. 78, No. 1

Dane S, & A.G Haldane (1993b). Interest rate control in a model of monetary policy: *Bank of England Discussion Paper* No. 17

Dale, S.& A.G Haldane (1993a). A simple model of money, credit and aggregate demand: *Bank of England Discussion Papers*: No. 7

Davidson J.E.H, D.F Hendry, F.Srba & S. Yeo (1978). Econometric modeling of aggregate time-series relationship between consumer's expenditure and income in the United Kingdom: *Economic Journal* No. 88:661-692

Deaton A.S (1972). Wealth effects on consumption in a modified life cycle model: *The Review of Economic Studies* Vol. 44-54

Duesenberry, J.S (1949). *Income, savings and theory of consumer behavior*

Flavin, M (1981). The adjustment of consumption to the changing expectation about future income: *Journal of Political Economy* 89 (5)

Flario, A (2004). Asymmetric monetary policy: Empirical evidence for Italy, in Friedman, M (1957). *A Theory of consumption function*: Princeton University Press.

Friedman, M (1957). *A theory of consumption function*: Princeton University Press.

Friedman, M & Schwartz, A.J (1963). Money and business cycles: *Review of Economics and Statistics*, Vol. 45, No. 1

Hall, R.E (1978). Stochastic implications of the life cycle-permanent income hypotheses: Theory and evidence: *Journal of monetary Economics* No. 16.

Jhingan, M.L (2005). *Macroeconomic theory*: 11<sup>th</sup> ed. Delhi, Vrinda Publications Ltd.

Kahneman, D & Tversky, A (1979). *Prospect theory*: An analysis of decision under

risk: *Econometrica*. Vol. 47, No. 2

Kynes, J.M (1936). *General Theory of Employment, Interest and Money*: Macmillan, London

Macintosh, H. (1984). Experiences in the use of instruments of monetary policy: (Mimeo). *Federal Reserve Bank of Jamaica*:

Modigliani .F. (1963). The monetary mechanism and its interaction with real phenomena: *Review of Economics and Statistics*. No. 45:79-107

Modigliani F. (1971). Monetary policy and consumption, in consumer spending and monetary policy: *The Linkages. Federal Reserve Bank of Boston Conference Series* No. 5

Modigliani F.& R. Brumberg (1954). Utility analysis and the consumption function: An interpretation of cross-sectional data. In post Keynesian Economics: *Kurihara ed. Rutgers University Press*

Modigliani, F. (1949). Fluctuation in the savings-income ratio: A Problem in economic forecasting. Students in income and wealth: *National Bureau of Economic Research, New York*. No. 11

Patinkin, D (1989). *Money, interest rates and price*: MIT Press. Cambridge.

Philips P.C.B.& Perron, P. (1986). Testing for unit Root in Time series Regression: *Biometrical*, Vol. 75

Pondexter, J.C. (1981). *Macroeconomics*: Japan, Holt Saunders Publishers Ltd Publishing Company

Robinson W & J. Robinson (1997). The transmission mechanism of monetary policy in Jamaican economy: *Bank of Jamaica Research Services Department*. Annual Conference of the Caribbean Centre for Monetary Studies

Robinson, J. (1996). *The foreign exchanges*: in Robinson J ed. Essays in the *Theory of Employment*. London: Macmillan Press Ltd.

Sgherri S. (2000). Monetary policy transmission channels, monetary regimes and consumption behaviour: *De Nederlandsche Bank Staff Reports* No. 53

Tulio B.& Y. Luigi (2006). Habit formation consumption and its implications for monetary policy models: *American Economic Review*: Vol. 90, No. 3

Watchel B. (1989). Theory of monetary policy: Some recent discussions: *Quarterly Journal of Economics*: Vol. 39, No. 2, MIT Press

Zellner, A, Huang D.S, & L.C Chau (1985). Further analysis of the short-run consumption function with emphasis on the role of liquid assets: *Econometrica* 33:571-581