

# **Empirical Analysis of Change in Income on Private Consumption Expenditure in Nigeria from 1981 to 2010**

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## **Abstract**

This study investigates the impact of change in gross domestic product (income) on private consumption expenditure in Nigeria, from 1981 to 2010. Using the classical (OLS) simple regression analysis, researchers' objectives were; to examine the impact of gross domestic product on consumption expenditure and to determine the order of integration of consumption expenditure and gross domestic product, results agree with researchers' theoretical expectation of the existence of a positive significant impact of Gross Domestic Product (income) on Private Consumption Expenditure with a slope of 0.6708253. The unit root test (order of stationary) also shows a non existence of unit root at their level. The p-value and the coefficient of determination ( $R^2 = .9838$ ), implies that gross domestic product explains 98.4% of private consumption expenditure. Hence, there is a significant relationship between gross domestic product and private consumption expenditure. Researchers' therefore recommended a policy in concluding remarks.

**Keywords:** Income, Private Consumption Expenditure, Gross Domestic Product, Disposable Income

## **Introduction**

Over the years economists are varied in their opinions on the variability of income and consumption relationship. For instance scholars like Alfred Marshall on income elasticity of demand, Ernest Engel on Engel curve, J.M. Keynes on Absolute Income Hypothesis, Duesenberry J.S. on Relative Income Hypothesis, Modigliani F. on Life Cycle Income Hypothesis, Milton Friedman on Permanent Income Hypothesis, etc. According to Alan and Angus (2012) the relationship between consumer spendings and income is one of the oldest statistical analysis of macroeconomics and one of the sturdiest. Like the aging movie star, it needs a little touching now and again, but always seems to be bouncing back. Within all the countries of the world, there are significant numbers of socio-economic and demographic influences which affect the consumer's income and expenditure patterns. Among these factors includes

population, number of households and associated data, Gross Domestic Product, annual inflation, and employment indicators (World Consumer Income and Expenditure Pattern, 2012).

The decisions and actions of the respective economic units in an economy determine the level of expenditure, income, production and distribution of goods and services in that economy. According to Ohale and Onyema (2002) every component of the economy performs one function or the other, to sustain the economy. Due to the complex state of the real world economy, economists found it convenient to create a simplified model of the economy in an attempt to capture various interactions among the various components of the economy. The simplified model used by economist in showing this interaction is the circular flow of income and expenditure. Okowa (1999) defined circular flow of income and expenditure as the interactive flow of income and expenditure in a reverse direction among the system in an essentially circular manner. That, every income, defines a corresponding and equal expenditure. In essence, the goods and services that have been sold in the product market must have been produced, so that income equals expenditure. Since all income at household disposal can either be spent or saved, all household expenditure based on what they have as disposable income.

Disposable income is personal income minus personal income taxes (Colander, 2004). To Ande (2005) it is the income left to an individual or household for either spending or savings after the deduction of personal income tax. Hence income (national or disposable) can either be spent as consumption expenditure or saved. For the purpose of this study, Researchers focus explicitly on income-consumption expenditure relationship. Consumption expenditure is expenses incurred for sustenance and protection as opposed to providing for future production. Consumption expenditure is made up of private and government consumption expenditures. Researchers delimit their study to private consumption expenditure, which implies expenditure made in the consumption of durable and non durable goods, maintenance and protection, payment of factor services, and goods and services (John, 2003). The consumption pattern of a household is the combination of qualities, quantities, acts and tendencies characterizing a community or a human group's use of resources for survival, comfort and enjoyment. Of course the type of food and non-food items consumed, vary from region to region. Consumption patterns normally contribute greatly to the social and economic policy of the country. In a developing economy like Nigeria, the consumption pattern is skewed towards food i.e. food accounts for a higher proportion of the total expenditure, while in developed economies the opposite is the case. The more developed a society becomes, the less it spends on food and the more it spends on non-food items (National Bureau of Statistics, 2010). The National Bureau of Statistics (NBS) Consumption pattern of 2009/2010 report reveals that Nigerian consumption expenditure is 24,253,670,127,758.90 annually, which consist of food and non food consumption expenditure.

The functional relationship between income and consumption expenditure predates Keynes General Theory of Income, Output, Interest rate and Employment of 1936. The argument of the psychological law of consumption that "the fundamental psychological law upon which we are entitled to, depends to a great extent on the knowledge of human nature and from the detailed

facts of experience that man is disposed to as a rule and on the average to increase their consumption as their income increases, but not at the same rate with the increase in their income"; hence the variability of marginal propensity to consume varies at income variability. The consumption patterns have been found to change across the income spectrum. It was reported that poor people in Africa and Asia tend to spend a large share of their income and increments to incomes on starchy staples, while higher income rural households spend a greater portion of their income on manufactured goods and preferred foods such as dairy products, meat and fruits (Delgado et al., 1998). This agrees with Engels law which state that consumer increases his/her expenditure in line with it income but the proportion spent on goods falls as income increases. Generally, the income consumption relationship is the consumption function implication; it is the functional relationship between the aggregate consumption and income.

With regards to spatial distribution, the Southern (geopolitical) zones of Nigeria experienced improvements in low income incidence in the 1990s while the Northern zones experienced deterioration, particularly in the rural areas, suggesting that one parameter along which income inequality is rising in the South-North longitudinal axis and that poverty intervention should vary accordingly (Benjamin & Joseph, 2011). In another study Erubami and Young (2003) reported that the poorest 40% of Nigerians devour one hundred percent of their income on home consumption: real subsistence suggesting that they had little or no surplus for says as a source of extra income. They also discovered that between the fifth and seventh income deciles, income from agricultural output rose to 50%, while the wealthiest 30% and middle class wage income earners constituted six to eight percent of sum total.

At this juncture researchers ought to ask; giving the variability of household consumption expenditure across the federation over the years, what then is the level of dependency of aggregated private/household consumption on national income in Nigeria? In other words what happens to private consumption at the variability of income; is consumption a function of national income in the Nigerian context? The answers to these necessitated the study.

### **Objectives Of The Study**

The broad objective of this study is to investigate the income consumption relationship in Nigeria. The specific objectives are;

- To examine the impact, of gross domestic product (income) variability on private consumption expenditure in Nigeria
- To determine the order of integration of private consumption expenditure and gross domestic product (income) in Nigeria

The following hypothesis was stated and tested:

Gross domestic product (income) has no significant impact on private (household) consumption expenditure in Nigeria.

## Theoretical and Empirical Literature

### Theoretical Literature

Theoretically, we have four widely accepted theories of consumption, which include; Absolute Income Hypothesis (AIH) by J.M. Keynes (1936), Relative Income Hypothesis (RIH) by J.S. Duesenberry (1949), Permanent Income Hypothesis (PIH) by Milton Friedman (1957) and Life Cycle Hypothesis (LCH) by F. Modigliani (1963). All these theories seek to explain the nature of income consumption relationship both in the short and long run, particularly with the variability nature of the MPC and APC (Onyema and Ohale, 2002).

Keynes in his theory argued that consumption is a function of absolute income. Which states that increases in income leads to a non proportional increase in consumption expenditure: Hence income-consumption relationship is not proportional. Keynes (1936) defined it consumption function as

$$C = \alpha + \beta Y \quad 0 < \beta < 1$$

Where C is consumption

$\alpha$  is autonomous consumption

$\beta$  is induced consumption or marginal propensity to consume and

Y is national income

Thus consumption function is the locus of mean point in the consumption income space for which consumption equals autonomous consumption ( $\alpha$ ) plus marginal propensity to consume ( $\beta$ ) multiplied by national income (Y).

The key properties of his hypothesis as stated by Okowa (1999) include: consumption is a fairly stable function of income, that the marginal propensity to consume is less than one, average propensity to consume decreases as income increases and average propensity to consume is greater than marginal propensity to consume. Hereto, consumption expenditure is a stable function of real income/disposable income.

According to Okowa (1999), Duesenberry (1949) attempted to reformulate the consumption function. The issue was not the dependence of consumption on income but the exact mathematical form of the dependency. To Duesenberry (1949), household consumption is a function of the relative income position of the household, not on absolute income but on household income in relation to other household income. Friedman (1957) in his hypothesis, divide income and consumption into permanent and transitory such that;

$$Y = Y_p + Y_t \text{ and } C = C_p + C_t$$

Where, p and t are permanent and transitory incomes respectively and c is consumption. He argued that consumption will be determined by the size of the household's permanent income rather than transitory income. That a change in observed income would systematically affect

consumption to the extent that it affects the value of permanent income. And finally, Modigliani (1963) explains that consumption behavior of households depends on the future income, wealth, and in addition to its current level of income. Hence argued that consumption will maintain a steady relationship with life earning of the household (Onyema and Ohale, 2002). Hitherto, Modigliani (1963) built its hypothesis on the assumption that people form their best guess about the income they will earn over their life time and form a life consumption plan which can just be financed out of life time income.

### **Empirical Literature**

A number of empirical studies have been carried out on the relationship between consumption and income, some of these literatures include; Benjamin and Joseph (2011) examine the Nigerian small scale farmers using the disaggregated Engel function analysis. The result showed that increase in total income would lead to a corresponding increase in each of the disaggregated expenditure groups. Household had high marginal propensity to consume more food for every naira increase in household income. That as household income rises, spending on necessities rises, but the proportion of income spent on them falls. Nwabueze (2009) investigate the causal relationship between gross domestic product and personal consumption expenditure in Nigeria, using data from 1994 to 2007. The result shows a non insignificant value of 0.0514 as the slope coefficient, indicating that an increase in GDP has no significant effect on personal consumption expenditure in Nigeria. In another study by Kweka and Morrissey (1998) who worked on the impact of economic growth on consumption expenditure using Granger causality test with time series data in Tanzania, the study reported no evidence or impact of GDP on consumption expenditure in Tanzania. Folster and Henrekson (1999) argued that there is no correlation regarding the direction of causality between economic growth and consumption expenditure.

Macroeconomic volatility as measured by inflation, exchange rate, debt service ratio and unemployment may affect level of welfare. For example, it is well known that the level of unemployment impacts the rate of welfare. An increase in unemployment will first impact those marginal low skilled, low wage earners that are the prime candidates to fall into poverty (Deutsch and Silber, 2005). Fabiosa and Jensen (2002) explained that macroeconomic shock will have impact on the level of household welfare via low private consumption expenditure and Inflation may also affect measure of welfare if the income of low income families responds slowly to increases in the price level.

Households respond to these shocks in various ways such as; Consumption patterns, production levels change across sectors. Employment pattern change: children are pulled out of school and sent to work as child labour; people turn to informal sector jobs. In some cases, poor women increase their labour force participation in response to decline in the income of the main household earner. Individuals and families divert savings and other assets, and so are forms of assistance available through family, kin and communities. Some of these responses have only shortened welfare effects, but some have more long-term and irreversible impacts. For example, both price effects and the reduction in access to public health and education may

severely limit the ability of the poor to accumulate human effects on long-term productivity. Reducing the nutritional intake of babies or pulling children out of school can have permanent effects on their future learning and income earning abilities; malnourished matters are more likely to give birth to low-birth-weight children, who in turn are more likely to suffer from poor health (Ferreira et al., 1999).

### **Methodology**

This study used secondary data sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin and the National Bureau of Statistics (NBS). The time series data covered a period of thirty years, from 1981 to 2010:

### **Private Consumption Expenditure And Gross Domestic Product (Income) At Current Purchasing Prices From 1981 To 2010**

YEAR	CONSUMPTION	GDP (INCOME)
1981	28574.86	51731.79
1982	30411.38	53658.95
1983	35215.14	57963.31
1984	42858.69	64326.34
1985	49302.92	73542.02
1986	51537.47	74908.22
1987	75981.13	111912.9
1988	106678.6	147941.1
1989	126186.2	228451.5
1990	177234.6	281550.3
1991	206813.5	329070.8
1992	373526.7	555445.5
1993	502775.2	715241.9
1994	610340.2	945557
1995	1387446	2008564
1996	2124271	2799036
1997	2091069	2906625
1998	2371328	2816406
1999	2454795	3312241
2000	2478777	4717332
2001	3687656	4909526
2002	5540186	7128203
2003	7044545	8742647
2004	8637732	11673602
2005	11075059	14735324
2006	11834578	18709786
2007	15682906	20940911

2008	15756158	24665244
2009	18859553	25225140
2010	17539050	29498163

[Source: Central Bank of Nigeria (CBN) Statistical Bulletin Vol. 20 December 2010 and The National Bureau of Statistics (NBS) 2010].

Here private consumption expenditure is the dependent variable while gross domestic product is the independent variable.

Researchers adopted the simple linear regression analysis to examine the impact of Gross Domestic Product (income) on private consumption expenditure; the purpose of the regression analysis is to reveal the relationship existing between the response (dependent) variable and the predictor (independent) variable. Researchers tested for order of stationary or better still unit root test (using the Augmented Dickey-Fuller (ADF) statistics), to see if the collected data are stationary or not by avoiding a spurious regression.

**Model Specification**

Based on the Keynes (1936) consumption function, we then specify the model as follow;

$$C = f(Y) \dots\dots\dots 1$$

Where

- C is consumption expenditure,
- Y is income and
- f is the functional relationship between the two variables.

Transforming eqn. (1) into an econometric equation result to eqn. (2)

$$C_t = \alpha + \beta Y_t + \varepsilon \quad (0 < \beta < 1) \dots\dots\dots 2$$

Where

- $C_t$  is private consumption expenditure at time t,
- Y is gross domestic product (income) at time t,
- $\alpha$  is autonomous consumption or the true intercept of the regression,
- $\beta$  is the slope (marginal propensity to consume) of the regression and
- $\varepsilon$  is the error term which is independently and identically distributed (i.i.d), which address other factors that may likely affect consumption expenditure other than income.

Researchers use STATA 10.0 and Eview 3.0 in analyzing data. And the apriori expectation is  $0 < \beta < 1$

### Empirical Result

The parametric estimate of private consumption expenditure and gross domestic product (income);

$$R^2 = .983, F\text{-ratio} (1, 28) = 1698.70$$

CONSUMPTION (Y)	COEFFICIENTS	STANDARD ERROR	T-STATISTICS	P-VALUES
Constant	151493	175089.1	.87	0.394
Income (X)	.6708283	.0162762	41.22	0.000

Software: STATA 10.0

The unit root test result of private consumption expenditure and gross domestic product (income) at their level; is as follows

VARIABLE	ADF-STATS	5% critical vale	INTERCEPT	TREND	LAG	REMARK
Consumption	3.069421	-2.9705	Yes	No	1	Stationary
Income	3.796682	-2.9705	Yes	no	1	Stationary

Software: Eview 3.0

### Discussion of Findings

The regression coefficient shows that gross domestic product (income) induce private consumption positively by 67.1% in Nigeria as income increases. This also agree with the coefficient of determination ( $R^2 = .9838$ ) that gross domestic product explain 98.4% of private consumption expenditure variability in the economy over the period of study.

Testing the stated hypothesis, using the probability value and t statistics calculated of the regression coefficient (0.000) and (41.22), on the decision that if the p-value is less than 0.05 then is significant. From the calculated value, Researchers conclude that gross domestic product (income) has a significant effect on consumption expenditure. Researchers therefore reject the null hypothesis which states that income has no significant impact on private consumption expenditure and accept the alternative hypothesis with the conclusion that gross domestic has a significant impact on private consumption expenditure in Nigeria at 5% level of significance. The F-ratio (1698.7) also reveals that the estimated regression line has a good fit, hence is a non-zero type.

In line with the second objective, Researchers carry out the unit root test. The result shows that consumption and income are both stationary at their ordinary level, as shown above. In other words they are both integrated at order zero  $I^0$ , since the ADF (argument dickey fuller) statistics is greater than the critical values calculate at 5%. Therefore, estimated result is not spurious as postulated by Yule; variables are integrated at the same order.



## **Conclusion**

The results of the study reveal that gross domestic product (income) has a significant effect on private consumption expenditure in Nigeria. The policy recommendation of this study is that government should induce private expenditure toward human capital development which will enhance macroeconomic stability. The consumption income causal relation seems to be almost proportional over the period under investigation with respect to the coefficient of determination, government needs to increase savings and investment inventories, diversify the economy to improve the service sector. Measures should also be taken to address high rate of the marginal propensity to import of goods by the household sector. Researchers believe that if savings increase, the economic status will improve, therefore Nigerian needs to adjust their expenditure on imported goods and invest domestically, if there must be a change in any unit, the starting point is proper and co-ordinate strategies in policy implementation.

## **Acknowledgement**

Researchers acknowledge the President of the Federal Republic of Nigeria Dr. Good luck Jonathan and his Special Adviser on Research and Strategy Bar. Oronto Douglas, for their unalloyed support in this Educational pursuit. Researchers also acknowledge the Departments of Economics of the University of Port Harcourt, Niger Delta University and University of Nigeria Nsukka for creating the enabling environment for the research. Researchers finally wholeheartedly appreciate the support and encouragements of their immediate family members, Dr. Edoumiekumo Samuel, Dr. Ajie H.A Prof. G.S. Angaye Dr. Michael Baghebo and other colleagues in the department of the prestigious Niger Delta University, in Bayelsa State of Nigeria.

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World Consumer Income and Expenditure Pattern. (2012). 12<sup>th</sup> edition Euromonitor International Ltd. 60-61 Britton Street, EC1M 5UX [www.euromonitor.com](http://www.euromonitor.com)