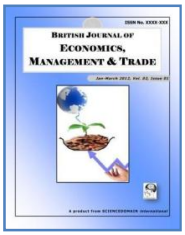

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The Effect of Financial Wealth on Private Consumption: Evidence from Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

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ABSTRACT

The study investigated the effect of financial wealth on private consumption in Nigeria using Modigliani-Brumberg's [1] life cycle hypothesis and permanent income hypothesis of Freidman [2] as theoretical basis for the empirics. The data were collected from Central Bank of Nigeria (CBN) statistical bulletin [3]. To analyze the effect of financial wealth proxied by average real market capitalization on real per capita private consumption spending, the study employed the Ordinary least square (OLS) technique as well as an error correction model in a multivariate framework. The empirical findings suggest that both disposable income and financial wealth have positive effect on private consumption in Nigeria. While both effects (disposable income and financial wealth) are positive on private consumption, the effect of financial wealth is infinitesimal relative to that of disposable income corroborating the findings of Ozer and Tang [4] for Turkey. The result further shows a long run relationship between private consumption and financial wealth in Nigeria.

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1. INTRODUCTION

Recent developments in international stock markets with particular reference to Nigeria as well as large declines in house prices all over the world have brought wealth effects on consumption expenditures of private households back on the agenda. And many researchers have been exploring this study area in recent times.

According to [5], "Consumption is an important component of aggregate demand, because of its influence on economic growth and its impact on business cycles. Therefore the study of private consumption decisions is relevant". However, understanding consumption behavior is important to make policy inferences not only on aggregate demand, in which private consumption has the largest share, but also on macroeconomic stability (e.g. output and employment levels, inflation).

The Permanent Income Theory by [2] and the Life-Cycle Hypothesis propounded by [1], states that household wealth is a key element for determining private consumption. According to these models, private consumption is a function of human wealth, measured as the current value of expected lifetime income, and of financial wealth, corresponding to the stock of assets held by households and the corresponding income. Consumers therefore tend to smooth consumption by taking expected income into account; they borrow while they are young, save throughout their working life and consume accumulated savings during retirement. Any unanticipated rise in (both human and financial) wealth is distributed over the remaining lifetime, raising not only current consumption but also future consumption, the aim being to maintain a relatively stable pattern over time [6].

Meanwhile, several authors have tried to bring to limelight the effect of wealth on consumption by developing some empirical models which are based on the permanent income theory and the life-cycle hypothesis. These empirical models were developed with a view to quantify the relationship between aggregate consumption, income and wealth. However the results of these empirical tests are mixed. Some works in this area deserve to be mentioned, among them are, [7-16,5,6,17,18]. Most of the literature on this subject area shows evidence of a significant effect of wealth on private consumption; however, there is some disparity in the findings, not only as regards the magnitude of the marginal propensity to consume out of the various wealth components, but also as regards values estimated for the same country in different studies. Other works that looked at the disaggregated wealth, disagreed on which of the various wealth component impact significantly on consumption.

Moreover, an understanding of how changes in household wealth influence the behavior of private consumption is of immense important in interpreting the changes that the Nigerian economy has under gone in recent past and in forecasting the future. This study however is aimed at estimating the wealth effect on private consumption in Nigeria for the period of 1981-2011.

There is virtually no literature relating to wealth effects on consumption in the Nigerian economy. This could be largely attributed to the fact that data on household wealth have only become available recently as well as the level of development in Nigerian stock market. The remaining of this work is organized as follows: Section 2 reviews some related literature on the wealth effect on private consumption and the various financial and housing wealth transmission mechanisms to household consumption. Section 3 introduces the model used in the analysis. Section 4 discusses the empirical results obtained in the estimation of the model formulated. Section 5 summarizes the main findings and then conclusions.

2. REVIEW OF RELATED LITERATURE

Ricardo [18] stated that the transmission mechanism by which wealth influences economic activity is categorized under four specific channels. (i) The wealth effect on consumption, in which household consumption is determined by income and asset wealth, namely, real estate and stock ownership. (ii) The wealth effect on investment, which increases asset prices, reduces the cost of capital and, therefore, increases demand for investment. (iii) The credit channel, which increasing the value of collateral and, therefore, affecting the balance sheets of

households and firms and reducing the problem of adverse selection and the risk associated to investment. (iv) The confidence effect on both present and future household consumption expenditures. Meanwhile the focus of this paper is on the wealth effect on consumption. The positive impact on consumption due to the increase in housing wealth is called housing wealth effect, whereas the effect that is due to the increase in financial wealth is called financial wealth effect.

Modigliani [1] made the first attempt in developing an empirical model aimed at quantifying the effect of changes in wealth on private consumption. This is what is known today in Economic theory as Life-cycle hypothesis. Borrowing a live from this, [6] in his work developed the Permanent income theory with a view to empirically quantify the effect of different wealth component on private consumption. Other literatures have also presented empirical evidence on the effect of wealth on consumption. Some looked at the effect of aggregated wealth on private consumption, while others examined the effect disaggregated wealth on household consumption. It is important to note here that despite the number of works on this subject area, there have not been conclusive agreements in the empirical result arise from these findings.

For example, [19] used a panel data on 14 developed countries for the 1975-1999 periods and a series of panel data on the United States for the 1982-1999 periods. They concluded that there was a stronger impact on consumption from the housing market for both the United States and the panel of other developed countries than from the stock market. [15] also concluded that increases in housing wealth have a stronger impact on consumption than rises in financial wealth. [20] used microeconomic data for the United Kingdom and found that house prices had an important effect on consumption. In turn, [7] studied the impact of stock and house prices on consumption based on data from 16 OECD countries. One of the main conclusions was that the long-term impact of stock market wealth on private consumption was approximately twice as much as the impact of changes in housing wealth. These results are far from homogeneous and general conclusions drawn from them have been contested in recent studies. For example, according to [21-23] there is a correlation between private consumption and the housing market because they both react to common factors, which are not usually considered in this type of analysis. Some studies conclude that the different findings obtained in estimating the marginal propensity to consume out of wealth relate to specific features of any given country, namely the nature of the financial system. These studies consider two types of economies: Bank-based and market-based. In market- based systems, a larger proportion of household wealth is usually made up of financial assets, especially shares and therefore the distribution and ownership of shares tends to be wider. In countries that are characterized by this type of financial system, it is generally easier for households to borrow against their assets (equity withdrawal), since the financial system is more developed and more financial instruments are available. As a result, it is often stated that the wealth effect on consumption will be stronger in market-based systems than in bank-based systems. In this sense, the marginal propensity to consume out of wealth is likely to increase over time, as financial markets become more developed.

[24] looked at the wealth effect on household consumption in Hong-Kong, taking it consideration the factors of money supply and interest rate, and concluded that there is a long-term equilibrium relationship between household consumption and the changes in housing wealth. This effect according to him appears to be more significant than that associated with changes in financial wealth. On the other hand [16], in his paper estimates the wealth effects on consumption in the Euro area as a whole, employing two main econometric methodologies: The Dynamic Ordinary Least Squares (DOLS); and the Instrumental Variables/Generalized Method of Moments (IV/GMM), and using quarterly data for the period of 1980:1-2007:4, he found that: Financial wealth effects are relatively large and statistically significant; housing wealth effects are virtually nil and not significant; consumption growth exhibits strong persistence and responds sluggishly to shocks; and the immediate response of consumption to wealth is substantially different from the long-run wealth effects. By disaggregating financial wealth into its major components, he found that wealth effects are particularly large for currency and deposits, as well as shares and mutual funds. In addition, he observed that consumption seems to be very responsive to financial liabilities and mortgage loans. Conclusively, he noted that his empirical findings highlight that consumption has become more sensitive to wealth, reflecting the beneficial effects of public finance consolidation on stock

markets and the importance of relaxation of access to credit in housing markets.

[4], recently studied the financial and housing wealth effects on aggregate private consumption in Turkey for the period of 1987-2007. The study by [4] used a proxy for housing wealth by constructing a quarterly housing price index as a weighted average of the housing investment deflator and the lagging rental price index and by multiplying this price index by housing stock series. They also used ECM to estimate the long-run equilibrium relationship between aggregate private consumption, disposable income, financial wealth and housing wealth. The study shows that disposable income is the major factor determining private consumption in Turkey, with an elasticity of over 0.90 and both financial wealth and housing wealth has positive effects on consumption, with elasticities of 0.077 and 0.046 respectively while there is not enough evidence to show that one effect is stronger than the other.

3. DEFINITION OF MODEL VARIABLES AND METHODOLOGY

Annual series data were used for this analysis. Data were sourced from [3]. The study covered the period 1981 to 2011.

Following the objectives of the study, Ordinary Least Square (OLS) technique was used to determine the effect of financial wealth on private consumption in Nigeria. The functional form is stated as:

$$RPC = f\,(RDI, FIW) \qquad (1)$$

where RPC = real per capita private consumption expenditure, RDI= real per capita disposable income measured as total income less total non-oil tax divide by total population, FIW = financial wealth proxied by average stock market capitalization. In order to estimate equation 1, we specify it in econometric form as:

$$RPC = \beta_0 + \beta_1 RDI + \beta_2 FIW + \mu \qquad (2)$$

where β_0 = intercept, β_i (where i = 1 and 2) = parameters to be estimated, and μ = white noise error term.

Following [25] and [26] which suggested that a log- linear form is more likely to find evidence of a deterrent effect than a linear form, we therefore log-linearized equation as:

$$lnRPC = \beta_0 + \beta_1 lnRDI + \beta_2 lnFIW + \mu \qquad (3)$$

ln = natural log of their respective variables.

To fully explore the data generating process, we first examined the time series properties of model variables using the Augmented Dickey- Fuller test.

The ADF test regression equations with constant are:

$$\Delta Y_T = \alpha_0 + \alpha_1 Y_{T-1} + \sum_{j=1}^{k} a_j \ \Delta Y_{T-1} + \varepsilon_T \ldots \qquad (4)$$

where Δ is the first difference operator ε_T is random error term that is iid k = no of lagged differences Y = the variable. The unit root test is then carried out under the null hypothesis α = 0 against the alternative hypothesis of α < 0. Once a value for the test statistics

$$ADF_\tau = \frac{\hat{\alpha}}{SE(\alpha)} \ldots\ldots\ldots\ldots \qquad (5)$$

is computed we shall compare it with the relevant critical value for the Dickey-Fuller Test. If the test statistic is greater (in absolute value) than the critical value at 5% or 1% level of significance, then the null hypothesis of α = 0 is rejected and no unit root is present. If the variables are non-stationary at level form and integrated of the same order, this implies evidence of co-integration in the model. The co-integration equation is stated in equation 6 as:

Co integrated equation

$$\left[\eta_m \log RPC_t = \alpha_1 + \sum_{i=2}^{p} \alpha_i \eta_m Z_t - \left[\eta_m \log RPC_t - \sum_{i=1}^{n} \beta X_{t-i} + v_{2t}\right]\right] \ldots\ldots\ldots\ldots (6)$$

Where

$\left[\eta_m \log RPC_t - \sum_{i=1} \beta X_{t-i}\right]$ is the linear combination of the non co integrated vectors, X is a vector of the non co integration variables. The individual influence of the co integrated variables can only be separated with an error correction mechanism through an error correction model as shown below.

The Error Correction Model

$$Equation\left[\eta_m \log RPC_t = \alpha_1 + \sum_{i=2}^{p} \alpha_i \eta_m Z_t - \left(\lambda ECM_{t-i} + v_{4t}\right)\right]. \quad .....(7)$$

Where $-\lambda ecm$ is the error correction mechanism, $-\lambda$ is the magnitude of error corrected each period specified in its a priori form so as to restore $\eta_m Z_t$ to equilibrium. Where Z_t represents the explanatory variables (RDI and FIW).

Also the optimum lag length was determined using the multivariate versions of information criteria of Akaike's Information Criteria (AIC) and Schwarz's Bayesian Information Criteria (SBIC).

4. DATA ANALYSIS AND DISCUSSION

4.1 Unit Roots Test Result

In this study, the Augmented Dickey Fuller (ADF) unit roots test was employed to test for the time series properties of model variables. The null hypothesis is that the variable under investigation has a unit root against the alternative that it does not. The choice of lag length was based on Akaike and Schwartz-Bayesian information criteria. Thus, the optimum lag length was 1. The decision rule is to reject the null hypothesis if the ADF statistic value exceeds the critical value at a chosen level of significance (in absolute term). These results are presented in Table 1 below.

The results of Table 1 below show that all the variables are non-stationary in their level form since their ADF values are less than the critical values at 1%, 5% and 10%, the null hypothesis of a unit root was accepted for all the variables but was rejected in 1st difference. Thus, we conclude that the variables under investigation are integrated of order one (I(1)). Since the variables are integrated of the same order. We therefore, examine their co-integrating relationship using Engle-Granger co-integration procedure.

4.2 Results from Co-integration Test

Given the unit root properties of the variables, we proceed to implement the Engle-Granger co-integration procedure. All the variables have the same order (I ~ (1)) of integration; we estimate their linear combination at their level form with intercept term and obtain their residual which is then subjected to co integration test as shown in Table 2:

From Table 2, since the residual t-adf of -5.766890 at lag length 1 is greater than the 5% and 1% critical values of -2.9627 and -3.6661, it means that the residual is stationary at level form and hence there is linear relationship among the variables. This implies that there is a robust long run equilibrium relationship between private consumption and financial wealth in Nigeria. Consequently, we adopt the Error Correction Model which was specified in case, co-integration was established among the variables.

From the result in Table 3 and in equation 8, the estimated model shows that real per capita disposable income has positive impact on private consumption. This implies that an increase in per capita disposable income will lead to increase in private consumption in Nigeria. This is in consistent with the 'a priori' expectation validating the Keynessian consumption theory. Specifically, a one percent increase in disposable income will increase private consumption by about 83%. Interestingly, the t- statistic reveals that the variable is highly significant at 1% level of significance since the probability value is less than 0.01 (p- value < 0.01). This suggests that per capita disposable income has a positive and significant impact on private consumption in Nigeria.

The coefficient of average stock market capitalization which was used as proxy for financial wealth shows that it has a positive but insignificant impact on private consumption in Nigeria. This implies that a 1% increase in financial wealth will increase private consumption by 5.3 percentage point. This is in line with the [1] life cycle hypothesis and permanent income hypothesis of [6]. This result corroborates the result of [27] for OECD countries and [18]. However, the t- statistic shows that financial wealth has no significant impact on private consumption in Nigeria. The decision is made based on the probability level of financial wealth (FIW) which is greater than 0.05 (p- value > 0.05). The result of the insignificant impact of financial wealth on private consumption supports the result [4] for Turkey.

The results show that the error correction term (ECM) for the estimated consumption function is statistically significant and negative. Thus, it will rightly act to correct any deviations from long-run equilibrium. Specifically, if actual equilibrium

value is too high, the ECM will reduce it, while if it is too low, the ECM will raise it. The coefficient of -0.016 denotes that 1.6% of any past deviation will be corrected in the current period. Thus, it will take a very long time (more sixty-two years) for any disequilibrium in the consumption function to be corrected.

The coefficient of determination and its adjusted are 0.714 and 0.669 respectively implying that there exists goodness of fit in the model. This means that about 71.4% of the variation in consumption is accounted for by variation in disposable income and financial wealth of an individual. The overall regression is significant at 1% level of significance implying that the joint effects of all the included variables ware significant.

The estimated model can be shown as:

$$\ln RPC = 0.054 + 0.830 \ln RDI + 0.053 \ln FIW \quad (8)$$

The Durbin Watson statistic of 2.3 shows evidence of no first order serial autocorrelation in the model given that it is approximately 2.

The long run structural equation of consumption function based on traditional model is reported in Table 3. The diagnostic statistic indicates that the equation is well specified and can be used for policy making and forecasting. The model fulfilled the conditions of no serial correlation, normality of the disturbance term and there is no heteroscedasticity in the model.

Table 1. Unit roots test result

Variable	ADF statistics				ADF statistics		
	Level	Critical values		1st difference	Critical values		Lag lenght
RDI	2.670027	1%	-3.6752	-3.723158	1%	-3.6752	
		5%	-2.9665		5%	-2.9665	1
		10%	-2.6220		10%	-2.6220	
RPC	1.590834	1%	-3.6752	-5.443165	1%	-3.6752	
		5%	-2.9665		5%	-2.9665	1
		10%	-2.6220		10%	-2.6220	
FIW	-0.156702	1%	-3.6752	-6.024155	1%	-3.6752	
		5%	-2.9665		5%	-2.9665	1
		10%	-2.6220		10%	-2.6220	

Table 2. Co-integration tests

	t-adf	Lag	5% critical val	1% critical val
Residual	-5.766890	1	-2.9627	-3.6661

Table 3. Multiple regression result. Dependable variable: DLOG(RPC)

Variable	Coefficient	Std. error	t- statistic	Prob.
Constant	0.054445	0.033773	1.612091	0.1190
DLOG(RDI)	0.829763***	0.140671	5.898627	0.0000
DLOG(FIW)	0.053206	0.035206	1.511254	0.1428
F-Statistic	13.77254***			0.0001
ECM (-1)	-0.01586***			0.0014
R2 =0.713771	Adjusted R2 =0.669206	Durbin Wat.= 2.30		
Diagnostic test:				
Arch Test = 0.203 (0.655)				
W-HeteroskedasticTest=0.65 (0.31)				
Jarque-Bera test= 0.46 (0.796)				

****[**] (*) denotes significant of variable at 1% [5%] (10%) significance level respectively*

5. CONCLUSION

This paper has investigated the effect of financial wealth on private consumption in Nigeria between the period 1981 and 2011. The estimated results point that both disposable income and financial wealth have positive effect on private consumption in Nigeria. This result validates the [1] life cycle hypothesis and permanent income hypothesis of [2]. While both effects (disposable income and financial wealth) are positive on private consumption, the effect of financial wealth is infinitesimal relative to the elasticity of disposable income corroborating the findings of [4]. The result further shows a long run relationship between private consumption and financial wealth in Nigeria.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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