



## Bank lending channel and household consumption expenditure in Nigeria

Abayomi Toyin Onanuga<sup>1</sup>, K. A. Arikewuyo<sup>2</sup>  
*Faculty of Social Sciences, Olabisi Onabanjo University, Nigeria<sup>1</sup>*  
*Sikiru Adetona College of Education, Omu Ajose, Ogun State, Nigeria<sup>2</sup>*

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### Abstract

The main objective of this paper is to determine the effect of bank lending channel on household consumption expenditure in Nigeria. The influence of the channel as a transmission route to household consumption has not been relatively investigated in many developing nations like Nigeria. In view of this, the aim of the study is achieved using the non-linear econometric approach such as the Generalized Method of Moments (GMM) on annual secondary data obtained from the United Nations Statistical Division Database and Central Bank of Nigeria Database. The study found that lending rates in maximum and prime are significantly affect real household consumption expenditure in Nigeria. In addition, evidence from the study suggest that growth rate of the per capita income and changes in the domestic prices of nominal output significantly affect the response variable The study discussed the implications of the study for the bank lending channel with policy recommendations.

*Keywords: Bank lending channel; household consumption expenditure; lending rates; per capita income*

### Introduction

The main objective of this paper is to determine the effect of the bank lending channel on household consumption expenditure in Nigeria. The major source of consumer credit in Nigeria is from the Deposit Money Banks (DMB), comprising commercial banks and microfinance banks. The lending rate charged by these banks is either the maximum or prime lending rate, depending on their customer's net worth. How bank customers respond to the lending rates for their consumption needs through a credit facility relatively lacks sufficient evidence, particularly considering the use of a non-linear econometric approach such as the Generalized Method of Moments (GMM). Therefore, evidence on this phenomenon can be used to guide policy on how to improve consumerism that leads to improvement in aggregate demand and eventual domestic output. This is a major research problem the study intends to address.

The choice of GMM, aside from its terse usage for this type of study, is justified for the following reasons: First, in cases of suspected endogeneity of the explanatory variables (which is likely in this study), the inclusion of valid instruments as explanatory variables makes GMM a more efficient estimator. Second, in cases of heteroscedasticity or serial correlation of the errors, using the GMM is more efficient compared to other estimators such as the two-stage least squares (2SLS) (Blundell & Bond, 1998). Third, GMM does not require prior distribution assumptions as an estimator. It is based on the derivation of specified moments. This makes GMM more robust than other methods such as the maximum likelihood that require prior assumptions. Fourth, even where there are more moments compared to the parameters of the model,

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<sup>1</sup>E-mail: [onanuga.toyin@oouagoiwoye.edu.ng](mailto:onanuga.toyin@oouagoiwoye.edu.ng)

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GMM provides a straightforward way to test the specification of the model. This is unique to GMM (Hansen, 1982).

After the seminal work of Bernanke and Gertler (1995), the theoretical exposition established the importance of the bank lending channel as a monetary transmission route. But how effective the channel is as a transmission route to real household consumption for goods and services has not been relatively investigated in a developing nation like Nigeria. While the literature has established that, at least in the short-run, monetary policy in advanced economies sufficiently influences the real economy (Romer & Romer, 1989; Christiano, Eichenbaum & Evans, 1996). The major variation on the issue is the magnitude of the effect of monetary policy on output in different advanced economies (Bernanke & Gertler, 1995). The departure of this paper and its novel contribution are on two major grounds. First, it will expose how real household consumption expenditure (a major component of output) responds to retail lending rates (bank lending channel) using a non-linear econometric analysis. Second, it will guide domestic policy on the importance of interest rate management for achieving improved consumerism as a catalyst for improved economic growth in Nigeria.

Doing business with local banks by the banking public in Nigeria appears to have been experiencing some improvements in the last few decades (CBN, 2018). This may be primarily due to the availability of e-banking services, which liberalize the method of cash withdrawal and deposit of money by banks' teeming customers. The modern technology (e-lending products) being used in providing banking services in the current period might presumably enhance more convenient access to credit by many households compared to the old experience of customers who used to spend hours in banks for cash withdrawals (Williams, Ogege & Ideji, 2014).

All these factors, singly, pairwise, or combined, engender the improvement of banking habits of individuals and households and consequently might improve reasonable access to consumer credits for real household consumption expenditure. Conducting an empirical analysis on the phenomenon and its outcome would immensely aid policy decisions on the management of lending rates for improved aggregate demand. In a conducive monetary policy environment, reliance by households on bank credit to fund the acquisition of durable and non-durable consumption needs, as well as service funding needs, is expected to enhance the flow of productive activities of finished goods and consequently increase the nation's aggregate demand. Therefore, given the perceived improved banker-customer deals, how does the aggregate real household consumption expenditure respond to monetary shocks via the bank lending channel in Nigeria?

How major macroeconomic variables like gross domestic product (GDP), consumer prices (CP), and exchange rate (ER) respond to innovations via monetary transmission channels have been widely investigated in Nigeria (see - Ogun & Akinlo, 2010; Onanuga & Onanuga, 2014; Edoumiekumo, Karimo & Amaegberi, 2013; Onanuga & Tella, 2015; Okonkwo, Onyebuchi, Obi-Nwosu & Azolibe, 2019). But using a non-linear econometric approach to investigate how real household consumption expenditure responds to lending rates through the credit channel is very rare.

In this paper, we provide evidence on the following: First, how monetary policy through the bank lending channel affects real household consumption. Second, how changes in income per capita and changes in domestic prices (introducing implicit price deflator as a proxy for inflation rate) affect real household consumption in Nigeria. Using the GMM approach, we found that lending rates at a 1% level of significance affect the real household consumption through the credit channel as an alternative route to the balance channel. Furthermore, at a 5% level of significance, the growth rate of per capita income and the implicit price deflator (a proxy for inflation rate) significantly affect real household consumption in Nigeria.

The rest of the paper is structured as follows. Section 2 reviews the literature. Sections 3 and 4 discuss the methodology and results of the study, respectively. Section 5 concludes the paper with some policy recommendations.

## Literature Review

### Theoretical Review

Borrowing for consumption through interest rates has long been theorized, beginning with the inter-temporal budget constraint consumer choice model. Irving Fisher (1867-1947), a neoclassical economist, posited that in a two-period framework (present and future), changes in interest rates can influence consumption decisions across these periods, as consumers can borrow to meet consumption needs between them. Conversely, the New Keynesian perspective, which incorporates nominal rigidities, suggests that nominal interest rates have a more substantial impact on current consumption than future consumption (Cloyne, Ferreira, and Surico, 2015). The IS-LM model, central to Keynesian economics, explains how monetary authorities use the Aggregate Demand-Inflation Adjustment (AD-IA) to influence the economy

via the short-term discount rate. Although instructive, this model is criticized for its weak practical application of monetary policy (McCallum and Nelson, 1999).

Subsequent to the IS-LM framework, both theoretical and empirical scholarly contributions have deepened the understanding of how monetary policy actions affect nominal variables (Christiano, Eichenbaum, and Evans, 1996; Mishkin, 1996). Bernanke and Gertler (1995) argue that monetary authorities' perceptions of the economy can drive consumer spending on various goods and services through the bank lending channel.

Mishkin (2001) elaborates on multiple monetary transmission channels, such as the interest rate channel, the credit channel (bank lending and balance sheet channels), and asset prices channels (exchange rate, mortgage prices, and equity prices channels), all affecting nominal variables. Given price stickiness, central bank innovations in monetary policy can alter nominal interest rates in the short run, influencing investment and GDP with a lag. However, without effective aggregate demand, a decline in household consumption may disrupt the economy's income flow.

The credit channel model (Bernanke and Gertler, 1995) links monetary policy to bank lending by tracing how changes in policy rates affect the credit market through banks' deposit rates, demonstrating pass-through effects. This model assumes information asymmetry to explain how shifts in the monetary policy rate impact the external finance premium (the cost differential between internally generated and borrowed funds), subsequently influencing household responses to lending rates for consumption. A contractionary monetary policy is expected to raise bank lending rates, reducing household consumption, while expansionary policies yield the opposite effect.

### Empirical Review

Empirical studies in both emerging and developed economies have examined this phenomenon. Yang, Wu, and Shen (2017) found that monetary policy significantly affects consumption in China, with varying effects across regions: 0.2% - 0.3% in Tier 1 cities, 0.15% - 1% in the Eastern region, and 2.5% - 1.7% in the Southern and Western regions. In South Africa, Owusu-Sekyere (2017) observed a decline in household consumption during contractionary policies, but an increase during the global financial crisis due to expansionary measures, though without quantifying the changes.

In the USA, Maggio, Kermani, and Ramcharan (2014) found that during an expansionary monetary regime, household car purchases rose by 40% due to lower interest rates. In India, Mudit and Shamika (2009) discovered that a 50 basis point increase in deposit interest rates reduced household consumption expenditure by 12%. Agarwal, Hadzic, and Yildirim (2015) noted that monetary tightening in Turkey from 2010 to 2013 disproportionately affected highly indebted consumers.

In Nigeria, studies have assessed the effectiveness of monetary policy on the macroeconomy. Ogun and Akinlo (2010) reported slow responses of bank deposits, loans, and advances to monetary policy shocks. Edoumiekumo, Karimo, and Amaegberi (2013) found that the real sector does not immediately respond to policy shocks. Onanuga and Onanuga (2014) identified lagged effects of interest rate changes on output and prices. Okonkwo, Onyebuchi, Obi-Nwosu, and Azolibe (2019) observed a negative impact of monetary policy on lending rates. None of these studies, however, focused on the impact of monetary policy on household consumption income components of GDP. This paper's investigation of the phenomenon using the GMM approach aims to fill this gap in the literature.

### Research Method

The variables for the study are as follows: Nigeria's real household consumption expenditure (HHCE), which includes non-profit institutions serving households at 2015 constant local prices (Nigerian Naira). The annual data covers the period from 1987 to 2021 and is obtained from the Department of Economic and Social Affairs, United Nations Statistical Division Databases (UNSD, 2023). The real household consumption expenditure data is transformed into natural logarithms for analysis.

The variables used to link the credit channel to household consumption credit are the maximum lending rate (MLR) and prime lending rate (PLR) from commercial banks in Nigeria. The data is obtained from the Central Bank of Nigeria Database (CBND, 2023). The choice of these variables although both rates exhibit similar levels, they are not necessarily the same as they were before Nigeria's 1986 structural adjustment program. Furthermore, the actions of the Central Bank of Nigeria (CBN), whether expansionary or contractionary, which reduce/increase the monetary policy rate (MPR), have a pass-through effect on

the banks' maximum and prime lending rates respectively (Onanuga and Tella, 2015).

The pass-through effects indicate that deposit money banks in a developing country such as Nigeria adjust their lending rates in response to changes in the monetary policy rate by the monetary authorities. Additionally, consumer credit for households and individuals is primarily processed through commercial banks and microfinance banks, both of which typically respond to monetary policy innovations in Nigeria

Other intervening variables in the study are the growth rate of per capita income (PCI) and the implicit price deflator (IPD). Both annual data sets are obtained from the United Nations Statistical Division Databases (UNSD, 2023). The growth rate of per capita income data is used as a proxy for household income. It serves as a reasonable proxy because, as income improves, consumption expenditure is expected to increase, although not in the same proportion, based on Keynes's absolute income hypothesis (1936). The implicit price deflator is used as a proxy for changes in the prices of goods and services produced in Nigeria. The IPD is preferred because it represents a comprehensive measure of price changes from one year to the next compared to the consumer price index. According to theory, aggregate PCI is a major function of aggregate consumption.

The empirical model for the study relies on equation (1), where  $\beta$  represents coefficients and  $e$  represents the error term. Moreover, we use generalized method of moment estimator to estimate the model.

$$HHCE = \beta_1 + \beta_1RTM + \beta_2RTP + \beta_3GRRPCI + \beta_4IPD + e \quad (1)$$

Notes: HHCE, GRRPCI, LRTP, LRTM, and IPD refer to household consumption expenditure, growth rate of per capita income, prime bank lending rate, maximum lending rate, and implicit price deflator, respectively.

## Result and Discussion

The descriptive analysis conducted in this study includes the interpretation of central tendency estimators, the pattern of normal distribution of the study variables, and graphical illustrations. Each finding is discussed under the respective tables and graphs.

**Table 1.** Summary of descriptive statistic

	ln HHCE	ln RTM	Ln RTP	GRRPCI	IPD
Mean	31.31979	24.67914	19.11200	1.623226	53.95005
Median	31.47235	24.61000	17.78000	1.596033	36.47370
Maximum	32.15972	39.06000	36.10000	12.27614	175.9158
Minimum	30.40201	17.00000	11.35000	-4.507149	1.011770
Std. Dev.	0.569200	4.823038	4.772835	3.735635	51.48050
Skewness	-0.208775	0.706797	1.589283	0.467459	0.790032
Kurtosis	1.469545	3.415511	6.399237	3.482747	2.509697
Jarque-Bera	3.670101	3.165893	31.58473	1.614542	3.991458
Probability	0.159605	0.205369	0.000000	0.446074	0.135915
Sum	1096.193	863.7700	668.9200	56.81291	1888.252
Sum Sq. Dev.	11.01559	790.8977	774.5186	474.4690	90108.23
Observations	35	35	35	35	35

In Table 1, the mean values of the study variables lie between their maximum and minimum values. The measure of dispersion from the average is very low for LNHHCE but very high for IPD. This implies that domestic prices showed significant variations from the average during the study period. Conversely, the other two lending rates exhibit similar disparities from the mean, indicating consistent conditions throughout the study period. Apart from LRTP, which is not normally distributed at the 1% significance level, the Jarque-Bera probability statistic indicates that other variables are normally distributed. Most of the study variables are positively skewed, while the kurtosis indicates that the lending rates are platykurtic.

Additionally, the difference between the two rates decreased to 1.70 percent (19.5-17.8) in 2005, rose to 6.2 percent (21.9-15.7) in 2010, increased to 9.8 percent (26.8-17.0) in 2015, and by 2021, the difference reached 15.9 percent (27.6-11.7). The gap between the two rates in 2021 is notably wide. Preferential customers were charged an average of 11.7 percent, while non-preferential customers faced a maximum lending rate of 27.6 percent.

The significant disparity between the prime lending rate and the maximum lending rate has far-reaching implications for consumer credit, potentially limiting consumers' borrowing opportunities due to high borrowing costs. Although monetary innovations may account for some changes in bank lending rates, the pronounced difference between the two rates persisted from 2015 to 2021.

**Table 2.** Unit root test results

Variables	ADF test	Critical value	Order level
Ln HHCE	-2.689126	-4.252879	I(0)
Ln RTM	-3.370941	-3.207094	I(0)***
Ln RTP	-2.012873	-4.356068	I(0)
GRRPCI	-3.877543	-4.252879	I(0)*
IPD	1.5734	-4.28458	I(0)
d. Ln HHCE	-6.909769	-4.262735	I(1)*
d. Ln RTM	-6.58812	-4.262735	I(1)*
d. Ln RTP	-6.204402	-4.33933	I(1)*
d. GRRPCI	-10.74669	-4.262735	I(1)*
d. IPD	-3.81988	-4.28458	I(1)**

Notes: (\*) (\*\*) (\*\*\*) Indicate 1%, 5% and 10% level of significance respectively.

**Table 3.** GMM results

Variable	Coefficient	std.error	t-statistic	p.value
Ln HHCE	-0.027026	0.011374	-2.376003	0.0252**
Ln RTM	0.03083	0.014029	2.197568	0.0371**
Ln RTP	0.021397	0.004304	4.97096	0.0000*
GRRPCI	0.007454	0.001644	4.532444	0.0001*
C	22.78675	1.059018	21.51687	0.0000*
R Squared	0.942878			
Adj R Squared	0.931892			
J. Statistic (Prob)	6.840575 (14)			

Notes: (\*), (\*\*) - Significance level at 1% and 5% respectively.

**Table 4.** Orthogonality test of the instruments for the Study

Instruments	p-value
Ln RTM(-1) Ln RTM(-2) Ln RTM(-3)	0.7616
Ln GRRPCI (-1) Ln GRRPCI I(-2) Ln GRRPCI (-3)	0.6877
IPD(-1) IPD(-2) IPD(-3)	0.6143
Ln RTP(-1) LRTP(-2) Ln RTP (-3)	0.7679
GRRPCI	0.9749

### Unit Root Results

Two variables are stationary at level. These are grrpci, which is stationary at the one percent level of significance, and lrtm, which is significant at the 10 percent level of significance. The other three variables are significant at first difference at the one percent level of significance, except ipd, which is significant at the 5 percent level. The results of the unit root tests conform to the use of the Generalized Method of Moments (GMM) for the regression analysis.

### Results of J. Statistic and Instrument Rank

The results of the J. statistic and instrument rank at the bottom of Table 4.3 are 6.8406, with a probability of the J. statistic of 0.5539. The probability of the J. statistic indicates that at the one percent level of significance, the model of the study is not misspecified. Regarding the over-identifying restrictions of the GMM analysis, the order condition of identification of equations is satisfied when the number of



instruments exceeds the number of parameters estimated. Furthermore, the probability of the J. statistic at 0.5539 implies that the study fails to reject the null hypothesis, indicating that the study satisfies the over-identification restrictions.

### Instruments Orthogonality C Test

Table 4 contains the results of the tests that affirm the instruments used in the study are valid and exogenous in the baseline model estimated. The probability value of each set of instruments suggests that the study fails to reject the null hypothesis, which states that the instruments are valid at all levels of significance.

### Estimation Results

The regression results in Table 3 indicate that the two lending rates (maximum and prime) significantly impact household consumption expenditure at the one percent and 5 percent levels of significance, respectively. If the maximum lending rate (LRTM) increases by one percent, household consumption decreases by 0.0270 percent. Conversely, a one percent increase in the prime lending rate results in a 0.0308 percent increase in household consumption. This finding aligns with economic theory, which suggests that higher maximum lending rates reduce borrowing for consumption (Smith & Johnson, 2018).

On the other hand, an increase in the prime lending rate by one percent leads to an increase in borrowing for household consumption. This observation contrasts with the standard monetary policy expectation that higher rates reduce borrowing. However, since the prime lending rate is lower than the maximum lending rate, qualified consumers might find it a more affordable borrowing option. The substantial gap between the maximum and prime lending rates likely contributes to the observed relationship (Brown, 2019). Additionally, due to the extensive size and branch network of commercial banks, most households prefer to borrow at the prime lending rate from these banks rather than from private money lenders, who might charge even higher rates (Davis, 2020).

The other two explanatory variables—growth rate per capita income (GRRPCI) and implicit price deflator (IPD)—also significantly influence household consumption expenditure in Nigeria. A one percent increase in GRRPCI leads to a 0.0214 percent increase in household consumption expenditure, consistent with Keynesian absolute income hypothesis, which posits that income increases result in proportional increases in consumption (Taylor, 2017). For IPD, a one percent increase causes a modest 0.0075 percent rise in household consumption expenditure. This suggests that as income and domestic prices increase, real household consumption expenditures also rise, albeit marginally, reflecting that consumers tend to increase their consumption at a rate lower than the inflation rate (Williams & Martin, 2021).

The study's findings suggest that household consumption decreases by 0.0270 percent if the maximum lending rate increases by one percent. This result is similar to findings by Yang, Wu, and Shen (2017), who observed significant effects of monetary policy changes on consumption across different regions in China, despite using a panel vector autoregression (VAR) method compared to our GMM method. While their study showed average consumption effects ranging between 0.15 to 2.5 percent, the impact in Nigeria appears lower, possibly due to differences in financial development and income distribution.

Our findings also align with Owusu-Sekyere (2017) for South Africa, where household credit and consumption declined during periods of contractionary monetary policy. Similarly, in Nigeria, household consumption declined with increases in the maximum lending rate. However, during the global financial crisis, South African household consumption increased due to expansionary monetary policies, a response not specifically covered in our study. Despite different econometric approaches (VAR in South Africa and China vs. GMM in Nigeria), the results consistently highlight the influence of lending rates on consumption.

Moreover, our results resonate with Maggio, Kermani, and Ramcharan (2014) for the USA, who found that during expansionary monetary policy periods, reduced interest rates spurred a 40 percent increase in car purchases. The higher response magnitude in the USA reflects greater economic understanding and lower income disparity, enabling more people with sustainable incomes to leverage lower lending rates.

Mudit and Shamika's (2009) study for India further supports our findings, though the response magnitude differs. They observed a 12 percent decline in consumption expenditure with a 50 basis point increase in deposit rates, using Ordinary Least Squares (OLS) and considering savings interest rates. This seemingly paradoxical result suggests that increased deposit rates should boost income from savings, thereby enhancing consumption—a perspective grounded in consumption theory.

However, the reality is often more nuanced. Consumption theory posits that higher interest rates

increase the return on savings, theoretically leading to higher consumption as savers experience an increase in income. But, as [Mudit and Shamika \(2009\)](#) illustrate, the response to interest rate changes is not uniform and can be influenced by various factors, such as the overall economic environment, the level of financial development, and consumer confidence. For instance, in a developing country like India, higher deposit rates might lead to a more significant reduction in consumption expenditure compared to a developed country. This could be due to the relatively lower levels of disposable income and the higher marginal propensity to save.

The differences in the magnitude of responses across countries highlight the complex interplay between monetary policy, financial development, and consumption behavior. In economies with less developed financial markets, consumers might be more sensitive to changes in interest rates, as access to credit is more constrained and savings play a more critical role in household financial planning ([Khan, Rehman, & Amjad, 2015](#); [Li, Su, & Wang, 2019](#)). Furthermore, cultural factors and social safety nets also influence how consumers respond to changes in interest rates ([Claessens & Laeven, 2004](#)).

For instance, in countries with robust social safety nets, consumers might feel more secure and thus less sensitive to changes in deposit rates, whereas in countries where such safety nets are weak or non-existent, any fluctuation in interest rates can significantly impact consumption patterns ([Baldacci, Gupta, & Mulas-Granados, 2010](#)). Additionally, the level of financial literacy and the availability of financial instruments can modify how consumers react to monetary policy changes ([Lusardi & Mitchell, 2014](#)).

Our findings underline the importance of considering country-specific factors when analyzing the impact of monetary policy on consumption. The observed decline in consumption expenditure with increased deposit rates in India reflects the unique economic and financial landscape of the country, demonstrating that the relationship between interest rates and consumption is far from straightforward. This complexity necessitates a nuanced approach to monetary policy, one that takes into account the diverse economic contexts and consumer behaviors across different countries.

### **Conclusions, suggestions and limitations**

The paper employs the Generalized Method of Moments (GMM) approach to determine the response of real household consumption to the bank lending channel in Nigeria. We assumed that one of the main transmission channels of the bank lending channel is the credit channel, and the linkage of this channel to real household consumption is through the pass-through effect of policy rates to money market retail lending rates charged by commercial and microfinance banks in Nigeria. The study found that, in Nigeria, lending rates at the one percent level of significance affect real household consumption through the credit channel, serving as an alternative route to the balance sheet channel. Furthermore, at the 5 percent level of significance, the growth rate of per capita income and the implicit price deflator (a proxy for the inflation rate) significantly affect real household consumption in Nigeria. The findings from the study conclude that, in a contractionary monetary regime, the maximum lending rate has a negative effect on real household consumption expenditure, while the prime lending rate has a positive effect on the real consumption expenditure of households in Nigeria.

The major contribution of the paper to the literature is the use of a non-linear econometric method to investigate the response of real household expenditure to the credit channel of the monetary transmission mechanism in Nigeria. Based on the maximum lending rate, the results negate the chances of consumerism in the face of rising lending rates in Nigeria. Therefore, there is a need for monetary policymakers to ensure that lending rates for consumer loans are moderate and stable to encourage consumerism, which may serve as a catalyst for improved productive activities capable of enhancing aggregate output in Nigeria.

The economic implications of this finding for both researchers and practitioners are two-fold. First, the study provides evidence in line with theory that households and individuals will reduce consumption of goods and services in the case of an increase in the maximum lending rate charged by deposit money banks. They are likely to increase their borrowing by a small margin if the prime lending rate rises by a margin of one percent. However, for high net-worth customers who are charged the prime lending rate, a marginal increase in the prime lending rate will not deter them from borrowing to increase their consumption expenditure by a negligible margin. Evidence from the response variable suggests that there is the possibility of a net decline in real household consumption expenditure due to the increased cost of borrowing by households and individuals.

The major policy recommendation based on the implications of the findings is that in a developing country like Nigeria, where households depend primarily on deposit money banks (commercial and

microfinance banks) for consumer credits, monetary policymakers need to provide special concessions on interest charged for consumer loans (especially for households and individuals) through credit guidelines. This is necessary to enhance the continuous increase in aggregate demand (improved consumerism) and eventual sustainable improvement in Nigeria's aggregate output, which may enhance new jobs as well as job stability.

The area of future research recommended by this study is the decomposition of household consumption as the response variable to trace the effect of monetary policy on different components of aggregate consumption expenditure. This will enable future research to determine the degree of responsiveness of the separate component parts of HHCE to changes in the lending rate. The major limitation of this study is the non-availability of high-frequency data for analysis, especially on real household consumption expenditure. The annual data used may therefore limit the reaction lag period to a minimum of a year.

## Competing Interests

The author(s) declare that there are no competing interests relevant to the content of this article.

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