

## **DYNAMIC RESPONSE ANALYSIS OF PRIVATE SECTOR CREDIT DELIVERY TO VARIATIONS IN FINANCIAL INTERMEDIATION COSTS IN NIGERIA**

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**ABSTRACT:** *This study investigated the dynamic responses of private sector credit delivery in Nigeria to variations in financial intermediation costs. Ex-Post Facto research design and Panel Vector Auto Regression estimation method were used. Annual panel data for 10years were collected from individual annual reports and financial statements of the selected banks. The dependent variable in the panel data regression model was private sector credit delivery proxied as the ratio of loans and advances to total asset while the independent variables were variations in bank operating cost, loan loss provision and interest rate spread. The study found that the magnitude of the shocks-impact of private sector credit delivery in Nigeria depends on the variations in the level of bank operating costs, loan loss provision and interest rate spread. The implication of the finding is that in subsequent years in the future (3-year period), there will be absence of shocks-impact in the 1<sup>st</sup> year but there will be presence of shocks-impact of various magnitude in the 2<sup>nd</sup> and 3<sup>rd</sup> years respectively. This means that shocks on bank operating costs, loan loss provisions and interest rate spread have no long lasting effect on private sector credit delivery in Nigeria. The study recommends that efforts should be intensified to ensure that shocks in financial intermediation costs (bank operating cost, loan loss provision and interest rate spread) does not adversely affect private sector credit delivery in Nigeria.*

**KEYWORDS:** Financial Intermediation Costs, Bank Operating Cost, Loan Loss Provision, Interest Rate Spread.

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### **INTRODUCTION**

Banks thrive on financial intermediation with lending of funds (bank loans) constituting the largest single income-earning asset in the portfolio of banks (Olokoyo, 2011). However, in the process of financial intermediation (mobilizing deposits and extending credit facilities) banks incur financial intermediation costs. Financial intermediation costs measured as interest rate spread refers to the gross margin between the total cost paid by the borrower and the net return received by the depositor. Specifically, financial intermediation cost arises because lower interest rate is paid to depositors by the banks whereas greater interest rate is charged on loans and advances extended to the borrowers. Financial intermediation costs affect the volume and cost of loans and advances extended to the borrowers because the costs incurred by the banks in the intermediation process are transferred to borrowers as the interest margin. The private sector needs credit facilities from banks to expand and grow their businesses but they are constrained by the high cost of bank credit. High lending rate is likely to discourage access to bank credit while low interest on deposits is likely to discourage savings mobilization which consequently will threaten the liquidity position of banks. Financial intermediation costs might affect the banks' capability to extend credit to the private sector; as high interest rate spread indicates that banks are charging borrowers high

interest rate on loans extended to them thereby reducing their demand for funds. Theoretically, a strong positive correlation exists between the level of financial intermediation costs and access to credit delivery.

Available evidence suggests that developing countries have banking systems that are mainly characterized by significantly high and persistent financial intermediation costs (Hesse, 2007; Tenant and Folawewo, 2008 and Sapci, 2014). Financial intermediation cost (interest rate spread) in Nigeria has remained persistently high as it rose sharply from 3.5% in 2008 to as high as 8.4% in 2012 (World Bank, 2012). The rising level of financial intermediation costs have adverse implications on the private sector credit delivery in developing countries like Nigeria because in the absence of developed capital market, the private sector businesses primarily rely on bank lending as an external source of business financing for investments that will lead to economic growth. The implication of persistent rise in financial intermediation costs is that it does not encourage savings due to low interest received on deposits which ultimately reduces lending activities and investment potentials of investors as a result of high cost of funding (Mahmood ul and Bilal, 2010). Private sector credit as a ratio of gross domestic product grew significantly up to 59.4% in 2008 (CBN, 2009) but dropped to 37.8% in 2009 and 35.6% in 2012 (World Bank, 2013). The growth recorded in this ratio in Nigeria is low compared to what is obtainable in developed countries where the ratio is a minimum of 70% (Sapci, 2014). The trend in credit growth showed that the percentage of private sector supply dropped from 90.8% in 2007 to 37.8% in 2009 and 31.6% in 2011 (CBN, 2012). This shows that there is a declining trend in private sector delivery which may have suggested that credit demand and supply are affected by the interest rate spread. The implication of the instability of private sector credit delivery is that credit demand and investment potentials of private sector businesses may be constrained which would lead to reduction in economic activities needed to stimulate economic growth and development.

Financial intermediation costs are decomposed into three specific costs element namely: bank operating costs, loan loss provision and reserve requirement (Randall, 1998 in Tigran, 2012). Bank operating cost is a bank specific cost element that measures operating expenses as a ratio of total assets (Tigran, 2012). Bank operating expenditures are non-interest bearing items and as such do not attract any interest or revenue for the banks; hence banks try as much as possible to minimize such cost in the intermediation process. This suggests that variation in the level of bank operating cost and its impact on private sector credit delivery needs to be investigated. Understanding the dynamic responses of private sector credit delivery to variations in the level of bank operating cost is important because rising operating cost of banks have been of increasing concern to researchers. Loan loss provision is a bank specific cost element that measures non-performing loan as a ratio of total loans (Tigran, 2012; Haruna, 2012). Loan loss provision is an implicit cost that captures the impact of credit risk exposure of banks in their lending portfolio. Variation in the level of loan loss provision might affect bank credit delivery because increase in loan loss provision decreases bank lending. It is therefore imperative to trace the dynamic responses of private sector credit delivery to variations in the level of loan loss provisions.

### **Statement of the Problem**

Despite the efforts of the CBN to drive down the cost of borrowing with a view to increasing bank lending capacity and maintaining the monetary policy rate at 15% over the last few years, the interest rate spread has remained very high. For instance, interest rate spread grew from 3.5% in 2008 to 8.5% in 2012 (World Bank, 2013). The fluctuations in the level of

interest rate spread might have a shock-effect in subsequent years on private sector credit delivery but the shock-effect has remained less investigated. Furthermore, banks in the post-consolidation era in Nigeria were expected to report low loan loss provisions, enhanced asset quality and improved availability of bank credit to customers; but unfortunately, banks have continued to record rising incidences of loan loss provision (Aminu, Dogarawa and Sabari, 2014). It therefore becomes imperative to access the extent to which the fluctuation in loan loss provision affects the dynamic response of bank credit delivery in Nigeria. Again, private sector credit delivery has not improved significantly in Nigeria despite government efforts in channeling credit to the private sectors through the commercial banks as significant proportion of private sector credit transaction still takes place in the informal financial market (CBN, 2012; Uremadu, 2009)

### **Objectives of the Study**

The broad objective of the study is to investigate the dynamic responses of private sector credit delivery in Nigeria to variations in financial intermediation costs. The specific objectives are as follows:

- i. To examine the dynamic responses of private sector credit delivery in Nigeria to variations in bank operating costs.
- ii. To ascertain the dynamic responses of private sector credit delivery in Nigeria to variations in loan loss provisions.
- iii. To determine the dynamic responses of private sector credit delivery in Nigeria to variations in interest rate spread.

### **Research Questions**

- i. What are the dynamic responses of private sector credit delivery in Nigeria to variations in bank operating costs?
- ii. What are the dynamic responses of private sector credit delivery in Nigeria to variations in loan loss provisions?
- iii. What are the dynamic responses of private sector credit delivery in Nigeria to variations in interest rate spread?

### **Research Hypotheses**

The hypotheses are stated in null forms as follows:

Ho<sub>1</sub>: The magnitude of the shocks-impact of private sector credit delivery in Nigeria does not depend on the level of variations in bank operating costs.

Ho<sub>2</sub>: The magnitude of the shocks-impact of private sector credit delivery in Nigeria does not depend on the level of variations in loan loss provision.

Ho<sub>3</sub>: The magnitude of the shocks-impact of private sector credit delivery in Nigeria does not depend on the level of variations in interest rate spread.

## CONCEPTUAL REVIEW

Sapci (2014) states that financial intermediation costs comprise of all the costs which banks incur in the intermediation process. Brock and Rojas (2000) define financial intermediation costs as the total interest income to loans less total interest expense divided by total interest-bearing assets. Bernanke (1983) cited in Idries (2010) states that financial intermediation costs refers to the gross margin between total cost that is paid by the borrower and the net return which the depositor has received. Financial intermediation cost at individual bank level is viewed as the ratio of net interest income to total assets of bank. Financial intermediation costs captures the spread by differencing implicit earnings from interest bearing activities of banks while adding implicit cost incurred for using interest bearing funds. In summary, financial intermediation cost refers to the charges required by banks to provide financial services to the borrowers/depositors. Investigating the impact of financial intermediation costs on private sector credit delivery is particularly important in Nigeria. In Nigeria, capitalization, merger and acquisition, and consolidation programmes as part of the financial reforms have led to the decrease in the number of commercial banks from 89 banks before 2004 to 20 banks (CBN, 2013). The phenomenal decrease in the number of banks and the corresponding increases in the size of banks and scale of operation of banks are indication of the emergence of oligopolistic market structure whereby few numbers of banks dominate financial intermediation processes. The likely implication of the emerging oligopolistic market structure is that the few larger banks would take advantage of their economies of scale, market power and low level of competition to raise lending rates and lower deposit rates and at the same time transfer a higher portion of overhead costs to depositors and borrowers.

Tigran (2012) used the accounting framework proposed by Randall (1998) to decompose financial intermediation costs into three costs element namely: operating costs; loan loss provision and reserve requirements. Similarly, increased loan loss provisioning, high operating expenses, high reserve requirements, policy environment and banking behaviours with regards to market power from unchanged operating structures have been identified as factors that sustain high intermediation costs in developing countries (Haruna, 2012, Tigran, 2012).

The private sector include large companies, micro, small and medium scale enterprises producing agricultural products, textile materials, fabricated metal, household utensils, woodworks and other services. The level of credit facilities that flow to the private sector varies according to the perceived credit risk exposures and financial intermediation costs incurred in the intermediation process by the banks. Private sector credit delivery measures the volume of financial resources provided by the banks to the non-financial private sectors (Onwumere, Imo, Frank and Oge, 2012). At individual bank level, the ratio of loans and advances to total bank assets measures private sector credit delivery.

## EMPIRICAL REVIEW

Doriana (2015) carried out a study on the impact of non-performing loan on bank lending behaviour in the Italian banking sector over the period 2007-2013 using panel regression model and ordinary least square regression model. The study found that non-performing loan has negative impact on bank credit supply in Italian banking sector.

Sebastine, Leode and Jan (2014) carried out a study on loan loss provisioning, bank credit and the real economy using a Panel Vector Auto Regression Model for an unbalanced sample of 12 Organization for Economic Cooperation and Development (OECD) countries for the period 1980-2008. The study found that bank lending and loan loss provision drives business cycle fluctuation. Also, it was found that loan loss provision decreases as bank lending increases.

Aminu, Dogarawa and Sabari (2014) carried out a study on the impact of loan loss provision on bank credit in Nigeria during the consolidation period using a sample of 10 deposit money banks for the period 2002-2008. The study found that loan loss provision has negative and insignificant effect on bank credit extended to customers. This implies that bank credit policy on loan loss provisions after consolidation was not effectively implemented by most banks; hence, the insignificant negative impact.

Sapci (2014) investigated the impact of financial intermediation costs on private sector credit supply to the housing market in developed and emerging countries. The study made use of Dynamic Stochastic General Equilibrium (DSGE) model which states that bank intermediates between the borrowers and savers at a cost and requires some borrowers' real estate and/ or physical capital to be collateralized. The study found that financial intermediation cost for banks in emerging countries such as Turkey is two times more than for banks in developed countries such as the United States of America.

Klein (2013) investigated the impact of non-performing loans on private sector credit and macro economic performance in Central, Eastern and South Eastern Europe (CESEE). Data was generated on annual basis from 16 CESEE economies for the period 1998-2011. The study employed Vector Auto Regression (VAR) and Generalized Method of Moment (GMM). The study found that non-performing loan has negative and insignificant impact on bank credit to the private sector in CESEE. The policy implication of the finding is that given the adverse effect of non-performing loans, there is need to strengthen bank supervision to prevent accumulation of non-performing loans in the future.

D'Erasmus (2013) utilized firm dynamic models to evaluate how financial intermediation costs affect corporate credit and size of the formal sector in Brazil. The study specifically sought to determine how changes in corporate credit and formalization can be attributed to reduction in financial intermediation costs. The study found that reduction in financial intermediation costs significantly affects corporate credit and firm size in Brazil.

Panetta (2013) examined the relationship between non-performing loans and growth in private sector credit in Italian banking sector. The study found that a positive relationship exist between non-performing loans and bank lending behaviour. The implication of the finding is that the main obstacle to the growth of loans is the deterioration of the credit risk.

Shijaku and Kalluci (2013) investigated how cost of lending affects bank credit supply to the private sector in Albania. Vector Error Correction Mechanism (VECM) was used based on the assumption that availability of credit is determined by economic activity and the capacity to supply and demand credit. Data were obtained on quarterly basis from 2001-2011. The result showed that lower cost of lending, diminished government borrowing and qualitative bank credit enhances bank credit delivery to the private sector.



Tan (2012) investigated the potential impact of relatively high banking spreads in the Philippines and Asia on private credit expansion. Using bank level data for 38 emerging markets from 2001-2010, the study found that higher credit growth, lower inflation, high reserve requirements, greater banking sector development, small stock market development and lower government deficits reduce interest rate spread.

Nkusu (2011) investigated the impact of non-performing loan on credit to the private sector and macroeconomic performance in 26 advanced economies in the period of 1998–2009. The study found that adverse shocks to macroeconomic performance and credit to the private sector leads to deterioration of loan quality. The implication is that higher level of non-performing loans lead to a decline in credit to private sector (credit to GDP ratio) and macroeconomic performance (GDP growth).

Olokoyo (2011) carried out a study on commercial banks' lending behaviour in Nigeria over the period 1980 to 2005. The study found that the volume deposits, lagged value of commercial bank loans and advances, investment portfolio, gross domestic product and foreign exchange had significant positive impact on loans and advances. The study also showed that lending rate, cash reserve requirement and liquidity reserve had positive but insignificant relationship with loans and advances. The implication of the findings is that higher reserves, high lending rate and high liquidity reserves reduces the volume of funds available for lending and consequently affects banks' ability to extend credit to the private sector.

Espinosa and Prasad (2010) studied the impact of non-performing loan on bank credit to the private sector in the Gulf Cooperation Council (GCC) region. The study selected a sample of 80 banks from the Gulf Cooperation Council (GCC) region. The study used the Panel Vector Auto-Regression (VAR) analysis and found that an increase in non-performing loan reduces credit growth and the non-GDP growth.

Vika (2009) investigated the factors that affect total credit to the private sector and credit denominated in domestic currency in Albania for the period 2004 to 2006. The Generalized Method of Moment (GMM) was used for the study. The study showed that gross domestic product (GDP) and liquidity of the banking system had positive correlation with private sector credit. On the other hand, repurchase agreement rate and size of banks had negative correlation with private sector credit in Albania.

Christos, Emmanuel and Anastasia (2007) carried out a study on bank operating performance in seven South Eastern European (SEE) countries for the period 1998-2003. The study adopted panel regression models and estimation techniques. The study found that bank operating cost (operating expenses/total asset) has negative and insignificant impact on private sector credit (loans and advances/total asset).

Hesse (2007) examined financial intermediation costs in pre-consolidated banking sector in Nigeria over the period 2000-2005 using fixed effect and pooled ordinary least square regression model to evaluate quarterly data on all the 89 banks in Nigeria. The study found that larger banks incur lower overhead cost and holding of liquidity decreases interest spread while increased bank concentration has no effect on interest spread.

Beck and Hesse (2006) investigated why financial intermediation cost is high in Uganda over the period 1999 to 2005. Using panel data regression model, the study found that bank

specific variables such as bank size, operating costs and composition of loan portfolio affects financial intermediation cost and that bank lending to agricultural sector attracts higher financial intermediation costs.

## THEORETICAL FRAMEWORK

This study adopted information asymmetry theory. Information asymmetry theory was propounded by Akerlof (1970) and the theory was first applied to market for used cars by Akerlof in the year 1970. The theory assumes that financial markets are not perfect and financial intermediaries primarily exist to reduce information and transaction costs that arise from market imperfection between borrowers and lenders. Information asymmetry theory states that it may be complex to differentiate between good/honest and bad/dishonest borrowers. Many potential private sector borrowers who are honest fail to access credit because the banks cannot objectively establish credit worthiness of borrowers as a result of information asymmetry. Some bad credit risk borrowers have taken advantage of the information asymmetry problems to create multiple bad loans in the Nigerian banking industry. Information asymmetry problems creates higher interest rate and as interest rate rises above the rate honest borrowers could pay; some honest borrowers will decide not to borrow and this increases the proportion of loans extended to dishonest borrowers who are not likely to repay the loans thus leading to increasing loan default rate. As loan default (non-performing loan) increases, the banks further raises the interest spread to offset the rising financial intermediation costs and this situation adversely affects bank credit delivery to the private sector. Information asymmetry emphasizes that lack of information about customers can increase the problems of adverse selection and moral hazard, and as such can exacerbate the quality of bank loans (Aryeetey, Hettige, Nissanke and Steel, 1997 cited in Ezeoha, 2011). Information asymmetry leads to adverse selection and moral hazard problems.

## Research Design

This study adopted the *Ex-post Facto* research design because the study relied on historic accounting data. The study involved both time series and cross-sectional data, and as such relied on panel data techniques. The study used panel estimation techniques to estimate a panel of 14 commercial banks that have been in operation in Nigeria since 2005 to 2014. Panel data also allow for better analysis of dynamic adjustment (Kennedy, 2003). Impulse Response Functions (IRFs) analysis was used to estimate the shocks-impact of dynamic responses of private sector credit delivery in Nigeria to variations in the level of bank specific costs element. Impulse Response Functions (IRFs) analysis in time series analysis is essential in ascertaining the effects of external shocks on the variables in the system. In general IRFs shows us how an unexpected change in one variable (private sector credit delivery) at the beginning affects another variable (bank specific costs element) through time. The impulse response graphs were used to trace the movement of the shocks-impact along, below or above the base line. The statistical package used in data analyses were E-view 9.0 and STATA 13.0 Versions.

## Model Specification

The study in line with previous studies (Klein, 2013; Doriana, 2015; Tigran, 2012) adopted multiple regression models using panel data from selected Nigerian banks. The baseline panel regression model is specified as follows:

$$PSC_{it} = \alpha_i + \beta_1 OC_{it} + \beta_2 LLP_{it} + \beta_3 IRS_{it} + \varepsilon_{it} \quad \text{--- 1}$$

Where;

$PSC_{it}$  = Private sector credit delivery measured as loans and advances to total assets (dependent variable),  $OC_{it}$  = Bank operating costs measured as operating expenses to total assets (independent variable),  $LLP_{it}$  = Loan loss provision measured as non-performing loan to total loan (independent variable),  $IRS_{it}$  = Interest rate spread measured as net interest income to total assets (independent variable)  $\alpha$  = intercept term or constant factor,  $\varepsilon$  = Error term (incorporating omitted factors),  $\beta_1 \dots \beta_3$  = Regression coefficients to be determined,  $i$  = index for individual bank (for the 14 sampled banks),  $t$  = time effects (year 2005 - 2014)

## Descriptive Test Results

**Table 1: Descriptive Statistics**

	PSC	OC	LLP	IRS
Mean	0.3782	0.0497	0.2135	0.1702
Median	0.3812	0.0498	0.0671	0.1379
Maximum	0.5804	0.1303	6.2252	3.4496
Minimum	0.0886	0.0031	0.0001	8.29E-05
Std. Dev.	0.1056	0.0205	0.6015	0.2857

**Source: Authors' Computation 2016 from E-view 9.0 Version**

Table 1 above shows the descriptive statistical analysis between the dependent and independent variables. The average percentage of private sector credit delivery (PSC) across the selected banks within the period under review (2005–2014) stood at 37.82%. This indicates that the volume of bank credit extended to the private sector is low compared to a minimum of 70% in developed countries (Sapci, 2014). The level of bank operating costs (OC) averaged 4.98% over the study period. It implies that banks might have taken advantage of economies of scale of operation arising from bank consolidation in Nigeria since 2005 to reduce operating costs. The volume of loan loss provision (LLP) stood at 21.35% on average and this shows that loan loss provision exerts the highest level of influence on private sector credit delivery in Nigeria. This is an indication of asset deterioration or poor asset quality in the balance sheet of banks. The level of interest rate spread (IRS) measured as the ratio of net interest income/total assets stood at 17.02% on average. This might suggest that on average, interest rate spread account for only 17.02% change in private sector credit delivery in Nigeria.

**Table 2: Correlation Matrix**

	PSC	OC	LLP	IRS
PSC	1.0000			
OC	-0.1437	1.0000		
LLP	0.0903		1.0000	
IRS	-0.3248	0.0864	0.0001**	1.0000
	0.0148**	0.3053	0.9608	

**Source: Authors' Computation 2016 from STATA 13.0 Version**

\*\* indicates significance at 5% level



The correlation test result in Table 2 above indicates that loan loss provision (LLP) has significant negative relationship with private sector credit delivery in Nigeria as indicated by its coefficient estimate of -0.3248 and p-value of 0.0001. This implies that loan loss provision has inverse relationship with private sector credit delivery meaning that increase in the volume of loan loss provision leads to the reduction in private sector credit delivery in Nigeria. Interest rate spread (IRS) has significant negative relationship with private sector credit delivery in Nigeria as confirmed by the value of the coefficient estimate of -0.2056 and the corresponding p-value of 0.0148. This implies that interest rate spread has inverse relationship with private sector credit delivery meaning that increase in the level of interest rate spread leads to the reduction in private sector credit delivery in Nigeria. The correlation result also showed that the level of bank operating costs (OC) has insignificant negative relationship with the private sector credit delivery (PSC) in Nigeria as the coefficient estimate was -0.1437 while the corresponding p-value was 0.0903. This implies that bank operating costs have inverse relationship with private sector credit delivery however the level of bank operating costs exerts insignificant influence on private sector credit delivery in Nigeria.

**Table 3: Heterogeneity Test Results.**

Banks	PSC	OC	LLP	IRS
Access	0.4244	0.0436	0.0653	0.1402
Diamond	0.3867	0.0535	0.0829	0.1976
ECO	0.4135	0.0509	0.1558	0.1258
FCMB	0.3785	0.0416	0.0498	0.1546
Fidelity	0.3808	0.0491	0.1166	0.1182
1 <sup>st</sup> Bank	0.3934	0.0537	0.0835	0.1730
GTBank	0.4361	0.0426	0.0395	0.1342
Skye bank	0.4531	0.0481	0.0755	0.1064
Stanbic Ibtc	0.4066	0.0255	0.0965	0.1458
Sterling Bank	0.3421	0.0607	0.7462	0.1231
UBA	0.3128	0.0518	0.4423	0.1361
Union Bank	0.2754	0.0606	0.3124	0.5586
Wema Bank	0.3346	0.0712	0.6915	0.1138
Zenith Bank	0.3568	0.0442	0.0321	0.1556

**Source: Authors' Computation 2016 from E-view 9.0 Version**

Table 3 reports the heterogeneity in the data across banks using the bank-specific parameters' mean (PSC, OC, LLP, IRS) computed from E-view 9.0 version. There is pronounced cross-bank variation. The parameters range from 0 to 0.75. The cross-sectional variation is observed for all the variables, for which the parameter (PSC) ranges from a maximum of 0.45 (Skye bank) to a maximum of 0.43 (GTBank). The parameter (OC) ranges from a maximum of 0.071 (Wema bank) to a maximum of 0.0607 (Sterling Bank). As for the parameter (LLP), it ranges from a maximum of 0.75 (Sterling Bank) to a maximum of 0.69 (Wema Bank). The mean score IRS ranges from a maximum of 0.56 (Union Bank) to a maximum of 0.19 (Diamond Bank) and PR, it ranges from a maximum of 0.09 (Stanbic Bank) to a maximum of 0.08 (Wema Bank). The cross-sectional variation amongst the banks in the sample is clearly more outstanding for Sterling bank having LLP mean score of 0.75 among all the banks.

### **Dynamic Response of Private Sector Credit Delivery (PSC) to Variations on Bank Specific Costs Element.**

The study presents the empirical results of bank specific costs element and private sector credit delivery by analyzing the impulse responses obtained from the Panel Vector Auto Regression (Panel VAR) process. The result of the Panel VAR process was presented in Table 4 below.

**Table 4: The VAR Lag Order Selection Criteria Test**

Lag	LogL	LR	FPE	AIC	SC	HQ
0	354.4316	NA	1.68e-10	-8.319799	-8.175108	-8.261635
1	427.1523	135.0528	5.39e-11	-9.456007	8.587858*	9.107018*
2	448.1663	36.52434	5.96e-11	-9.361102	-7.769496	-8.721290
3	480.9562	53.08850*	5.03e-11*	9.546577*	-7.231514	-8.615941
4	496.4250	23.20319	6.51e-11	-9.319644	-6.281123	-8.098184

**Source: Authors' Estimation 2016 from Eview 9.0.**

Table 4 above was used to ascertain the impact of the stated shocks (dynamic response of the private sector credit delivery in Nigeria to variations in the level of bank operating costs, level of loan loss provisions of banks and the level of interest rate spread of banks) obtained from the Panel VAR process, we performed an impulse response analysis of the specified model, by calibrating the unrestricted VAR model with common lag lengths as specified by the lag order selection criteria which were justified by the Final Prediction Error (FPE) criterion and the Akaike Information Criterion (AIC). The Cholesky adjusted degree of freedom, one standard deviation innovation impulse response, report the responses for 3 annual horizons with 95 percent confidence intervals. This analysis was used to capture the impacts of the stated shocks by dividing the original impulse responses by the standard deviation of the respective bank specific costs element shocks. This process made it possible for the researcher to deal with the sizes of the levels of shocks in the other variables in the model to a subsequent unit change in private sector credit shock of similar magnitude.

The result of the impulse response function was presented in Table 5 below.

**Table 5: Response of PSC to Bank Specific Costs Element**

Variables	Period	Response	Presence of Shock
PSC	1 <sup>st</sup> Year	0.0698	(Reject)
PSC	2 <sup>nd</sup> Year	0.0378	(Accept)
PSC	3 <sup>rd</sup> Year	0.0205	(Accept)
OC	1 <sup>st</sup> Year	0.0000	(Reject)
OC	2 <sup>nd</sup> Year	-0.0108	(Accept)
OC	3 <sup>rd</sup> Year	-0.0327	(Accept)
LLP	1 <sup>st</sup> Year	0.0000	(Reject)
LLP	2 <sup>nd</sup> Year	0.0038	(Accept)
LLP	3 <sup>rd</sup> Year	0.0013	(Accept)
IRS	1 <sup>st</sup> Year	0.0000	(Reject)
IRS	2 <sup>nd</sup> Year	0.0046	(Accept)
IRS	3 <sup>rd</sup> Year	-0.0316	(Accept)

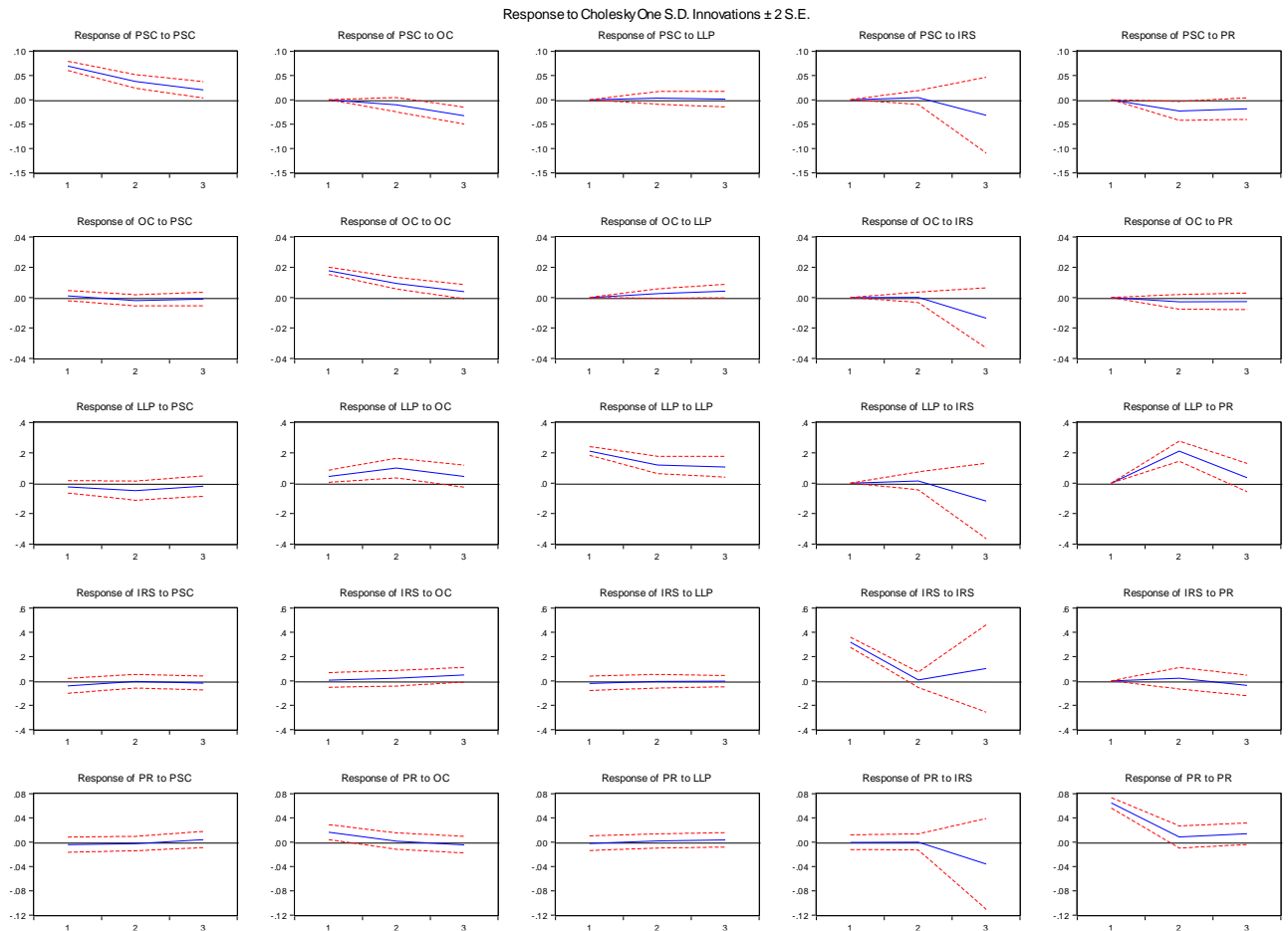
**Source: Authors' Estimation 2016 from Eview 9.0**

Based on Table 5 above, Private Sector Credit (PSC) reacts strongly and persistently to variations in its own shock. Its shock effect remains positive in the first to third year periods. This further shows that the response of PSC to the positive innovation in PSC was about 0.0698 units in just one year period, it gained about 0.0378 units in the subsequent period and obtained 0.0205 unit changes in the 3<sup>rd</sup> year.

The response of private sector credit (PSC) to positive shock of bank operating cost neither decreased nor increased the impact with 0.0000 units in the first year period. The response indicating the shock effect of bank operating cost (OC) on PSC revealed a decrease with about -0.0108 units in the second year period. Subsequently, it decreased more in the 3<sup>rd</sup> year with about -0.0327 units.

The response of private sector credit (PSC) shows high levels of no effect to shocks from bank loan loss provision (LLP) in the 1<sup>st</sup> year period. However, it exhibited increasing impact of about 0.0038 units and 0.0013 units between the second and third year periods.

The response of private sector credit (PSC) to interest rate spread (IRS) consistently remained on the baseline in the first year but witnessed 0.0316 unit decrease in the 3<sup>rd</sup> year. In the first year, there was no significant response of PSC to shock in interest rate spread. This indicated that positive shock to interest rate spread (IRS) did not exert significant impact on private sector credit in the first year but did influence the private sector credit in the 2<sup>nd</sup> year period by 0.0046. However, in the third year, positive shock to interest rate spread exerted negative influence on private sector credit (PSC) by 0.0316 units.

**Table 6: Impulse Response Graphs**

**Source: Authors' Estimation 2016 from Eview 9.0**

### Test of Research Hypotheses

Research hypothesis one to three examined the magnitude of the shocks-impact of private sector credit delivery in Nigeria on the level of variations of bank specific costs element (bank operating costs, loan loss provision and interest rate spread). Test of hypotheses were based on the magnitude of the coefficients in Table 5 and the position of the graph plot along, above or below the baseline in Table 6 (Graph plots) respectively. The decision rules were: Decision Rule 1: Reject the null hypothesis and accept the alternate hypothesis if the graph plot lies above or below the baseline. Decision Rule 2: Accept the null hypothesis and reject the alternate hypothesis if the graph plot lies along the baseline.

Based on Table 5 and 6 (Graph Plots), the dynamic responses of PSC to PSC and PSC to the bank specific costs elements (bank operating costs, loan loss provisions and interest rate spread), it was observed that the graph plots were seen to be on the baseline in the first year while in the second and third years, the graph plots were either above or below the baseline. The weight of the observations lies either above or below the baseline. Thus, the null hypothesis of no presence of shock-impact was rejected while the alternate hypothesis of presence of shock-impact was accepted. Therefore, it was concluded that the magnitude of the shocks-impact of private sector credit delivery in Nigeria depends on the variations in the level of bank specific costs elements.

## DISCUSSION OF FINDINGS

The study found that the magnitude of the shocks-impact of private sector credit delivery in Nigeria depends on the variations in the level of bank specific costs elements. Based on the lag length order for the VAR process, 3 year lag lengths was considered enough time to ascertain the shocks-impact because more weight lies on the three selection criteria {Likelihood Ratio (LR) Test, Final Prediction Error (FPE) and the Akaike Information Criterion (AIC)}. The coefficients of the impulse responses and the graph plots of the impulse response function indicates that one positive change in bank operating costs (OC) will exert no shocks-impact on private sector credit delivery in the 1<sup>st</sup> year but will cause decrease in private sector credit (PSC) from -0.0102 units in the 2<sup>nd</sup> year and

-0.0327 units in the 3<sup>rd</sup> year. It was also observed that an increase in loan loss provision (LLP) will cause no shocks-impact on private sector credit delivery in the economy in the 1<sup>st</sup> year but will decrease private sector credit delivery of 0.0038 units in the 2<sup>nd</sup> year and 0.0013 units in the 3<sup>rd</sup> year. The study further showed that a positive change in interest rate spread (IRS) will cause no shock effect on private sector credit (PSC) in the 1<sup>st</sup> year, but will exert a positive change of 0.0046 units in the 2<sup>nd</sup> year and a negative change of -0.0316 units in the 3<sup>rd</sup> year.

The implication of the finding in the future (3-year period) is that there will be absence of shocks-impact in the 1<sup>st</sup> year but there will be presence of shocks-impact of various magnitude in the subsequent years (2<sup>nd</sup> and 3<sup>rd</sup> years) respectively. The result is in conformity with Sebastine, Leode and Jan (2014) and Klein (2013) who found that loan loss provision decreases as bank lending increases. Finally, the policy implication of the result is that in subsequent years in the future, the shocks-impact of private sector credit delivery on bank specific costs element will be felt in 2<sup>nd</sup> and 3<sup>rd</sup> years respectively. This means that shocks on bank operating costs, loan loss provisions and interest rate spread has no long lasting effect on private sector credit delivery in Nigeria.

## CONCLUSION

The study concludes that the magnitude of the shocks-impact of private sector credit delivery in Nigeria depends on the variations in the level of bank specific costs elements. The foregoing conclusion indicates that financial intermediation cost is high and that it impacts negatively on private sector credit delivery in Nigeria. The conclusion equally indicates that banks as financial intermediaries primarily exist to reduce transaction and information costs associated with lending and borrowing activities.

## RECOMMENDATIONS

Based on the research findings and the conclusions drawn thereof, the following recommendations were made:

1. That the high level of loan loss provision (non-performing loans/total loans) should be addressed through efficient information sharing system among the commercial banks. Information sharing reduces adverse selection problems by enhancing information on



loan applicants. This means that through credit information sharing mechanism, lenders can distinguish between bad and good borrowers from a pool of borrowers.

2. That efforts should be intensified to ensure that shocks in bank specific costs element does not adversely affect private sector credit delivery in Nigeria.

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**APPENDIX 1: RAW DATA FOR ANALYSIS**

<b>BANK</b>	<b>YEAR</b>	<b>NPL</b>	<b>NII</b>	<b>NI</b>	<b>OE</b>	<b>TLA</b>	<b>TA</b>
<b>ACCESS</b>	2005	1752232	3929248	501515	4182839	16183353	66918315
	2006	8092412	8732783	737149	8383807	54111173	174553866
	2007	10741448	10358344	6083439	13110924	107750578	328615194
	2008	9588685	22431481	16056464	20112197	244595621	1031842021
	2009	8765935	61836721	22885794	26253003	391688687	674865041
	2010	31228154	59388433	880752	38797403	360387649	647574719
	2011	20682485	50745459	12931441	39776147	403178957	726960580
	2012	23861019	84996482	13660448	38964674	463131979	945966603
	2013	17924178	66685119	29754522	65619998	735300741	1704094012
	2014	19966521	88667121	22057198	64938813	1019908848	1981955730
<b>DIAMOND</b>	2005	2534977	6939152	2526522	7876222	18444445	124994957
	2006	4005619	10078431	3849545	11906030	40822966	223047862
	2007	7244809	15905687	6930754	18665528	96384941	312249721
	2008	10280201		11822011	24570069	231445158	603326540
	2009	23378125	24731795	4883446	27356396	296537785	604000914
	2010	46605507	49165644	6522455	43115551	294920909	548402560
	2011	36878356	69203014	22868254	34865734	344397331	714063959
	2012	25334646	84800858	23073427	39549134	523374608	1059137257
	2013	20262048	99089280	29754522	76355705	585953062	1354930871
	2014	33195372	101933000	22057198	90619000	712065000	1750270423
<b>ECO</b>	2005	3108114	3188945	1668174	4458013	19130959	67652618
	2006	1688989		3558591		52279284	132091706
	2007	11307655	13257793	7449777	15469293	116180680	311395894
	2008	69406287	18391667	2130461	26602095	144917536	432466245
	2009	89620000	23257000	4588000	30614000	183719000	355662000
	2010	64539000	28554000	1619000	30521000	231108000	454239000
	2011	7359940	22129000	19344000	26511000	410150000	1085058000
	2012	548053	73382000	7805000	47340000	546873000	1325315000
	2013	744272	88399000	11658000	42459000	625907000	1460811000
	2014	96154	99128000	29733000	54981000	892721000	1772922000
<b>FCMB</b>	2005	995597	3360471	797792	2628184	11436232	51318268
	2006	1628132	2747402	2841380	4556131	19070768	106611289
	2007	2739982	9492904	5802857	10674615	83577134	262805890
	2008	5290848	29920489	13720470	19380206		465210901
	2009	22517000	36823966	3465812	26460056	270188782	614409614
	2010	19085000	40702524	669371	28369962	323631060	630073488
	2011	9086000	53748587	7322322	29648123	315101376	593273465
	2012	909012	37398853	10322664	12417616	350489990	890313606
	2013	9450876		6027752	6088029		131482189
	2014	22962196	438029	66027752	5450877		131570290
<b>FIDELITY</b>	2005	2008165	2298072	856885	2189767	13892290	34953351
	2006	7756529	4500585	3162347	4579601	38661271	119985351

	2007	6264340	8820212	4160007	9039820	70237512	217144465
	2008	7207519	29839060	12986570	15825410	230713051	533122233
	2009	48084866	43491275	2296799	26013943	215112075	504163720
	2010	47116000	26381000	5828000	29235000	158516000	478020000
	2011	17355000	29178000	5959000	38387000	255257000	739508000
	2012	13829000	36810	17924000	50708000	345500000	914360000
	2013	16573000	30812000	7721000	54816000	426076000	1081217000
	2014	17451000	48826000	13796000	57099000	541686000	1187025000
<b>FIRSTBANK</b>	2005	34674000	26421000	13243000	26648000	114673000	377496000
	2006	17339000	29468000	17383000	33748000	175657000	540129000
	2007	6620000	39627000	20636000	41446000	219185000	762881000
	2008	6195000	57527000	36540000	62260000	437768000	1165461000
	2009	88506000	87059000	35074000	81533000	684107000	1667422000
	2010	89703000	46045000	1275000	14153616	575790096	1410243538
	2011	28098000	167223000	32123000	133368000	580293531	1841737651
	2012	22171000	205547000	23052000	168908000	924807196	2047496098
	2013	22174000	206709000	59365000	96308000	1134069198	2088134589
	2014	23070000	215449000	79351000	127727000	1794037000	3490871000
<b>GTBANK</b>	2005	1359293	7535955	13234000	9103465	65035248	167897704
	2006	2911474	11593534	17383000	12199196	83476852	305080565
	2007	2289784	17555062	20636000	17688652	113705183	478369179
	2008	3573179	45762318	36540000	35423810	413983817	918278756
	2009	70123787	73468110	23848061	49963277	538137569	1019911536
	2010	41107607	77596839	38411612	54451935	574255521	1067172389
	2011	22397489	93527341	51653251	60701662	678358919	1525010483
	2012	21464872	123098741	85263826	67343628	742436944	1620317223
	2013	25355634	127857215	85545510	72049146	926967093	1904365795
	2014	23085493	128698830	93431604	79148134	1182393874	2126608312
<b>SKYE BANK</b>	2005	1252503	1763469	492719	3003522	12122680	31990861
	2006	4759897	6840000	1961371	10919472	71718000	174197000
	2007	5513000	16238000	5517000	18427000	108450000	446114000
	2008	8535000	26233000	15126000	28082000	246390000	784878000
	2009	69100000	47583000	1130000	41535000	317764000	622164000
	2010	49639000	39936000	9308000	38485000	385435000	674664000
	2011	25341000	45287000	2627000	21423000	489251000	876527000
	2012	17079000	44071000	12692000	39370000	540036000	1071311000
	2013	17545000	61209000	15865000	50465000	551328000	1114009000
	2014		16209000	2766000	17476000	567472000	1042934000
<b>STANBIC</b>	2005	396543	3047505	4250440	2358155	13487436	34567664
	2006	12130171	5614344	8164014	4124020	50067653	110781785
	2007	9258018	9499455	18872568	6941765	79635690	304519994
	2008	15537000	21950000	35087000	9214000	99010000	345762000
	2009	17702000	24082000	36835000	6258000	110967000	331796000
	2010	8642776	25796000	40627000	7811000	164203000	372612000
	2011	7542256	26836000	45221000	3964000	302771000	554507000

	2012	14340000	31603000	52728000	5576000	290915000	676819000
	2013	13407000	34802000	61228000	8386000	383927000	763046000
	2014		46658000	104602000	32065000	398604000	944542000
<b>STERLING</b>	2005	10725125		4820558		1722851	19435289
	2006	11839912	3350650	961645	7214315	38945949	109664427
	2007	10901676	2952041	620658	9934041	45957835	145974674
	2008	7196566	11720717	6523153	13966433	65787520	236502923
	2009	22289082	12452784	6660406	19434227	78140098	205640827
	2010	11059183	14468906	4178493	15162982	99312070	259579523
	2011	8227240		6908598		162063156	504048213
	2012	11752908	23894000	6953539	31952000	229420873	580225940
	2013	12945690	35812646	8274864	40013363	321743748	707797181
	2014		43016783	9004973	50626714	371246273	824539426
<b>UBA BANK</b>	2005	2420000	10966000	4921000	15737000	67610000	248928000
	2006	12989000	32328000	11468000	43512000	107194000	851241000
	2007	14087000	26531	19831000	44424000	320229000	1102348000
	2008	15579000	71372000	40002000	58345000	405540000	1520091000
	2009	39647000	108536000	12889000	107717000	573465000	1400879000
	2010	40200000	62927000	2167000	82458000	569312000	1432632000
	2011	9088000	56224000	79669000	101978000	552526000	1655465000
	2012	827141628	74845000	54765000	91704000	570714000	1933065000
	2013	1045248209	76176000	46483000	85922000	796942000	2217417000
	2014	1120731414	82125000	40083000	99226000	884587000	2338858000
<b>UNION</b>	2005	18588000	31175000	9375000	23745000	78684000	398271000
	2006	28281000		10036000		116060000	517564000
	2007	23597000		12126000		149376000	619800000
	2008	54289000	53809000	24737000	41926000	244845000	907074000
	2009	209089000	72869000	71052000	60369000	401546000	1106779000
	2010	102044000					845231000
	2011	95044000	56224000	7966000	82084000		842763000
	2012		74845000	47373000	75393000		886468000
	2013		791700000	3800000	58600000	229500000	1002800000
	2014		95300000	26800000	58700000	312800000	1009000000
<b>WEMA</b>	2005	15677263	2527994	844285	7213096	46183046	97909060
	2006	42284405	584613	6601962	8525158	53702803	120109067
	2007	21161431	4239718	2554098	11014350	68796732	165081532
	2008	25151243	8377591	57738739	16794212	48394253	128906575
	2009	69907288	3717430	2094492	13293765	28636557	142785723
	2010	37427763	5670177	16238533	18206006	38637809	203144627
	2011	32123453					
	2012	12932960	11768106	5040629	17786240	73745728	245704597
	2013	4076942	12524356	1596531	1016882	98631825	330872475
	2014	3789373	18551913	2372445	3093940	149293849	382562312
<b>ZENITH</b>	2005	2084923	17265208	7155926	18153540	122494396	329716511
	2006	2309405	26832021	11488800	31298000	199707860	608505175



2007	4022377	43283859	17509145	45388460	218306000	883941000
2008	9406000	87851598	46524991	85094715	417073000	1680032000
2009	46413000	103183000	18365000	103410000	669261000	1573196000
2010	41832000	83969000	33335000	89074000	667860000	1789458000
2011	31476000	117960000	32100000	108450000	767372000	2169073000
2012	28457000	147878000	42411000	51733000	895354000	2436886000
2013	34208000	175381000	45419000	72066000	1126559000	2878693000
2014	26407000	185732000	47445000	75366000	1580250000	3423819000

**Key:** NPL = Non Performing loans, NII = Net Interest Income, NI = Net Income, OE = Operating Expenses, TLA = Total Loans and Advances, TA = Total Assets.

**Source:** Individual Bank Annual Reports and Financial Statements (2005-2014)