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This paper examines the dynamics of deposit money banks (DMB) credit and the role of consolidation in credit growth in Nigeria using vector error correction model and Granger causality test. The empirical investigation involved DMBs that have maintained a unique name and some market characteristics before and after the 2004 banking sector consolidation. Using quarterly data from 1999Q1 – 2013Q2 of the selected DMBs, the results show a positive relationship between post-consolidation credit supply growth and the real gross domestic product. The results also show that despite the one-sided positive causality from credit supply to economic growth, the total contribution of the consolidated credit growth to real activity was not significant. The paper, therefore, recommends that in order to improve the credit channel of monetary policy transmission, policy makers should take into account how the banks react to such policies.

Keyword: Bank Consolidation, Credit Growth, Economic Activity, Monetary Policy

JEL Classification: E20, E51, E52

1.0 Introduction

It is well established that financial intermediaries have a fundamental role in determining the amount and distribution of credit to the economy. Nevertheless, there is less agreement about the precise way in which alternative structures of the banking industry due to bank consolidation will manifest their influence on the economy. Over the past two decades, the Nigerian banking sector has undergone remarkable changes, prominent among which is financial consolidation influenced largely by weak capital base of the banks, overdependence on public sector deposits, insolvency and internally focused competition (Soludo, 2004; Pat and James, 2011). In 2004 specifically, DMBs in Nigeria decreased from 89 to 25, primarily due to the wave of bank mergers and acquisitions (see Barros and Caporale, 2012). Alao (2010) also advocated for further mergers of DMBs in consonant with a

[1] The views and expressions in this paper are those of the authors and do not reflect the position of the Central Bank of Nigeria.

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former Governor of the Central Bank of Nigeria ideology of no more than 10-20 megabanks all over the world by 2025 and 2050 (see also Soludo, 2004). Of particular interest to the policy makers and analysts was the hope of an efficient banking system that will also make an extensive contribution to economic growth in the country through credit to private sector and establishment of robust asset management outlook (Pat and James, 2011; Lemo, 2005; Soludo, 2004).

According to Kashyap and Stein (1995), the sensitivity of loan to changes in monetary policy is related to bank size. In other words, it is believed that credits of big banks have greater sensitivity to changes in monetary policy than those of smaller banks. However, the existence of many banks may shelter small firms from the negative asymmetric effect of monetary policy, whereas a significantly concentrated banking industry may penalize them more than large firms. It is also evident in Nigeria that real activity which is encapsulated in gross domestic product (GDP) and consumer price index (CPI) is driven more by small firms than large firms. Bernanke and Gertler (1995) reported that increased riskiness of small firms during the periods of restrictive monetary policy causes banks to concentrate their loans on larger, more diversified firms. Given the dominance of small firms in Nigeria, the relationship between economic growth and DMB's credit growth after the merger at any instance of monetary policy shock motivates this study.

The objective of this paper therefore is to examine the dynamics of bank credit growth in Nigeria before and after bank consolidation. The intuition is that if a positive relationship exists between DMBs' credit growth and economic activity after the consolidation, then any wave of further bank mergers may be impactful to economic growth in Nigeria. This underpinning phenomenon, to the best of our knowledge, has since been an open problem until now. The remaining sections of the paper present a brief background of the study, the related literature, the methodology adopted for the analysis, estimation results, concluding remarks and policy implications.

1.1 Stylized Facts on DMBs in Nigeria and Consolidation

Bank consolidation is considered to be one of the major policy instruments in correcting deficiencies in the financial sector as well as accelerating the rate of growth in the sector (Barros and Caporale, 2012).

Table 1: Post-Consolidated Banks in Nigeria after 2004 Banking Reform

S/N	Bank Name	Members of the Group
1	**Access Bank Plc**	Marina Bank Capital Bank International Access Bank
2	**Afribank Plc**	Afribank Plc Afrimerchant Bank
3	**Diamond Bank Plc**	Diamond Bank Lion Bank African International Bank (AIB)
4	**EcoBank**	EcoBank
5	**Equitorial Trust Bank Plc**	Equatorial Trust Bank (ETB) Devcom
6	**First City Monument Bank Plc (FCMB)**	FCMB Co-operative Development Bank Nig-American Bank Midas Bank
7	**Fidelity Bank Plc**	Fidelity Bank First Savings Bank Manny Bank
8	**First Bank Plc (FBN)**	FBN plc FBN Merchant Bank Muslim Commercial Bank (MBC)
9	**FirstInland Bank Plc**	IMB International Bank Inland Bank First Atlantic Bank NUB International Bank Limited
10	**Guaranty Trust Plc (GT)**	GT Bank
11	**IBTC-Chartered Bank Plc**	Regent Chartered IBTC
12	**Intercontinental Bank Plc**	Global Equity Gateway Intercontinental
13	**Nigerian International Bank (NIB)**	Nigerian International Bank
14	**Oceanic Bank Plc**	Oceanic Bank In't Trust Bank
15	**Platinum-Habib Bank Plc**	Platinum Bank Habib Bank
16	**Skye Bank Plc**	Prudent Bank Bond Bank Coop Bank Reliance Bank European Investment Bank (EIB)
17	**Springbank Bank Plc**	Guardian Express Bank Citizens Bank Fountain Trust Bank Omega Bank TransInternational Bank African Continental Bank (ACB)
18	**Stanbic Bank Ltd**	Stanbic Bank
19	**Standard Chartered Bank Ltd**	Standard Chartered Bank Ltd
20	**Sterling Bank Plc**	Magnum Trust Bank NBM Bank NAL Bank Indo-Nigeria Merchant Bank Trust Bank of Africa
21	**United Bank for Africa Plc (UBA)**	Standard Trust Bank (STB) UBA Continental Trust Bank
22	**Union Bank Plc**	Union Bank Union Merchant Bank Universal Trust Bank Broad Bank
23	**Unity Bank Plc**	New Africa Bank Tropical Commercial Bank Centre-Point Bank Bank of the North New Nigeria Bank (NNB) First Interstate Bank Intercity Bank Societe Bancaire Pacific Bank
24	**Wema Bank Plc**	Wema Bank National Bank
25	**Zenith International Bank Plc**	Zenith International Bank Plc

Source: CBN Publication (2006)[4]

According to the Nigerian Companies and Allied Matters Act 1990, bank consolidation is defined as ‘‘any amalgamation of the undertakings or any part of the undertakings or part of the undertakings of one or more companies and one or more bodies corporate’’ (Alao, 2010). In other words, it is viewed as the reduction in the number of banks and other deposit taking institutions with a simultaneous increase in size and concentration of the consolidation entities in the sector as well as strengthening the institutional framework for the

[4] http://www.cenbank.org/OUT/PUBLICATIONS/BSD/2006/COMPONENTS OF MERGED BANKS.PDF

conduct of monetary policy (see Assaf *et al.*, 2012; Balogun, 2007). Prior to the 2004 banking sector consolidation, the banking system was viewed as being highly oligopolistic with remarkable features of market concentration and leadership (Lemo, 2005).

In 2004, the banking industry of Nigeria consisted of 89 deposit money banks. The industry was disjointed into relatively small, weakly capitalized banks. It was observed that 19.2% of the total assets in the banking system as at June, 2004 was accounted for by marginal and unsound banks with 17.2% of total deposit liabilities, while industry non-performing assets was 19.5% of the total loans and advances (Soludo, 2004). The result of a new, much larger capital requirement was the consolidation of banks into larger entities where a number of mergers and acquisitions among Nigerian banks took place in order to meet the new capital requirement. In the end, the 89 banks that existed in 2004 decreased to 25 larger, better-capitalized banks (Table 1).

2.0 Review of Literature

Over the past decade, many studies have been conducted on the impact of mergers and acquisitions in various industries and in various countries. A substantial portion of these studies focused on the impact of mergers on bank loan and deposit rates (Craig and Dinger, 2008). However, it is believed from the theory of multiple-lending that mergers and acquisitions increase banks' lending capacities (Carletti *et al.*, 2006; Karceski *et al.*, 2004; Degryse *et al.*, 2004). Thus, most of the literature on the impact of bank consolidation focused basically on testing the validity of two hypotheses. One states that the consolidated banks might realize economies of scale and other efficiency gains, transferring these to the customers in the form of more beneficial interest rates; while the other states that they may exploit their increased market power and impose interest rates that are disadvantageous to customers (Craig and Dinger, 2008).

Literature on bank lending channel has also given credence to the role of banks in the monetary transmission mechanism (Chang and Jansen, 2005). De Graeve *et al.* (2007) reported that in the Belgian banking market, the loan prices of well capitalised and highly liquid banks are least responsive to changes in market rates, while Opiela and Kishan (2000) reported that loan growth of small, undercapitalized banks is more responsive to changes in

monetary policy than loan growth at lager and better-capitalized banks. Kashyap and Stein (1993) opined that in the period 1964 to 1989, interest rates on loans in the US depended positively on the real GDP and inflation rate. Several other commentators believed that the sensitivity of loans to changes in monetary policy is related to bank size (Chang and Jansen, 2005; Kashyap and Stein, 1995).

Hannan and Berger (1991) and Neumark and Sharpe (1992) documented that deposit rates adjusted sluggishly to changes in market interest rates. Other related studies include Berger and Hannan (1989) who showed, in a static framework, that high market concentration results in lower deposit rates. Later on, Hannan and Prager (1998) examined bank mergers and explored the dynamics of deposit rate changes. They found that after a substantial in-market merger, the merging banks significantly decreased their deposit rates, which they explained by an increase in market power. However, Focarelli and Panetta (2003) maintained that the post-merger period examined by Hannan and Prager was too short. They extended the analysis time and argued that, whereas merging banks tend to decrease deposit rates in the transition period (up to three years after the merger), deposit rates of merged banks go up and beyond those of rival banks in the long-run.

Montoriol-Garrige (2008) also investigated the impact of bank mergers and acquisitions on the average interest rates of firms and found significant impacts of bank consolidations on loan interest rate. In particular, the study finding showed significant positive effects of mergers for borrowers that continue their lending relationship with the consolidated bank. On average, consolidated banks were found to reduce loan interest rates and the most beneficial mergers from the borrower point of view were those involving two large banks and commercial banks.

Badreldin and Kalhoefer (2009) conducted a study to measure the performance of Egyptian banks that have undergone mergers or acquisitions during the period 2002-2007. Their findings indicated that not all banks that undergone deals of mergers or acquisitions shown significant improvements in performance and return on equity when compared to their performance before the deals. Thus the study suggested that mergers and acquisitions had no clear effect on the profitability of banks in the Egyptian banking sector. Pat and James (2011) investigated the impact of the consolidation of the banking industry on the Nigerian Capital Market between 2004 and 2008

using primary (questionnaires) and secondary data from the Nigerian Stock Exchange.

Azeez and Oke (2012) examined the effect of banking reforms on the economic growth of Nigeria from 1986 to 2010. The study modeled Gross Domestic Product as being dependent on Interest Rate Margin, Credit to Private Sector, Savings and Inflation, all representing banking reform indices. The overall findings suggested that banking reforms has not adequately and positively impacted on the economy.

Okafor (2012) evaluated the performance of Nigerian banks before and after the consolidation exercise, using t-test statistic to ascertain whether there was a significant difference in the performance of banks before and after consolidation. The result showed that consolidation had improved the performance of the Nigeria banking industry in terms of asset size, deposit base and capital adequacy. It concluded that the profit efficiency and asset utilization efficiencies of the banks deteriorated since the conclusion of the consolidation programme.

Overall, literature suggests that bank mergers will influence changes in credit supply, which will in turn affect real activity (Craig and Dinger, 2008; Bernanke and Gertler, 1995).

3.0 Methodology

This study is based on selected DMBs that have maintained the same brand name and some market characteristics for the pre and post-2004 banking reform on merger and acquisition with effect from January 1, 2006. Theory suggests that mergers will motivate positive changes in credit supply, which will in turn affect real activity. Using vector error correction model (VECM), we examined the influence of mergers on DMBs' credit growth and its relation with real activity at any instance of monetary policy shocks. To account for the impact of macroeconomic environment on credit demand, we include price changes captured by CPI and real GDP growth (Beņkovskis, 2008). The evidence on DMBs' credit dynamics is obtained by estimating the GDP growth that takes into account not only the monetary policy rate and CPI but also DMBs loans-specific differences in reaction to total deposit and required reserves. The thrust of this study is to establish whether or not there

exists a significant and positive relationship between loan growth and real activity after bank consolidation.

3.1 Model Specification

In order to achieve the stated objective, we first consider a dynamic vector autogression (VAR) model of the form:

$$\boldsymbol{X}_t = \boldsymbol{\mu} + A_1\boldsymbol{X}_{t-1} + A_2\boldsymbol{X}_{t-2} + \cdots A_p\boldsymbol{X}_{t-p} + \varphi_t + \boldsymbol{\varepsilon}_t;\ t = 1, \cdots, T \quad (1)$$

where $\boldsymbol{X}_t = (x_{1t}, x_{2t}, x_{3t}, \ldots, x_{kt})'$, is the numbers of endogenous variables; φ denotes an exogenous dummy variable; p is the lag length; A is an $(k \times k)$ matrix of coefficients; $\boldsymbol{\varepsilon}_t = (\varepsilon_{1t}, \ldots \varepsilon_{kt})'$ denotes the shocks in the VAR system, and t is the time period. Given non-stationarity in the series of interest, it became imperative to carry out a cointegration test to verify whether the series in the VAR model were cointegrated or not. With the existence of cointegration, the VECM version for Equation (1) is specified in the form:

$$\Delta\boldsymbol{X}_t = \boldsymbol{\pi_1}\Delta\boldsymbol{X}_{t-1} + \boldsymbol{\pi_2}\Delta\boldsymbol{X}_{t-2} + \cdots \boldsymbol{\pi}_{p-1}\Delta\boldsymbol{X}_{t-p+1} + \boldsymbol{\Phi}\boldsymbol{X}_{t-1} + \varphi_t + \boldsymbol{\varepsilon}_t;$$
$$t = 1, \cdots, T \quad (2)$$

where $\boldsymbol{\pi_j} = -\left(\boldsymbol{I} - A_1 - \cdots - A_j\right),\ j = 1, \ldots, p-1$; and $\boldsymbol{\Phi} = -\left(\boldsymbol{I} - A_1 - \cdots - A_p\right)$. $\boldsymbol{\Phi} = \alpha\beta'$ where α is the speed of adjustment to disequilibrium and β is a matrix of long-run coefficients.

Equation (2) is transformed into Equation (3) where the economic growth is regressed on its lag and lagged selected DMBs consolidated loan, CPI, monetary policy indicator, and DMBs specific characteristics like total deposit and required reserves. The log of real gross domestic product measures aggregate economic activity as follows:

$$\Delta lY_t = \mu + \sum_{i=1}^{k} \alpha_i\, \Delta lY_{t-j} + \sum_{i=1}^{k} \gamma_i\, \Delta lnX_{t-j} + \sum_{i=1}^{k} \eta_i\, \Delta lZ_{t-j} + \sum_{i=1}^{k} \lambda_i\, \Delta lR_{t-j} + \sum_{i=1}^{k} \theta_i\, \Delta LP_{t-j} + \sum_{i=1}^{k} \beta_i\, \Delta MPR_{t-j} + MD_t + \varepsilon_t \quad (3)$$

Here, Y and P denote real gross domestic product and consumer price index, respectively, which are proxies for real activity, x is the consolidated credit to private sector, MPR is monetary policy rate, Z is the total deposit, R is the required reserves and MD denotes a merger/acquisition dummy assigned to

reflect the pre and post-merger era. The dummy variable takes the value of 1 when the data refers to the post-merger period $(i.e., when\ t = 2006Q1 - 2013Q2,)$ and zero for the pre-merger period $(1999Q1 - 2005Q4)$.

Various researchers have suggested several bank characteristics that determine how sensitive different banks are to changes in real activity and monetary policy to include bank size, reserve requirement and total deposits (Kashyap and Stein 1995; Peek and Rosengren, 1995). These formed the basis for including these variables in the model with the assumption that the size of the selected banks is large as a result of the merger.

3.2 Estimation Procedure

Prior to the estimation of the model, preliminary analyses were carried out due to the properties of most time series (see Figure 1 and Table 3). These include unit root tests using Augmented Dickey-Fuller (ADF) and Phillips-Peron (PP) test statistics to certify the stationarity of each series. Individual effect from the series was eliminated by taking the natural logarithm of the variables except (MPR) and differencing the equation once. Stability diagnosis was also carried out after selection of optimal lag length (Table 5). In what followed, a possible cointegrating relationship between the series was investigated using Johansen multivariate cointegration technique (Johansen, 1988). This technique provided two different likelihood ratio tests based on trace statistics and maximum eigenvalue statistics (Table 6). These tests were carried out to ensure stationarity and stability of the estimated coefficients on the condition that the disturbance in equation (1) is not subject to serial correlation. Cointegration between the variables could exist, as is the case in this work. At this instance, the model was analyzed as a VECM, with impulse response functions and forecast error variance decomposition defined as:

$$y_t = \Omega_0 u_t + \Omega_1 u_{t-1} + \Omega_2 u_{t-2} + \cdots, \tag{4}$$

$with\ \Omega_0 = I_k\ and\ \Omega_s$ computed recursively according to:

$$\Omega_s = \sum_{j=1}^{s} \Omega_{s-j} A_j \ \ for\ s = 1,2, \ldots \tag{5}$$

where $A_j = 0\ for\ j > p.$

3.2 Data

The analysis was carried out using quarterly data for the period from the first quarter of 1999 until the second quarter of 2013 (58 observations) (Table 2). Data on loans and DMBs specific characteristics were computed from the quarterly CBN Statistical Bulletins, CBN Annual Reports and other CBN financial data sources.

The sample covers all banks that were operating with a unique name before and after the 2004 merger/acquisition. It is assumed that the selected DMBs share common characteristics before and after the merger. Other DMBs were not included in the analysis due to lack of unique data of specific characteristics in their balance sheets. We treat mergers in such a way that DMBs involved in a merger were consolidated and subsequently reported under the absorbing bank for the whole sample period. Thus, DMBs that were absorbed were not included in the original sample, which consists of 5 independent DMBs.

4.0 Empirical Results

The graphical representation in Figure 1 shows that except for MPR and R all other series exhibited trend effects while the descriptive statistics in Table 3 shows the asymmetries in the series, implying they are not normally distributed. The standard deviation for all the series except for P and MPR was relatively large.

A preliminary check for stationarity of the series shows in general that all the series are integrated of order 1 using Augmented Dickey-Fuller (ADF), Phillips-Peron (PP) and Kwiatkowski-Phillips-Schmidt-Shin test statistic.

Table 2: Unit Root Statistics

Variable	ADF	PP	KPSS	Decision
LY	-7.85884*	-17.7736*	0.215362***	I(1)
LX	-4.70873*	-4.69498*	0.106057*	I(1)
LZ	-2.52367**	-9.35574*	0.435931***	I(1)
LR	-8.66793*	-8.67212*	0.14424*	I(1)
LP	-7.638837 *	-12.28522 *	0.162868***	I(1)
MPR	-6.664*	-6.65919*	0.306413 *	I(1)

(;**;*** impliy significance at 5%, 10% and not significance at 5%)*

While ADF and PP hypothesized on existence of unit root, KPSS hypothesized on existence of stationarity. The results presented in Table 2 give a confirmation of two out of the three tests statistics which is sufficient to conclude the non-stationarity of the series.

Table 3: VAR Lag Order Selection Criteria

Endogenous variables: LY LX LZ LR LP MPR
Exogenous variables: C MERGER

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-6.116784	NA	8.09E-08	0.696799	1.147086	0.869429
1	244.2279	423.6603	2.16E-11	-7.547228	-5.746080*	-6.85671
2	309.6276	95.58418	7.44E-12	-8.677986	-5.525977	-7.46958
3	364.4923	67.52578	4.26E-12	-9.403551	-4.900681	-7.677257
4	438.083	73.59068*	1.41e-12*	-10.84935*	-4.995615	-8.605164*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

For selection of appropriate lag length, the Schwarz information criterion (SIC) used indicates that the VAR has lag length of one (Table 3).

Table 4: Johansen Maximum Likelihood Tests for Cointegration

Unrestricted Cointegration Rank Test (Trace)					Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**	Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.877957	177.3352	95.75366	0.0000	None *	0.877957	113.5825	40.07757	0.0000
At most 1	0.418768	63.75272	69.81889	0.1385	At most 1	0.418768	29.30067	33.87687	0.1597
At most 2	0.30937	34.45205	47.85613	0.4773	At most 2	0.30937	19.98813	27.58434	0.342
At most 3	0.188587	14.46392	29.79707	0.8136	At most 3	0.188587	11.28482	21.13162	0.6189
At most 4	0.057172	3.179104	15.49471	0.9582	At most 4	0.057172	3.179077	14.2646	0.9341
At most 5	5.04E-07	2.72E-05	3.841466	0.9981	At most 5	5.04E-07	2.72E-05	3.841466	0.9981
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level					Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level					* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values					**MacKinnon-Haug-Michelis (1999) p-values				

Given that all series have unit roots, a Johansen Maximum Likelihood ratio tests for cointegration was conducted. The results given in Table 4 indicate the existence of one cointegrating vector.

Thus, our benchmark model was identified as a first-order linear VECM. Hence, a causal inference was drawn via Granger causality tests (Table 5).

Table 5: VEC Granger Causality/Block Exogeneity Wald Tests

Dependent variable: D(LY)				Dependent variable: D(LX)				Dependent variable: D(LP)			
Excluded	Chi-sq	df	Prob.	Excluded	Chi-sq	df	Prob.	Excluded	Chi-sq	df	Prob.
D(LX)	22.46009	1	0.0000	D(LY)	0.04114	1	0.8393	D(LY)	0.197456	1	0.6568
D(LZ)	6.42391	1	0.0113	D(LZ)	1.580857	1	0.2086	D(LX)	0.001068	1	0.9739
D(LR)	5.352613	1	0.0207	D(LR)	4.52218	1	0.0335	D(LZ)	0.801313	1	0.3707
D(LP)	0.003353	1	0.9538	D(LP)	1.52742	1	0.2165	D(LR)	0.683013	1	0.4086
D(MPR)	0.044315	1	0.8333	D(MPR)	9.904124	1	0.0016	D(MPR)	0.047982	1	0.8266
All	31.57961	5	0.0000	All	14.72752	5	0.0116	All	1.847487	5	0.8698

A cursory observation of Table 6 shows that in line with theoretical expectation, DMBs loan supply growth after the merger have a positive relationship with gdp that measures aggregate economic activity, at 95% percent level of confidence. Interestingly, it could also be seen that increased real activity which include changes in GDP and CPI as a benchmark for loan demand, does not incites loan growth of DMBs. Diagnosing the empirical model's dynamic behavior through forecast error variance decompositions (Table 8) and impulse response functions (Figure 2) present further detailed explanations.

The results in Table 5 show that CPI may not be contributing significantly directly to loan supply but to required reserves which is believed to be one of the catalysts for loan growth but exhibits a decline in its contribute to CPI after the first quarter. Other catalysts like total deposit continue to show an increase in contribution to loan growth while policy rate at any instance have a higher contribution to loan growth as expected. The contribution of loan supply to economic activity keeps fluctuating from the second to the twelfth quarters. Although loan growth granger caused economic activity as shown in Table 4, the decomposition in Table 5 shows that loan catalysts indicate higher contribution to economic activity than loan itself. In other word, the possibility of asymmetric loan distribution to large firms rather than small firms that drives the economy could not be over-emphasized.

The Impulse Response Functions in Figure 2 reflect how individual variables respond to shocks from other variables in the system. It gives a visual representation of the behaviour of GDP and price in response to shocks to loans in the VECM system. In other word, the interpretation of the impulse

response functions takes into consideration the first differencing of the variables and the vector error correction estimates for a response forecast period of three years to enable us capture both the long term and short term responses.

Table 6: Post Merger Forecast Error Variance Decompositions

Variance Decomposition of LY:

Period	S.E.	LY	LX	LZ	LR	LP	MPR
1	0.0481	100.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	0.0692	51.6243	1.8852	3.9820	31.3505	3.3536	7.8045
3	0.0809	60.7064	1.6584	4.4149	24.0604	2.6469	6.5129
4	0.0848	55.6854	4.1320	6.9334	24.7743	2.5434	5.9316
5	0.0951	59.7310	5.6763	5.7987	20.3564	2.6466	5.7911
6	0.1026	52.3015	4.8766	6.4282	24.4307	3.1499	8.8132
7	0.1072	54.0999	4.4704	6.1466	22.9632	2.9093	9.4106
8	0.1091	52.5002	5.7835	6.7748	22.8761	2.8173	9.2482
9	0.1142	53.5914	6.7334	6.3320	21.1689	2.8424	9.3319
10	0.1187	50.3076	6.3236	6.4011	22.8648	3.1088	10.9942
11	0.1212	50.4998	6.1141	6.2680	22.4316	3.0237	11.6629
12	0.1223	49.7215	6.9059	6.4832	22.1724	2.9727	11.7444

Variance Decomposition of LX:

Period	S.E.	LY	LX	LZ	LR	LP	MPR
1	0.0503	0.0958	99.9042	0.0000	0.0000	0.0000	0.0000
2	0.0919	0.3085	90.6377	0.9824	0.3505	1.1103	6.6106
3	0.1292	0.8678	87.0745	0.9780	0.2790	1.4991	9.3018
4	0.1638	0.7069	84.5146	1.3976	0.4599	1.8472	11.0737
5	0.1941	0.5231	83.1579	1.4837	0.4810	1.8524	12.5020
6	0.2210	0.4830	82.0223	1.4622	0.4625	1.8654	13.7047
7	0.2457	0.5501	81.1595	1.4908	0.5196	1.9096	14.3705
8	0.2688	0.5274	80.6377	1.5696	0.6067	1.9398	14.7188
9	0.2902	0.4709	80.2842	1.6005	0.6268	1.9353	15.0823
10	0.3098	0.4536	79.9480	1.5890	0.6191	1.9311	15.4591
11	0.3284	0.4777	79.6511	1.5954	0.6390	1.9445	15.6923
12	0.3463	0.4711	79.4564	1.6262	0.6753	1.9561	15.8150

Variance Decomposition of LP:

Period	S.E.	LY	LX	LZ	LR	LP	MPR
1	0.0342	0.4200	1.7468	3.7050	6.3606	87.7676	0.0000
2	0.0472	0.3207	2.2437	5.7949	4.4012	87.2043	0.0352
3	0.0560	0.2292	2.9248	5.3148	3.6027	87.9027	0.0258
4	0.0643	0.2544	3.4302	5.2058	3.1921	87.8942	0.0234
5	0.0716	0.2282	3.6082	5.2931	3.1239	87.6995	0.0472
6	0.0782	0.2006	3.7357	5.3511	2.9817	87.6740	0.0568
7	0.0841	0.1739	3.9514	5.2617	2.7778	87.7799	0.0553
8	0.0897	0.1776	4.1330	5.1914	2.6621	87.7775	0.0585
9	0.0951	0.1681	4.2004	5.2209	2.6451	87.6954	0.0701
10	0.1001	0.1532	4.2470	5.2463	2.5980	87.6796	0.0759
11	0.1048	0.1398	4.3391	5.2079	2.5108	87.7271	0.0753
12	0.1094	0.1388	4.4247	5.1725	2.4561	87.7314	0.0766

Variance Decomposition of LR:

Period	S.E.	LY	LX	LZ	LR	LP	MPR
1	0.3135	1.4854	8.9869	3.7088	85.8188	0.0000	0.0000
2	0.4256	1.0257	6.9514	9.3827	77.9598	4.3763	0.3041
3	0.5159	1.0247	5.2898	8.8082	76.9679	7.6476	0.2617
4	0.5925	0.9149	4.3266	9.4308	76.7122	8.2111	0.4044
5	0.6599	0.8368	3.6943	9.5799	76.5147	8.8433	0.5310
6	0.7212	0.8283	3.2599	9.6997	76.3867	9.1737	0.6518
7	0.7789	0.8345	2.9189	9.8082	76.3400	9.3654	0.7330
8	0.8328	0.8080	2.6488	9.9177	76.3212	9.5070	0.7973
9	0.8827	0.7799	2.4452	9.9854	76.2784	9.6501	0.8610
10	0.9299	0.7769	2.2869	10.0238	76.2362	9.7605	0.9157
11	0.9754	0.7811	2.1507	10.0673	76.2215	9.8260	0.9535
12	1.0189	0.7699	2.0325	10.1158	76.2165	9.8817	0.9836

The interpretation of impulses and corresponding responses in Figure 2 is very clear as was earlier discussed. The first graph in Figure 2 shows that there is immediate negative response of real GDP to loan supply starting from the first quarter and reverted at the second quarter to equilibrium at the fourth quarter. The response of price to loan supply was however positive and stable though not significant. There was no sign of reversion to equilibrium even up to the third year. A shock to policy rate at all instance records a significant negative

response of economic activity with a possible reversion to equilibrium after two or three quarters except the initial shock that took just a quarter. This could not be said of price that glove around equilibrium though with slight negative influence. On the other hand, a sharp negative response was recorded from quarter two of loan to policy rates. The negative response stabilizes from quarter six up to the third year without reverting to equilibrium.

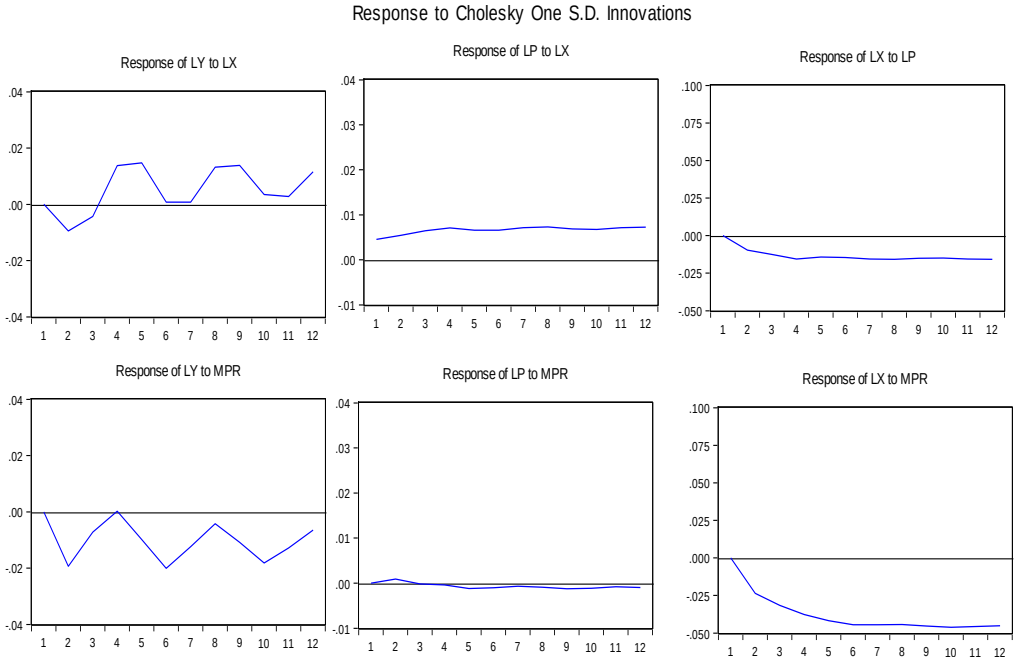

Figure 2: Post-Merger Impulse Response of Real Activity to DMBs Loan Supply at any instance of MPR

5.0 Conclusion and Policy Implications

This paper investigated claims in the literature that merger influences changes in loan supply which in turn affect real activity using selected DMBs in Nigeria. The results show that there exists a one sided positive relationship between economic growth and DMB's loan growth after the merger and at any instance of monetary policy shock. The results also show that despite the one sided positive causality between economic growth and loan supply, the total contribution of loan growth to real activity was about 11% which commensurate with Bernanke and Gertler (1995) report that increased riskiness of small firms during the periods of restrictive monetary policy causes banks to concentrate their loans on larger, more diversified firms. The stylize facts for policy implications therefore include:

- The persistence negative spread between loan and policy rate lessens the strength of the credit channel of monetary policy because the loan rate has a relatively positive influence over economic growth.
- The negative spread (a measure of lending conditions) affects the real activity.
- The transmission process of monetary policy which affects the supply of loans also depends on the structure of the financial system. This means that structural changes in financial area due to merger/acquisition may affect monetary transmission.

In conclusion, since the major interest of policy makers towards merger is the hope of efficient banking system that will also make an extensive contribution to economic growth, monetary policy on merger and acquisition can also have a distribution effect on the dynamic response of loan growth, as DMBs with different specific (or individual) characteristics will have an asymmetric reaction to monetary shock. Hence, we recommend that for any wave of further merger/acquisition, a policy formation that can takes into account not only the macroeconomic variables, but also DMBs-specific differences in the lending reaction to monetary policy actions will give a good account on the bank lending channel. Also, a further study on sectorial distribution of loan is emphasized to examine the exact sector of the economic activities that incited the positive one sided causal relationship between real GDP and DMBs loan supply.

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Table 2: Selected DMBs Consolidated Data (1999Q1- 2013Q2)

obs	P	X	Y	Z	R	MPR
1999Q1	30.49292	395399.5	98099.48	396644.9	28365.02	19
1999Q2	31.15949	425237.1	98394.12	466669	62863.57	20
1999Q3	29.48156	437373.2	98546.73	494970.6	60541.59	20
1999Q4	29.62606	452411.1	98066.84	501060.2	64000.83	18
2000Q1	30.0578	470107.9	103201.2	592171.1	64211.73	18
2000Q2	32.98872	511632.8	103182.9	704749.2	73469.28	17
2000Q3	34.05504	552125.7	103234.4	732181.8	71318.11	16
2000Q4	33.92983	587486.2	102713.5	743349.8	75053.92	14
2001Q1	35.5281	690357.6	108099.8	969764.7	97670.33	16.5
2001Q2	38.286	729382.7	108093.2	957705.5	115172.7	16.5
2001Q3	40.56503	810457.9	108083.7	1015632	116993.5	20.5
2001Q4	39.52651	827122.9	107506.5	947182.9	118665.5	20.5
2002Q1	41.70377	871739.3	112633	1087258	107246	20.5
2002Q2	42.9658	925343.2	113328.2	1112235	113345.8	20.5
2002Q3	44.61127	944648.1	113096.1	1171273	106757.3	18.5
2002Q4	44.3363	938271.2	112728.4	1157112	98021.3	16.5
2003Q1	44.14844	1010638	124036.8	1417987	127697.3	16.5
2003Q2	48.9757	1047583	123928.7	1451040	149711.8	16.5
2003Q3	52.80752	1045848	123782.6	1313555	147287.9	15
2003Q4	54.89338	1191546	123259	1337296	139903.9	15
2004Q1	54.06462	1303422	114617.6	1621500	123139.1	15
2004Q2	55.88044	1372906	123702.9	1627090	143599	15
2004Q3	57.62641	1464170	142373.6	1643850	145413.9	15
2004Q4	60.38737	1507885	146881.9	1661482	144668.8	15
2005Q1	62.85967	1642872	120048.9	2036984	172772.5	13
2005Q2	66.2585	1816681	128755.5	2224021	186791.9	13
2005Q3	71.64075	1937515	153933.6	2303057	241570.3	13
2005Q4	67.37126	1950380	159193.4	2036090	99421.3	13
2006Q1	70.42555	2040808	128579.8	2620959	123760.8	13
2006Q2	71.88286	2257454	135438.6	3131259	159454.2	14
2006Q3	76.11975	2494475	162498.8	3572449	193775	14
2006Q4	73.13065	2556920	169304.4	3245156	108636.8	10
2007Q1	74.12236	2982217	135774.7	4158318	108715.6	10
2007Q2	76.50619	3463444	142790.5	4575371	121107.9	8
2007Q3	79.25319	4144173	173067.5	5117643	140998.8	8
2007Q4	77.93091	4968967	182618.6	5001471	141482.1	9.5
2008Q1	79.8864	5862327	142071.4	7280610	181322.9	9.5
2008Q2	85.72493	6655282	150862.2	7159926	268649.2	10.25
2008Q3	89.57538	7378526	183678.8	8040472	146090.7	9.75
2008Q4	89.66384	7909784	195590.1	7960167	149737.5	9.75
2009Q1	91.36326	8015573	149191.5	7913268	146944.5	9.75
2009Q2	95.32079	8305283	162101.2	8039511	72479.52	8
2009Q3	98.88258	9516412	197084.3	8228464	77047.55	6
2009Q4	102.1536	9895762	210600.4	9150038	84070.8	6
2010Q1	104.8958	9715608	160117	9762255	90134.01	6
2010Q2	108.76	9783650	174734	9606602	89445.99	6
2010Q3	112.4	9994874	212771.7	9689339	92246.42	6.25
2010Q4	114.2	9460534	228709.5	9784542	92562.99	6.25
2011Q1	118.3	9070175	171265.9	10193185	189119.5	7.5
2011Q2	119.9	9537712	187833.1	10659010	189119.5	8
2011Q3	124	10710576	228454.8	11052823	794448.3	9.25
2011Q4	126	13670373	246447.1	11452763	771736.2	12
2012Q1	132.6	13581772	182119.4	11533071	822825.8	12
2012Q2	135.3	14114785	199831.6	11787757	842406.8	12
2012Q3	138	14154969	243263.1	12390660	1254990	12
2012Q4	141.1	14485883	263678.9	13135887	1339731	12

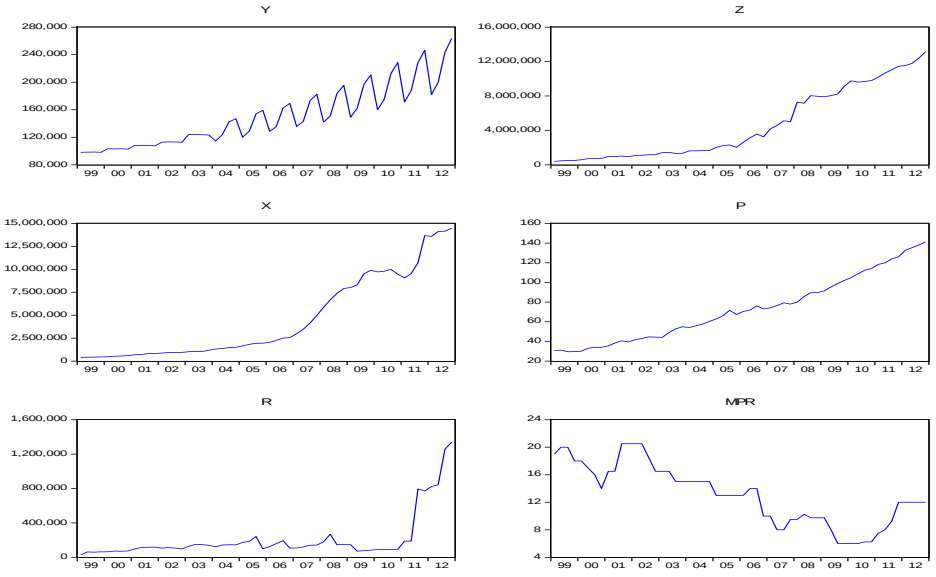

Figure 1: Graphical representation of each series of interest

Table 3: Descriptive Summary Statistical Analysis

	Y	X	Z	R	P	MPR
Mean	149892.9	4546230	4642266	214084.2	72.9219	13.06696
Median	142222.5	1995594	2462008	123450	71.03315	13
Maximum	263678.9	14485883	13135887	1339731	141.1	20.5
Minimum	98066.84	395399.5	396644.9	28365.02	29.48156	6
Std. Dev.	43479.85	4526232	4108237	279157.4	33.08405	4.41163
Skewness	0.787431	0.857245	0.620986	2.810862	0.45552	0.036849
Kurtosis	2.751998	2.32303	1.82437	10.03257	2.089804	1.967534
Jarque-Bera	5.930616	7.928121	6.824067	189.1418	3.86972	2.499975
Probability	0.051545	0.018986	0.032974	0	0.144445	0.286508
Sum	8394001	2.55E+08	2.60E+08	11988714	4083.626	731.75
Sum Sq. Dev.	1.04E+11	1.13E+15	9.28E+14	4.29E+12	60200.49	1070.436