



Seemingly Unrelated Regression Analysis of Bank Lending and Economic Growth in Nigeria

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ABSTRACT

Using a unique sector-level bank lending and output data sets on the Nigerian economy over the period 1981–2014, we examine the impact of bank lending on economic growth, specifically to ascertain whether different sector-level bank lending impact on Nigeria's economic growth differently. Due to the perceived interrelationships among the sectors, we adopt a seemingly unrelated regression (SUR) equations model consisting of five single equations. The Model was fitted using the SUR estimator. Empirically, we find strong evidence that bank lending to agriculture, industry, real estate and construction and commercial sectors has exerted significant positive impact on economic growth real gross domestic product of the respective sectors, thus lending credence to the finance-led-growth hypothesis" in those sectors. Our study further provides evidence that sector-level bank lending impact on Nigeria's economic growth differently. The highest impact of bank lending is in the agriculture sector, followed by commercial sector, then industrial sector and real estate and construction. However, bank lending does not have any significant impact on economic growth in the service sector. By utilizing sector-level bank lending and output data in our analysis, this study addressed important gap in the relevant literature. It is important for banks to recognize this existence of sectoral differences and to have a proper understanding of sectoral characteristics and therefore, tailor their lending activities in response to sectoral needs. This is critical, especially in our situation where from our analysis, bank lending to agriculture with the highest tendency to impact on economic growth was only about 3% of total bank credits during the period covered by the study whereas, bank lending to the service sector (including government services) with no significant impact on economic growth was about 53% of total bank credit.

Keywords: Bank Lending, Economic Growth, Seemingly Unrelated Regression Analysis, Nigeria

JEL Classifications: C5, E5, O4

1. INTRODUCTION

The Nigerian economy comprises five main sectors which relate with one another using the stock of capital and other factors of production within the economy to produce the desired output of goods and services. Capital is important in the process of production in these sectors as it helps the producers to procure the necessary inputs of production and thereby helps in the expansion of production capacities. Therefore, availability or non-availability of capital explains, to a greater extent, the growth process in the various sectors and hence the economy as a whole.

Owing to abject poverty, low savings capacity and consequent low capital formation, entrepreneurs in developing countries such as Nigeria are unable to finance their production activities and as such have to depend on external sources of funding. According to Uma (2001), availability of external funding, especially access to long-term credit influences firms' investments level in any economy. Policy makers believe that credit is a productive input and therefore, it is possible to promote specific economic activities by disbursing specific amounts of loans to producers. Hence, bank lending has become an essential feature in economic growth process in Nigeria. Availability of bank credit enables producers

to harness innovations by bringing about new combinations of productive resources and employing hitherto unemployed resources.

Crucial to the Nigerian economy is a banking system that has been in existence prior to her independence in October 1960. The history of banking in Nigeria dates back to 1892 with the establishment of the African banking corporation in Lagos. In 1894, the Bank of British West Africa (now First Bank) took over the African Banking Corporation. The Bank for British West Africa remained the only bank in Nigeria until 1912 when Barclays Bank (now Union Bank) was set up. The first banking ordinance in Nigeria was enacted in 1952 thus signifying the commencement of a formal banking system in the country. The banking system occupies a vital position in the stability of the nation's economy. It plays an essential role in fund mobilization, credit allocation, payment and settlement system as well as monetary policy implementation. The banking industry in Nigeria has undergone serious reforms over the past years arising from the Central Bank of Nigeria's (CBN's) requirement for deposit money banks to increase their capital base to a minimum level of 25 billion naira. Before the consolidation exercise there were 89 commercial banks whose overall performance led to sagging of customer's confidence, as there was lingering distress in the industry. The supervisory structures were inadequate, as they were cases of official recklessness amongst managers, and the industry was notorious for financial abuses. The consolidation exercise however, triggered off several mergers and acquisitions which reduced the number of players from 89 to 25 banks as at the beginning of 2006. Thus from 1952 to the present day, the banking sector has witnessed vast transformations in character, structure and organization with the primary aim of promoting a more efficient allocation of funds and ensuring that financial intermediation occurs as efficiently as possible thereby enhancing funds mobilization and accessibility, which are required for economic growth in any economy. Apart from the lending channel also known as the financial allocation channel, the other key channels through which financial intermediation affects growth are the transaction cost reduction channel, liquidity channel, and financial enforcement contract channel.

Economic literature contains discussions by several authors on the importance of bank lending in generating economic growth within an economy. Early economists such as Schumpeter (1934), McKinnon (1973) and Shaw (1973) identified banks' role in facilitating technological innovation through their intermediation role. This role according to them is performed through the process of channeling funds in the form of credit or loan for investment to those deficit spending units put them into the most productive use. Thus, lending which is defined in this context, as the link through which resources are transferred for capital formation, facilitates investment which leads to economic growth. Several scholars thereafter, such as Fry (1988), King and Levine (1993), Levine (2004) and De Serres et al. (2006), have supported the above assertion about the importance of bank lending in economic growth process of any economy.

Although there exist many studies on the role of bank lending in economic growth, it is important to note here that most of

these studies were conducted in the developed economies. Limited studies exist in the developing/emerging economies (such as Nigeria), thereby creating a huge knowledge gap. To our knowledge, earlier studies on the role of bank lending in economic growth in Nigeria were carried out by Emecheta and Ibe (2014), Haruna et al. (2013), Oluitan (2007), and Josephine (2009). However, these previous studies neglected the role played by sectoral differences in determining the impact of bank lending on economic growth and the effect of different sector level bank credit on economic growth of the various sectors of a developing economy like Nigeria still remains unclear. Therefore, the lack of clarity about the effect of different sector level bank credit on economic growth of a developing economy like Nigeria is the motivating factor for this study. In the case of Nigeria, banks discriminate across economic sectors - preferring to lend more to some sectors than to others, which makes it difficult for a definite conclusion on how bank credit impacts on economic growth.

The present study intends to reduce this knowledge gap by examining the impact of bank lending on economic growth (using Nigerian sector level bank lending data), specifically to ascertain whether different sector level bank lending (namely, bank lending to agriculture, bank lending to industry, bank lending to real estate and construction, bank lending to general commerce, and bank lending to service) impact on Nigeria's economic growth differently. Therefore, we hypothesize that the regression coefficients on bank lending to agriculture (BNK^A), bank lending to industry (BNK^I), bank lending to real estate and construction (BNK^{RE}), bank lending to general commerce (BNK^C), and bank lending to service (BNK^S) are equal.

The rest of this paper is organised as follows: Section two is literature review and discusses the theoretical and empirical evidence of the effect of bank lending on economic growth. Section three contains the sectoral distribution of commercial bank loans and advances in Nigeria. Section four specifies the model used to investigate the hypothesis that the regression coefficients on bank lending to the different economic sectors are equal, while section five discusses the results and policy implications of the findings. The sixth section gives the summary and concluding remarks.

2. LITERATURE REVIEW

The allocation of financial resources in every economy follows not only economic reasoning but also sectoral considerations. In the course of ensuring efficient allocation of funds, the Central Bank through credit guidelines, directs credit to certain sectors of the economy. Schumpeter (1934) argues that efficient allocation of savings through the identification and extension of credit to entrepreneurs with the best chances of successfully implementing innovative products and production process accelerates output growth in the long-run. To Schumpeter, financial intermediation serves as a useful tool for increasing the productive capacity of the economy.

Through bank lending, the financial institutions play a major role of mobilizing domestic savings and fostering investment

thereby promoting productivity. Financial institutions help mobilize savings and provide payments services that facilitate the exchange of goods and services. In addition, they produce and process information about investors and investment projects to enable efficient allocation of funds; to monitor investments and exert corporate governance after those funds are allocated; and to help diversify, transform, and manage risk (World Bank, 2009). Through the various mechanisms provided by financial institutions and markets there is increase in output and income in the economy. A vital ingredient for output growth in an economy is the availability of credit which is through the intermediation role provided by the financial system. Bank lending is the amount of loans and advances given by the banking sector to economic agents. It is the most profitable source of income to banks since the interest rates realized on loans are above those realized on investments.

Considering the relationship between bank lending and output growth such as finance-led growth, it is well known that through bank lending, savings are channelled into productive investments thereby facilitating output growth. King and Levine (1993) show that finance seems important to lead economic growth. Other studies have also confirmed the relationship between finance and economic growth (Levine, 2004; Franklin and Oura, 2004; Eatza and Malik, 2009). In a study by Habibullah and Eng (2006) using 13 Asian developing countries, they lend support to the old Schumpeterian hypothesis and agree with other causality studies by Calderon and Liu (2003), Fase and Abma (2003) and Christopoulos and Tsionas (2004). Despite a handful of studies that confirm the relationship between finance and growth some studies report otherwise. Lucas (1988) argues that economists have exaggerated the role of finance in economic growth. In his view, banks only respond inactively to industrialization and economic growth. Favara (2003) using panel estimation technique reports that the relationship between financial development and economic growth is at best weak because finance does not have a first order effect on economic growth. Oluitan (2007) examines the significance of bank credit in stimulating output and the factors that prompt financial intermediation within the Nigerian economy over the period 1970–2005. She uses the Johansen cointegration and error correction model to provide evidence that although, a long run equilibrium relationship exists between private sector credit and economic growth, real output causes financial development, but not vice versa.

It is worthwhile to note that most of the studies on the role of bank lending in output growth were conducted in the developed economies. Limited studies exist in the developing/emerging economies (especially in Nigeria), thereby creating a huge knowledge gap. Also, previous studies on the impact of bank lending on output growth in Nigeria have neglected the sectoral allocation of bank credit in their analysis. This study intends to reduce these knowledge gaps by examining the impact of bank lending on output growth in Nigeria (using sector level productivity and bank lending data), specifically to ascertain whether bank lending has any impact on output growth of the various sectors (namely; agriculture, manufacturing, and mining and quarrying sectors).

3. SECTORAL DISTRIBUTION OF COMMERCIAL BANK LOANS AND ADVANCES IN NIGERIA

The sectoral distribution of commercial bank loans and advances in Nigeria for the period 1981 through 2014 is summarized in Table 1.

An examination of Table 1 shows that a total of N75561.82bn of credit was disbursed by deposit money banks in Nigeria during the period 1981–2014. Out of this amount, about N2406.02bn went to agriculture, N22826.58bn went to the industrial sector, N4073.57bn was disbursed to real estate and construction sector, N6033.62bn went to general commerce and N40222.04bn to the service sector.

These represent about 3.0%, 30.0%, 6.0%, 8.0%, 53.0% of the total sum disbursed respectively. A representation of this distribution is shown in Figure 1.

Thus during the period under review, the service sector including was the most preferred sector while the agricultural sector was the least preferred sector in the disbursement of credit by deposit money banks in Nigeria.

Furthermore, the highest percentage distribution of credit to agriculture over the period 1981–2014 was in 1996 while the lowest was in 2008. In 1996 agriculture received N33.26bn of the N169.44bn credit that was disbursed representing about 19.6% while in 2008, it received N106.35 of the N7, 799.40bn credit that was disbursed representing about 1.4%. For the industrial sector, the highest percentage distribution of credit over the period 1981–2014 was in 1996 while the lowest was in 2007. In 1996 industry received N87.29bn of the N169.44bn credit that was disbursed representing about 51.5% while in 2007, it received N978.29 of the N4, 813.49bn credit that was disbursed representing about 20.3%. The highest percentage distribution of credit to real estate and construction over the period 1981–2014 was in 1984 when it received N2.37bn of the N11.5bn credit that was disbursed representing about 20.6% while the highest percentage distribution of credit to general commerce was in 1993 when it received N13.49bn of the N65.67bn credit that was disbursed representing about 20.5%. For the services sector, the highest percentage distribution of credit over the period 1981–2014 was in 2007 while the lowest was in 1996. In 1996 services received N15.89bn of the N169.44bn credit that was disbursed representing about 9.4% while in 2007, it received N3, 619.07 of the N4, 813.49bn credit that was disbursed in representing about 75.2%. Therefore, over the period 1981 through 2014, sector wise, there is a misallocation of credits to the different economic sectors in the country so much so that can affect economic growth.

4. MODEL, DATA AND ESTIMATION TECHNIQUE

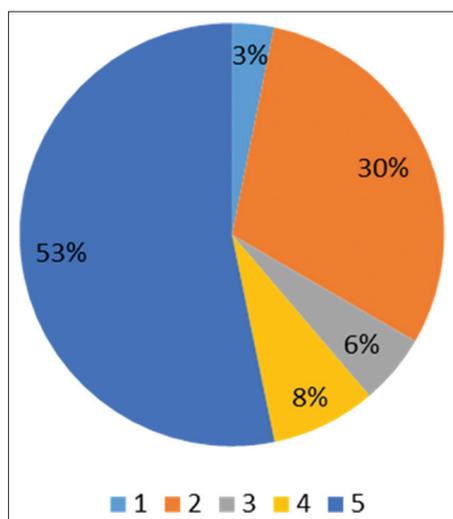
The main objective of this study is to examine the impact of bank lending on economic growth, specifically to ascertain whether

Table 1: Sectoral distribution of commercial Banks’ loans and advances (1981–2014) in billions of Naira

Years	Agriculture	Industry	Real estate and construction	General commerce	Services	Total
1981	0.59	2.75	1.75	1.48	2.02	8.58
1982	0.79	3.13	2.09	1.83	2.45	10.28
1983	0.94	3.17	2.26	1.73	2.99	11.09
1984	1.05	3.25	2.37	1.82	3.01	11.50
1985	1.31	3.47	2.49	2.05	2.85	12.17
1986	1.83	4.68	2.84	2.75	3.59	15.70
1987	2.43	5.21	2.89	3.04	3.97	17.53
1988	3.07	6.31	3.01	3.62	3.57	19.56
1989	3.47	6.94	3.23	4.22	4.15	22.01
1990	4.22	8.25	3.21	4.53	5.48	25.69
1991	5.01	11.45	3.57	4.98	6.17	31.18
1992	6.98	16.16	4.06	6.66	8.14	42.01
1993	10.75	24.53	5.41	13.49	11.48	65.67
1994	17.76	34.82	0.00	7.61	33.99	94.18
1995	25.28	70.16	0.00	19.44	29.69	144.57
1996	33.26	87.29	0.00	33.00	15.89	169.44
1997	27.94	103.43	0.00	16.37	237.81	385.55
1998	27.18	119.58	0.00	29.77	96.36	272.90
1999	31.05	140.44	0.00	18.77	132.50	322.76
2000	41.03	173.58	0.00	25.31	268.38	508.30
2001	55.85	277.37	0.00	34.53	428.42	796.16
2002	59.85	303.64	0.00	26.71	564.43	954.63
2003	62.10	390.29	0.00	34.47	723.18	1,210.03
2004	67.74	463.17	0.00	31.35	956.99	1,519.24
2005	48.56	524.57	0.00	26.43	1,377.15	1,976.71
2006	49.39	697.27	0.00	52.69	1,724.95	2,524.30
2007	149.58	978.29	0.00	66.55	3,619.07	4,813.49
2008	106.35	1,779.74	466.80	220.07	5,226.43	7,799.40
2009	135.70	2,184.19	778.14	1,245.08	4,569.03	8,912.14
2010	128.41	2,165.74	670.30	943.19	3,798.79	7,706.43
2011	255.21	2,348.51	453.50	791.86	3,463.65	7,312.73
2012	291.31	2,625.17	530.45	788.67	3,577.79	7,813.39
2013	348.14	2,991.41	664.99	765.36	4,342.30	9,112.20
2014	401.90	3,369.08	469.50	804.20	5,975.39	11,020.07
1981–2014	2,406.02	22,826.58	4,073.57	6,033.62	40,222.04	75,561.82

Source: Researchers’ computations based on data from CBN Bulletin (various issues). CBNs: Central bank of Nigeria’s

Figure 1: Sectoral distribution of commercial banks’ loans advances (1981–2014)



Key: 1 = Agriculture, 2 = Industry, 3 = Real estate and construction, 4 = Commerce, 5 = Service.

different sector level bank lending (namely, bank lending to agriculture, bank lending to industry, bank lending to real estate

and construction, bank lending to general commerce, and bank lending to services) impact on Nigeria’s economic growth differently. For this purpose, we adopt a seemingly unrelated regression equations (SURE) model. Proposed by Zellner (Zellner, 1962), a SUR system consists of several individual relationships that are linked by the reason of their disturbances being correlated.

The SUR proposed by Zellner (Zellner, 1962) consists of M regression equations each of which satisfies the assumptions of the standard regression model as follows:

$$\begin{cases} Y_1 = X_1\beta_1 + \varepsilon_1 \\ Y_2 = X_2\beta_2 + \varepsilon_2 \\ \cdot \\ \cdot \\ \cdot \\ Y_m = X_m\beta_m + \varepsilon_m \end{cases} \tag{1}$$

The structural form of the model described above can be written in matrix terms as:

$$\begin{pmatrix} Y_1 \\ Y_2 \\ \cdot \\ \cdot \\ \cdot \\ Y_m \end{pmatrix} = \begin{pmatrix} X_1 & 0 & 0 \dots 0 \\ 0 & X_2 & 0 \dots 0 \\ & & \dots \\ & & \dots \\ & & \dots \\ \dots & X_m & \dots \end{pmatrix} \begin{pmatrix} \beta_1 \\ \beta_2 \\ \cdot \\ \cdot \\ \cdot \\ \beta_m \end{pmatrix} + \begin{pmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \cdot \\ \cdot \\ \cdot \\ \varepsilon_m \end{pmatrix} \quad (2)$$

Where Y_i and ε_i are $N \times 1$ vectors and X_i is an $N \times K$ matrix.

Zellner (1962) opines that the jointly estimated equation models such as the SURE method are more efficient than the independent equation solution methods where contemporaneous correlation is present because independent equation solution methods such as multiple regression models will suffer from simultaneous bias. The SURE method, also known as the multivariate regression, or Zellner’s method, estimates the parameters of the system, accounting for heteroskedasticity and contemporaneous correlation in the errors across equations.

The complete model used in this study to estimate the impact of bank lending on economic growth consists of five single equations as follows:

$$\begin{pmatrix} gr^A_t = a_0 + a_1BNK^A_t + a_2INTR_t + a_3EXRATE_t + a_4HCAP_t + \varepsilon_1 \\ gr^I_t = b_0 + b_1BNK^I_t + b_2INTR_t + b_3EXRATE_t + b_4HCAP_t + \varepsilon_2 \\ gr^{RE}_t = \gamma_0 + \gamma_1BNK^{RE}_t + \gamma_2INTR_t + \gamma_3EXRATE_t + \gamma_4HCAP_t + \varepsilon_3 \\ gr^C_t = \delta_0 + \delta_1BNK^C_t + \delta_2INTR_t + \delta_3EXRATE_t + \delta_4HCAP_t + \varepsilon_4 \\ gr^S_t = \alpha_0 + \alpha_1BNK^S_t + \alpha_2INTR_t + \alpha_3EXRATE_t + \alpha_4HCAP_t + \varepsilon_5 \end{pmatrix} \quad (3)$$

Where gr^A , gr^I , gr^{RE} , gr^C , gr^S is economic growth measured by real gross domestic product (RGDP) for agriculture, industry, real estate and construction, general commerce and service sectors respectively. BNK^A is bank lending to agriculture, BNK^I is bank lending to industry (comprising manufacturing and mining and quarrying), BNK^{RE} is bank lending to real estate and construction, BNK^C is bank lending to general commerce, and BNK^S is bank lending to services, $INTR$ is interest rate, $EXRATE$ is exchange rate, and $HCAP$ is human capital. “t” is the time period, $a_0, \beta_0, \gamma_0, \delta_0$ and α_0 are the respective constant terms while the respective random error terms ε_i s capture the impact of other variables not included in the models. Theoretically, we expect the signs of the regression coefficients $a_1, a_4, \beta_1, \beta_4, \gamma_1, \gamma_4, \delta_1, \delta_4, \alpha_1$ and α_4 to be positive; $a_2, b_2, \gamma_2, \delta_2$ and α_2 to be negative while $a_3, b_3, \gamma_3, \delta_3$ and α_3 is positive or negative.

Data for this study were obtained from secondary sources. Specifically, data on the hypothesized variables from 1981 to 2014 were obtained. They were collected from the various issues of the CBN’s statistical bulletin and publications of the National Bureau of Statistics. Engle and Granger (1987) show that the direct application of Least Squares estimation technique to non-stationary data produces regression results that are spurious in nature. That is, the regression could give “good fit” judging by

the usual goodness of fit statistics when in fact the series are uncorrelated. Therefore, since the model uses time series data, in order to avoid spurious results, obviously we must establish the stationary properties of the variables using unit root tests. To determine the stationarity of the data we utilize the Augmented Dickey–Fuller unit root test procedures. Within the framework of the SURE model, the equation system above is estimated with the application of the SUR estimator and the help of StataMP 11 software package.

5. EMPIRICAL RESULTS AND INTERPRETATION

5.1. Test for Unit Roots

The augmented dickey fuller unit roots test was performed on the variables of the study and the pre-estimation tests indicate that the variables; RGDP for agriculture, RGDP for industry, RGDP for real estate, RGDP for commerce, RGDP for services, bank lending to agriculture, bank lending to industry, bank lending to real estate, bank lending to commerce, interest rate, exchange rate and human capital are each integrated of order one.

The result on the Table 2 shows that the absolute values of the variables’ computed ADF test statistics are greater than the absolute values of their tabulated ADF critical values at 5% and 1% level of significance.

5.2. Test for Cross-sectional (Contemporaneous) Correlation

In the absence of contemporaneous correlation between errors in different equations, the OLS equation-by-equation is fully efficient. However, in Zellner (1962), it was shown that when the error terms are correlated across the equations, the equations are related and joint estimation, rather than equation-by-equation estimation, leads to more precise estimates of the regression coefficients. Table 3 shows the result of the Breusch-Pagan test of independence of the separate OLS equations.

The cross-correlation matrix shows high correlation coefficients of the residuals among the equations across the sectors, which indicates that the SUR estimation is more appropriate than the OLS equation-by-equation procedure.

5.3. Test for Multicollinearity

To assure the drawing of valid inferences from the regression analysis, we test for the level of multicollinearity using the variance inflation factor (VIF). Gujarati (2003) proposes that the maximum acceptable VIF value is 10.0.

In this study multicollinearity is not a problem because none of the variables has a VIF value of up to 10.0. The result on the Table 4 shows that the highest mean VIF value of each of the sectors (equations) is 5.32 (<10.0). In addition,

Table 4 shows diagnostic statistics for agriculture, industrial, real estate and construction, commercial and service sectors of the Nigerian economy. The value of the R^2 for agriculture, industrial,

Table 2: ADF unit root test results

Variable	Order of integration	ADF t-statistics	Critical values	Trend stationary
RGDP for agriculture	I (1)	-3.953	-3.709 at 1% -2.983 at 5% -2.623 at 10%	No trend
RGDP for industry	I (1)	-4.001	-3.709 at 1% -2.983 at 5% -2.623 at 10%	No trend
RGDP for real estate	I (1)	-3.809	-3.709 at 1% -2.983 at 5% -2.623 at 10%	No trend
RGDP for commerce	I (1)	-3.742	-3.709 at 1% -2.983 at 5% -2.623 at 10%	No trend
RGDP for services	I (1)	-3.862	-3.709 at 1% -2.983 at 5% -2.623 at 10%	No trend
Bank lending to agriculture	I (1)	-4.390	-3.709 at 1% -2.983 at 5% -2.623 at 10%	No trend
Bank lending to industry	I (1)	-3.132	-3.709 at 1% -2.983 at 5% -2.623 at 10%	No trend
Bank lending to real estate	I (1)	-3.815	-3.709 at 1% -2.983 at 5% -2.623 at 10%	No trend
Bank lending to commerce	I (1)	-4.085	-3.709 at 1% -2.983 at 5% -2.623 at 10%	No trend
Bank lending to services	I (1)	-6.017	-3.709 at 1% -2.983 at 5% -2.623 at 10%	No trend
Interest rate	I (1)	-5.759	-3.709 at 1% -2.983 at 5% -2.623 at 10%	No trend
Exchange rate	I (1)	-3.542	-3.709 at 1% -2.983 at 5% -2.623 at 10%	No trend
Human capital	I (1)	-4.434	-3.709 at 1% -2.983 at 5% -2.623 at 10%	No trend

Source: Researcher’s result using StataMP 11. RGDP: Real gross domestic product

Table 3: Correlation matrix of residuals

	RGDP ^A	RGDP ^I	RGDP ^{RE}	RGDP ^C	RGDP ^S
RGDP ^A	1.0000				
RGDP ^I	0.7520	1.0000			
RGDP ^{RE}	0.4527	0.7753	1.0000		
RGDP ^C	0.4589	0.7212	0.9542	1.0000	
RGDP ^S	0.6512	0.7792	0.8908	0.8454	1.0000

Breusch-pagan test of independence: Chi² (10)=188.775, Pr=0.0000. Source: Researcher’s result using StataMP 11

real estate and construction, commercial and service sectors indicates that 74.6%, 66.7%, 49.4%, 51.3%, and 43.7% variations in economic growth (RGDP) respectively have been explained by variations in selected independent variables of bank lending, interest rates, exchange rate and human capital. F-value for each of the sectors is higher than its critical value suggesting a good overall significance of the estimated model for all five sectors. Therefore, fitness of the model is accepted empirically.

An examination of the result shown on Table 5 indicates that the sign of the coefficient of bank lending to each of the sectors is positive and conforms to our theoretical expectation. It is also significant at 1% and 5% level except in the case of the service sector. This implies that during the period covered by this study, bank lending to agriculture, industry, real estate and construction and commercial sectors has exerted significant positive impact on economic growth (RGDP) of the respective sectors. This finding supports Emecheta and Ibe (2014) who find strong evidence of a significant and positive relationship between bank credit to the private sector and GDP in Nigeria and further lends credence to the “finance led growth hypothesis” in the case of the agriculture, industrial, real estate and construction and commercial sectors of the Nigerian economy. However, bank lending does not have any significant impact on economic growth of the service sector. Our result suggests that if there is a 1% point increase in bank lending all things being equal, economic growth (RGDP) increases by

about 29.1% points in the case of agriculture, 1.98% points in the case of industry, 1.95% points in the case of real estate and construction and 2.22% points in the case of commerce. However, as can be observed from the result on the Table 5, interest rates and human capital do not exert any significant effect on economic growth in all the sectors while exchange rate tends to exert significant positive effect on economic growth in all the sectors.

The positive and significant effect of exchange rate on economic growth in all the sectors suggests that Nigeria could benefit from the current drive to diversify her export base and make the country more export oriented. It also suggests that exchange rate management is crucial to economic growth in Nigeria and should therefore be considered a policy thrust of every government in Nigeria. The coefficient of human capital appeared with the wrong sign (negative) in all the sectors although not significant implying that the stock of human capital available in the country over the period has not been able to play a significant role in the economic growth process of the country. This might have been as a result of inappropriate training of the work force or the work force not being provided with the appropriate tools of production. It might also have been as a result of misallocation of human resources in the various sectors. These suggest that there is the need for labour

force expansion and education policy to raise the stock and quality of human capital in the country. To ensure continuous productivity growth, labour needs to be retrained on relevant skills required.

Table 6 shows the result of the Wald test of equality of regression coefficients also known as the test of coefficient restriction.

An examination of the result on the Table 6 shows that the hypothesis that regression coefficients on bank lending to agriculture (BNK^A), bank lending to industry (BNK^I), bank lending to real estate and construction (BNK^{RE}), bank lending to general commerce (BNK^C), and bank lending to service (BNK^S) are equal is rejected implying that the different sector level bank lending impact on Nigeria's economic growth differently.

6. CONCLUSION

The main objective of this study is to examine the impact of bank lending on economic growth, specifically to ascertain whether different sector level bank lending (namely, bank lending to agriculture, bank lending to industry, bank lending to real estate and construction, bank lending to general commerce, and

Table 4: SUR diagnostic/statistical test for the five sectors

	Sectors				
	Agriculture	Industrial	Real estate and construction	Commercial	Service
R-squared	0.7456	0.6667	0.4941	0.5131	0.4374
F-statistic	28.54***	21.35***	9.03***	9.36***	6.09***
Prob (f-statistic)	0.0000	0.0000	0.0000	0.0000	0.0001
Mean VIF	4.67	5.25	4.65	4.72	5.32
Obs	34	34	34	34	34

*, **, *** indicate significance at 10%, 5% and 1% levels, respectively. Source: Researcher's result using StataMP 11. SUR: Seemingly unrelated regression. VIF: Variance inflation factor

Table 5: Seemingly unrelated regression dependent variable: RGDP

Sector	Variable	Coefficient	SE	t-statistic	Probability
Agriculture sector	Intercept	-307.8134	1541.088	-0.20	0.842
	Bank lending	29.11105***	4.043749	7.20	0.000
	Interest rates	-7.764133	73.83987	-0.11	0.916
	Exchange rate	31.19846*	16.98043	1.84	0.068
	Human capital	-0.1691849	0.1106082	-1.53	0.128
Industrial sector	Intercept	-603.269	1486.897	-0.41	0.686
	Bank lending	1.984142***	0.3667534	5.41	0.000
	Interest rates	13.01376	71.44062	0.18	0.856
	Exchange rate	35.59735**	16.69377	2.13	0.035
	Human capital	-0.1601551	0.1077139	-1.49	0.139
Real estate and construction sector	Intercept	-328.4594	1102.363	-0.30	0.766
	Bank lending	1.953532***	0.662896	2.95	0.004
	Interest rates	-0.2395224	52.85594	-0.00	0.996
	Exchange rate	31.18132***	11.3329	2.75	0.007
	Human capital	-0.1156889	0.0786527	-1.47	0.143
Commercial sector	Intercept	-386.686	1567.511	-0.25	0.805
	Bank lending	2.216001***	0.810225	2.74	0.007
	Interest rates	-3.565061	75.15726	-0.05	0.962
	Exchange rate	45.17208***	16.44403	2.75	0.007
	Human capital	-0.1681518	0.1125276	-1.49	0.137
Service sector	Intercept	-897.2076	3097.107	-0.29	0.772
	Bank lending	0.4796771	0.3382425	1.42	0.158
	Interest rates	1.023635	148.8826	0.01	0.995
	Exchange rate	85.68411**	32.82392	2.61	0.010
	Human capital	-0.3365612	0.2204587	-1.53	0.129

*, **, *** indicate significance at 10%, 5% and 1% levels, respectively. Source: Researcher's result using StataMP 11. RGDP: Real gross domestic product, SE: Standard error

Table 6: Results of the test of equality of regression coefficients: Test $bnka=bnki=bnkre=bnkc=bnks$

1	$[RGDP^A] BNK^A - [RGDP^I] BNK^I = 0$
2	$[RGDP^A] BNK^A - [RGDPR^E] BNKR^E = 0$
3	$[RGDP^A] BNK^A - [RGDP^C] BNK^C = 0$
4	$[RGDP^A] BNK^A - [RGDP^S] BNK^S = 0$

Chi² (4)=71.16, Prob>Chi²=0.0000. Source: Researcher's result using StataMP 11.
RGDP: Real gross domestic product

bank lending to service) impact on Nigeria's economic growth differently. For this purpose, we adopt a SURE model consisting of five single equations (one for each sector) which were estimated with the application of the SUR estimator and the help of Stata 11 software package. Our study provides evidence that bank lending to agriculture, industry, real estate and construction and commercial sectors has exerted significant positive impact on economic growth (RGDP) of the respective sectors thus lending credence to the finance-led-growth hypothesis.

Our study further provides evidence that sector level bank lending impact on Nigeria's economic growth differently. The highest impact of bank lending is in the agriculture sector, followed by commercial sector, then industrial sector and real estate and construction. However, bank lending does not have any significant impact on economic growth of the service sector. Having established that bank lending to the different sectors of the Nigerian economy contributes differently to economic growth, bank credit in Nigeria is not a homogenous concept. Therefore, aggregating bank credit in any analysis could lead to wrong conclusion on its effect on economic growth because of these sectoral differences. It is important for banks to recognize these sectoral differences and to have a proper understanding of sectoral characteristics and to tailor their lending activities in response to sectoral needs and wants. By utilizing sector level bank lending data in our analysis, this study addressed important gap in the relevant literature.

The results have important implications for further investigations, like designing appropriate sectoral credit allocation policies. These policies are to be based on sound macro- and microeconomic management, coupled with good governance aimed at promoting sustained economic growth. This is critical, especially in our situation where from our analysis, bank lending to agriculture with the highest tendency to impact on economic growth was only about 3% of total bank credits during the period covered by the study whereas, bank lending to the service sector (including government services) with no significant impact on economic growth was about 53% of total bank credit.

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