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The Impact of Private Sector Credit on Economic Growth in Nigeria

Ganiyu B. A. Amoo, Matthew I. Eboreime, Yusuf Adamu and Maximillian C. Belonwu¹

The paper determines empirically the local conditions and policy environment that influence the absorptive capacity of credit in the Nigerian economy for the period 1993:Q1 to 2013:Q4 using fully modified least squares. Findings show that credit is growth-enhancing, even when trade openness, monetary policy, investment climate and infrastructure are low. Also, the composite local condition index analysis revealed that private sector credit increased economic growth when domestic or local conditions were favourable and the absorptive capacity of the domestic economy for credit was estimated at 29% of the GDP in 2013. These results suggest that there is ample room for growth-enhancing credit expansion in Nigeria.

Key words: Absorptive Capacity, Credit, Fully Modified Least Squares
Real economy

JEL Classification: A10, C10, C50, C51

1.0 Introduction

The importance of credit in economic development cannot be over-emphasized, especially in the context of developing countries that are trapped in a web of poverty which has become known as the vicious circle of poverty. As noted in Jhingan (2011), the vicious circle of poverty implies a circular constellation of forces tending to act and react upon one another in such a way as to ensure that poverty is self-perpetuating. Several theories emphasised the over-riding importance of capital in breaking the grip of poverty, removing structural rigidities and promoting economic development. For instance, the “big push” theory contends that a high minimum amount of investment is required to overcome the obstacles of development in poor countries and to launch it on the part of progress. Similarly, the “take-off” in Rostow’s stages of growth theory is largely predicated on massive investment of capital.

¹ The authors are staff of the Real Sector Division, Research Department, Central Bank of Nigeria, Abuja. The views expressed in the paper are those of the authors and do not reflect those of the Bank or its policy.

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Globally, economies (especially those of developing countries) are sometimes subject to serious financial shocks and capital constraint which impact negatively on macroeconomic variables, and cause the financial intermediation mechanism to suffer. This in turn dislocates the central role of banks as agents of savings mobilization and lenders for investment. To ameliorate this trend, especially after the 2007-2008 global financial crises, central banks around the world began to adopt traditional as well as unconventional credit easing policies to inject liquidity into the banking system so as to obviate recessionary outcomes in the economy. Thus, public authorities in Nigeria have in the last several years rolled out a number of credit or development interventions with the aim of promoting income and employment expansion at both the firm and aggregate levels, build basic infrastructure and engender overall sustainable development.

The experience of Nigeria leaves no doubt that capital is a prerequisite for its economic and social progress as well as for effective public policy making. The Central Bank of Nigeria (CBN) recognizes that for the economy to function efficiently given structural rigidities, and for the private sector to develop and flourish, businesses need to have access to credit. In view of the paucity of credit, coupled with the problems of inadequate infrastructure, huge skills gaps, and very large informal sector, the CBN and other development partners such as the Bank of Industry (BoI), the Bank of Agriculture, among others embarked on significant credit injections to support the critical sectors of the economy.

First, indirect monetary policy intervention was used from 2004 to 2008 to inject funds into major financial and non-financial institutions in order to revitalize the entire economy. These capital injections prevented the bankruptcy of various financial institutions by strengthening their balance sheets and restoring their ability to raise and productively deploy credit. Despite several policy initiatives of the CBN, small and medium-sized businesses in Nigeria continued to experience difficult moments in accessing funds.

The second class of intervention were those made to the critical sectors of the economy aimed at bridging the yawning financing gap that have existed over time. In this regard, some notable interventions in recent years by the CBN include the ₦200 billion Commercial Agriculture Credit Scheme; ₦200 billion Restructuring and Refinancing Facility;

₦200 billion SME Credit Guarantee Scheme; and ₦300 billion Powers and Airline Intervention Fund, amongst others. For instance, the Bank of Industry (BoI) implemented some intervention funds such as the ₦5 billion BoI/Dangote Matching Fund, Cassava bread Fund, ₦1.1 billion Cottage Fund, ₦5 billion FGN Special Intervention Fund for MSME, ₦800 million National Programme for Food Security, ₦13.6 billion Rice and Cassava Intervention Fund, Sugar Council Development Fund, National Automotive Council Fund comprising ₦1 billion for Automotive Assembly Plants, ₦200 million for automotive component manufacturers, ₦100 million for automotive garage workshop and ₦20 million for artisans, craftsmen and mechanics. Also the Bank has disbursed ₦8, 479,486.76 under the Cement Fund. Similarly, the Bank of Agriculture disbursed ₦41 billion to over 600 enterprises across Nigeria in the last ten years, ₦3 billion on-lending facilities to about twelve states of the Federation and ₦4 billion to about 30,000 beneficiaries. In addition to these, a total of US\$86.56 billion was received as capital inflows into the economy in the form of direct and portfolio investment, trade credits and loans as well as currency and deposits from 2011 to 2015.

Given the multiplicity of credit interventions by the CBN and other funding institutions, it is plausible to express some doubt about the absorptive capacity of the economy. The basic problem of interest is that credit purveyance may lead to sub-optimal outcomes and poor resource allocation decisions if local conditions are unfavourable, which may eventually cascade into a huge stock of non-performing credit facilities. Thus, a number of important questions come to mind: Does the growth enhancing attribute of credit depend on the absorptive capacity of the economy? What are the factors constraining the absorptive capacity for further credit in Nigeria? Does the macroeconomic policy framework have any effect on domestic credit absorption? Given the absorptive capacity of the Nigerian economy, what is the threshold point beyond which credit ceases to significantly impact on growth? Providing the answers to these questions constitute the objectives of this paper.

Specifically, the three-fold objectives of the paper include: to determine the necessary factors that influence the absorptive capacity for credit in the Nigerian economy; examine public policy effects on the absorptive capacity for credit; and assess the possibility of diminishing return to credit. The contribution of this paper to empirical literature hinges on the fact that it is perhaps the first study on absorptive capacity of credit in

Nigeria that is focused on the above objectives. The approach adopted in this study is yet to be seen in any similar study in Nigeria. The remainder of the paper is structured as follows: section two reviews the relevant literature for the study; section three discusses the methodology/specification; section four presents the findings of the study; and section five concludes the paper.

2.0 Review of Literature

2.1 Theoretical Framework

Theoretically, the relationship between credit and growth is established by an assessment of the transmission mechanism through which credit promotes economic growth. The neoclassical growth model provides a basis to illustrate the impact of credit interventions on economic growth through the augmentation of saving which in turn, translates to an enhancement in gross domestic investment and capital accumulation (Thiel, 2001).

Based on a different class of theoretical models, Papaioannou (2007) argue that financial development affects growth by reducing inequality through the process of human capital accumulation. In addition, it provides a mechanism to assess how various factors such as institutional quality, government policies, infrastructure, endowments and finance affect the growth process of an economy. Burnside and Dollar (2000) argued that policies that affect economic growth are expected to affect the extent to which aid is productively used. Therefore, they proposed the interaction between aid and policy. Adopting this line of argument with respect to credit, it is plausible to hypothesize that credit will promote growth in a good policy environment. Additionally, we hypothesize that when the local conditions are right, credit will be more growth enhancing. To test these propositions, the following equations are specified.

Following the exposition of Papaioannou (2007), the neoclassical aggregate production function is specified as:

$$Y_t = AK^\alpha(Lm)^{1-\alpha} \quad (1)$$

Equation (1) expresses output in year (t) as a function of aggregate capital stock K_t ; labour force, L (adjusted for human capital m); and technological level, A ; which enters the equation in a Hicks-neutral way.

Share of capital and quality adjusted labour is measured by α and $1-\alpha$ respectively.

In its intensive form (per worker terms), the production function is represented as;

$$y = Ak^\alpha m^{1-\alpha} \quad (2)$$

Taking the derivative of (2) with respect to time;

$$\dot{y}/y = a \dot{k}/k + (1-\alpha) \dot{m}/m + \dot{A}/A \quad (3)$$

In equation (3), output growth per worker is determined in three parts. The first $a \dot{k}/k$ captures investments or capital deepening, the second, $(1-\alpha) \dot{m}/m$ captures the role of human capital development through education, and the third, \dot{A}/A captures the role of total factor productivity which measures the degree of efficiency with which inputs are combined in the production process.

However, it should be noted that this framework includes all factors not related to education and physical capital investment since technical change is measured in the form of the Solow residual and this framework should be seen as an analytical tool through which the sources of growth through finance (credit) and other inputs is understood.

In the above framework, credit does not impact on growth directly but through the main sources of economic growth. It is plausible to assume that increased credit purveyance would enhance investment which in turn would accelerate the pace of capital accumulation and economic growth.

2.2 Empirical Literature

There is paucity of literature on the absorptive capacity of credit. However, attempt has been made in this paper to review other studies that relates to financial injections. These studies, we believed, have similar effects with credit in an economy and as such, reasonable inference could be drawn from them as a proxy. For instance, a strand of literature on absorptive capacity dwells on overseas development assistance or foreign aid of which some of its principles and methods can reasonably be adapted to study credit interventions generally in any given domestic economy.

Sandrina, (2005) used a Harrod-Domar and GAP models to assess the macroeconomic impact of foreign aid on economic growth and found that such injections are beneficial to developing countries. The results suggest that non-linearity and time lags in the aid-growth relationship, country heterogeneity and endogeneity of foreign aid should be factored when assessing the impact of foreign aid on economic growth of developing countries.

Clemens and Radelet (2003) employed a “saturation point” technique to determine how excessive amount of aid above the saturation point will bring less-than-anticipated impact in stimulating growth and development in the recipient country. They found that large inflows of US Millennium Challenge Account (MCA) aid to recipient countries would have a less-than-anticipated impact, either in terms of absorptive capacity or in terms of stimulating growth and development.

Narula (2004) undertook an in-depth explanation of how the nature of absorptive capacity changes with stages of economic development, and the importance of the different aspects of absorptive capacity at different stages. The study found that the benefits that accrue from marginal increases in absorptive capacity change over time.

Fu (2007) investigated the impact of foreign direct investment (FDI) on the development of regional innovation capabilities using a panel dataset from China. The outcome indicates that FDI has a significant positive impact on the overall regional innovation capacity. FDI intensity is also positively associated with innovation efficiency in the host region and that the strength of this positive effect depends, however, on absorptive capacity and the presence of innovation-complementary assets in the host region. It noted that the type and quality of FDI inflows and the strength of local absorptive capacity and complementary assets in the host regions are crucial for FDI to serve as a driver of knowledge-based development.

Farkas (2012) found that the contribution of FDI to economic growth is positive and significant depending on the level of human capital and the development of financial markets but its presence in developing countries must compliment rather than substitute a set of other growth determinants.

Burnside and Dollar (2004) examined the relationship between aid and growth using data set focusing on the 1990s. The evidence supports the

view that the impact of aid depends on the quality of state institutions and policies. They also found that the interaction of aid and institutional quality has a robust positive relationship with growth that is strongest in instrumental variable regressions. Their results further show that in the 1990s the allocation of aid to low-income countries favored the ones with better institutions.

Hansen and Tarp (2000) re-examined the literature on the aid–savings, aid–investment, and aid–growth relationships, and a comparative appraisal of more recent research contributions. Using an analytic framework for evaluating the empirical work, they found a coherent and positive picture of the aid–growth. In other words, that there is a robust aid–growth link even in countries hampered by an unfavourable policy.

Audu (2012) examines the relationship between absorptive capacity, credit market development and economic development in Nigeria using Ordinary Least Squares. The model specified in the study and the caption of the work appears to irreconcilable and disjointed. Aside the numerous disadvantages associated with the use of OLS, the study actually looks at the impact of some macroeconomic variables on credit. Thus, credit rather than a growth proxy was used as the dependent variable without any indicator of absorptive capacity identified in literature appearing on the right-hand side of the specification. This paper fails to fill the gap of ascertaining the absorptive capacity of credit in Nigeria by determining the growth maximizing level of credit in the Nigeria economy.

2.3 Concept of Absorptive Capacity

Absorptive capacity is a term subject to varied interpretations depending on the context in which it is applied. Within the context of credit, aid and other interventions, absorptive capacity can be seen as the ability of an economy to utilize credit so as to achieve the aim intended by the intervention, which could be to generate employment, improve productivity of firms or the overall promotion of economic growth. High absorptive capacity enhances productivity and results in better resource allocation. Thus, it can be a moderator to crucial resource allocation decisions (Narula, 2003).

In relation to Foreign Direct Investment (FDI) which is another form of financial injection, Farkas (2012) conceptualized absorptive capacity to mean the existence of various local conditions favourable to economic

growth. These growth determinants referred to as measures of absorptive capacity (such as trade openness, financial market development, level of human capital, technology gap and natural resource abundance), interacts with the resource allocation mechanism to determine the extent to which FDI will influence economic growth in the host country.

Absorptive capacity issues are better understood when the intervention is considered in relation to GDP. In the case of credit interventions or quantitative easing, overseas development assistance or FDI, they are usually considered as a ratio of GDP or GNI. At low levels of financial injection absorptive capacity problem might not arise, but at high levels, absorptive capacity is more likely to become an issue. Clemens and Radelet (2003) posits that the more financial injections (aid) are used in financing imports, especially consumables, the less the macroeconomic impact. On the other hand, the more aid is spent on locally manufactured goods, the greater will be the inflationary and other macroeconomic impact.

It is reasonable to hypothesize that as credit interventions becomes increasingly larger and larger in an economy (given subsisting local conditions) a point will be reached when the rate of return on additional financial injection is zero. This point is known in the growth literature as the saturation or turning point. This brings to the fore the popular question in development interventions, how much is too much? With increasing credit interventions, the speed at which a country attains the saturation point is a function of the quality of institutions, macroeconomic and development policies, among others. Therefore, the better the institutions and public policies, the greater will be the absorptive capacity and the farther will be the saturation point (see Farkas 2012; Clemens and Radelet 2003; Burnside and Dollars 2000; Collier and Hoeffler 2002; Hansen and Tarp 2000).

3.0 Methodology

3.1 Data Description and Sources

The dependent variable employed throughout this paper is the growth rate of real gross domestic product (RGR) while the regressors, include appropriate proxies for trade openness (TOP), monetary policy (MP), fiscal policy [Budget Surplus/Deficit to GDP (BSD)], domestic investment (DI), infrastructure [Electricity Power Consumption per Capita (EP)] and credit [domestic credit to the private sector (PSC)]. In

addition, two composite indices were computed, namely, local conditions index and policy index.

The main sources of data include: Central Bank of Nigeria Statistical Bulletin 2013; the National Bureau of Statistics; World Bank; and The Economist Intelligence Unit. The study employed quarterly data converted from annual series and the scope runs from 1990 to 2013. Appendix 1 provides a detailed note on the variables as well as sources.

3.2 Model Specification and Estimation Technique

One of the objectives of the study is to determine the impact of private sector credit on the economic growth given the various measures of absorptive capacity. Two baseline growth equations (4 and 5) were estimated:

$$gc_{4t} = b'_t \alpha_b + \varepsilon_t^{gc4} \tag{4}$$

$$gc_{5t} = a_t \alpha_a + e'_t \alpha_e + b'_t \alpha_b + \varepsilon_t^{gc5} \tag{5}$$

where

gc = real GDP growth (RGR)

a_t = domestic credit to private sectors (PSC)

e'_t = 1 x 2 vector of policy variables (MP and BSD)

b'_t = 1 x 3 vector of control variables (TOP, DI and EP)

$\alpha_a, \alpha_e, \alpha_b$ = coefficients

ε_t^{gc} = error term

The *a priori* expectation is that PSC will have a positive effect on growth in all the regressions.

The first two of the control variables are commonly included in growth regressions. However, we have included electricity consumption per capita as a variable because of its importance in promoting economic growth. These three growth determinants are the measures of absorptive capacity. Next a number of interaction equations are presented below in equations (6), (7), and (8). The interaction terms are useful in determining the extent to which the control variables facilitated the

domestic absorption of credit into growth. Equations (9) and (10) are meant to assess the effects of monetary and fiscal policies on the absorptive capacity of the economy.

$$gc_{6t} = a_t\theta_a + b'_t\theta_b + a_t s_t \theta_{as} + \varepsilon_t^{gc6} \quad (6)$$

$$gc_{7t} = a_t\gamma_a + b'_t\gamma_b + a_t \dot{c}_t \gamma_{af} + \varepsilon_t^{gc7} \quad (7)$$

$$gc_{8t} = a_t\gamma_a + b'_t\gamma_b + a_t \acute{o}_t \gamma_{af} + \varepsilon_t^{gc8} \quad (8)$$

$$gc_{9t} = a_t\beta_a + b'_t\beta_b + a_t q_t \beta_{aq} + \varepsilon_t^{gc9} \quad (9)$$

$$gc_{10t} = a_t\gamma_a + b'_t\gamma_b + a_t f_t \gamma_{af} + \varepsilon_t^{gc10} \quad (10)$$

where s_t is proxy for trade openness (TOP); q_t , investment (DI); f_t electricity consumption per capita (EP); \dot{c} , monetary policy (MP); and \acute{o} is for fiscal policy (BSD).

In terms of *a priori* expectation, credit should have a positive sign as it is expected to impact favorably on growth in conjunction with policy and control variables.

$$gc_{11t} = a_t + n'_t \lambda_m + a_t \cdot v'_t \lambda_t + \varepsilon_t^{gc11} \quad (11)$$

$$gc_{12t} = a_t + m'_t \lambda_m + a_t \cdot k'_t \lambda_t + \varepsilon_t^{gc12} \quad (12)$$

where

m'_t = vector of policy variables

n'_t = vector of control variables

k'_t = locdx, index of local conditions

v'_t = podx, fiscal-monetary policy index

The construction of the composite index for local conditions (locdx) takes into cognizance the variables for investment, infrastructure and trade openness:

$$Locdx = \hat{y}_0 + (\hat{y}_1 * q_t) + (\hat{y}_2 * f_t) + (\hat{y}_3 * s_t) \quad (13)$$

Furthermore, the composite policy index (Podx) computation makes use of the following specifications (Burnside and Dollar, 2000; and Hansen and Tarp, 2000):

$$Podx = \hat{y}_0 + (\hat{y}_4 * \hat{c}) + (\hat{y}_5 * \hat{o}) \quad (14)$$

where, the \hat{y} 's are the estimated coefficients in the baseline model (equation 5). The coefficients are used as weights.

Theoretically, it is plausible to reason that, *ceteris paribus*, if capital is increased continuously, a point is reached when diminishing returns sets in. Consequently, an attempt is made to assess the possibility of diminishing returns to credit through the inclusion of a quadratic term as is found in growth literature. We expect the quadratic term to turn up with a negative sign as an indication of decreasing returns.

$$gc_{13t} = n' \lambda_m t + a_t \cdot v' t \cdot \bar{u}_{av} + (a_t)^2 + \varepsilon_t^{gc13} \quad (15)$$

To determine the saturation or turning point, we take the first derivative of equation (15) and solve for the absorptive capacity.

Given that all the variables are integrated to the first order (the unit root test based on Augmented Dickey-Fuller (ADF) is presented in Appendix 2), we employed the fully modified least squares method in the data analysis. The technique has the advantage of modifying ordinary least squares to account for the problem of serial correlations of error terms and for the endogeneity in the regressors that result from the existence of a cointegrating relationship (Philips and Hansen, 1990; and Philips, 1993).

4.0 Results and Discussion

The various estimation results discussed below are aimed at exploring the nature of relationship between credit and absorptive capacity of the Nigerian economy.

4.1 Credit and Absorptive Capacities

The results in Table 1 show the baseline outcomes and the impact of each regressor on growth prior to the introduction of interaction terms. In equation (4), the monetary policy (MP), domestic investment (DI) and electricity power consumption per capita (EP) variables were statistically significant at the 1% and 5%, respectively. The coefficient MP has the *a priori* positive sign but that of DI and EP were negative (the outcomes for DI and EP may serve as a reflection of the general poor state of physical/domestic infrastructure for many years, which exerted significant negative impact on growth). Trade openness (TOP)

coefficient possessed the expected positive sign and is statistically significant at the 10% level. Furthermore, the afore-mentioned variables continued to exert their impact on economic growth in a similar pattern in equation (5) following the introduction of private sector credit. After controlling for different measures of absorptive capacity, PSC was found to exert a statistically significant positive effect on economic growth.

Table 1: Growth (Baseline) Regressions with Control and Credit Variables. Dependent Variable: RGR

Variables	Control (4)	Credit (5)
C	5.648 (0.169)	4.123 (0.314)
TOP	0.171* (0.069)	0.173* (0.060)
MP	0.453*** (0.000)	0.436*** (0.000)
BSD	-0.568 (0.108)	-0.714** (0.044)
DI	-1.339*** (0.001)	-1.541*** (0.000)
EP	-0.088** (0.038)	-0.081** (0.050)
PSC	-	0.163*** (0.005)
R^2 (Adjusted)	0.3	0.45

***, **, * significant at 1%, 5% and 10% levels respectively; Figures in parenthesis are probability values

In Table 2, the interaction terms were added one at a time in the growth regressions and they portray the impact of credit on economic growth when the measures of absorptive capacities were factored into the analysis. The interaction term, credit and trade openness (PSC*TOP) in equation (6) enters negatively (-2.735) and it is statistically significant at the 5% percent level. The results show that with addition of the interaction term, the positive contribution of PSC to growth increased by eleven times and is statistically significant at 5% level. However, the negative coefficient of the interaction term suggests that PSC is growth

enhancing in the economy even where the share of total trade to GDP is low.

Table 2: Growth Regressions with Credit Interaction Terms (Openness, Monetary Policy and Fiscal Policy). Dependent Variable: RGR

Variables	PSC*TOP (6)	PSC*MP (7)	PSC*BSD (8)
C	-15.982* (0.069)	-1.537 (0.724)	4.611 (0.243)
TOP	0.498*** (0.000)	0.177 (0.038)**	0.165* (0.064)
MP	0.442*** (0.000)	0.696*** (0.000)	0.439*** (0.000)
BSD	-0.576* (0.063)	-0.601* (0.071)	0.403 (0.717)
DI	-1.637*** (0.000)	-1.542*** (0.000)	-1.632*** (0.000)
EP	-0.066* (0.066)	-0.090** (0.020)	-0.071* (0.086)
PSC	1.794** (0.010)	0.667*** (0.006)	0.115 (0.106)
PSC*ABS. CAPACITY	-2.735** (0.019)	-0.019** (0.030)	-0.087 (0.276)
R ² (adjusted)	0.47	0.47	0.45

***, ** and * significant at 1, 5 and 10 per cent levels respectively; Figures in parenthesis are probability values

Furthermore, equation (7) reveals that the interaction term, PSC and MP (PSC*MP) enters negatively (-0.019) into the regression and is statistically at 5% level. This outcome suggest that PSC is growth enhancing despite the overall scenario of a tight monetary policy as the contribution of credit to growth relative to the baseline increased by four times. Similarly, the coefficient of the interaction term (PSC*BSD) is negative but not statistically significant (8), suggesting that PSC is growth enhancing where the share of budget deficit in GDP is low. Moreover, the contribution of credit to growth increased by 0.71 times after the interaction term was introduced.

Table 3: Growth Regressions with Credit Interaction Terms (Investment, and Electricity). Dependent Variable: RGR

Variables	PSC*DI (9)	PSC*EP (10)
C	-8.166 (0.219)	-15.965** (0.045)
TOP	0.158* (0.058)	0.122 (0.127)
MP	0.418*** (0.000)	0.396*** (0.000)
BSD	-0.518 (0.113)	-0.451 (0.142)
DI	0.089 (0.910)	-1.550*** (0.000)
EP	-0.803** (0.028)	0.114 (0.149)
PSC	1.183** (0.010)	1.819*** (0.002)
PSC*ASB. CAPACITY	-0.116** (0.026)	-0.013*** (0.005)
R ² (Adjusted)	0.46	0.50

***, **, * significant at 1, 5 and 10 per cent levels respectively; Figures in parenthesis are probability values

In equations (9) and (10), the contribution of PSC to growth relative to the baseline scenario increased by seven times and eleven times, respectively, following the introduction of the interaction terms (PSC*DI and PSC*EP). The intuition is that even where the share of domestic investment in GDP is low, PSC is growth enhancing. Also, even where the electricity power consumption per capita is low, PSC contributes positively to growth. The above results are all statistically significant at either the 5% or 1% levels (see Table 3).

The regression results of equations 11 and 14 presented in Table 4 shows that the interaction between the composite policy index and credit yield a positive coefficient, though not significant. The result indicates that PSC is growth enhancing when the fiscal-monetary policy mix is favourable.

Table 4: Growth Regression and Composite Policy Index

Dependent Variable: RGR

Regression (Equations 11 and 14)	Coefficients	Probability
C	8.704	0.202
TOP	0.041	0.764
DI	-0.57	0.293
EP	-0.04	0.582
PSC	0.085	0.743
PODX*PSC	0.013	0.484
R ² (adjusted) : 0.10		

4.2 Local Conditions Index and Diminishing Returns to Credit

The first part of this section involves the examination of certain indicators of local conditions that may affect the absorptive capacity of credit in the domestic economy. Three variables, namely; trade openness, investment and electricity consumption per capita (infrastructure) were combined to construct a composite local condition index (LOCDX). The aim is to assess the effect of the sum of local conditions on the absorptive capacity of credit.

Equations 12 and 13 indicate that the coefficient of the interaction term between credit and the composite local condition index is positive and quite significant; thereby portraying that PSC increases economic growth, given a favourable local environment. Furthermore, to determine the point of diminishing returns to credit, the first derivative of equation (15) is obtained. Solving for private sector credit to GDP [PSC (%)] yield the following result:

$$PSC = 28.5 + (0.042L * podex)$$

The value of the constructed composite policy index in 2013Q4 is 12.715.

Table 5: Growth Regressions (LOCDX and Quadratic Model)

Dependent Variable: RGR

Regressions	LOCDX (12)	Quadratic Model (13)
C	-7.381*** (0.000)	-5.743 (0.346)
TOP	-	0.111 (0.288)
DI	-	-0.744 (0.114)
EP	-	-0.034 (0.596)
BSD	-0.507** (0.033)	-
MP	0.372*** (0.000)	-
PSC	0.826*** (0.000)	1.368*** (0.006)
PSC*LOCDX	0.069*** (0.000)	-
PSC*PODX	-	0.002 (0.900)
(PSC)^2	-	-0.024** (0.014)
R ² (adjusted) :	0.48	0.29

***, ** significant at 1 and 5 per cent levels respectively; Figures in parenthesis are probability values

This translates to an absorptive capacity for private sector credit in the domestic economy of 29 per cent of GDP. Consequently, if the policy environment changes for the better, we should expect domestic credit absorption to increase, hence greater absorptive capacity. In 2013, data from the World Bank indicates that the domestic credit to private sector (% of GDP) for Nigeria stood at 12.8 per cent. Thus, credit purveyance to the private sector was well below the country's absorptive capacity in 2013.

Moreover, World Bank statistics show that in 2013, the domestic credit to private sector (% of GDP) in Brazil, Egypt, India, Indonesia, Kenya, Malaysia and South Africa stood at 70.7%, 27.8%, 51.8%, 37.9%, 39.6%, 124.3% and 156.1, respectively. It is evident that Nigeria trailed behind.

5.0 Conclusion and Policy Implication

The aim of this study is basically twofold: the first is to determine the local conditions and policy environment that influence the absorptive capacity of private sector credit in Nigeria; and the second, is to determine the existence of a saturation point for private sector credit in Nigeria. The findings of the study are summarized as follows:

Private sector credit impacted positively and significantly on economic growth after controlling for local conditions and the policy environment;

The outcome of including the interaction term (PSC*TOP) indicates that private sector credit is significantly growth enhancing in the economy even where the share of total trade to GDP is low as the contribution of credit to growth relative to the baseline increased by eleven times;

The result of including the interaction term (PSC*MP) provides significant evidence that private sector credit is growth enhancing despite the overall scenario of a tight monetary policy as the contribution of credit to growth relative to the baseline increased by four times;

The finding from the inclusion of the interaction term (PSC*BSD) suggests that private sector credit is growth enhancing where the share of budget deficit in GDP is low as the contribution of credit to growth relative to the baseline increased by 0.71 times. However, this result is not statistically significant.

Furthermore, private sector credit contributes significantly to growth even where domestic investment and power infrastructure is low (or sub-optimal).

The coefficient of the interaction term between credit and the composite local condition index is positive and quite significant, thereby portraying that private sector credit increases economic growth when domestic or local conditions are favourable.

The quadratic model supports the notion that there is diminishing return to credit. The analysis shows that the absorptive capacity of domestic credit to private sector stood at 29% of the GDP in 2013.

The policy implication of these outcomes is that there is ample room for growth-enhancing private sector credit expansion initiatives in Nigeria.

Specifically, we recommend that:

The electricity power intervention programme by the CBN to address this aspect of critical infrastructure should be enhanced and reviewed for greater effectiveness. Better power supply will further increase the absorptive capacity of credit;

There should be a more benign monetary policy in order to create a better investment friendly climate by moderating the interest rate structure in the banking sector, which in turn increases the absorptive capacity of credit.

The Bank, as an advisor to the Federal Government, should leverage on that platform to ensure that the power sector and other infrastructure deficiencies in the country are addressed to enhance credit absorption capacity.

The Bank should continuously interface with the Government to ensure moderation in the budget deficits to avoid crowding out of private investment and increase the flow of private sector credit.

The recent foreign exchange restriction placed on certain commodities is deemed to be proper and should be rigidly implemented. Contraventions should be heavily penalized to serve as deterrent to others. The implicit advantage is that it will expand the productive base of the domestic economy, promote exports of local manufactures, and increase trade openness. Consequently, the absorptive capacity of credit will rise.

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Appendix 1

Notes on Data/Sources

1. All data are annual series that were converted into quarters using Eviews.
2. PSC is Domestic Credit to Private Sector which was obtained from the World Bank data base.
3. BSD is Budget Surplus/Deficit to GDP. It is available in the 2013 Statistical Bulletin.
4. TOP is Total Trade divided by nominal GDP multiplied by 100. Trade and nominal GDP data comes from the Statistical Bulletin.
5. MP is Broad Money Supply to nominal GDP (%). Computed from data in the Statistical Bulletin
6. DI is Gross Domestic Investment to GDP (%). Investment data is from National Bureau of Statistics
7. EP is Electricity Power Consumption per Capita . See Factfish World Statistics/Data Research and Index Mundi for data on electricity power consumption per capita
8. RGR is real GDP growth. The data comes from: The Economist Intelligence Unit.
9. Podx stands for policy index that is constructed in line with the formula in the methodological section of the paper. Basically, it is a weighted combination of BSD and MP which are the proxies for fiscal and monetary policies.
10. Locdx represents the index for local conditions. It is the weighted combination of TOP, DIN and EP.

Appendix 2**ADF Unit Root Test**

Variables	ADF	Order of Integration
RGR	-6.23***	I(1)
BSD	-4.24***	I(1)
PSC	-3.35**	I(1)
EP	-4.58***	I(1)
DI	-4.07***	I(1)
MP	-3.60**	I(1)
TOP	-4.80***	I(1)

, *Rejection of unit root hypothesis at 5% and 1% levels