PRIVATE SECTOR CREDIT AND CONSTRUCTION SECTOR GROWTH IN NIGERIA, 1990-2014: A CO-INTEGRATION ANALYSIS

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Abstract
The study examines the relationship between private sector credit and construction sector growth in Nigeria over a period, (1990-2014). The study used time series secondary data obtained from Central Bank of Nigeria Statistical Bulletin and National Bureau of Statistics. The study used Construction Sector Growth as the dependent variable; whereas, Broad Money Supply, Credit to the Private Sector, Interest Rate and Inflation Rate as the explanatory variables. Hypotheses were formulated and tested using time series econometrics techniques. The study reveals that all the variables of the study are stationary at first difference. The study shows the existence of at least one co-integrating relationship at 5% level of significance. The study reveals a short-run equilibrium significant relationship between private sector credit and construction sector growth in Nigeria. There is no causal relationship between private sector credit and construction sector growth in Nigeria. The study concludes that private sector credit has not significantly contributed to construction sector growth in Nigeria. The study recommends that for the economy to grow, the construction sector should be encouraged in form of concessional and reduced interest rate. The study suggests that regulatory authorities should stabilize the interest rate which is capable of ensuring price stability and maintaining inflation to a single digit. This may build confidence in the banking institutions and will enable them to introduce innovations to boost construction sector growth in the economy. CBN and policy makers should adopt vibrant economic policies such as interest rate stability, flexible exchange rate, indigenization and economic diversification which will encourage the banks in financing the construction sector.

Keywords: Private, sector, credit, construction sector, growth and Nigeria.
Introduction
Andabai (1914) stated that the activities of financial institutions serve as a veritable tool to stimulate the productive sectors of the economy. This is in line with the supply-leading hypothesis; because, the direction of relationship flows from financial institutions to the private sector. Hence, bank credits are used for investment purposes; and, thus, contribute to the growth and development of the real sector. This proposition is supported by the empirical works of Tawose (2012), Ayeni (2014), Oluwafemi, Akinlo and Elumilade (2014) who found a positive significant relationship between bank credit and private sector growth. Since, bank credit is used to support investment which brings about productivity or profit; it thus has influence on construction sector growth.

The construction sector appears to be one of the major contributors to the Gross Domestic Product (GDP) given the available data (CBN, 2014). Hence, it is widely acknowledged that the construction sector plays a critical role in economic transformation in Nigeria. For instance, in 1988, it started as low as N4.8billion, increasing gradually to N5.5billion in 1989 to N5.7billion in 1990 and N9.5billion in 1991 respectively as indicated in appendix 2. This is supported by the work of Ademola (2014) who concludes that the sector still maintained increasing share of GDP between the third quarter of 2010 and third quarter of 2013. The study conducted by Uduak and Chinedu (2014) posit a positive significant relationship between credit to the private sector and construction sector growth in Nigeria. They conclude that the construction sector in Nigeria is growing, and should be encouraged by creating conducive operating environment for the operators in the sector to thrive.

Theoretical Framework
This study is anchored on the financial intermediation theory by Gurley and Shaw (1967). The theory explains the role of bank credit in an economy. According to the theory, the business of financial intermediation in any modern economy is to provide a mechanism to draw financial flows from financially exceeding agents to those having a financial need in the economy. This means that banking institution can influence private sector growth by extending credit to the sector.

Recent studies such as Eyas and Abdelraheem (2014), Emecheta and Ibe (2014), Nwaru and Okorontah (2014) reveal that bank credit also promotes the function of financial intermediation in the private sector-led economy. They conclude that the function of financial services had enhanced private sector growth and development through an effective capital accumulation and investments in the sector. Their argument further corroborate the work of Chang, Jai and Zhicheng (2010) which state that financial institutions acts as a shock absorber to growth and development of productive sector. Eatzaz and Malik (2009) stated that the under-development of the financial sector is one of the reasons why, private sector investment in developing countries tend to produce lower output than that of advanced countries.

Lemo (2002) observed that the role of bank credit to private sector in stimulating economic growth and development cannot be over emphasized. As a result, this is one of the most important sources of financing firms; especially, in countries where capital markets are not fully developed. Nzotta (2014) posits that bank credit is one of the important aspects of financial intermediation that provide funds to economic entities that can put them to the
most productive investment in an economy. They conclude that credit availability for consumption and investment are capable of raising the level of private sector output and create employment opportunities in the economy. Hence, banks should finance any positive net present value project if the cost of investment is below the expected returns. Based on these contributions, there is a justification for anchoring this study on endogenous growth model and financial intermediation theory.

**Empirical Literature**

Uduak and Chinedu (2014) use Ordinary Least Square (OLS) to examine the relationship between bank’s credit to the private sector and construction sector growth in Nigeria using time series spanning data (1985-2013). Gross Domestic Product, Bank Credit to Private Sector, Interest Rate, Broad Money Supply, and Exchange Rate were used as variables for the study. The results show a positive significant relationship between credit to the private sector and construction sector growth in Nigeria. The study concludes that the construction sector in Nigeria is growing; and, should be encouraged by both the government and investing public.

Emejeoka and Ugbeanu (2014) adopt Error Correction Model (ECM) to investigate the role of banking services and the building and construction sector growth in Nigeria using time series data for a period of 29 years (1984-2014). Gross Domestic Product (GDP) was used as the dependent variable and proxy for building and construction sector growth, while bank Credit to the Private Sector (CPS), Broad Money Supply (M₂), Interest Rate (INT) and Inflation Rate (INFL) were used to measure banking services. Augmented Dickey-Fuller (ADF) and Philips-Perron (PP) unit root tests were conducted. All the variables were integrated of order two i.e., 1(2). The findings show that there is a positive significant relationship between banking services and the building and construction sector growth in Nigeria.

Ujuamani (2013) employs Ordinary Least Square (OLS) to examine the role of financial credit and construction sector performance in Nigeria for a period of 25 years (1988-2012). Broad Money Supply (M₂), Interest Rate, Inflation and credit to the Private Sector (CPS) were used as variables for the study. The study reveals a positive significant relationship between financial credit and construction sector performance in Nigeria. The study concludes that credit to the private sector, interest rate, broad money supply and inflation rate have a long-run relationship with construction sector performance in Nigeria.

Obinna (2014) adopts Ordinary Least Square (OLS) to examine the relationship between bank lending and construction sector growth in Nigeria using time series spanning data (1997-2014). Gross Domestic Product (GDP), Bank Lending (BL), Broad Money (M₂), Interest Rate (INT) and Exchange Rate (EXR) were used as variables for the study. The results show a positive significant relationship between bank lending and construction sector growth in Nigeria.

Ademola (2014) employs time series econometrics models to examine the overview of the building and construction sector in the Nigerian economy for a period of 6 years (2008-2013). The study reveals that in 2008 and 2009 the sector was the 8th largest contributor to the country’s GDP. Between the third quarters of 2010 and 2012, the sector’s contribution...
to the GDP increased to 7th position while it improved slightly to 6th position in third quarters of 2012 and 2013. Hence, the sector still maintained increasing share of GDP between the third quarter of 2010 and third quarter of 2013. Therefore, there is the need to create conducive business environment for operators in the sector to thrive.

Ugochukwu and Onyekwena (2014) use time series econometrics techniques to investigate the role of financial deepening and construction sector performance in Nigerian over a period of 26 years, (1988-2013). Gross Domestic Product (GDP), Financial Deepening Ratio (M2/GDP), Broad Money Supply (M2) and Credit to the Private Sector (CPS) were used as variables for the study. The results show a positive significant relationship between financial deepening and construction sector performance in Nigeria. The study concludes that the construction sector contribution to the growth of the economy which leads to improved standard of living in Nigeria.

Methodology
The study applied ex-post-facto research design to source requisite information. An ex-post-facto research design is a systematic empirical inquiry that requires the use of variables which the researcher does not have the capacity to change its state or direction in the course of the study (Kerlinger, 1973 & Onwumere, 2009). Data for this study were sourced from the Central Bank of Nigeria Statistical Bulletin, 2014, Online Edition available in: www.cenbank.org and also from the National Bureau of Statistics (NBS, Nigeria). Data collected and used for the variables form the basis of this study which covered the period of 25 years (1990-2014). The variables classified in the model specification were drawn from the objective of the study. The variables used for this study are stated as follows: COSG, CPS, INT, M2 and INFL. Where: COSG = Construction Sector Growth as the dependent variable of the study. Bank credit variables (explanatory variables) include: CPS= Credit to the Private Sector. INT=Prime Lending Rate. M2=Broad Money Supply. INFL= Inflation Rate.

Model Specification
Model specification is the determination of the endogenous and exogenous variables to be included in the model as well as the a priori expectation about the sign and size of the parameters of the function (Ibenta, 2012). Multivariate linear regression model is used to test the null hypotheses proposed for the study: (i) there is no long-run equilibrium relationship between private sector credit and construction sector growth in Nigeria, (ii) there is no causality between private sector credit and construction sector growth in Nigeria.

Based on this hypothesis; a model is developed and the function is stated as:

\[ COSG = f(CPS, M_2, INT, INFL) \] \hspace{1cm} \text{(1)}

The equation becomes:

\[ \ln(COSG) = d_0 + d_1\ln(CPS) + d_2\ln(M_2) + d_3\ln(INT) + d_4\ln(INFL) + \mu_t \] \hspace{1cm} \text{(2)}

Where: \( COSG \) = Construction Sector Growth as dependent variable. \( CPS \) = Credit to the Private Sector. \( M_2 \) = Broad Money Supply. \( INT \) = Interest Rate (Prime Lending Rate). \( INFL \) = Inflation Rate. \( d_0 \) = intercept and \( d_1, d_2, d_3 \) and \( d_4 \) are the coefficients of the
regression equation. μ is the stochastic or error term while Ln is the natural log of the variables. Log transformation is necessary to reduce the problem of heteroskedasticity because it compresses the scale in which the variables are measured, thereby reducing a tenfold difference between two values to a twofold difference (Gujarati, 2003).

Data Presentation and Discussion
An of observations 25 years of time series data for the period, 1990-2014 were collected from CBN Statistical Bulletin and National Bureau of Statistics and presented as follows: Time series econometrics techniques were used to test the hypotheses: (i) there is no long-run equilibrium relationship between private sector credit and construction sector growth in Nigeria, (ii) there is no causality between private sector credit and construction sector growth in Nigeria.

Unit Root Test
The Augmented Dickey-Fuller (ADF) and the Philips-Perron (PP) tests are conducted on the variables, to determine whether they are stationary or non-stationary series as presented in table 1.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Order of Integration</th>
<th>Augmented Dickey-Fuller test</th>
<th>Phillips-Perron test</th>
<th>Order of Integration</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>COSG</td>
<td>1* Difference</td>
<td>-0.624513</td>
<td>2.637693</td>
<td>1(1)</td>
<td>Stationary at 1st difference</td>
</tr>
<tr>
<td></td>
<td>1* Difference</td>
<td>-5.982653*</td>
<td>-1.642428</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPS</td>
<td>1* Difference</td>
<td>0.3594163</td>
<td>0.323728</td>
<td>1(1)</td>
<td>Stationary at 1st difference</td>
</tr>
<tr>
<td></td>
<td>1* Difference</td>
<td>-4.224177*</td>
<td>-4.041604*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFL</td>
<td>1* Difference</td>
<td>-1.298462</td>
<td>-2.823710</td>
<td>1(1)</td>
<td>Stationary at 1st difference</td>
</tr>
<tr>
<td></td>
<td>1* Difference</td>
<td>-4.772822*</td>
<td>-7.764415*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M2</td>
<td>1* Difference</td>
<td>-0.438135</td>
<td>0.115207</td>
<td>1(1)</td>
<td>Stationary at 1st difference</td>
</tr>
<tr>
<td></td>
<td>1* Difference</td>
<td>-3.306049**</td>
<td>-3.324700**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INT</td>
<td>1* Difference</td>
<td>-3.324502**</td>
<td>-3.283532**</td>
<td>1(1)</td>
<td>Stationary at 1st difference</td>
</tr>
</tbody>
</table>

Note: The critical values are -3.64, -2.95 and -2.61 at 1%, 5% and 10% significance levels respectively. Significance of coefficients are reported using p-values. * denotes significant at 1%, ** denotes significant at 5%. Source: Author’s computation from Eviews 8.0

Decision rule: Reject the null hypothesis when the test statistical value is less than the critical value. Otherwise accept and test at higher difference (1 or 2). The significance level
for the analysis is 5%. The results of the stationarity tests are shown in table 1, and reveals that the variables are stationary at first difference.

**Co-integration Test**

Having established that all the variables in the model are stationary, the study then moves on to test for long-run relationship between the dependent and the independent variables using the Johansen Co-integration test (Johansen, 1991).

**Table 2: Co-integration Test for COSG, CPS, M₂, INT, INFL**

<table>
<thead>
<tr>
<th>Hypothesized No. of CE(s)</th>
<th>Max-Eigen Statistic</th>
<th>Critical Value</th>
<th>Trace Statistic</th>
<th>Critical Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>30.70259</td>
<td>33.87687</td>
<td>71.80498*</td>
<td>69.81889</td>
</tr>
<tr>
<td>At most 1</td>
<td>21.85095</td>
<td>27.58434</td>
<td>41.10240</td>
<td>47.85613</td>
</tr>
<tr>
<td>At most 2</td>
<td>14.12671</td>
<td>21.13162</td>
<td>19.25145</td>
<td>29.79707</td>
</tr>
<tr>
<td>At most 3</td>
<td>4.962265</td>
<td>14.26460</td>
<td>5.124736</td>
<td>15.49471</td>
</tr>
<tr>
<td>At most 4</td>
<td>0.162472</td>
<td>3.841466</td>
<td>0.162472</td>
<td>3.841466</td>
</tr>
</tbody>
</table>

Trace test indicates 1 co-integrating equation (s) at 5% significant level
Max-eigenvalue test indicates no co-integration at 5% significant level
* denotes rejection of the hypothesis at 5% significant level

**Source:** Author’s computation from E-views 8.0

The result in table 2, examines the presence of long-run relationship among bank credit variables (CPS, M₂, INFL and INT) and construction sector output. Based on the FPE and AIC lag selection criteria, the lag length adopted for the model is 1 to 2. From the results in table 2 and Max-Eigen statistics indicate no co-integrating equation; while, Trace Statistics shows one co-integrating equation. Based on the result of the Trace statistics, we conclude that there is one co-integrating equation from the model. Co-integrating equation derived from the long-run relationship is shown below:

\[
COSG = -1.4346 \times CPS + 0.0341 \times INFL + 0.9191 \times M₂ + 0.05291 \times INT - 2.724847
\]

\[
(0.59733) \quad (0.00618) \quad (0.64413) \quad (0.02877)
\]

\[
[-2.40181] \quad [5.53287] \quad [1.42686] \quad [1.83884]
\]

(\) is standard error and \([\) are the t-statistics

The above equation shows that INFL, M₂ and INT have a positive significant long-run relationship with construction sector output (COSG). Hence, CPS has a negative relationship with COSG in the long-run. The result indicates that a unit decrease in CPS will lead to a unit decrease in COSG by 1.43. Again, a unit increase in INFL, M₂ and INT will lead to a unit increase in COSG by 0.03, 0.91 and 0.05 respectively.

Based on the rule of thumb described by Onuorah and Akujuobi (2012) where coefficients are accepted as statistically significant when the t-statistics is greater than 2.0. Thus, only credit to the private sector is statistically insignificant. Because, credit to private sector has negative significant long-run relationship with construction sector growth in Nigeria. While inflation rate has a positive significant long-run relationship with the construction sector growth in Nigeria. Hence, the study concludes that long-run relationship exists among the variables.

**Vector Error Correction Mechanism**
Given the existence of co-integrating equations in the model employed for this study, it becomes ideal to carry out Error Correction Mechanism (ECM) test in order to determine the short-run dynamics of the relationships. Thus, the Vector Error Correction Mechanism (VECM) was conducted to determine the speed of adjustment private sector credit and construction sector growth relationship in Nigeria. Hence, this is to find out whether short-run disequilibrium can be returned to long-run equilibrium trend.

<table>
<thead>
<tr>
<th></th>
<th>D(COSG)</th>
<th>D(CPS)</th>
<th>D(INFL)</th>
<th>D(M₂)</th>
<th>D(INT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CointEq1</td>
<td>0.119081</td>
<td>-0.012987</td>
<td>-12.82345</td>
<td>-0.018074</td>
<td>-4.143158</td>
</tr>
<tr>
<td></td>
<td>(0.09905)</td>
<td>(0.05044)</td>
<td>(5.36669)</td>
<td>(0.03277)</td>
<td>(0.89679)</td>
</tr>
<tr>
<td></td>
<td>[1.20226]</td>
<td>[-0.25745]</td>
<td>[-2.38945]</td>
<td>[-0.55151]</td>
<td>[-4.61997]</td>
</tr>
</tbody>
</table>

() is standard error and [] are the t-statistics
Source: Author’s computation from E-views 8.0

Table 3 shows the result of short-run relationship between private sector credit and construction sector growth in Nigeria. The error correction term coefficient is (0.119081). The result of the error correction term coefficient is positive and therefore not rightly signed. This reveals that the short-run adjustment to long-run equilibrium is not statistically significant. Thus, the study concludes that private sector credit has no significant short-run relationship with construction sector growth in Nigeria.

**Granger Causality Analysis**
Granger causality test is used to examine the causal direction; that is, which of the variables (dependent and independent variable) influences the relationship between them. The null hypothesis is: Independent variable does not granger cause the dependent variable. The decision rule is to reject the null hypothesis, when the Chi-Square statistics and their corresponding probability values are less than (5%) level of significance. Otherwise, do not reject the null hypothesis.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Chi-sq</th>
<th>Df</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPS</td>
<td>2.082927</td>
<td>2</td>
<td>0.3529</td>
</tr>
<tr>
<td>INFL</td>
<td>0.521490</td>
<td>2</td>
<td>0.7705</td>
</tr>
<tr>
<td>M₂</td>
<td>0.193593</td>
<td>2</td>
<td>0.9077</td>
</tr>
<tr>
<td>INT</td>
<td>2.853990</td>
<td>2</td>
<td>0.2400</td>
</tr>
<tr>
<td>All</td>
<td>4.790901</td>
<td>8</td>
<td>0.7797</td>
</tr>
</tbody>
</table>

Note: Dependent variable: COSG, * denotes significant at 1%, ** denotes significant at 5%
*** denote significant at 10%

Source: Author’s computation from E-views 8.0

Table 4 is to test whether private sector credit variables (CPS, INFL, M₂, and INT) have causality with construction sector growth in Nigeria. Based on the Chi-Square statistics and their corresponding probability values, none of the private sector credit variables (CPS, INFL, M₂, and INT) granger-causes construction sector output in Nigeria. The joint Chi-Square values and its probability values also indicate that private sector credit variables do not jointly have causal relationship with construction sector output. The study concludes that private sector credit variables (CPS, INFL, M₂ and INT) have no causality with construction sector growth in Nigeria.

Conclusion
Study carried out by Ademola (2014) shows that the construction sector has maintained increasing share of GDP between the third quarter of 2010 and third quarter of 2013. Thus, this contradicts our findings which reveal that private sector credit has no significant relationship with construction sector growth in Nigeria. This implies that credit extended to investors in the construction sector by the banking institutions have not effectively helped to boost productivity in the economy. The causality investigation shows that private sector credit variables do not have causal relationship with construction sector growth in Nigeria. This means that banks have no relationship in financing the construction industry in Nigeria. Further finding reveals that private sector credit lacks short-run adjustment mechanism, indicating that there is no significant short-run relationship between private sector credit and construction sector growth in Nigeria. It implies that economic policies by the regulatory authorities have not been effective to improve the construction sector growth in Nigeria within a short period. This could be as a result of harsh economic environment, which make it difficult for the sector to stabilize within the short period.

Recommendations.
The study recommends that government should formulate functional policies such as price stability, full employment, exchange rate stability, economic growth and favourable balance of payment in order to cushion short-run economic problems such as inflation rate, interest rate and exchange rate fluctuations in the private sector-led economy. The regulatory authorities should encourage the private sector through concessional and reduced interest rate. Though, low interest package for the private sector has been provided by the Bank of Industry (BOI); thus, efforts should be made by government at all levels to encourage investors in the sector to access these funds. The monetary authorities should stabilize the interest rate which is capable of ensuring price stability and maintaining inflation to a single digit. This may build confidence in the banking institutions and will enable them to introduce innovations to boost construction sector output in the economy. The study suggest that CBN and the policy makers should have a common ground in order to establish specialized banking institutions that will be responsible for financing the construction investments in the economy. CBN should reduce the legal reserve and liquidity ratios respectively in order to increase the flow of investable funds which may improve the capacity of banks to extend credit to the construction.

Contribution to Knowledge
The study was able to modify the model and expand the existing literatures, empirical review, geographical spread and updated data that will enable researchers and scholars to use it for further studies. Hence, from the results, this study has also contributed to knowledge by modifying the existing model. Thus, from the results, this study has also contributed to knowledge by discovering that construction sector growth has no direct causality with bank credit and the factors responsible for this can be traceable to economic and political instability and inability to implement the formulated policies by the regulatory authorities (Central Bank of Nigeria and Federal Ministry of Finance).

References


