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An Error Correction Model of the Impact of Private Sector Credit on Private Domestic Investment in Nigeria

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Abstract

The study investigated the impact of private sector credit on private domestic investment in Nigeria using the error correction model technique. The objective of the study was to determine the impact of private sector credit (PSC) on private domestic investment (PDI) in Nigeria using the error correction model that addressed all errors associated with time series data. The study found out that increase in private sector credit (PSC) though not statistically significant leads to increase in private domestic investment (PDI) as typified by 10% increase in private sector credit which led to 6% increase in total domestic investment in Nigeria. However, the non statistical significance of private sector credit showed that there is need for increase in private sector credit in the Nigerian economy.

Keywords: Private Sector Credit, Private Domestic Investment, Error Correction Model.

Introduction

Nigeria has over the years pursued vigorously policies geared towards the enhancement of availability, reduction of cost and access of credit to the private sector as well as the stimulation of growth in the productive sectors of the economy through investments. Notably, empirical studies carried out by Calomiris and Himmelberg (1995) gave support to the argument that policy-based finance was effective in stimulating initial growth and encouraging private investment in priority industries in Japan.

Consequently, credit guidelines were designed to ensure that the financial needs of small and medium scale enterprises were adequately catered for. Banks were, therefore, required to pay greater attention to the prescribed aggregate and sectoral allocation to enhance the attainment of the objectives of the Government (Essien and Akpan, 2007).

In the early 1980s, credit allocation was sectorial, namely preferred sectors. The preferred sector comprised production (agriculture and manufacturing), services, exports and development finance institutions, while the less preferred sector comprised general commerce (imports & domestic trade), government and others (credit & financial institutions, personal & professional and miscellaneous). Analysis by the CBN indicated that between 1981 and 1985, 75% of commercial banks' aggregate credit went to the preferred sector, while 25% was allocated to the less preferred sector. Out of this, a larger chunk was allocated to the productive sub-sector: commercial banks 59%, merchant banks 69%. Banks were allowed to expand their credit limits by specified margins over the previous year's level. For instance, the permissible credit expansion in 1982 was 30%. However, small banks with loans and advances not exceeding ₦100 million were allowed to exceed the 30% ceiling up to 40% or 70% of their total deposit liabilities (excluding government deposits maturing earlier than six months), whichever was higher.

Banks were also required to maintain a minimum credit allocation of 70% to indigenous borrowers as means of encouraging the development of small scale enterprises. In order to enhance the rapid economic development of the rural areas, banks were required to lend not less than 30% of the total deposits collected in the rural areas. Also, the range of lending rates for the preferred sector/sub-sectors for loans maturing within 3 years was 8.5 % to 10.5%; but loans to these sectors maturing after 3 years could carry interest rates up to a maximum 12%.

The policy objectives of 1985 was geared towards the stimulation of increased agricultural production (especially staple food items and basic raw materials) and increased industrial production in order to reduce the persisting high level of dependence on external sector.

However, the share of manufacturing was reduced from 36% to 35% and that of services from 12% to 11% in recognition of capacity under utilization of plants due to shortages of imported inputs in these sectors. For merchant banks, the share of agriculture was raised from 5% to 6% while the share of services was reduced from 7% to 6%.

Also, banks were required to reserve not less than 16% of their total loans and advances exclusively for small-scale enterprises wholly owned by Nigerians, and to lend not less than 40% of the total deposits collected in their rural branches to borrowers in such rural areas.

In 1986, it was envisaged that foreign exchange scarcity would continue to constrain full utilization of the productive sector. In order to accommodate the expected increase in the demand for bank credit, particularly for agricultural production, it became necessary to raise the ceiling on bank credit expansion from 7% fixed for the

previous year to 10%. In view of the special operational characteristics of merchant banks, their aggregate credit was no longer subjected to the same quantitative control as the commercial banks. In order to facilitate the channelling of bank lending directly to the productive sectors of the economy, the 18 sectors/sub-sectors categorization of banks' loans and advances was regrouped into 8 in 1985 and further compressed to 4 in 1986. Banks were also required to grant stipulated grace periods on their loans to all categories of agricultural production.

The need to give banks greater initiative and flexibility in their credit operations led to further simplification of the credit categorization to two sectors in 1987, namely high priority sector (agricultural production and manufacturing enterprises) and 'others' sector. The stipulated credit allocation was as follows: high priority sectors (50 per cent) comprising, agricultural production (15 %) and manufacturing enterprises (35%); and 'others' sectors (50%). In line with government's policy to deregulate the economy, interest rates policy was sufficiently flexible and responsive to market forces. The minimum interest rate payable on time deposits was 12% and that on savings deposits 11%, while banks were allowed to negotiate higher rates with their customer. However, the maximum lending rate was raised from 13% to 15%, while other lending rates were to be negotiated between the banks and their customers.

In pursuit of the objective of achieving non-inflationary growth, there was a compelling need for the moderation in bank credit expansion to the domestic economy in 1989. In this regards, the ceiling on commercial and merchant banks' aggregate credit expansion was reduced from 12.5 % to 10.0% in 1989, but raised again to 12.5% in 1990. Unlike in the past when the ceiling applied to only loans and advances, the 1990 ceiling applied to all credit granted to the private sector without any exception. In order to ensure adequate provision of credit to the priority sector, preference continued to be accorded the agricultural and manufacturing sectors in the allocation of available credit. Thus, the prescribed distribution of commercial banks' credit to agricultural production and manufacturing enterprises remained at 15% and 35%, while merchant banks' distribution was 10% and 40%, respectively. However, the maturity pattern of merchant banks' credit to private sector had over the years deviated widely from stipulated targets. Indeed, concentration had been at the short end of the credit spectrum contrary to the expectation that they would design appropriate financial instruments to attract long-term deposits for long-term lending.

In order to further enhance the development of small-scale enterprises, commercial and merchant banks' total credit outstanding to small-scale enterprises wholly owned by Nigerians was raised from 16% to 20% in 1990. Such loans would finance strictly activities in the industrial sector and exclude general commerce. The policy of interest rates deregulation continued to be in force in 1989. Under the dispensation, individual bank was free to determine the level and structure of its deposit and lending rates in line with prevailing market conditions. Banks were however, required to narrow the spread between their savings deposit and prime lending rates to a maximum of 7.5% points.

In an effort to eliminate the distortion and inefficiency in the financial system caused by the prolonged use of credit ceilings, monetary policy in 1991 shifted from the direct control of credit to growth to a market-oriented approach based on the use of instruments to indirect credit control. Similarly, Government's commitment to abstain from additional borrowing from the banking system was expected to make more credit available to the private sector and exert a downward pressure on interest rates. These developments further enhanced the objective of stimulating private sector productive capacity and output growth. Thus, the ceiling on commercial and merchant bank's aggregate credit to the private sector was raised from 1.5% to 13.2% in 1991 fiscal year. In an effort to provide stimulus for the growth of output, a higher rate of bank lending to the private was allowed in 1992. To this end, the ceiling on the growth of commercial and merchant bank's credit to the sector was raised to 16% from 13.2% in the preceding year. For effective monitoring of the performance of banks, the permissible expansion rate was broken into four quarterly growth ceiling of 3.8%, 2.7%, 3.5%, and 6%. Effective 1st September, 1992, the ceiling imposed on individual bank's credit growth was removed for banks which met the specified credit performance criteria set by CBN. Banks were however, required to maintain a 5% spread between their average cost of funds and their lending rates.

In 1983, interest rate rose to unprecedented high levels, following the deregulation of interest rates and the undue discretion it conferred on key market players in pricing their funds as well as the arbitraging activities of market players. Savings deposit rates ranged from 13.5 to 25%, while prime-lending rates ranged from 26% to 60% for commercial banks and 42% and 80% for merchant banks. This resulted in the widening of the margin between banks' savings and lending rates. Such high rates seriously discouraged investment, especially in the directly productive sectors of the economy. Similarly, the persistently high and rising government deficit financing resulted in 'crowding out' of the private sector in the credit market.

Consequently, several measures were adopted in 1994 to address the identified causes of high and unstable interest rates in order to ensure a more investor-friendly regime. For instance, the instilling of fiscal discipline through the zero-deficit budget adopted during the year was expected to release more loan able funds to the

private sector and thereby exert a downward pressure on market interest rates were introduced in 1994. These measures resulted in rapid increase in banking systems' credit to the private sector as well as relatively low interest and exchange rates during the year. In particular, private sector borrowers took advantage of the cheap bank credit to buy cheap foreign exchange. However, interest rates were substantially negative in real terms as the inflation rate remained high during the period.

The low interest rate regime was maintained in 1995 and 1996 but with a minor modification to make for flexibility. Under the new arrangement, banks and other financial institutions were required to maintain a maximum spread of 7.5% points between their deposit and lending rate of 21%. In 1996, the requirement that a minimum of 20% of merchant banks' loans and advances should be of medium and long term tenure was abolished. In recognition of the need for enhanced efficiency of resource allocation in the economy, the prolonged use of policy of sectoral credit allocation was phased out in stages in 1996, and was replaced by an incentive system which encourages banks' voluntary lending to the priority sectors. In line with the need to realign the interest rate regime with the policy of financial market deregulation, the cap on interest rates which was imposed since 1994, was removed with effect from 1st October, 1996. However, the CBN continued to influence interest rates through its intervention with various market instruments, especially through the minimum rediscount rate (MRR) and the marginal rate at the weekly tender for treasury bills. The abolition of mandatory bank credit allocation to the preferred sectors remained in force since 1997. However, banks were enjoined to continue to provide adequate credit to the growth sectors of the economy, including loans to rural borrowers and small-scale enterprises.

In 2000, the CBN pursued initiatives to strengthen the community banks with the view to enhancing their efficiency to attract savings and provide credit at the micro level. A new initiative was evolved in 2001, under the auspices of the bankers' committee, to ensure adequate assistance to small and medium scale industries to enhance their performance in terms of employment generation, developing local technology, and contributing to output growth. Under the Small and Medium Industries Equity Investment Scheme (SMIEIS), banks were required to set aside 10% of their profit before tax for the financing and promotion of small and medium scale industries. Banks' investment would be in the form of equity participation and long term loans, project packaging/ monitoring of specific industries to maturity. The scheme, which has been the most recent up till the end of 2006, was expected to enhance and improve funding that would facilitate the achievement of higher economic growth.

In recognition of the role of small and medium scale enterprises (SMEs) in the promotion of economic growth and employment generation, the Government put in places various programmes and schemes to assist them, including the establishment of sector specific development finance institutions (DFIs). These include the Family Economic Advancement Programme (FEAP), People' Bank of Nigeria (PBN), Nigerian Agricultural and Co-operative Bank (NACB), Nigerian Bank for Commerce and Industry (NBCI) and National Economic Reconstruction Fund (NERFUND). These institutions were later merged in 2001 to form the Nigerian Agricultural, Co-operative and Rural Development Bank (NACRDB) and the Bank of Industry (BOI). Also, to ensure improved supply of credit to the agricultural sector, the Agricultural Credit Guarantee Scheme (ACGS) was established to cater for secured and unsecured loans to individuals as well corporate borrowers.

During the review years, analysis of the maturity structure of deposit money banks' credit to the domestic economy revealed that the bulk of their aggregate credit was short term, and that such loans were channeled mainly to general commerce and trade. The need to encourage medium to long term lending to the productive sectors of the economy therefore became imperative in order to expand and diversify the productive base of Nigerian economy. In this regard, the CBN introduced the Rediscounting and Refinancing Facility (RRF) in 2002 to support medium to long term bank lending at concessionary interest rates to the productive sectors of the economy. The RRF was designed to provide temporary relief to banks that faced liquidity problems as a result of committing their resource to long term financing of the specified productive sectors.

In order to provide small scale credit and enhance access to adequate formal productive credit to poor and low income persons, Nigeria introduced the Microfinance Scheme in 2005. The objective was to make financial services accessible to a large segment of the potentially productive population, which otherwise would have little or no access to such services. It was also aimed at promoting synergy and mainstreaming the informal sub sector into the national financial system, as well as enhancing service delivery by microfinance institutions to medium and small scale enterprises and contributing to rural transformation.

Finally, CBN (2009) reported that credit to the private sector has not been static as it grew significantly up to 59.4% in 2008. It however, dropped to 26% in 2009 and further moved down again to 15.96% in 2010.

Given these policy efforts in making sure that private sector takes its place as the engine of economic growth, one still wonders if the private sector credit has actually made any significant impact on the private domestic investment of Nigerian economy.

Therefore, this study is motivated to ascertain the impact of private sector credit allocation to private domestic

investment.

The Analytical Model

The study was driven by the objective, determination of the impact of private sector credit on private domestic investment. Data were sourced from various issues of Central Bank of Nigeria (CBN) via www.cenbank.org. To address the objective of the study; we adopted the error correction model specified thus:

$$PDI = \beta_0 + \beta_1PSC + \beta_2PUI + \beta_3 INFL + \beta_4 EXR + \beta_5 LR + U_t \dots \dots \dots 1$$

Where β = vector of parameters to be estimated, U_t = stochastic error term, PDI = private domestic investment, PSC = private sector credit, PUI = public investment, $INFL$ = inflation, EXR = exchange rate, LR = lending rate.

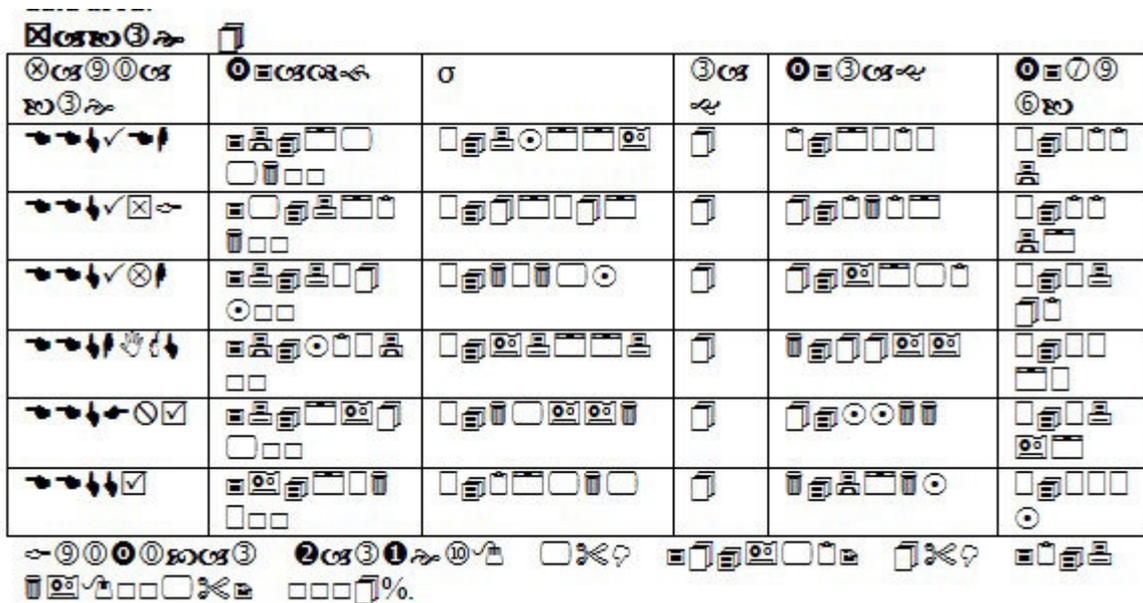
The transformed error correction model is given as:

$$\Delta \ln PDI_t = \beta_0 + \beta_1 \Delta \ln PSC_{t-1} + \beta_2 \Delta \ln PUI_{t-1} + \beta_3 \Delta \ln INFL_{t-1} + \beta_4 \Delta \ln EXR_{t-1} + \beta_5 \Delta \ln LR_{t-1} + \beta_6 \Delta \ln PDI_{t-1} + ECM_{t-1} + U_t \dots \dots \dots 2$$

(Gujarati and Porter, 2009).

Empirical Results

Before presenting the empirical findings, we first report the time series status of the data used.



The result from the table above shows that there is suspicion of presence of unit root. Therefore, to ascertain the statutes of the model, we conducted a residual test. The result of the residual test of long run relationship among the co integrated variables is shown as follows;

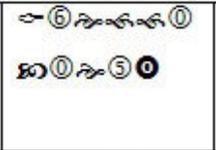
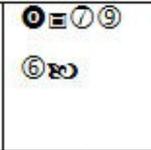
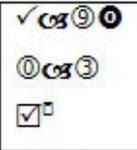
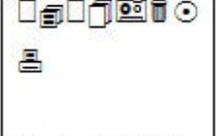
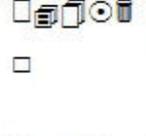
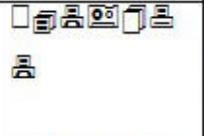
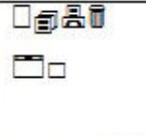
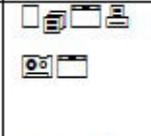
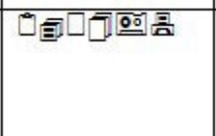
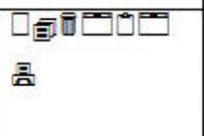
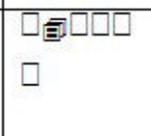
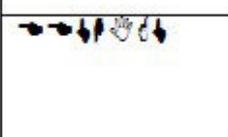
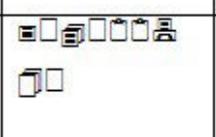
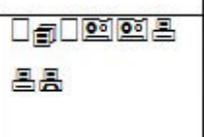
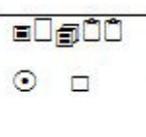
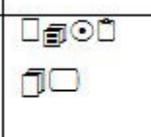
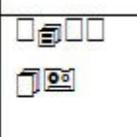
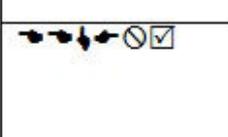
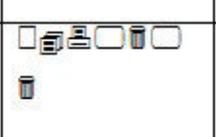
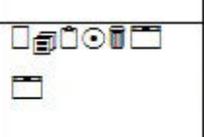
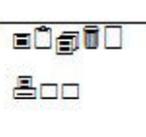
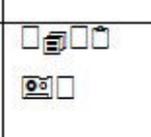
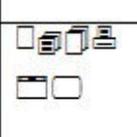
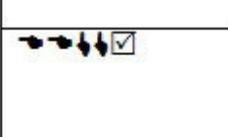
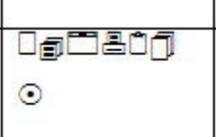
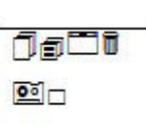
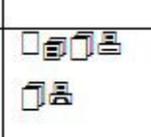
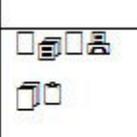
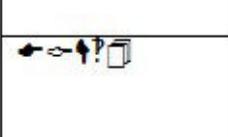
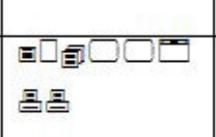
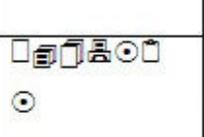
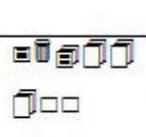
Table 2



The result above shows that the variables are not stationary at order zero and, as such, there is unit root present in the model.

The residual test of table 2 confirms the tie between private domestic investment and all the explanatory variables at 5% significant level. This means that these variables are co integrated. Accordingly, long run relationship is a necessary and sufficient condition for running an error correction model to adjust to equilibrium. Following the generation of error correction mechanism from the residual test, our estimated model is as shown in equation 2 with the result below:

Table 3

$R^2 = 0.65$ $DW = 2.10$

NB: **Indicates significant at 5% level, *Indicates not significant at 5% level

The above result shows that only two of our explanatory variables were statistically significant as shown by the t-value statistic. The coefficient of determination - R^2 shows that explanatory variables explained approximately 65% of the variations on private domestic investment in Nigeria. Nevertheless, the impact of each variable is discussed in turn below;

Private Sector Credit (PSC)

The result shows that logged private sector credit (DDLPS) has a positive relationship with logged total domestic investment (DDLPI) even though it was not statistically significant. Therefore, a 10% increase in the present private sector credit will bring about approximately a 6% increase in private domestic investment in the Nigerian economy.

Public Investment (DDPUI)

The result shows that logged public investment (DDPUI) has a positive relationship with logged private domestic investment (DDPDI) in Nigeria. Furthermore, 1% increase in public investment will bring about approximately 20% increase in private domestic investment in the Nigerian economy.

Exchange Rate (DDLEXR)

The result shows that logged exchange rate (DDLEXR) has a positive impact on private domestic investment in the Nigerian economy. Furthermore, a 10% increase in exchange rate will bring about a 7% increase in private domestic investment of the Nigerian economy.

Error Correction Mechanism (ECM)

The result shows that a 6% of error in the model can be corrected by the error correction mechanism of immediate past (ECM_{t-1}). This means that the model returns to equilibrium by 6%.

Conclusions and Policy Issues

The impact of private sector credit PSC on private domestic investment PDI has received little or no attention as no empirical studies have looked at the quantitative relationship between PSC and PDI. However, in Nigeria so much effort has been made by the government to encourage private domestic investments through different policy measures. Nevertheless, there exists dearth of empirical evidence on the impact of private sector credit on private domestic investment.

The aim of this study has therefore been to contribute too little literature, in particular, to examine quantitatively the impact of private sector credit PSC on private domestic investment PDI in Nigeria.

Results from our analysis indicate that logged private sector credit (DDL PSC) has a positive relationship with logged total domestic investment (DDL PDI) as a 10% increase in the present private sector credit will bring about approximately a 6% increase in private domestic investment in the Nigerian economy. Furthermore, the result indicates that the available private sector credit has not equalled the available private domestic investment opportunities.

This suggests that the government of Nigeria should insist on encouragement of private sector credit by the appropriate bodies. This is because as private domestic investment increases economic growth will increase and developmental problems like high unemployment, high costs of living, high crime rate etc will reduce.

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