# The Causality Between Banking Sector Reforms and Sectoral Output Growth: Empirical Evidence from Nigeria

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## ABSTRACT

This study attempts to determine the causal linkages between banking sector reforms and output growth of manufacturing sector as well as the direction of such causality. A selected sample of financial development and manufacturing output of Nigeria with annual data between 1970 and 2008 is used and cointegration and Granger-causality techniques were applied to ascertain evidence regarding this important issue. The result of Granger causality analysis showed that the MDGP and banking sector reforms indicators (BF) move differently with one not predicting the other within the study period. Moreover, the empirical results showed that Bank assets with co-efficient 0.7688 (t=2.4267, $\rho < 0.05$), Lending Interest rate with co-efficient 0.1662 (t=2.996, $\rho < 0.05$), Exchange rate with co-efficient 0.0285 (t = 4.6748, $\rho < 0.05$) and Real rate of interest with co-efficient 0.0224 (t= 3.4927, $\rho < 0.05$) positively and significantly affected the manufacturing sector's output growth in Nigeria. On the other hand, the financial deepening indicator ($M_2$/GDP) with co-efficient -3.3665 (t= -4.8493, $\rho < 0.05$) and Interest rate spread with co-efficient -0.2595 (t = -3.2902, $\rho < 0.05$) negatively and significantly impacted on the MGDP in Nigeria, showing that the effects of banking sector reform indicators could vary widely in an economy. In conclusion, it was discovered that with proper banking policy formulations and guidance in the financial sector, the manufacturing output growth would be positively affected.

**Keywords:** Banking Reforms, Manufacturing Growth, Cointegration, Granger Non-causality, Country-Specific Analysis

## 1.    INTRODUCTION

One of the main issues in development economic literature and that of the developing economies like Nigeria is to look for the major determinants of long-term economic growth. Hence the causal relationships between banking development and real sector growth have been extensively studied since the last few decades. It is now widely acknowledged that faster economic growth will not be possible without a deepening of the financial system and with the banking sector setting the pace (Rodrik, 2005; Temple, 2003; Barro and Sala-i-Martin, 2004).

The theoretical underpinnings of the linkage between financial development and economic growth can be traced back to Bagehot (1873), Schumpeter (1911) and Lewis (1956). They stressed the importance of the banking sector in providing the necessary capital to fund real economic activities especially the manufacturing sector which is regarded as an engine of economic growth and development (Jayaratne and Strahan, 1996; Soyibo, 1997; Adam and Agba, 2006).

There is a general consensus that manufacturing sector has the capability to create a set of stepping-stones, or a stairway to development that would provide a more continuous progression of rungs than other economic activities. Several studies have revealed that most manufactured goods are network hubs which tend to connect to many other activities like mining, oil and gas, and agriculture. It has also been documented that the multiplier effect which Manufacturing has on other sectors of the economy is believed to be transformative and growth-driven. This is one of the reasons why most of the sustained growth miracles of the past 30 years have been manufacturing miracles. Think of Japan, Korea, China, Thailand and Turkey. But in contrast, it has also been argued that the main reason why so many resource-rich countries such as the Sub-Saharan African countries, have had trouble in transforming their natural wealth into a self-sustaining growth process was because of their lack of manufacturing capabilities (Ricardo and Cesar, 2012). Thus, countries that are able to harness its power have achieved great industrial development and economic growth (World Bank, 2005; Sanusi, 2010; Anyanwu, 2010).

According to Mahmoud and Osman (2007), a well-functioning and efficient financial sector with sophisticated institutions and regulatory systems foster economic growth and development through private initiatives and new technologies. However, in spite of the recent financial sector liberalizations, the growing concern of the Nigerian economy is that its banking industry remains shallow and performs well below average when compared with economies such as the USA, Germany and Japan; and in the newly industrialized countries of South East Asian; China and India etc. Thus, the financial systems in Nigeria lack depth, and they only serve a small proportion of the geometrically-growing population at a relatively high cost (Anyanwu, 2010; Hamid, 2012).

The deregulatory reforms in the banking sector were essentially designed to reduce the cost of obtaining funds for investments. However, opinions are divided in the literature on whether high borrowing cost as well as access to finance actually constitutes a constraint to economic growth, in the specific case of the Nigerian economy. Against these backdrops, the major research issues to be addressed are as follows: have the Nigerian banks advanced sufficient funds to the real sector and particularly to the manufacturing sector in order to stimulate output growth?; is there any causal link between banking sector reforms (hereafter referred to as BF) and output growth of the manufacturing sector (hereafter referred to as MGDP) in Nigeria, and if yes, what is the direction of causation?

The goal of this present study, therefore, is to analyze the relationship between banking development and output growth from a sectoral specific perspective rather than from country's aggregate economic growth point of view. The study seeks to determine the causal linkage between (BF) and (MGDP).

## 2.    THEORETICAL

Most literature focus on two main diverging theoretical paradigms namely, the "supply-leading hypothesis" and "demand-leading hypothesis" in line with Patrick (1966) which postulates a feedback relationship between economic growth and financial development.

### 2.1    The Supply-Leading Hypothesis

The supply-leading hypothesis posits an unidirectional causation that runs from financial development to economic growth, implying that new functional banking firms will increase the supply of financial credits to manufacturing sector. This will definitely lead to high but sustainable real economic growth. Thus, this hypothesis performs two roles: one, to transfer resources from low growth sectors to high growth sector and two, to promote entrepreneurial response in the later sector (manufacturing sector). Previous studies that support the supply-leading hypothesis are Schumpeter (1934), Calderon and Liu (2002), King and Levine (1993 a, b), Neusser and Kugler (1998) and Loayza et, al. (2000).

### 2.2    The Demand-Leading Hypothesis

The demand-leading hypothesis posits a unidirectional causation from economic growth to financial development.  This implies banking sector passive response to manufacturing growth sector as well as growth of GDP. This simply means that the increasing demand for financial services might result in aggressive expansion of the financial system as the manufacturing sector of the economy grows. Previous studies that support this view include Gurley and Shaw (1955), Goldsmith (1969) and Jong (1986).

### 2.3    Stage Development Hypothesis

Patrick (1966) suggests a third hypothesis known as the 'stage of development hypothesis' which posits that supply-leading financial development can induce real investment in the early stage of economic development through the lending interest rate which will be endogenously determined. It equally predicts that a country's long-run growth will depend on economic factors such as lending capacity of the banking system and all the policies and institutions that affect the efficiency of resources allocation in the country. Thus, the growth rate of the economy depends positively on the volume of lending and investment rate, and any public policy measure that increases the lending capacity rate accelerates economic growth permanently.

## 3.    EMPIRICAL LITERATURE REVIEW

A substantial body of empirical research has examined the links between economic growth and financial sector development. The mounting studies, using different statistical methods and data applied to different economies have found that causality pattern varies across countries depending on the success of financial development implemented in each country and the level of financial liberalization policies (Fama, 1980; King and Levine, 1993; Levine and Zervos, 1998; Greenwood and Javanovic, 1990; Jayaratne and Strahan, 1996; Beck,et al. 2000; Demetriades and Hussein, 1996; Akinlo and Egbetunde,2010),among others.

Fama (1980) applied the Modigliani-Miller (MM) theorem of irrelevance pure financing decision to banking sector. He found that portfolio management activity of banks under strong MM theorem is irrelevant to economic activities. However, the role of a competitive banking sector in a general equilibrium is passive. Thus if finance is money, and money is a veil financial development is a neutral factor in real economic development since increase in banking operations led to increases in money supply, and so, inflationary prices. By implication, increasingly better resource allocation depresses saving rates such that growth is retarded (Levine et al., 2000).

In a response to the question "does finance cause economic growth?" King and Levine (1993) explore the Schumpeter's statement that "banker authorizes people in the name of society as it were to innovate". They used various measures of financial development in 12 regression equations and found that all the indicators of intermediation development are strongly associated with real per capital GDP growth, the rate of physical capital accumulation and improvements in the efficiency with which economies employ physical capital. They also show that commercial banks advance credits better than any other financial institutions and this is due to the risk sharing information services provided by commercial banks. However, their findings are not tantamount to the conclusion that finance causes growth; but it may be that finance is only a leading factor.

Levine and Zervos (1998) extend the work of King and Levine to include the independent impact of stock markets, as well as banks, on real economic growth. They find that stock market liquidity and banking sector development are independently and positively correlated with both current and future rates of capital accumulation and economic growth. Similarly, Bencivenga and Smith (1991) assert that "the introduction of financial development in any economy shifts the composition of savings towards capital, causing intermediation to be growth promoting".

Greenwood and Javanovic (1990) in their study employed an endogenous growth model to demonstrate that there is a positive two-way causal relationship between output growth and financial sector development. They opined that, the process of growth stimulate higher borrowing requirements for working capital and investments, thereby necessitating the entry and expansion of more banking institutions. While the process of financial intermediation by banks, encourages investment projects to be financed more efficiently, thereby stimulating investment and output growth.

In explaining the causality and evidence whether finance is an engine of growth, Jayaratne and Strahan (1996) observe that rates of real per capital growth in income and output increased significantly following interstate bank reform in USA. They also note that improvements in the quality of bank lending via branch banking and not increased volume of bank lending are responsible for growth changes. Nevertheless, this finding is a step forward in ascertaining the causality issue. However, the causality direction seems to depend on the studied countries.

Beck, Levine, and Loayza (2000) also take advantage on the questions of unobserved heterogeneity and spurious causality; though without considering industries as well as countries, but applying novel econometric techniques. They use a dynamic Generalized-Method-of Moment (GMM) panel estimator that allows simultaneously the exploitation of time series variation in the data to account for unobserved country-specific effects for the inclusion of lagged variables as regressors, and controls for endogeneity of all the explanatory variables. They also use an instrumental variable estimator in order

to extract the exogenous component of financial intermediary development and found a positive effect of the financial development on growth.

In Nigeria, several empirical attempts have been made to assess more generally the relationship between financial liberalization and economic growth (Soyibo and Adekanye, 1992; Ikhide and Alawode, 2001; Nnanna, 2004; Asogwa, 2005; Akpan, 2004 and 2008; UNIDO, 2006 among others)**.** For instance, Soyibo and Adekanye (1992) examine the links between interest rates, savings, investment and money supply in Nigeria. They find that there exists positive relationship between returns on financial assets and the rate of savings. They also show that bank deposits are important in the level of productive investment in Nigeria. However, they cautiously note that the general expectation in terms of the link between savings, investment and economic growth is ambiguous due to structural imperfections such as information asymmetries, moral hazards, and the likes.

Nnanna (2004) adopted the OLS, two-stage least squares (TSLS) and vector auto regression (VAR) to investigate the relationship between output growth and bank lending in Nigeria. The study covers the regulation and deregulation periods (1970-1999). He observes that there exists a significant relationship between bank lending behavior and output growth. The analysis further reveals that the influence of policy distortions in the system and inappropriate interest rate regime will have negative impact on banks' credit expansion.

The study of Asogwa (2005) reports of oligopolistic competitions in the Nigerian banking industry for the period 1997 – 2001, using a conjectural variation analysis. The general evidence from this study shows that the entry of new banks has not substantially improved both operational and allocative efficiency in the banking industry. However, Aryeetey and Sebnet (1998) rather point out that the limited competition despite the proliferation of banks following financial liberalization is a testimony of the fact that competition does not simply come from numbers, but is largely dependent on market structure.

Akpan (2004, 2008) employs the endogenous growth model to explore the impact of financial liberalization on economic performance in Nigeria. He used annual data from 1970 – 2002 and 1970-2006 respectively and finds that following financial liberalization, the economy has failed to experience any impressive performance such as attracting foreign direct and/or indirect investment or reduce capital flight. He observed that neither domestic savings nor investment have appreciably improved since the introduction of the reform programme. More so, the banking sector has remained largely oligopolistic and uncompetitive.

UNIDO (2006) in its first round of the Nigerian Manufacturing Enterprise Survey (NMES) conducted in 2001 to collect both contemporaneous and retrospective data on the performance of Nigerian manufacturing sector, in comparism to other studies of African manufacturing firms, observes that about 81% of the manufacturing firms admitted facing liquidity/cashflow problem;27% of larger firms applied for bank loans between 2001 and 2003;the majority of manufacturing firms were deterred from applying for bank loans due to high interest rates and inadequate collateral; banks are not interested in advancing long-term loans due to high incidence of non-performing loan (NPL).

From the foregoing empirical literature review, it becomes very evident that a lot of research has dwelt on the relationship which exists between financial development and economic growth. That is, most of the empirical studies could only establish the causal linkage between financial sector development and output growth generally, using a bank credit variable as a measure of financial deepening.

## 4.1    METHODOLOGY AND MODEL SPECIFICATION

Based on the arguments presented in the theoretical framework and the intuition from the reviewed literature, the model adopted in this study is the Schumpeterian Circular flow of creditary production (1934).The popular view underlying this theory is that a sectoral output of the entrepreneur will depend on banking reform measures, lending capacity of the banking system, and other conditioning variables that are capable of influencing the productivity of capital (A). Therefore, the relationship between BF and MGDP via investible funds can be expressed as:

$$MGDP_t = f(BF_t, LC_t, A_t)\text{-------------------------------------------------- (3.1)}$$

Where MGDP is the manufacturing output growth; BF is the measure of banking reforms that is proxied by real interest rates (RR); interest rate spread (IRS); lending rates (LR); ratio of broad money ($M_2$) to nominal GDP to measure Deposit Money Banks' liquid liabilities ($M_2$/GDP). The lending capacity of the banking system is measured by ratio of Deposit Money Banks' assets to total banking assets (BA). A, in the model (3.1) represents those conditioning variables which would also determine the productivity of the invested capital. These variables include power infrastructure (ENG); manufacturing capacity utilization (MCU); trade openness as the degree to which the banking system is able to intermediate funds across borders, measured by ratio of imports plus exports to nominal GDP (TO) and exchange rate (EXR)

## 4.2    Techniques of Data Analysis

According to Engle and Granger (1987), co-integration variables must have an error correction representation in which an error correction term (ECM) must be incorporated into the model as below:
Thus,
$$\Delta \ln MGDP_t = ECM_{t-1} + \lambda_1\Delta \ln BF_{t\,t} + \lambda_2\Delta \ln TO_t + \lambda_3 \Delta\ln ENG_t + \lambda4\Delta EXR_t + \lambda_5 \Delta\ln MCU_t + \varepsilon_t \text{---------------------------------------------------------------------------------------}3.2$$

Here, $\Delta$ denotes first difference operator. $\mu_{t-1}$ is the one period lagged value of the residual from the co-integration regression which captures the adjustment toward the long-run equation. $\varepsilon_t$ represents white noise with usual zero mean and constant variance. Equation 3.2 becomes the Error Correction Model with which our variables can be regressed.

However, in the absence of co-integrating relationship between the banking reforms and the manufacturing sector output growth variables, we may adopt the practice of Mahdavi et.al (1994) and Demirbas (1999) by applying the Granger Causality test, using 1(0) series.  In other words, only changes in manufacturing sector output growth (MGDP) and banking reforms (BF) variables will be used. Hence, a bivariate causality formulation between these two variables can be seen as follows:

$$\Delta LRMGDP_t = \beta_0 + \gamma_i \Sigma\Delta_i LRBF_{t-i} + \gamma_j \Sigma\Delta_j LRMGDP_{t-j} + \lambda ECT_{t-1} + \nu_t \text{------------------------}3.3$$
$$\text{i=1} \qquad\qquad \text{j=1}$$

$$\Delta LRBF_t = \beta_0 + \beta_i \, \Sigma \Delta lRBF_{t-i} + \beta \, \Sigma \Delta LRMGDP_{t-j} + \lambda ECT_{t-1} + \mu_t \text{-----------------------------3.4}$$
$$\qquad\qquad\qquad i=1 \qquad\qquad\qquad j=1$$

Equation 3.3 models the first difference of the manufacturing output as a function of the lagged difference values of real banking reform of order $p$, the lagged difference values of real MGDP of order $n$, and one period lagged value of error correction terms. While equation 3.4 models the first difference of real BF as a function of the lagged difference values of real BF of order $p$, the lagged difference values of real MGDP of order $n$, and one period lagged value of error correction terms.

The hypothesis that BF does not cause MGDP could be tested simply by running the unrestricted regression of MGDP on the lagged values of MGDP and BF, and examining whether the coefficient of the latter variable is significantly different from zero using the F-test.

Given the equations 3.3 and 3.4 above, there are two sources of causations i.e. through the $ECT_{t-1}$, when $\lambda \neq 0$ or through the lagged dynamic terms. The error-correction term ($ECT_{t-1}$) measures the long-run equilibrium relationship while the coefficients on lagged difference terms indicate the short-run dynamics.

In equations (3.3) and (3.4), to test $\Delta MGDP_t$ does not granger cause $\Delta BF_t$ in the short-run; the study will examine the significance of the lagged dynamic terms by testing the null $H_{0:} \, \gamma\beta ij = 0$ using the F-test. Non-rejection of the null hypothesis implies that MGDP does not Granger-cause BF in the short-run. That is, $MGDP_t$ does not cause $\Delta BF_t$ if the null $H0_: \, \gamma\beta ij = \gamma = 0$ is not rejected. The study will equally investigate the joint significance of both the lagged dynamic terms and ECM due to Charemza and Deadman (1992) and Engle et al (1983).

The standard Granger Causality test examines whether past changes in the ($MGDP_t$) help to explain current changes in the (BF) over and above the explanation provided by the past changes in BF. To determine whether causality is bi-directional i.e. runs from BF to MGDP, one simply repeats the experiment, but with MGDP and BF interchanged.

## 5.1    GRANGER CAUSALITY TEST

Since correlation does not necessarily connote causation, the Granger causality tests on the variables were performed. The Granger causality tests, a pair-wise test of the existence of causality and possible feedback confirmed the results from the correlation analysis. The probability values for most of the null hypothesis are not significant even at the 5 per cent level.

In the Table 4.1 below, the results show that none of the banking reform variables was found to granger cause output growth of manufacturing sector. Both lending rate and interest rate spread were not significant in causing a change in output growth of manufacturing sector, even though, they were positively correlated with the latter (i.e MGDP). On the other hand, lending rate and interest rate spread were significant in causing a change in the financial deepening indicator (M2/GDP).Similarly, both manufacturing capacity utilization (MCU) and exchange rate (EXR) were respectively found to

granger cause lending rate (LR) and commercial bank assets (BA), but without evidence of feedback. MGDP was however, found to granger cause interest rate (opposite causation).

**Table 1: Granger Causality Test Results**

| Null Hypothesis | Statistics | Probability |
|---|---|---|
| LMGDP does not Granger Cause LR | 1.69891 | 0.19896 |
| LR does not Granger Cause LMGDP | 0.07677 | 0.92627 |
| RR does not Granger Cause LMGDP | 0.38061 | 0.68659 |
| LMGDP does not Granger Cause RR | 0.25145 | 0.77924 |
| LM2/GDP does not Granger Cause LBA | 0.85986 | 0.43277 |
| LBA does not Granger Cause LM2/GDP | 0.13211 | 0.87672 |
| LMGDP does not Granger Cause LM2/GDP | 1.23739 | 0.49539 |
| LM2/GDP does not Granger Cause LMGDP | 0.71805 | 0.30365 |
| RR does not Granger Cause LM2/ GDP | 1.07828 | 0.35260 |
| LM2/GDP does not Granger Cause  RR | 0.76690 | 0.47306 |
| LBA does not Granger Cause EXR | 0.81525 | 0.45151 |
| EXR does not Granger Cause LBA | 3.76272 | 0.03407 |
| LENG does not Granger Cause LMGDP | 0.23580 | 0.79130 |
| LMGDP does not Granger Cause LENG | 0.09100 | 0.91325 |
| MCU does not Granger Cause LR | 5.01892 | 0.01293 |
| RR does not Granger Cause MCU | 0.81347 | 0.45256 |
| LTO does not Granger Cause LBA | 0.36479 | 0.69728 |
| LBA does not Granger Cause LTO | 3.79913 | 0.03344 |
| LM2/GDP does not Granger Cause EXR | 2.04953 | 0.14537 |
| EXR does not Granger Cause LM2/GDP | 1.43718 | 0.25252 |
| LR does not Granger Cause LBA | 3.39679 | 0.04586 |
| LBA does not Granger Cause LR | 1.36619 | 0.26956 |
| IRS does not Granger Cause MCU | 0.50358 | 0.60922 |
| MCU does not Granger Cause IRS | 3.77344 | 0.03414 |
| LMGDP does not Granger Cause MCU | 3.87325 | 0.03151 |
| MCU does not Granger Cause LMGDP | 0.63477 | 0.53681 |

Overall, the result from the causality test is indicative of the poor relationship between the BF variables and MGDP.

## 6.    SUMMARY OF FINDINGS

The main objective of this study is to determine the causal links between BF and MGDP in Nigeria between the period 1970 and 2008. The empirical results rather display evidence, though weak, in favor of causality running from manufacturing output growth to conditioning banking reform variables. This deviation in the case of Nigeria support Robinson's (1952) argument that banking development may follow real sector growth in response to economic expansion.

The summary of empirical findings from the results of analysis is presented as follows:

(i)   The Granger causality test showed that none of the banking variables was found to Granger cause output growth of the manufacturing sector.

(ii)  Although, both the lending rate and interest rate spread were not significant in causing a change in output growth of the manufacturing sector, but they were rather significant in causing a change in the financial deepening indicator ($M_2$-GDP)

(iii) Manufacturing capacity utilization (MCU) and exchange rate (EXR) were respectively found to Granger cause lending rate (LR) and commercial bank assets (BA).

(iv)  Manufacturing output growth was found to Granger cause interest rate.

## 7.   POLICY DIRECTION AND RECOMMENDATIONS

From the findings of this study, a number of policy issues stand out clearly. The empirical evidence presented above has important implications for the conduct of economic and financial reforms in Nigeria, with particular attention being paid to her banking sector. Indeed, with an empirical evidence favoring, either a causal effect from manufacturing output growth to banking development or a bi-directional relationship, the Nigerian monetary authorities must be oriented towards, not only, the promotion of manufacturing output growth, but also continuing banking development processes that focus on performance of the real sector generally, and manufacturing sector in particular.

Government efforts should be directed at creating a stable macroeconomic and political environment coupled with an improvement of the institutionalized legal framework, in order to reduce corruption and informal activities which tend to be responsible for high levels of non-performing loans.

## 8.   CONCLUSION

In this paper, the causal relationship between banking reform (BF) and MGDP is investigated for Nigeria for the period 1970 and 2008. The results do not provide evidence of causal linkage between banking sector reform manufacturing output growth. That is, the Nigerian banking sector has not been playing a vital role in channeling financial credits to the sector widely believed to be an engine of growth. However, it was rather observed that the diversionary activities of the Nigerian banks were responsible for the noticeable buoyancies of the property sector and share market immediately after bank consolidation in 2007. Banks were only concerned about profits and capital adequacy norms that they went for extensive retail lending at the expense of lending to manufacturing sector. The phenomena high bank profit-margin of that period clearly revealed that the banking liberalization policy in Nigeria is yet to produce the expected positive result of stimulating output growth of manufacturing sector.

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