Financial System Stability and Manufacturing Performance in Nigeria

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Abstract

This study investigates the relationship between the three measures of manufacturing performance [manufacturing production growth rate (MPGR), share of manufacturing in GDP (SMGDP), capacity utilization rate (CUR)] and the variables of financial system stability [exchange rate (EXR), fiscal deficit (FD), lending rate (LR), saving rate (SR), consumer price index (CPI), bank loan to manufacturing sector (BLM)]. The study uses Johansen cointegration and Parsimonious error correction model as the estimation techniques. Findings from the results of the study reveals that there is a long-run relationship between the three measures of manufacturing performance (i.e. MPGR, SMGDP and CUR) and the variables of financial system stability in Nigeria during the period under review. Also, consumer price index (CPI) and lending rate (LR) have negative and significant impacts on manufacturing production growth rate (MPGR) in Nigeria. In addition, fiscal deficit (FD) and lending rate (LR) have significant and negative effect on share of manufacturing in GDP (SMGDP). Lastly, banks loan to manufacturing sector (BLM) has significant negative effect on capacity utilization rate (CUR) while exchange rate (EXR) has positive and significant impact on capacity utilization rate (CUR).

Keywords: Financial System Stability; Manufacturing Production Growth Rate; Share of Manufacturing in GDP; Capacity Utilization Rate; Johansen Cointegration

JEL Classifications: B26; E52; E62

Introduction

A strong and stable financial system plays vital roles in the development of manufacturing sector. Countries with stable and strong financial system are capable to absorb external shock. Levine (2005) posited that, enhancing the openness of financial institutions through deregulation may not impact positively on economic growth unless financial system is stable and robust enough to absorb international investment, competition and negative shocks. A financial system is said to be stable whenever it is capable of facilitating the performance of an economy and dissipating financial imbalance that arise endogenously as a result of significant adverse and unanticipated events (Diamond and Rajan, 2001). A well-structured and stable financial system can help channel finances from well-endowed sectors to financially constrained sectors, thereby giving room for capitals to cater for the production processes of manufacturing firms at a lower cost (Gokmenoglu, Amin and Jaspinar, 2015).

Manufacturing sector plays a significant role in economic growth of a country. It serves as a catalyst that speed up the pace of technological changes, economies of scale and easy integration into global production networks. These roles attributed to manufacturing firms cannot be effectively carried out without sufficient finance and capital brought about by a stable financial system. McKinnon and Shaw (1973) stressed the significance of seeking for both internal and external funds to enhance the manufacturing activities in developing countries. McKinnon (1973) emphasized the essence of generating internal funds in which manufacturers need to amass savings before procuring capital goods. However, generation of savings for investment purposes in Nigeria is always being constrained by poverty (Eyraud, 2002).

In the case of generating external funds for investment purposes in Nigeria, some financial institutions have been set-up to enhance the growth of manufacturing sector. Some of these financial institutions consist of the Nigerian Industrial Development Bank (NIDB), Nigerian Bank for Commerce and Industry (NBCI), Nigerian Agricultural and Cooperative Bank (NACB), Urban Development Bank (UDB) and Bank of Industries (BOI) (Adebisi, 2004). Despite the establishment of these financial institutions, Nigerian manufacturing sector is still constrained with enough capital as a result of bad institutional framework and financial malpractices. The inability to meet up with the loan repayment as a result of bad loan assessment, coordination, incidence of diversion and inadequate collaterals has depleted the level of loans to the manufacturing sector (Adebisi, 2004).

Series of research works have been put up to assess the relationship that exist between financial system development and some areas of economic development. Most of these research works, for example Jenkins and Katircioglu (2010), Gokmenoglu et al (2015), Agu and Chukwu (2008), Iheanacho (2016), Moureen and Borniface (2019) focused their studies of the effect of financial system only on economic growth without considering the manufacturing sector performance. Although, careful studies by Okoye, Nwakoby and Okorie (2016), Aiyetan and Aremo (2015), Otubu (2019) about the impact of financial system on the manufacturing performance only used industrial output to proxy manufacturing performance while Chimere, Simplice, Kingsley and Patrick (2020) only looked at the impact of financial system development on domestic investment. Meanwhile, industrial output and domestic investment are not robust enough to capture the growth of manufacturing sectors. Therefore, in a bid to fill the aforementioned gaps above and to contribute to the existing literature, this study used sufficient and adequate parameters which include production growth rate, share of manufacturing in GDP and capacity utilization rate to capture the performance of manufacturing sector.

The remaining aspect of the paper include section two which discusses the review of empirical literature, section three captures the research method while section four presents the analysis of results. Section five discusses the findings while section six presents the conclusion and policy recommendation of the study.

Review of Empirical Literature

Iheonu, Asongu, Odo, and Ojiem (2020) examined the impact of financial system development on investment in Economic Community of West African State (ECOWAS) between the period of 1985 and 2017. By using heterogenous panel data estimation techniques, findings of the study revealed that the effect of financial system development on domestic investment relies on the parameters of financial sector development employed. Also, private sector credit exerted positive and insignificant effect on domestic investment in ECOWAS. The findings of the study further showed that there are differences in the ways financial system development affect domestic investment in ECOWAS countries.

Moureen and Borniface (2019) examined the effect of financial system development on economic growth in Nigeria between the period of 1980 and 2017. The study used the Ordinary Least Squares (OLS) estimation method to assess how some financial indicators such as credit to private sector, inflation and trade openness affect the growth of economy in Nigeria. Findings of the study showed that private sector credit and money supply are good predictors of economic growth in Nigeria.

Iheanacho (2016) investigated the relationship between financial institutional development and economic growth in Nigeria between the period of 1981 and 2011. The study employed Auto-regressive Distributed Lag (ARDL) of cointegration estimation techniques. The findings of the study revealed that the relationship between financial institutional development and economic growth in Nigeria is similar to the one obtainable in some of the oil producing countries. The findings further showed that the effect of financial institutional development on economic growth in Nigeria is negative and significant in the short-run but insignificant in the long-run.

Khan, Qayyum, Sheikh and Siddique (2005) examined the impact of financial system on economic growth in Pakistan. The time series of the study covered the period of 1971-2004. With the use of Autoregressive Distributed lag as the estimation techniques, the study revealed that financial system has a positive effect on economic growth in the long-run, but has insignificant relationship in the short-run. Also, Jenkins and Katircioghi (2008) investigated the impact of financial system on both the international trade and economic growth in Cyprus. The study revealed that financial system has positive and significant impact on international trade and economic growth in Cyprus.

Gokmenoglu et al (2015) investigated the correlation among international trade, financial system and economic growth in Pakistan. The study revealed that there is a long-term co-movement among the three components. The findings in the study indicates that the financial system is able to stimulate growth in the manufacturing productivity. Agu and Chukwu (2008) assessed the relationship between some financial variables and economic growth in Nigeria. The study confirmed that financial system variables have long-term relationship with economic growth. The study equally revealed that financial system variables have positive and stable relationship with economic growth.

Aiyetan and Aremo (2015) investigated the effect of financial sector development on manufacturing output growth in Nigeria over the period of 1986 to 2012. The study emphasized on the impacts of financial sector development on disaggregated manufacturing output growth in Nigeria. By using Vector Autoregressive (VAR) model, the finding in the study revealed that liberalized financial system and a deepened financial sector would boost output growth of manufacturing sector in Nigeria.

Adeusi and Aluko (2015) examined the relevance of financial sector development on real sector productivity in Nigeria in the 21st century. The study adapted the financial sector development measures used by King and Levine (1993) as predictors of industrial sector production output. By using the Ordinary Least Square (OLS) technique, the study revealed that there is a strong linear relationship between financial sector and real sector productivity. The finding from the study therefore implied that financial sector development is a vital tool to boost the real sector productivity.

Okoye, Nwakoby and Okorie (2016) investigated the effect of economic reform policy on the performance of industrial sector in Nigeria over the period of 1986 to 2014. By using Vector error correction mechanism and granger causality test, findings from the study revealed that financial deepening exert a significant positive impact on industrial output while the granger causality test showed that there is a weak causal relationship between financial deepening and industrial output with trade openness and industrial output exhibiting a bidirectional causation.

Research Method

The framework of this study rests on the traditional IS-LM-BP theory. This is a theory that was propounded by Mundell and Fleming (1963) and was later revised by (Tobin and Macedo, 1980). The theory explains the open economy in the general Keynesian model. The reason behind the adoption of this theory is as a result of the consensus by some economic theorists that the production growth rate of firms depends, among other things, on exchange rate and interest rate (Gylfason and Helliwell, 1983).

The analysis of this theory is in two policy forms (i.e. Fiscal policy and Monetary policy). The theory is used to assess how a country's interest rate, real income and exchange rate (representing the position of balance of payment) can generate the output of firms. Variations in the money supply can alter the state of LM curve and change in the expenditure policy of government can influence the position of IS curve. These two policy frameworks can therefore have impact on a country's economic development. In this regard, the two economic agents (i.e government and Central Banks) can decide to adopt policy measures with the aim of attaining a specific national economic goal.

Part of the objectives of Central Bank and government might be to attain internal economic equilibrium which is as a result of a better application of domestic policy measures. The internal economic equilibrium objective of policy makers might be targeted toward the achievement of the highest level of manufacturing productivity.

In a bid to bring uniqueness into this research work as compared to other previous works, three equations are used. One that defines the manufacturing performance in terms of manufacturing production growth rate (MPGR), the second defining it in terms of capacity utilization rate (CUR) and the third that defines the measure as a share of manufacturing in gross domestic product (SMGDP). The reason behind the adoption of these three measures is that the strong and robust growth in the manufacturing sector can sufficiently be felt by these three dependent variables (Gylfason and Helliwell, 1983).

The explanatory variables that fit into the model are as follows: Lending rate (LR), saving rate (SR), bank loan to manufacturing sector (BLM), consumer price index (CPI), fiscal rate (FD) and exchange rate (EXR). Therefore, based on the theoretical framework of IS-LM-BP model adopted in this study, the model for this research work is explicitly specified as follows:

$$MPGR_t = \alpha_1 + \alpha_2 LR_t + \alpha_3 SR_t + \alpha_4 CPI_t + \alpha_5 FD_t + \alpha_6 BLM_t + \alpha_7 EXR_t + \mu_t \dots \dots \dots 1$$

$$SMGDP_t = \theta_1 + \theta_2 LR_t + \theta_3 SR_t + \theta_4 CPI_t + \theta_5 FD_t + \theta_6 BLM_t + \theta_7 EXR_t + \mu_t \dots \dots \dots 2$$

$$CUR_t = \beta_1 + \beta_2 LR_t + \beta_3 SR_t + \beta_4 CPI_t + \beta_5 FD_t + \beta_6 BLM_t + \beta_7 EXR_t + \mu_t \dots \dots \dots 3$$

Where:

MPGR = Manufacturing Production Growth Rate

SMGDP = Share of Manufacturing in Gross Domestic Product

LR = Lending Rate

SR = Saving Rate

CPI = Consumer Price Index (CPI proxies the inflation rate)

EXR = Exchange Rate

BLM = Bank Loan to Manufacturing sector

FD = Fiscal Deficit

μ_t = Vector error term

The data for this study consists of annual time series that spans through the periods of 1980-2018. Data on manufacturing production growth rate (MPGR), capacity utilization rate (CUR), share of manufacturing in GDP (SMGDP) were sourced from the International Financial Statistics (IFS) database (2019). Data on lending rate (LR), saving rate (SR) and bank loan to manufacturing sector (BLM) were sourced from Central Bank of Nigeria (CBN) statistical bulletin (2019). While data on consumer price index (CPI), fiscal deficit (FD) and exchange rate (EXR) were sourced from National Bureau of Statistics year books (2019).

Analysis Results

This section investigated the time series properties of the variables in this study. This was done through the unit root test which was used to determine the stationarity of the series. In this study, Phillip-Perron unit root test was adopted to determine the order of integration of variables.

Table 1: Philip-Perron Unit Root Test

Variables	Philip-Perron Unit Root Test		
	T-statistics	P-value	Order of Integration
EXR	-3.9108	0.0062***	I(1)
LR	-5.9072	0.0008***	I(1)
FD	-6.8331	0.0018***	I(1)
SR	-4.0165	0.0042***	I(1)
BLM	-5.9831	0.0008***	I(1)
CPI	-3.7637	0.0072***	I(1)
SMGDP	-4.2814	0.0064***	I(1)
CUR	-3.5718	0.0009***	I(1)
MPGR	-4.3611	0.0005***	I(1)

Source: Author's Computation

(***) refers to the statistical significance at 1%. Each model includes trend and constant term.

The results of the Phillip-Perron unit root test in the table1 above showed that all the variables are non-stationary at levels, but are stationary at their first difference at 1% level of significance. The implication of the result is that all the variables are integrated of order one, denoted as I(1) and any shock to the variables will not be prolonged for a long period of time. Since all variables are I(1), a necessary condition for a long-run equilibrium relationship known as cointegration is met. The result of the Johansen Cointegration test on the three measures of manufacturing performance (i.e MPGR, CUR and SMGDP) and financial system stability is presented in the table below.

Table 2: Johansen Cointegration test on Manufacturing Production Growth Rate (MPGR) and Financial System Stability

Maximum Rank	Eigenvalue	Trace Statistics	5% Critical Value
0	0.752631	185.2055	140.0200
1	0.683141	121.1319	109.1800
2	0.631494	78.8433	82.2300
3	0.583416	48.9611	58.9300

Source: Author's Computation

The results of Johansen cointegration test in the table 2 above confirmed the existence of at least two cointegrating vectors, in which their trace statistical value is greater than the critical value at 5% level of significance. This indicates that the null hypothesis of no cointegration is rejected for this study and it means that there is a long-run relationship between the manufacturing production growth rate and the financial system stability variables. This study therefore proceeds to estimating the parsimonious error correction model.

Table 3: Parsimonious Error Correction Model for MPGR and Financial System Stability

Variables	Coefficient	Standard Error	Probability value
constant	1.2711	2.1675	0.563
Δ MPGR (-1)	-0.076991	0.19854	0.702
Δ EXR (-1)	-0.004211	0.14219	0.707
Δ SR (-1)	-0.23820	0.99854	0.814
Δ BLM (-1)	2.6381	2.1611	0.235
Δ LR	0.11396	0.13716	0.415
Δ FD	0.13581	0.43746	0.669
Δ LR	-0.18057	0.38943	0.016
Δ CPI	-0.710978	0.23372	0.018
Δ ECM (-1)	-0.66770	0.24128	0.011

Source: Author's Computation

R-square = 0.72470

Durbin-Watson Stat. = 1.977

F-Stat (9,23) = 1.933/0.038

Table 3 above represents the estimated parsimonious error correction model which showed the best result obtainable from the OLS regression for the long-run relationship between MPGR and the financial system stability in Nigeria. Findings from the results revealed that apart from lending rate (LR) and consumer price index (CPI), all the explanatory variables that proxy financial system stability exhibited insignificant effect on the manufacturing production growth rate (MPGR) in Nigeria. Both lending rate (LR) and consumer price index (CPI) have negative and significant impacts on MPGR. The parsimonious model showed a high value of R² as 0.72470, which implies that the financial system stability variables are able to account for about 72% variation in MPGR. The F-statistics is statistically significant meaning that financial system stability variables can jointly have significant impacts on MPGR. The ECM value is correctly signed i.e negative and significant. The indication is that ECM can correct any disequilibrium of the long-run relationship between MPGR and financial system stability.

Table 4: Johansen Cointegration Test on Share of Manufacturing in GDP (SMGDP) and Financial System Stability.

Maximum Rank	Eigenvalue	Trace Statistics	5% Critical Value
0	0.532861	183.4065	140.0200
1	0.434576	119.1898	109.1800
2	0.318942	74.8290	82.2300
3	0.293454	49.0518	58.9300

Source: Author's Computation

The results of Johansen cointegration test above also confirmed the existence of at least two cointegrating vectors, indicating that there is a long-term correlation between SMGDP and the variables representing financial system stability.

Table 5: Parsimonious Error Correction Model for SMGDP and Financial System Stability

Variables	Coefficient	Standard Error	Probability value
constant	0.14960	0.28303	0.002
Δ SMGDP (-1)	-0.126430	0.19432	0.325
Δ EXR	0.015146	0.022808	0.463
Δ SR	0.29852	0.19863	0.513
Δ BLM	-0.21826	0.26727	0.423
Δ LR	-0.26744	0.286173	0.014
Δ LR (-1)	-0.40719	0.135695	0.051
Δ CPI (-1)	-0.028418	0.035675	0.434
Δ FD	-0.155691	0.57736	0.035
Δ ECM (-1)	-0.53532	0.17004	0.005

Source: Author's Computation

R-square = 0.8134

Durbin-Watson Stat. = 1.73

F-Stat (9,23) = 1.4008/0.025

Results of the parsimonious error correction model in table 5 above revealed that FD and LR have negative and significant impacts on share of manufacturing in GDP (SMGDP) while the remaining variables like EXR, SR, BLM, CPI do not have significant impact on SMGDP in Nigeria during the period under review. The parsimonious model showed the value of R² as 0.8134, which means that the variables that represent financial system stability are able to account for about 81% changes in SMGDP. The F-statistics is statistically significant which indicates that financial system stability variables can jointly have significant impact on SMGDP. The ECM value is negative and significant which means that it can correct any disequilibrium of the long-term relationship between SMGDP and financial system stability.

Table 6: Johansen Cointegration Test on Capacity Utilization Rate (CUR) and Financial System Stability.

Maximum Rank	Eigenvalue	Trace Statistics	5% Critical Value
0	0.814314	197.2251	140.0200
1	0.639402	119.7209	109.1800
2	0.553211	76.1613	82.2300
3	0.362410	47.0837	58.9300

Source: Author's Computation

The results of Johansen cointegration test in the table 6 above revealed that there is an evidence of long-run relationship between capacity utilization rate (CUR) and the variables that capture financial system stability. This is because there is at least two cointegrating vectors in the model.

Table 7: Parsimonious Error Correction Model for CUR and Financial System Stability

Variables	Coefficient	Standard Error	Probability value
constant	1.3207	0.95858	0.183
Δ CUR (-1)	0.49616	0.18768	0.115
Δ EXR (-1)	0.14035	0.184644	0.012
Δ LR (-1)	-0.36135	0.21797	0.112
Δ SR (-1)	0.80478	0.54906	0.158
Δ CPI	0.20257	0.11022	0.301
Δ BLM	1.0613	0.79282	0.008
Δ EXR	0.2969	0.60175	0.019
Δ LR	0.08815	0.16348	0.596
Δ CPI	-0.1761	0.11274	0.133
Δ FD	-0.25491	0.16147	0.129
Δ ECM (-1)	-0.21979	0.11218	0.063

Source: Author's Computation

R-square = 0.7512

Durbin-Watson Stat. = 2.28

F-Stat (11,21) = 4.6386/0.001

The results of parsimonious error correction model in table 7 above confirmed that exchange rate (EXR) and bank loan to manufacturing sector (BLM) have significant impacts on capacity utilization rate (CUR). Exchange rate (EXR) exerted positive and significant impact on CUR while bank loan to manufacturing sector (BLM) has negative and significant impact on CUR in Nigeria. Just like other two measures of manufacturing performance (i.e MPGR and SMGDP), the parsimonious model of capacity utilization rate (CUR) showed a high value of R² as 0.7512. This indicates that financial system stability variables are able to account for about 75% variation in CUR. Also, the F-statistics is statistically significant which indicates that financial system stability variables can jointly have significant impacts on CUR. The ECM value is negative and significant, meaning that the model can correct any disequilibrium of long-term relationship between CUR and financial system stability.

Discussions and Conclusion

Findings from the result of Johansen cointegration showed that there is a long-run co-movement between the three measures of manufacturing performance (i.e MPGR, SMGDP and CUR) and the variables of financial system stability in Nigeria during the period under review. Also, findings from the result of error correction parsimonious model revealed that consumer price index (CPI) which is a measure of inflationary rate, exerted negative and significant impact on the manufacturing production growth rate (MPGR). This finding corroborates the assertions of Donbush and Reynosol (1989) that the slumpy growth rate of manufacturing sector in Nigeria has always been associated with the increase in general price level.

Findings from the results of error correction parsimonious model also showed that the lending rate (LR) has a negative and significant impact on the MPGR in Nigeria. This is not surprising in Nigeria, since high lending rate without a corresponding increase in deposit rate has been identified as a principal factor responsible for high cost of production in the manufacturing sector. This actually aligns with the position of Stiglis and Weiss (1981) that too high an interest rate would attract riskier borrowers (adverse selection) and would give the current pool of borrowers the incentives to choose riskier projects (adverse incentives) to cover the higher financial costs. This definitely causes general financial breakdown with bank panics and failures.

Moreover, of immense importance is the finding from the results of government deficit financing (FD) which exhibited negative and significant impacts on share of manufacturing in GDP (SMGDP). This finding confirms the assertions of Ojo (2001) that the practice of financing the fiscal deficit through the banking system

especially the Central Bank's ways and means facility, always results in rapid growth of domestic liquidity. This in turn, exerts immense pressures on prices, interest rates and exchange rate of the naira. This has the potential of destabilizing the micro-economic environment, thereby retarding economic productivity and developments. In addition, findings from the results of parsimonious error correction model showed that lending rate (LR) exerted negative and significant impact on the SMGDP. This finding supports the assertions of Burkett and Dutt (1991) that the rise in interest rate increases firms' costs (due to higher borrowing costs) and this leads to cost push inflation, which in turn reduces aggregate demand and share of manufacturing in GDP.

Findings from the result also revealed that exchange rate (EXR) has positive and significant impact on the capacity utilization rate (CUR). This positive effect might be attributed to some stabilization measures embarked upon by the Nigerian government over the years, which required to bring about a substantial improvement on the balance of payments. This was made possible by a drastic depreciation of the exchange rate to promote exports in order to provide funds for the importation of capital goods and raw materials to boost the production of domestic firms. But it is quite unfortunate that the capital goods importation has not been effectively transformed to an increase in manufacturing productivity.

Furthermore, banks loan to manufacturing sector (BLM) has negative and significant impact on capacity utilization rate (CUR). This finding conforms to the position of Idoko, Eche and Kpeyol (2012) that huge loans are earmarked for the manufacturing sector in the records of commercial banks in Nigeria, but only few of the money are assessed by manufacturers. This is majorly attributed to the negligence of commercial banks in lending to the manufacturing sector. This confirms a common belief among many banks that lending to the manufacturing sector is not justified in forms of balancing risk and cost. The perceived risk is commonly attributed to the difficulty of banks in obtaining accurate and reliable information on a firm's true condition and performance.

Based on the results and discussion of findings of this research work, the study hereby concludes as follows: First, there is a long-run relationship between the three measures of manufacturing performance (i.e MPGR, SMGDP and CUR) and the variables of financial system stability in Nigeria during the period under review. Second, consumer price index (CPI) and lending rate (LR) have negative and significant impacts on manufacturing production growth rate (MPGR) in Nigeria. Third, fiscal deficit (FD) and lending rate (LR) have negative and significant impact on share of manufacturing in GDP (SMGDP). Lastly, banks loan to manufacturing sector (BLM) has negative and significant impact on capacity utilization rate (CUR) while exchange rate (EXR) has positive and significant impact on capacity utilization rate (CUR).

In the light of the above conclusion, this study therefore recommends that government in Nigeria should limit the way of deficit financing to the minimum. Financing budget deficit should be done according to the financial rules and regulation which restrict the federal government from using the Central Bank of Nigeria to finance its deficit through the ways and means mechanism. In addition, efforts should also be made to strengthen the prudential, regulatory and supervisory framework on loan classification, provision for bad debts, capital adequacy standards and limits on loan consideration. This will go a long way in preventing the banks from giving volatile and risky loans at high interest rate. Furthermore, a well-designed exchange rate policy should be put forward to formulate the real exchange rate that will be capable of maintaining both internal and external economic equilibrium, as this will give room for domestic producers of tradable products to compete internationally. Lastly, Nigerian government should give room for appropriate policies that will enhance the provision of long-term funds for the manufacturing industries.

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