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Modeling MSMEs Financing and Economic Growth: Evidence from Nigeria

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Abstract

MSMEs constitute the driving force in the attainment of industrial growth and development. Several previous studies have examined the relationship between MSMEs financing and economic growth in Nigeria but the results of these studies are still mixed. Therefore, this paper examines the causality between MSMEs financing and economic growth in Nigeria during the periods 1992 to 2013. However, the analysis technique of this study differs from the previous studies as the approaches of the previous studies are not adequate in obtaining robust estimates and drawing meaningful inference given the potential impact of MSMEs financing on economic growth. Unlike previous studies that totally relied on traditional methods for unit root testing, co-integration analysis, and causality test, our study relies on the ultra-modern econometric methods such as; the Ng-Perron modified unit root test, Autoregressive Distributed Lag (ARDL) Bound testing approach to co-integration, parsimonious ECM version of ARDL model, and the Toda – Yamamoto causality procedure. The empirical results indicate evidence of a stable long – run relationship among the chosen variables. The Toda – Yamamoto causality test show evidence of a unidirectional causality running from MSMEs financing to MSMEs output, a bi-directional causality between MSMEs output and economic growth, as well as, a unidirectional causality running from MSMEs financing to economic growth in Nigeria during the periods covered. The study therefore recommends that the government through the monetary authority (CBN) should energize the MSMEs by instituting a programme that will adequately promote the financing of MSMEs with relatively low interest rate for sustainable economic growth.

Keywords: MSMEs financing, economic growth, Ng- Perron, ARDL, Toda– Yamamoto

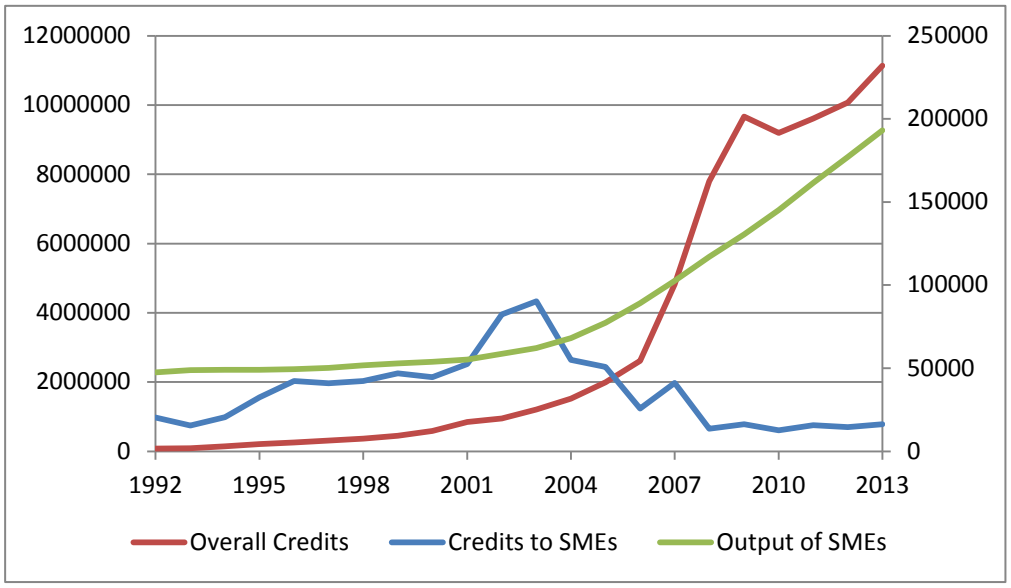
1. Introduction

A recent survey of Organization for Economic Co-operation and Development(OECD) have shown that micro, small and medium – scale enterprises, henceforth known as (MSMEs) account for a large share of the private sector economy representing between 96 and 99 per cents of the total number of enterprises in these economies. Micro enterprises (0-9 employees) account for between 70 per cent and 90 per cent while small firms (0-49 employees) constitute at least 90 percent of total enterprises. Only about 0.5 per cent of the enterprises in the manufacturing sector employ more than 500 in OECD countries (Alese and Alimin, 2014).

MSMEs constitute the driving force in the attainment of industrial growth and development in most economies. Their great potentials in ensuring diversification and expansion of industrial production as well as promoting economic growth are well known in the development literature. Meanwhile, lacks of institutional improvements and direct government financial support have been identified as impending factors to MSMEs development in Nigeria. The financing needs and institutional framework of MSMEs has not been effective in Nigeria. The challenges facing MSMEs is multifaceted. Inadequate capital, inaccessibility of credit facility, infrastructural inadequacies, lack of business strategy, and inadequate market research among others have been identified as the major challenges of MSMEs in Nigeria. Finance for MSMEs has remained problematic because their borrowing requirements are usually small and frequently does not appeal to financial institutions in Nigeria. In rare cases where they are available, more collateral may be required. There are indications that the performance of MSMEs has not been commensurate with the attention the government is paying to them. Some of the low performance indicators are low or poor gross domestic product (GDP), rising unemployment and poverty among others.

The low employment performance is worrisome because in other countries, MSMEs are the main drivers of the economy. According to Obadan and Agba (2005), MSMEs accounted for 41% of total South Korean export in 1996. Thus, the contribution to GDP and employment generation of these institutions suggests that they have little or no influence on economic growth in Nigeria. However, Governments' effort in the growth of MSMEs with the objective of constituting them into an engine of growth in Nigeria has been emphasized. For instance, in 1972, the Nigerian Enterprises Promotion Decree as amended was enacted and enforced to redress the dominance of foreign industry. Also, from 1985 to 2000, the Federal Government through the Structural Adjustment Programme (SAP) introduced the industrial policies aimed at encouraging the development of MSMEs. The Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) is yet another effort of the Nigerian government towards the development and promotion of MSMEs. In reversing the death of long – term finance for small scale industries (SMI) in Nigeria, the Small and Medium Industry Equity Investment Scheme (SMEIS) was developed. The concept of SMIEIS in Nigeria was the initiative of the Central Bank of Nigeria with the voluntary support and effort of the Bankers' Committee. The scheme requires among others that all banks in Nigeria should set aside 10 percent of their profit before tax annually for equity investment in small and medium industries. Despite these laudable government policy responses to the precarious nature and performance of MSMEs to enhancing economic growth in Nigeria, MSMEs are still characterized by numerous key setbacks among which is high interest rate, extreme high cost of administration of small loans and discrimination from banks averse to risk lending to small borrowers. These characteristics have contributed to the negative and low productivity of MSMEs in Nigeria, a situation where government efforts on MSMEs are not reflected on their output as shown in the Chart I below.

Figure 1: Trends in SMEs Output, Credits to SMEs andthe overall Credits in Nigeria.



Source: Authors' Initiative using Data from CBN Bulletin.

Previous studies have been carried on the link between MSEMs financing and economic growth. Such studies include that ofEigbiremolen and Igberesa, 2013; Alese and Alimi, 2014 etc, who examined the causality between both by employing the Granger – causality test proposed by Granger (1969). However, the limitations of such test include:

- A two-variable Granger causality test without consideration of the effects of other variables is subject to possible specification bias. Therefore, the empirical evidence of such studies is fragile.

- Although researchers can still test the significance of individual coefficients with t-statistic, one may not be able to use f-statistic to jointly test the Granger causality.
- These is a big gap in the literature concerning the quantitative relationship between MSMEs financing and economic growth in Nigeria.

These problems in previous studies have necessitated an in-depth inquiry into the probable causality between MSMEs financing and economic growth in Nigeria. As a result of the forgoing, the obvious questions to ask are:

- What is the causality between MSMEs financing and economic growth in Nigeria?
- Do they reinforce each other?

The objective of the study is therefore to investigate the causality between MSMEs financing and economic growth. Specifically, the study seeks to contribute to the body of knowledge through the use of Toda-Yamamoto (TY) causality test to overcome the limitations of the Granger – causality test used by previous studies.

The rest of the study is organized as follows: section 2 is on literature review and theoretical framework. Section 3 is on methodology and the model, section 4 contains the empirical results and discussion. Finally, section 5 discusses the conclusion and policy recommendations.

2. Literature Review and Theoretical Framework

The study is located within the theoretical framework of endogenous growth model, which maintains that long – run growth is derived considerably from other sources other than the exogenous technical change. In other words, the technology which induced growth is perceived as having evolved endogenously rather than being the product of any economic agent. Thus, technology could evolve from a number of factors, such as research and development outlay, activities of engineers and scientists, among others (Howitt, 1992, Romer, 1990). Endogenous growth could equally evolve from accumulation of human capital development that characterizes the labour force (Lucas, 1988).

Models of endogenous growth bear some structural resemblance to their neoclassical counterparts but they differ considerably in their underlying assumptions and the conclusions drawn. The most significant theoretical differences stem from discarding the neoclassical assumption of diminishing marginal returns to capital investments, accepting that increasing returns to scale do exists in aggregate production, and place emphasis on the role of externalities in determining the rate of return on capital investment. The relevance of this theory to the present study is derived from the fact that MSMEs represents a fundamental source of growth which the government is capable of influencing to achieve economic growth in an economy. From a worldwide perspective, it has been recognized that small and medium enterprises (MSMEs) play a vital role in economic development, as they have been the primary source of job creation and output growth, not only in developed countries but also developing countries. Similarly, Aharoni (1994) submitted that MSMEs make up more than 99% of all business entities and employ more than 80% of the total workforce in the country in India. Accordingly, these enterprises called foundation enterprises are the core of the U.S. industrial base from the conclusion of Piper(1997). MSMEs are also important in many European countries. For example, in the Netherlands, they account for 95% or more of total business establishments (Bijmolt and Zwart, 1994) while Thornburg (1993) also summarized that in industrialized/OECD economies such as Japan, Australia, Germany, France and Canada, MSMEs are engines of economic growth and technological progress.

Some empirical studies have been carried out on the relationship between MSMEs and economic growth .For instance, Qureshi (2012) explored the problems and constraints faced by small and medium – sized enterprises (SMEs) in Pakistan with regard to financing. The study argues that formal financing is the biggest problem of SMES because a substantial portion of SMES does not have the security required for collateral and long loan processing time.Oreoluwa (2011) examined specifically financing options available to SMES in Nigeria. The spearman's Rho correlation test was employed in

the study. The finding of the study is that there is a significant positive relationship between SMEs financing and economic growth in Nigeria. Afolabi (2013) in a similar study and using the ordinary least square (OLS), identified MSMEs output as a component of gross domestic product. He therefore concludes that, deposit banks' credit to SMEs and the exchange rate of naira exerts a positive influence on economic growth while interest rate exerts negative effect on economic growth in Nigeria.Alese and Alimi (2014) investigated the role of small and medium scale enterprises financing as a catalyst for economic growth of the Nigerian economy. They employed the methods of Error correction mechanism (ECM) and Engle Granger causality tests. Empirical findings reveals that deposit money banks' loans as a form of SMEs financing options significantly improves the economic size of the Nigeria in the long-run, but not significant in the short-run. The study therefore concluded that this may be attributed to the high cost of lending and cost of doing business prevalent in the Nigerian economy while the Engle Granger causality test reveals a bi-directional causality between SMEs financing and economic growth.

Briefly summarizing these studies, it was discovered that MSMEs are the engines of growth in both developed and developing countries. It was also discovered that high interest rate, infrastructure constraints and inaccessibility to finance pose major challenges to MSMEs and development in Nigeria.Bi-directional causality was also identified between MSMEs financing and economic growth. However, most of these studies are silent on the nature of causality between the variables of interest. The present study therefore aims to fill this research gap.

3. Methodology and the Model

The model of the study is adapted with modification from Eigbiremolen and Igberase(2013). The model of their study is stated as follows:

$$LRGDP = \lambda_0 + \lambda_1 LSMEs + \lambda_2 RINTR + \lambda_3 INF + U_1 \text{--------- (1)}$$

Where RGDP = real gross domestic product (Proxy) for economic growth.LSMEs = loans to SMEs, RINTR = Real Interest rate, INF = inflation, λ_0 = intercept of relationship in the model and λ_1 - λ_3 – coefficient of each exogenous or explanatory variables. U_1 = disturbance error term. Adapting the model (1) with modification, the model of this study becomes:

$$LRGDP = \theta_0 + \theta_1 LCBSE\ \theta_2 LSME0 + \theta_3 LM2 + \theta_4 INTR + U_2 \text{ --- (2)}$$

$$\theta_1 > 0,\ \theta_2 > 0,\ \theta_3 > 0,\ \theta_4 < 0$$

Where RGDP = real gross domestic product, CBSE = credit to small and medium scale enterprises, SMEO = small and medium scale enterprises output. M_2 = broad money supply, INT = real interest rate, θ_0 = intercept relationship of the model, θ_1 - θ_4 = explanatory variable coefficient, U_2 = disturbance error term. The logarithmic function enhances explanatory variable coefficients as elasticities. The major modification of equation (3) is the inclusion of SMEO.

3.1 Source of Data/Analytical Techniques

This study used essentially secondary data for analysis. The data on various variables, such as real gross domestic product (RGDP), credit to small and medium scale enterprises (CBSE), small and medium scale enterprises output (SMEO), money supply (M_2) and interest rate were obtained from the publications of the Central Bank of Nigeria (CBN): Statistical Bulletin, Annual Report and Statement of Accounts and National Bureau of Statistics of various issues.All variables except INTR were in log form and the data scope is 1992-2013. The time series property of the variables used in the models was investigated before the associated ARDL/Error – Correction Mechanism and Toda Yamamoto causality tests. Diagnostic test/stability analysis was also carried out to examine the statistical properties of the estimated model.

Unit Root Test

Having specified the MSMEs financing and economic growth model, we conducted the unit root test. This is to ascertain whether the time series are stationary or not. Moreover, stationarity of the variables are required so as to avoid spuriousness of the regression results. Standard economic theory requires that economic variables be stationary before estimating their relationship. Thus, we employed the Ng-Perron modified unit root test or the modified Z tests proposed by Perron and Ng (1996). This class of tests, denoted by the M-tests, has much less size distortion in the presence of moving average (MA) errors than the standard tests. These tests are MZp, MZ_t, and MSB. These are defined as,

$$MZp = (T^{-2}Y^2_t - S^2_{AR})\,(2T^{-2}\sum_{t-1} Y^2_{t-1})^{-1} \text{ ---------- (3)}$$

$$MSB = \left(\frac{T^{-2}\sum_{t-1} Y^2_{t-1}}{S^2_{AR}}\right)^{1/2} \text{ ---------- (4)}$$

And $MZt = MZ_P \times MS_B$. All these tests are based on S^2AR, an autoregressive estimate of the spectral density at frequency zero of Vt. The ADF versions of the stationarity test were reported for clarity purposes.

Co-integration Test

Our next task is to investigate whether the series under consideration are integrated using the autoregressive distributed lag approach (ARDL). The ARDL model is the more statistically significant approach to determining the co-integration relationship in small samples (Ghatak and Siddiki, 2001), while the Johansen co-integration technique requires large data samples for validity.

Moreover, the application of ARDL is justified for this study on the fact that the technique can be applied whether the regressors are I (1) and I (0). This means that the ARDL approach avoids the pre-testing problems associated with the standard Johansen approach, which requires that the variables be already classified into I(1) or I(0). According to Pessaran and Pessaran (1997), the ARDL approach requires the following two steps. In the first step, the existence of any long-term relationship among the variables of interest is determined using an f-test. The second step of the analysis is to estimate the coefficients of the long-run relationship and determine their values, followed by the estimation of the short-run elasticity of the variables with the error correction representation of the ARDL models (Kalu, 2015). By applying the ECM version of ARDL, the speed of adjustment to equilibrium will be determined. Accordingly, the ARDL model is represented by the following equation.

$$\phi(L, P)Y_t = \sum_{i-y}^{k} \beta i(L, qi)\, X_{it} \times \delta W_t = E_t \text{ ---------- (5)}$$

Where

$$\phi(L,P) = I - \phi 1L - \phi_2 L^2 \text{ ----------} \phi_P L^P$$

And $\beta_i (L, q_i) = 1 = \beta_i IL - \beta i_2 L^2$ ---------$\beta_i q_i Lqi$, i = 1,2 ------- k

Where y_t is the dependent variable, xit denotes the i independent variables, L is a lag operator, and W_t is the S x I vector of deterministic variables, including intercept terms, dummy variables, time trends and other exogenous variables. The ECM version of the ARDL model can be obtained by rewriting equation (5) in terms of the lagged levels and first difference of yt, $x_i t$, X_{2t}…….. X_{Kt} and W_t as follows:

$$\Delta Y_t = -\phi(I,P)\, EC_{t-1} + \sum_{i=1} \beta_i 0 \Delta x_{1t} + \delta^1 \Delta W_t - \sum Q^* Y_{t-j} - \sum_{j=1} \sum_{i=1} \beta_{ij}^* \Delta X + Ut \text{---(6)}$$

The error correction term is defined by:

$$EC_t = Yt - \sum_{i=1}^{k} \theta_i X_{it} - \Psi^1 W_t \text{ ---------- (7)}$$

Where: ϕ^*, δ_1, and β_{ij}^* are the coefficients which is related to the short – run dynamics of the model's convergence to equilibrium, and $\phi(I, P)$ is the speed of adjustment. Following the ARDL model (P,q) of equation (5), we formulate the Unrestricted Error Correction Model (UECM) as follows.

$$\Delta y_t = \sum_{j=1}^{p-1} \beta j \Delta Y_{t-1} + \sum_{j=1}^{p-1} \propto j \Delta X_{t-j} + \phi[Y_{t-1} - \{\beta + \delta_i X_{t-1}\}] + E_t \text{--------- (8)}$$

Where y_t is difference stationary economic growth variable (RGDP), Δx_t is a vector of difference stationary explanatory variables (CBSE, SMEO, M_2 and INTR), β and α are short-run coefficients of the determinants of economic growth in our model.

Error Correction Model Mechanism (Parsimonious)

According to Engle and Granger (1987), if co-integration exists between non-stationary variables, then an error- correction representation becomes necessary. As discussed earlier, by applying the ECM version of ARDL, the speed of adjustment to equilibrium will be determined.

Toda – Yamamoto Causality Test

In order to conduct the causality test, we employed the Toda- Yamamoto (TY) testing procedure. Toda and Yamamoto (1998) proposes an interesting but yet simple procedure requiring the estimation of an augmented VAR which guarantees the asymptotic distribution of the Wald Statistic (an Asymptotic X^2-distribution), since the testing procedure is robust to the integration and co-integration properties of the process. We use a bivariate VAR (M + dmax) comprised of MSMEs financing and economic growth, following Yamada (1988).

$$x_t = \alpha + \sum_{i=1}^{m} \theta i x_{t-I} + \sum_{i-m+1}^{m+dmax} \theta i x_{t-1} + \sum_{i=1}^{m} \delta i y_{t-1} + \sum_{i=m+1}^{m+dmax} \delta i y_{t-1} +$$

$$\sum_{i=m+1}^{m+dmax} \delta i Y_{t-1} + V_{1t} \text{ ---------- (9)}$$

$$Y_t = \psi + \sum_{i=m+1}^{m} \alpha i y_{t-1} + \sum_{i-m+1}^{m+dmax} \theta i y_{t-1} + \sum_{i=1}^{m} \beta i X_{t-1} +$$

$$\sum_{i=m+1}^{m+dmax} \beta i X_{t-1} + U_{1t} \text{ ---------- (10)}$$

Where X = MSMEs financing and Y = economic growth and α, θ's, δ's, Ψ, β's are parameters of the model, dmax is the maximum order of integration suspected to occur in the system, V_1t n___ N $(0, EV_1)$ and V_{2t} ___ N $(0, EV_2)$ are the residuals of the model and EV_1 and EV_2, the convince matrices of V_1t and V_2t, respectively. The null hypothesis of non-causality from MSMEs financing to economic growth can be expressed as H0: $\delta = 0$, Vi = 1, 2 ……m. Two steps are involved with implementing the procedure. The first step includes the determination of the lag length (m) and the second one is the selection of the maximum order of integration (dmax) for the variables in the system. Measures such as the Akaike Information criterion (AIC), Schwarz Information Criterion (SC) etc can be used to determine the appropriate lag order of the VAR.

Diagnostic Test/Stability Analysis

It is also necessary to examine the statistical properties of the estimated model. The model was tested for normality, serial correlation, autorgressive conditional heteroscedastcity, specification and stability. This was done using the different diagnostic/stability statistical tools.

4. Empirical Results and Discussion

4.1 Unit Test Results

Table 1: Ng – Perron (2001) Modified M –Test

Variables	MZa	MZt	MSB	MPT
RGDP	-8.74226	-2.09043	0.23912	2.80357
1%	-13.8000	-2.58000	0.17400	1.78000
5%	-8.1000	-1.98000	0.23300	3.17000
10%	-5.7000	-1.62000	0.27500	4.45000
CBSE	-9.12444	-2.07159	0.23299	2.89167
1%	-13.8000	-2.58000	0.17400	1.78000
5%	-8.10000	-1.98000	0.23300	3.17000
10%	5.70000	1.62000	0.27500	4.45000
SMEO	-7.18437	-1.89518	0.26379	3.41060
1%	-13.8000	-2.58000	0.17400	1.78000
5%	-8.10000	-1.98000	0.23300	3.17000
10%	5.70000	1.62000	0.27500	4.45000
M_2	-6.55608	-1.57656	0.24047	4.44526
1%	-13.8000	-2.58000	0.17400	1.78000
5%	-8.10000	-1.98000	0.23300	3.17000
10%	5.70000	1.62000	0.27500	4.45000
INTR	-6.01037	-1.64987	0.27450	4.32174
1%	-13.8000	-2.58000	0.17400	1.78000
5%	-8.10000	-1.98000	0.23300	3.17000
10%	5.70000	1.62000	0.27500	4.45000

The Ng-Perron modified unit root results as presented indicates that real GDP is integrated of order 1, i.e. I(1) at the conventional 5% level of significance, CBSE is integrated of order zero, i.e I(0), SMEO is integrated of order 1 i.e I(1) at 10% level of significance, M_2 is integrated of order one, I(1) while INTR is also integrated at order zero, I(0). In addition, the fact that the variablesare mixture of I(0) and I(1), further show that ARDL bound test is the appropriate method for testing the long-run relationship concerning the interdependence between economic growth and MSMEs financing. Similarly, the Augmented Dickey Fuller Test (ADF) results reported below confirm the stochastic nature of the variables.

Table 1b: ADF Test Statistics

Variables	ADF Test Statistics	0.05 level	Order of integration
LRGDP	-5.529380	-3.029970	1(1)
LCBSE	-5.76450	-3.020686	1(1)
LSMEO	-3.452785	-3.029970	1(1)
LM2	-3.179336	-3.020686	1(1)
INTR	-5.543764	-3.012363	1(0)

Source: Authors' computation using E-view 8.

4.2 Cointegration Test Result

Table 2: ARDL Bound F-test for Co-integration

Test statistic	Value	DF	Prob
F-statistic	5.488953	(5,7)	0.0227
Chi – square	27.44476	5	0.0000
Assuming intercepts and Trend			
Lower Bound 1(0)		Upper Bound 1(1)	
3.12		4.25	

Source: Authors' Computation

The F-statistics shows the results of each calculated variable. The calculated F-statistics is compared with the critical values for the bound test using the Pessaran et al (2001) approach. The null hypothesis of no co-integration is rejected if the f-statistic is higher than the upper bound critical values at the significant level chosen, and the null hypothesis of no co-integration is accepted, if the F-statistic is lower than the lower bound critical values. Based on the statement above, a 5% level of significance is adopted for the critical values for the bound testing technique and therefore, we deduced that the null hypothesis of no co-integration is rejected for the variables of interest, when normalized for Nigeria. This implies long – run relationship among RGDP, CBSE, SMEO, M2 and INTR as the computed F-statistic of 5.488953 is greater than the upper bounds of 4.25.

Table 2b: Unrestricted Johansen Co-integration Rank Test (Trace)

Hypothesized		Trace	0.05	
No. of CE(s)	**Eigenvalue**	**Statistics**	**Crtical value**	**Prob.****
None*	0.974090	143.9506	69.81889	0.0000
At most 1*	0.844480	70.8882	47.85613	0.0001
At most 2*	0.711808	33.66893	29.79707	0.0170
At most 3	0.347737	8.786098	15.49471	0.3856
At most 4	0.011926	0.239947	3.843666	0.6242

Trace test indicates 3 co-integrating eqn.(s) at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level

** Mackinnon – Haug – Michelis (1999) p – values

Unrestricted Co-integration Rank Test (Maximum Eigen value)

Hypothesized		Max- Eigen	0.05	
No. of CE(s)	**Eigenvalue**	**Statistics**	**Critical value**	**Prob.****
None*	0.974090	73.06240	33.87687	0.0000
At most 1*	0.844480	37.21958	27.58434	0.0021
At most 2*	0.711808	24.88254	21.13162	0.0141
At most 3	0.347737	8.546151	14.26460	0.3259
At most 4	0.011926	0.239947	3.841466	0.6242

Source: Authors' Computation.

Max – eign value test indicates 3 cointegrating egn(s) at the 0.05 level. *denotes rejection of the hypothesis at the 0.05 level **Mackinnon – Haug – Michelis (1999) P. vaues

Panel B

Normalized Co-integrating coefficients (Standard error in parentheses)

LRGDP	LCBSE	LSMEO	LM2	INTR
1.0000	-0.063649	-0.88004	0.012871	-0.014511
	(0.01345)	(0.04266)	(0.01381)	(0.00147)

So far, the results shows that the variables in MSMEs financing and economic growth in equation (2) tend to move together in the long-run as predicated by economic theory. In the short-run, deviations from this relationship could occur due to shocks to any of the variables. In addition, the dynamics governing the short – run behaviour of MSMEs financing and economic growth are different from those in the short-run. Due to these differences, the short-run interactions and the adjustments to long-run equilibrium are important because of policy implications. According to Engle and Granger (1987), if co-integration exits between non-stationary variables, then an error – correction representation becomes necessary.

The result in Panel B of Table 2b shows that the variables (CBSE and SMEO) are statistically significant but inappropriately signed implying that CBSE and SMEO do not contribute to economic growth over the sample period.

Table 3: short – run parsimonious Growth Model

Dependent variable: ΔRGDP

Variables	**Coefficients**	**Std. error**	**t-statistic**	**Prob.**
C	-0.047043	0.020118	-2.338399	0.0581
ΔRGDP (-2)	1.436151	0.175361	8.189670	0.0002
ΔRGDP (-3)	-0.644925	0.209210	-3.082661	0.0216
ΔCBSE (-1)	-0.070873	0.017429	-4.066263	0.0066
ΔSMEO (-1)	1.238759	0.533622	2.321416	0.0593
ΔSMEO (-2)	-3.166739	0.569672	-5.558885	0.0014
ΔSMEO (-3)	1.860070	0.374322	4.969172	0.0025
ΔM2(-1)	0.105231	0.087994	1.195889	0.2769
ΔM2(-2)	0.22470	0.051460	4.323186	0.0050
ΔINTR	-0.002089	0.002381	-0.877285	0.4141
ECM (-1)	-0.461508	0.160719	2.871521	0.0327

R-square	0.937026	Mean dependent var	0.067599
Adjusted R-square	0.821574	S.D dependent var	0.039234
S.E. of regression	0.016573	Akaike info criterion	-5.127385
Sum of squared resid	0.001648	Schwarz criterion	-4.533804
Log likelihood	58.14647	Durbin Walson	2.0213336
F-statistic	8.116132		
Prob (F-statistic)	0.008988		

Source: Authors' ComputationΔ before any variable stands for first difference

The dynamic model shows that the explanatory variables account for 93 per cent of the variation in the Nigerian growth process over the sample period. Though the variables are significant in explaining the growth process in Nigeria, with the exception of M2 and INTR, others are not of the expected sign (a priori). For example, the indicators of credit and output comes up significant but of the unexpected sign, implying the dismal performance of MSMEs and in extension real GDP in Nigeria. However, the variable M2 was of the expected sign andthis suggest the effectiveness of the monetary sector in generating growth over the entire period. The coefficient of the error correction term ECM (-1), which is an indication of the speed at which growth adjusts to changes in the long – run and the long – run equilibrium relationship between economic growth and the explanatory variables is not only appropriately signed, but also significant. This means that actual growth and long- run value of growth are corrected by a factor 0.46 every year. The value of F-statistic and its associated p-value show that the model is robust. The Durbin-Watson value shows that our model is not plagued by autocorrelation of any order.

Table 4: VAR Granger Causality/Block Exogeneity Wald Test

Dependent variable: LRGDP				
Excluded	Chi-Sq	**Df**	**Prob**	**Remark**
LCBSE	12.81977	2	0.0016	CBSE → RGDP
LSMEO	15.02416	2	0.0005	SMEO → RGDP
LM2	18.76335	2	0.0001	M2 → RGDP
INTR	4.912451	2	0.0858	
Dependent variable: LCBSE				
Excluded	Chi-Sq	**Df**	**Prob**	
LRGDP	0.279093	2	0.8698	No causality
LSMEO	0.858324	2	0.6511	
LM2	3.917728	2	0.1410	
INTR	0.023812	2	0.9882	
Dependent variable: LSMEO				
Excluded	Chi-Sq	**Df**	**Prob**	
LRGDP	21.97886	2	0.0000	RGDP →SMEO←RGDP
LCBSE	10.33281	2	0.0057	CBSE → SMEO
LM2	4.863227	2	0.0879	M2 → SMEO
INTR	5.935564	2	0.0514	
Dependent variable: LM2				
Excluded	Chi-Sq	**Df**	**Prob**	
LRGDP	0.791940	2	0.6730	No causality
LCBSE	0.438025	2	0.8033	
LM2	0.923079	2	0.6303	
INTR	1.284008	2	0.5262	
Dependent Variable: INTR				
Excluded	Chi-Sq	**Df**	**Prob**	
LRGDP	0.246342	2	0.8841	
LCBSE	1.089394	2	0.5800	No causality
LSMEO	0.093790	2	0.9542	
INTR	3.084007	2	0.2140	

Source: Authors' Computation

It is in terms of avoiding integration and complexity that this study adopts the TY (1995) procedure to improve upon the power of the Granger – causality test. Toda and Yamamoto procedure is a methodology of statistical inference, which makes parameter estimation valid even when the VAR system is not co-integrated. One advantage of TY is that, it makes causally test easier. One does not have to test for co-integration or transfer VAR into ECM. The methodology is estimated through MWALD Test. The estimates of MWALD test shows that the test result follows the chi-square distribution with 2 degrees of freedom in accordance with the appropriate lag length of the associated probability.The TY causality result indicates that there is a unidirectional causality running from MSMEs financing to MSMEs output, a bi-directional causality between MSMEs output and economic growth and an evidence of unidirectional causality running from MSMEs financing and economic growth in Nigerian during the period under study.

Table 5: Diagnostic/Stability Test

	Test	F-statistic	Probability
1	Specification error Ramsey Reset Test	1.192582	0.3246
2	Serial correlation Breush – Godfrey Serial Correlation (LM Test)	2.246193	0.2219
3	Heteroskedasticity White Heteroskedasticity Test	0.714467	0.7028
4	Normality Jarque – Bera Statistic	0.047759	0.976404
5	Stability Cumulative sum of squared Residual (CUSUM)	Within the 5% critical bound	

Source: Author's computation

Having presented the results from the empirical analysis, it is also necessary to examine the statistical properties of the estimated model. The model was tested for normality, serial correlation, autoregressive conditional heteroskedasticity, specification bias and for stability. The result of Table 5, suggests that the model is well specified and the residuals are normally distributed, homoskedastic and serially uncorrelated and the parameters appears to be stable. The cumulative sum of squares (CUSUM) (Plot not presented) was found to stay within the 5% critical bound. The results of the various tests therefore suggest that the model of MSMES financing and economic growth causality is fairly robust for policy analysis.

5. Conclusion and Recommendation

This study examined the causality between MSMEs financing and economic growth in Nigeria, adopting ultra-modern econometric methods of Ng-Perron Unit root test, ARDL co-integration test, associated ARDL/ECM test and the Toda – Yamamoto causality. The empirical results reveal that there is evidence of a stable long-run relationship between the chosen variables. The TY causality test indicates that there is a unidirectional causality running from MSMES financing to MSMEs output, a bi-directional causality between MSMEs output and economic growth and also an evidence of uni-directional causality running from MSMEs financing and economic growth in Nigeria. The stability/diagnostic tests reveal that the model of MSMEs financing and economic growth nexus is well specified and that the residuals are normally distributed, homoskedastic and serially uncorrelated. Stability of the parameters was observed and the CUSUM of squares was found to stay within the 5% critical bound. To this end, we recommend that government should employ policies that would accelerate MSMEs financing so as to increase MSMEs output vis-à-vis economic growth in Nigeria. These policy options include:

- Government strengthening and promoting the banks (SMIEIS) scheme through the Central Bank of Nigeria
- Lowering of interest rates on MSMEs loans and financing activities
- Investment in infrastructure(road, power etc)

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