

Financial Deregulation and Economic Growth in Nigeria: Evidence from Error Correction Model

Dada James Temitope^{1*}
Awoloye Emmanuel Olayemi²

Abstract

This paper examines the effect of financial deregulation on economic growth in Nigeria using annual data from 1986 to 2016. An index was used to capture financial deregulation. The index was generated using Principal Component Analysis from six variables namely: bank denationalisation, restructuring and interest rate liberalisation, prudential regulation, directed credit abolition, free entry into banking and capital market liberalisation. Johansen Cointegration test and Error Correction Model (ECM) were used to analyze the effect financial deregulation on economic growth. The result shows that there is long run relationship between financial deregulation and economic growth. Furthermore, the result reveals that financial deregulation has positive effect on economic growth both in the short run and long run, but the effect is not significant in the short run. The error correction term shows that the model corrects its short run disequilibrium by 35% annually.

Keyword: Financial Deregulation, Economic Growth, Johansen Cointegration, Error Correction Model, Principal Component Analysis

JEL Classification: G28, F43

1. Introduction

Debate over finance-growth relationship has been an unending one. Authors like Robison (1957) and Lucas (1988) established that it is economic growth that spur financial development. Schumpeter (1961) and Levine and Zerus (1988) argues that it is financial development that bring about economic growth. Theoretically, there are two strands in the literature in which the government can influence the economy; regulation and deregulation. The former is defined as any policy which alters market outcomes by the exercise of some coercive government power while the latter focused on removal of rules and restrictions. Argument in favour of

¹ Department of Economics, Obafemi Awolowo University, Ile-Ife, Nigeria.

*corresponding author. temitope2081@yahoo.com

² Department of Economics, Obafemi Awolowo University, Ile-Ife, Nigeria.
yemmy_emma@yahoo.com

financial regulation stressed that competition in the financial markets is imperfect, and therefore deregulation will only support further non-competitive behavior, while those in support of financial deregulation argued that financial institutions, such as financial intermediaries, affect the level of savings and the distribution of investment funds positively, and therefore encourage economic growth. The argument is premise on competition in the financial market. Increased competition between financial institutions leads to an increase in interest rates on investment, reduces the spread between rates on investment and lending, and ensures optimal credit allocation by channeling funds to the most feasible investment projects. The overall impact on economic development and welfare is positive (Grath, 2005).

After the oil price shock of 1973, countries of the world (both developed and developing) face a decline in their economic growth, thereby making these countries to embark on a series of economic policy including financial sector deregulation. Financial deregulation according to McKinnon (1973) and Shaw (1973) can be categorised into the domestic banking sector, stock market and national capital account. Financial deregulation involves giving power to apex bank (central bank in some countries) to conduct among others; monetary policy, to restructure banking sectors, improve competitiveness among banks and financial sector, to improve saving, encourage international diversification and access to capital market.

Nigeria economy had a lot of structural distortions in the 1980s, economic policies pursued prior to 1985 made the economy vulnerable to external shocks. Consequently, in 1986, Structural Adjustment Program (SAP) was adopted in Nigeria in order to correct structural distortions and to promote efficient market operation (Kumar, 2012). While SAP call for gradual process in the implementation of the policies, it gives autonomy and more power to the apex bank of a country. Studies have examined the role of financial deregulation for both developed and developing countries (Ahmed, 2013; Bumann et al., 2013; Oshikoya,1992). These results can be generally classified as mixed due to various measure of financial deregulation. This study is different from previous studies that have been conducted in this area by measuring financial deregulation from an index. The index captures the three components of financial deregulation (domestic financial sector, financial market and capital account). The financial deregulation index was generated using principal component analysis from six important deregulation indicators as used by Bekaert and Harvey (2000). These indicators are denationalisation of bank and restructuring, interest rate deregulation, prudential regulation, directed credit abolition, free entry into banking and capital market deregulation. The rest of this work is organised as follows: section 2 centres on the theoretical and empirical literature on the subject matter. Section 3 focuses on the methodology, section 4

presents empirical results while section 5 focuses on conclusion and policy recommendation.

2. Literature Review

Since the early 1970, researchers and policy maker are concerned about the link between financial deregulation and economic growth. Theories have reached different conclusion on the nexus between deregulation of the economy and economic growth. For instance, McKinnon (1973) and Shaw (1973) formulate the financial liberalisation hypothesis. The hypothesis establishes a negative link between government restrictions on the financial system especially banking sector and the quality and quantity of investment thereby having negative feedback on economic growth. Furthermore, the neo-structuralist school of thought found that deregulation of the economy could trigger bank crises, which have negative effect on economic growth.

In an empirical study conducted by Ahmed (2013) to investigate the link among liberalisation of financial market, financial development and economic growth in twenty-one sub-Saharan African countries, the study period span from 1981 to 2009. Using dynamic panel data and generalised method of moment as the estimation techniques, the result from the study shows that financial liberalisation reduces economic growth in the region. In addition, the finding shows that financial liberalisation does not spur financial development in sub-Saharan African countries. Similarly, a meta analysis on the link between financial liberalisation and economic growth was conducted by Bumann et. al. (2015). The meta- analysis comprises of more than sixty empirical studies. The result from the meta-analysis shows that for studies conducted between 1970 to 1980, financial deregulation does not have significant effect on economic growth, while studies conducted from 1980 reveals a positive correlation between financial liberalisation and economic growth. Furthermore, Handi and Jlassi (2014) examines weather capital market liberalisation enhance bank crises and threatening economic stability and growth. The authors' sample comprises of 58 developing countries between the period of 1984-2007. Applying two indexes to measure financial liberalisation, that is de facto and de jure, the result of the study shows that financial liberalisation is not the major cause of banking crises among the countries considered. In another study conducted by Karikari (2010) to examine the effect of financial liberalisation on economic growth in sub-Saharan African countries, the author concludes that financial liberalisation does not improve financial development and do not promote economic growth. On the other hand, when financial liberalisation was interacted with good institutions, financial liberalisation has positive on financial development and economic growth. Focusing on interest rate liberalisation, Osikoya (1992) examine the effect interest

rate deregulation has on macroeconomic performance in Kenya from 1970-1989. The result of the study shows that interest rate deregulation has insignificant negative effect on macroeconomic variables such as gross domestic product. However, dividing the sample period into two sub-periods (1970-1979 and 1980-1989), the result reveals that interest rate deregulation has negative correlation with macroeconomic variables between 1970-1979, but positive correlation was recorded between 1980-1989.

In Nigeria, Idoko, Emmanuel and Kpeyol (2012) examine the effect of deregulation of interest rate on economic growth from 1970-2009. The authors divided the sample period into two sub-sample era: the regulated era (1970-1986) and deregulated era (1987-2009). Using autoregressive distributed lag techniques, the result shows that interest rate has an insignificant effect on economic growth during the regulated and deregulated eras. In the light of Idoko et. al. (2012), Obamuyi (2009) also divided the sample period into regulated and deregulated era in order to investigate the relationship between rate of interest and economic growth. Using dummy variables to capture financial deregulation and regulation, the author found the existence of a unique positive relationship between interest rate and economic growth. Ikeora et. al (2006) evaluates the relationship between financial liberalisation and economic growth in Nigeria from 1987-2013. The result reveals that there is long-run equilibrium relationship between financial liberalisation and economic growth in Nigeria and the result shows that the model corrects its short-run disequilibrium by 73%. Furthermore, the result shows that there is no causality between financial liberalisation and economic growth in Nigeria. Amassoma et. al (2011) investigates the relationship among interest rate deregulation, lending rate and agricultural productivity in Nigeria from 1986 to 2009. The authors employs co-integration and error correction techniques as the estimation tools. The findings from the study shows that interest deregulation has a positive and significance effect on agricultural productivity in Nigeria. In a recent study, Anthony (2017) investigates the effect of bank interest rate reforms on economy growth of Nigeria using annual data from 1986 to 2013. Applying ordinary least square technique, the result indicates that bank interest rate reforms have significant negative effect on economic growth in Nigeria. Similarly, Jelilov (2016) examines the effect of interest rate deregulation on economic growth in Nigeria from 1990 to 2013. The result reveals that interest rate deregulation has a slight positive impact on economic growth in Nigeria. Awoleye and Dada (2018) examines the effect of liberalisation of financial market on stock market volatility in Nigeria from 1986 to 2016. Financial liberalisation was measure using financial liberalisation index and stock market volatility was generated using standard deviation approach. Applying Autoregressive Distributed Lag (ARDL) as the estimation technique, the result

shows that financial liberalisation has positive effect on stock market volatility in Nigeria, both in the short run and long run. Since there are still conflicting report on the effect of financial deregulation on economic growth in Nigeria, there is need for further research along this line using different measure of financial deregulation.

3. Methodology

Two sources have been identified in the literature as the channel through which financial sector could affect the long run economic growth. The channel includes its impact on capital accumulation (including human and physical capital) and the rate of technological progress. In order to investigate the impact of financial deregulation on economic development in Nigeria, the study employs a Cobb-Douglas production function, specified below:

$$Y = AL^\alpha K^\beta \quad 1$$

Where Y is output, A is technology, L is labour, K is capital and, α and β are output elasticity of labour and capital respectively.

Decomposing technology (A) in equation 1 into financial deregulation (Fid)

$$A = f(Fid) \quad 2$$

Substituting equation 2 in 1, and taking log of the model becomes

$$\log Y = \psi + \chi \text{LogFid} + \alpha \text{LogL} + \beta \log K + \varepsilon \quad 3$$

Where Y is real gross domestic product, L is total labour force participation rate, K is gross capital formation and Fid is financial deregulation.

The study period for this study spans from 1986 to 2016 and data on real gross domestic product, total labour force participation and gross capital formation are sourced from World Bank Development Indicators (WDI) 2016 edition. Financial deregulation proxy by financial deregulation index is measured using Bekaert and Harvey (2000) approach. Moreover, six important indicators towards deregulation such as: bank denationalisation and restructuring, interest rate deregulation, prudential regulation, directed credit abolition, free entry into banking and capital market deregulation were identified. Furthermore, dummy variable is used to capture financial deregulation; a dummy value of zero “0” is attached to pre-

deregulation era while one “1” is attached to deregulation period. The study uses the first principal component as an index for deregulation. This method has been widely used in the financial literature because of its simplicity and ability to identify difference cycles of deregulation.

The study employs Error Correction Model (ECM) procedure to test the short and long run effect of financial deregulation on economic growth in Nigeria. This method is prefer because the variables are non-stationary and are cointegrated (Engle and Granger, 1987). ECM are theoretically driven approach useful for estimating both short term and long term effects of one-time series on another. Also the ECM directly estimates the speed at which a dependent variable returns to equilibrium after a change in other variables.

The existence of a long run is investigated by estimating the following unrestricted error correction model

$$\Delta \log Y_t = \psi + \sum_{j=1}^p \phi_j \Delta \log Y_{t-j} + \sum_{j=0}^p \chi_j \Delta \log Fib_{t-j} + \sum_{j=0}^p \alpha_j \Delta \log L_{t-j} + \sum_{j=0}^p \beta_j \Delta \log K_{t-j} + \lambda ECT_{t-1} + \varepsilon_t$$

4

Where p is the lag length that will be determine optimally, Δ is the change parameter. In equation 4 the terms with summation signs represent the short run dynamics, while the second part (containing λ) corresponds to the speed of adjustment of the model.

4. Empirical Result

Unit Root Test

Non-stationary time series data posed some problems in regression result; it is importance to check the properties of time series data before analyzing the relationship that exist among the variables. It has been well established in the literature that regression analysis produces spurious results while using data that are not stationary (has unit root). To avoid spurious regression result, unit root test is performed on all the variables used in this study in order to know their properties. It was observed from Table 1 all the variables are stationary at first difference using both Augmented Dickey-Fuller test and Philips Peron test.

Table 1 Unit Root Test

Variables	ADF			PP		
	Level	1 st Difference	Status	Level	1 st Difference	Status
GDP	3.1159 (1.0000)	-3.9010 (0.0060)*	I(1)	3.0341 (1.0000)	-3.9711 (0.0051)*	I(1)
GCF	1.4957 (0.9987)	-3.8168 (0.0074)*	I(1)	3.0513 (1.0000)	-3.8197 (0.0073)*	I(1)
LF	1.1921 (0.9973)	-3.0077 (0.0464)*	I(1)	1.6689 (0.9993)	-3.0515 (0.0423)*	I(1)
FID	-2.6386 (0.0971)	-6.4008 (0.0000)*	I(1)	-2.4899 (0.1282)	-7.8323 (0.0000)*	I(1)
Test critical values:		1% level		-3.467205		
		5% level		-2.877636		
		10% level		-2.575430		

Note *' means significance at 5% level, “()” are the probability values, ADF= Augmented Dickey-Fuller test, PP= Philips Peron. Lag 1 based on Schwarz information criterion was used as the lag length.

Since the unit root properties of the variables has been identified using Augmented Dickey-Fuller test and Philips Peron, this study proceeds to establish the long run equilibrium relationship among the variables in the model. From Table 2, both the trace test and the Max-Eigen test indicates that the null hypothesis of no co-integration among the variables should be rejected, as both of them indicate at least one co-integrating equation at the 5% significant level. This implies that there is co-integration between economic growth, financial deregulation and other explanatory variables in the model at 5% significant level. The existence of co-integration implies that there is long-run relationship among the variables in the model. Hence, the linear combination of two or more of these variables exhibits a long-run relationship.

Table 2: Johansen's Cointegration Test

Trace Test				Max-Eigen Test			
Null	Alternative	Statistic	Critical Value (5%)	Null	Alternative	Statistic	Critical Value (5%)
$r = 0$	$r = 1$	60.22134*	47.85613	$r = 0$	$r = 1$	29.60412*	27.58434
$r \leq 1$	$r = 2$	30.61722*	29.79707	$r \leq 1$	$r = 2$	20.57112	21.13162
$r \leq 2$	$r = 3$	10.04609	15.49471	$r \leq 2$	$r = 3$	8.853134	14.26460
$r \leq 3$	$r = 4$	1.192960	3.841466	$r \leq 3$	$r = 4$	1.192960	3.841466

Trace Test	Max-Eigen Test
<i>Trace test indicate 2 co-integrating equation at the 0.05 level.</i>	<i>Max-Eigen test indicate 1 co-integrating equation at the 0.05 level.</i>

Table 3: ESTIMATES OF CO-INTEGRATING VECTOR (Dynamic Long-Run Relationship)

LGDP	LGCF	LLF	LFID
1.000000	30.74900	-3.725803	-0.306710
	(9.51446)	(0.99156)	(0.11424)

The co-integrating equation which is normalized on economic growth (that is, LGDP) is as shown in Table 3. This co-integrating equation portrays a dynamic long-run relationship between economic growth and the explanatory variables. The signs of the explanatory variables in the co-integrating equation are reversed because of the normalization process (Akinlo, 2004). Hence, the normalized co-integrating equation has its long-run equation re-specified below:

$$\begin{aligned}
 LGDP = & -30.75LGCF + 3.73LLF + 0.31LFid \\
 & (9.515) \quad (0.992) \quad (0.114)
 \end{aligned}$$

Using the standard error coefficient rule to judge the significance or otherwise of the variables, the estimated equation shows that gross capital formation has negative and significant effect on economic growth, while the coefficient of labour force participation rate has positive and significant effect on economic growth. Financial deregulation has positive and significant effect on economic growth in the long run. Financial deregulation brings about health competition, improvement in efficiency of financial market and channel funds from the surplus area to deficit ones through amelioration of information asymmetries and proper screening of credit worthy and productive borrowers, in order to facilitate business transaction and economic development.

Table 4 shows that the short run coefficient of financial deregulation is positive but has insignificant effect on economic growth. Specifically, a unit increase in financial deregulation leads to 0.6% increase in economic growth in Nigeria. This result further reveals that it takes time before financial deregulation could have significant effect on economic growth in Nigeria. Similarly, the short run effect of gross capital formation and labour force participation rate is positive on economic growth while the effect of labour force participation is significant. The coefficient of the error correction term (ECT) -0.35 implied that the model corrects its short run disequilibrium by 35% speed of adjustment annually in order to return to long run equilibrium. The validity of the long run and short run results are confirmed by

cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) in Figure 1 and 2 respectively. The CUSUM and CUSUM of square graph in Figure 1 and 2 shows that the parameters estimated are stable since CUSUM and CUSUM of square are within the upper and lower boundary (Pesaran and Pesaran, 1997)

Table 4 Short Run Coefficient of Economic Growth

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LGCF)	0.070515	0.050292	1.402115	0.1732
D(LLF)	1.169372	0.544487	2.147660	0.0416*
D(LFid)	0.006304	0.006259	1.007186	0.3235
ECT(-1)	-0.348781	0.111434	-3.129922	0.0044*

* means significance at 5% level

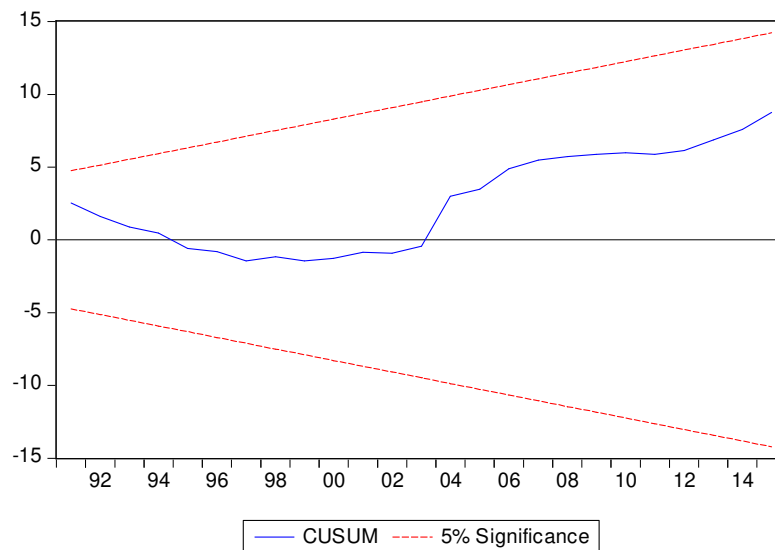


Figure 1 CUSUM

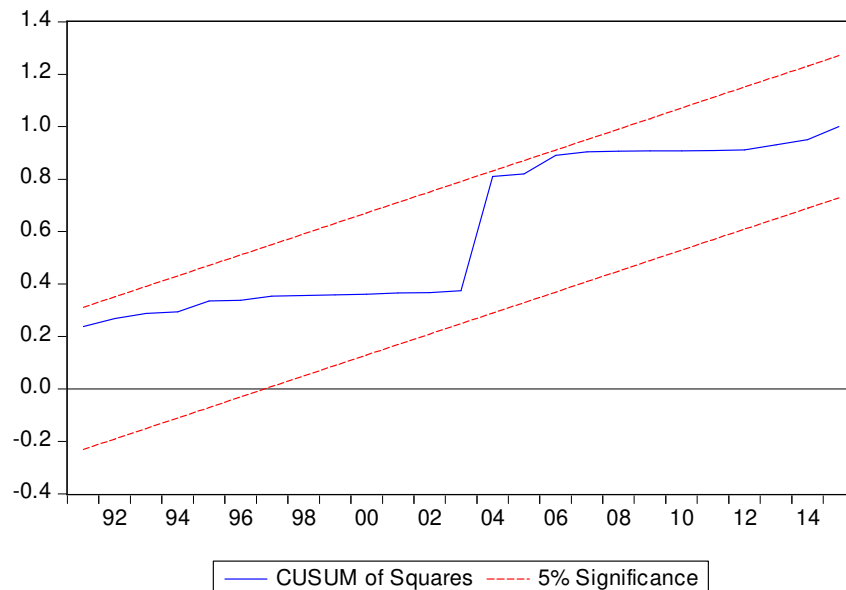


Figure 2 CUSUM of Squares

5. Conclusion and Policy Recommendation

This study investigates the effect of financial liberalisation on economic growth in Nigeria between the periods of 1986 to 2016. Principal component was used to generate financial deregulation index from six variables namely: bank denationalisation and restructuring, interest rate liberalisation, prudential regulation, directed credit abolition, free entry into banking and capital market liberalisation. Based on the empirical results obtained from this study, financial deregulation has positive effect on economic growth in Nigeria both in the short run and long run. The effect of financial deregulation on economic growth is not significant in the short run, indicating that financial deregulation requires time lag before it could have positive effect on economic growth. Therefore, financial deregulation in Nigeria should be implemented in phases in order to reduce the shock in the economy. Furthermore, since financial deregulation has significant influence on economic growth in the long run in Nigeria, there is need for authorities (especially monetary authority) to carry out far reaching reforms that would improve the role of the money market in financial intermediation. This, for example, may include an effective deregulation of interest rates which would allow its value to be absolutely determined by the forces of demand and supply alone instead of being paired to the bank rate. Finally, Government should not always look at the deregulation policies

as a way of stimulating output growth in the Nigeria economy, as it has showed from the findings as a weak instrument of stimulating output growth in the short run.

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