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FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH IN NIGERIA: NEW EVIDENCE FROM A THRESHOLD AUTOREGRESSIVE AND ASYMMETRIC ANALYSIS

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ABSTRACT

Financial development is concerned with policies, procedures and initiatives to increase the financial access, depth and productivity of financial institutions and financial markets. To that regards, this paper investigates the asymmetric relationship between financial development and economic growth by incorporating financial globalization uncertainty and inflation into a production function covering the Nigerian economy from 1980–2019. The threshold Autoregressive co-integration and nonlinear autoregressive distributed lag techniques are applied to examine the asymmetric cointegration between the variables, as well as the degree of the relationship among the variables. The results indicate long-run relationship between the parameters in the light of asymmetries. The asymmetric estimation results show that positive shock of financial development dampen economic growth. By comparison, symmetrically, the negative shock of the financial development improves the productivity growth of the Nigerian economy. Finally, while inflation shows a positive relationship, the financial globalization uncertainty indicates insignificant result. The implications of the said findings for productivity policies in Nigeria are also discussed.

Contribution/Originality: This study contributes to investigating the asymmetric relationship between financial development and economic growth by incorporating financial globalization uncertainty and inflation into a production function covering the Nigerian economy from 1980.

1. INTRODUCTION

Financial development is concerned with policies, procedures and initiatives to increase the financial access, depth and productivity of financial institutions and financial markets. A well-efficient financial structure increases economic performance by channeling scarce capital to the most productive uses that contribute to sustainable development (Slesman, Baharumshah, & Azman-Saini, 2019). The effect of finance on development has been at the

core of most policy discussions among scholars over the last few decades (Ang & McKibbin, 2007; Seven & Yetkiner, 2016).

Theoretical literature indicates that financial development will foster productivity expansion by pooling savings, risk avoidance and risk control, encouraging trade through lower transaction costs, exchanging knowledge on investment prospects, optimizing resource allocation, and growing investor ability to fund new ventures through corporate supervision (King & Levine, 1993; Levine, 2005). Most of the evidential literature (e.g., (King & Levine, 1993; Levine, 1998)) argued that there was a positive relationship involving finance and growth, whereas I. S. Farouq, Sulong, and Sanusi (2020) and Demirgüç-Kunt and Maksimovic (2002) reported similar industrial and firm-level relationships.

However, finance-growth literature forecast four potential paths. Firstly, finance is a driving force for economic development (Fishkin, Keniston, & McKinnon, 1973; Levine, 2005; Schumpeter, 1912; Shaw, 1973). Savings and investment as well as the wealth distribution to productive sectors are considered essential mechanisms by which the efficiency of resources improves, which in turn boosts economic development (Al-Yousif, 2002; King & Levine, 1993; Masten, Coricelli, & Masten, 2008).

Secondly, economic growth generates desire for financial services, which in turn has a positive effect on financial development (Demetriades & Hussein, 1996; Panizza, 2012; Robinson, 1952). Thirdly, the causality of the finance-growing nexus is bi-directional. Most of the studies (for example, Greenwood and Smith (1997); Luintel and Khan (1999); Al-Yousif (2002)) indicated a bi-directional link between financial development and productivity growth. Fourthly, there is no causal link between financial development and productivity growth.

Holding the value of the finance-growing nexus, the Nigerian State embarked on a number of reforms in the financial system in the 1980s. The aim of these regulations was to establish a fair playing environment for the financial institution by detaching entry barriers and promoting competition between financial institutions, abolishing distortions and differentiation of the financial system, eradicating direct and subsidized lending systems and enhancing the supervisory position of the Central Bank of Nigeria. It is assumed that if the financial system is liberalised, it would still be able to collect infrastructure capital and thereby allow the most efficient use of the funds possible. This resulted in the privatisation of a number of public banks. A series of banks and financial institutions have been subsidised during this time as the programme has made the possession and operation of a financial institution profitable (Ndako, 2010).

Several financial-growth nexus investigations have been conducted in Nigeria (for instance, (Farouq & Sulong, 2020; Farouq, Sulong, & Sambo, 2020)). However, few researchers have used the non-linear method to analyze the effect of financial development on growth in the economy. Most of the previous studies presented clear positive proof of the linear association between finance and growth nexus. However, the proposal for a linear association between financial development and productivity growth is constraint, particularly where policy action is taking place in the economy (Ibrahim, 2015). Latest empiric research has emphasized the significance of non-linear ties between financial development and productivity growth (Deidda & Fattouh, 2002; Kumar & Paramanik, 2020; Rahman, Khan, & Charfeddine, 2020). Nevertheless, in reference to Nigeria, longitudinal research on the non-linear association between financial development and productivity growth is scarce. As a result, the current study aims to analyze the effect of financial progress on productivity growth in Nigeria under the non-linear autoregressive distributive lag paradigm.

2. LITERATURE REVIEW

The intellectual discourse on the nexus between finance and growth began when (Schumpeter, 1912) acknowledged the function of finance in the mechanism of economic growth. He concluded that, through capital investment and technical advances, financial progress leads to economic growth. Fishkin et al. (1973) and Shaw (1973) subsequently affirmed the constructive role of financial progress in the promotion of productivity growth.

Patrick (1966) suggested the hypothesis of 'phases of progress' in relation to the finance-growth nexus, which identifies supply-leading and demand-following theories.

In the supply-leading theory, financial development is crucial in supporting economic growth through capital pooling, risk control and intermediary roles (Levine, 1998). Several authors tested this theory employing panel, cross-section and time series data set, and found mixed findings. Luintel and Khan (1999) for example, observed substantial support in 10 developed nations for the reliability of the supply-leading hypothesis. De Gregorio and Guidotti (1995) found a favorable relationship in cross-country data between financial progress and productivity growth and a negative relationship in panel data for Latin American nations. High level of financial liberalization and poor banking regulations were the main reason behind the negative relationship.

The demand-following theory, on the other hand, supported the unidirectional causality of financial production from economic growth. Robinson (1952) claimed that, at the early phase of financial growth, financial development followed the corporation. Kuznets (1955) accepted the claim and observed that financial growth was greatly influenced by the dynamics of the economic cycle. In view of the endogenous growth structure, Romer (1986) and Lucas Jr (1988) have argued that by mobilizing savings, efficient distribution of economic resources, minimizing knowledge, tracking and transaction costs, enabling the trade of goods and services and risk diversification, the financial sector immensely contributes to productivity expansion. A number of scholars have recognized the demand-following hypothesis (for example (Ang & McKibbin, 2007; Farouq, Sulong, & Sambo, 2020; Khan, Qayyum, & Sheikh, 2005; Khan, Ahmed, & Bibi, 2019; Rehman & Cheema, 2013)). They argued that the key driver of economic growth is financial production. A bi-directional relationship between finance and development was established by one strand of literature.

3. METHODOLOGY

The theoretical structure of this research is based on the principle of endogenous development. Several empiric experiments have found that financial progress impacts economic activity through capital investment and technical advances. Our modelling methodology is based on the endogenous growth theories put forward by Lucas Jr (1988); Romer (1986) and Pagano (1993). After Ang (2011) and Chong, Mody, and Sandoval (2017) we consider the following aggregate output function:

$$Y_t = AK_t \quad (1)$$

Where in equation 1, Yt reflects the degree of economic progress for the t period, while A indicates the total productivity, Kt denotes capital for the t period, which encompasses human and financial resources rather than only physical capital. Here, the gross productivity factor is equivalent to the marginal output of resources.

In order to expand Equation 1 and add variables that represent the overall productivity factor (A), we define our model as follows:

$$LGDP_{it} = \beta_0 + \gamma_{1i} LFD_{it} + \gamma_{2i} LCPI_{it} + \gamma_{3i} LNFGU_{it-1} + u_{it} \quad (2)$$

Where $LGDP_t$ measures economic growth at time t, $LCPI_t$ is inflation rate at time t, $LFGU_t$ represents financial globalization uncertainty at time t.

Financial development is expected to have a favorable impact on economic activity as it encourages savings and investment decisions. In addition, the banking industry also promotes investing opportunities in the stock market. Other industries, such as banking, mutual fund and debt and securities markets, also contribute to the growth of the finance industry. Financial globalization instability is projected to be negligible to Nigeria's economic development due to low institutional efficiency in the economy. Increasing inflation raises macroeconomic instability, which is projected to have a negative effect on the TFP, and thus economic development.

3.1. Data

The current study uses annual data for the period 1980- 2019. The World Bank's World Development Indicators (WDI, 2020) and International Monetary Fund (IMF) are the primary data sources. In this research, we used the real GDP as a measure of economic growth following Farouq, Sulong, Ahmad, Jakada, and Sambo (2020); Farouq et al. (2020); Jakada, Mahmood, Ahmad, Farouq, and Mustapha (2020); Dabachi et al. (2020); Ahmad et al. (2020). Domestic credit to private sector by Banks is the measure for financial development following Farouq et al. (2020); Ahmad, Ismail, Jakada, et al. (2020); Farouq et al. (2020); Jakada et al. (2020). Inflation is calculated as the annual percentage change in the consumer price index and it captures macroeconomic uncertainty following Farouq et al. (2020). While we proxy financial globalization uncertainty as the lagged one period of foreign direct investment inflows following Farouq and Sulong (2020): Farouq et al. (2020).

3.2. Non-Linear Autoregressive Distributive Lag

The NARDL approach is the asymmetrical development of a simple linear ARDL approach to check the degree of long-term interaction. Pesaran, Shin, and Smith (2001) established the approach and applied it to Shin, Yu, and Greenwood-Nimmo (2009) thus offering partial breakdown of nonlinearity. The method thereby models long-term interactions and dynamic ways of changing at the same time in a normal way. Applied to it, this approach entails the decomposition of the chosen element. Simply stated, the study breaks down the financial development into negative and positive sub-parameters. FD + and FD- represents partial positive and negative shifts. It can also be calculated as:

$$X_t = b^+Y_t^+ + b\text{-}Y_t\text{-} + u_t \qquad (3)$$

Where in equation 3, X_t is the f × 1 vector of economic growth, t stands for the period; Y_t is the f × 1 vector of multiple regressors given that $Y_t = Y_t + Y_t^+ + Y_t\text{-}$, standing in place of the natural logarithm of economic growth; μt represent error term; and b^+ Are the integrated asymmetric parameters of the long run, depicting that exchange rate reacts asymmetrically during increase and decrease periods.

4. RESULTS

Table 1 below displays the descriptive details and the correlation matrix. The results show that FD has the greatest vector instability, and economic growth tends to be less unpredictable than the variability of inflation, and subsequently the financial globalization uncertainty. Meanwhile, in both parameters, the mean surfaces the standard deviation, which is a clear distribution of normal data. In addition, the kurtosis and skewness values of the data suggest possible asymmetry in the distribution. Therefore, in this empiric analysis, we pay heed to the asymmetric. With respect to the correlation matrix results, taking into account the correlation values, none of the variables seem to have a multicollinearity problem.

4.1. Diagnostic Tests

Both P-values in the three above diagnostic measures are negligible. Therefore, the data is said to be free of serial correlation and heteroscedasticity; also, the normality test indicates that the data is normally distributed.

4.2. BDS Test

The BDS test is used to determine the asymmetric existence of the time series effects. Specifically, the test was applied for the residual data series produced by ARIMA models (Dorina & Simina, 2007). The test was named after

influential economists Brock, Dechert, and Schneinkman. The hypothesis is based on the idea that the series demonstrates randomness within the sequence against the alternative presumption that the sequence is asymmetric within the model.

Table-1. Descriptive Statistics.

	LGDP	LFD	LCPI	LFGU
Mean	2.319	17.253	13.247	14.054
Std. Dev.	1.254	11.421	4.125	5.412
Skewness	-2.291	1.643	1.542	0.308
Kurtosis	9.532	6.036	4.120	1.842
	LGDP	LFD	LCPI	LFGU
LGDP	1.000			
LEXR	0.025*	1.000		
	(0.000)			
LFD	0.102*	0.014*	1.000	
	(0.000)	(0.000)		
LFGU	0.013*	0.201*	0.127*	1.000
	(0.000)	(0.000)	(0.000)	

Table-2. Diagnostic Tests

	χ^2_{NT}	χ^2_{SERIAL}	χ^2_{ARCH}
GDP=F(FD, CPI,FGU)	0.273 (0.302)	0.520 (0.238)	1.042 (0.204)

Table-3. BDS Linearity Test

Series	D2	D3	D4	D5	D6
LGDP	0.356*	0.474*	0.451*	0.291*	0.346*
LFD	0.430*	0.532*	0.532*	0.354*	0.863*
LCPI	0.074*	0.530*	0.178*	0.649*	0.45*
LFGU	0.810*	0.042*	0.056*	0.561*	0.927*

Table 3 shows result of the BDS test. The table reveals that the null hypothesis is denied at a significance amount of 1% in all percentages. This suggests a non-parametric form. The BDS method restricts the concept of I(0) (identical and independent distribution) of multidimensional residues (Ahmad, Ismail, Dayyabu, et al., 2020; Baz et al., 2020; Farouq et al., 2020; Zafeiriou, Mallidis, Galanopoulos, & Arabatzis, 2018; Zeraibi, Balsalobre-Lorente, & Shehzad, 2020). These findings are closely connected to the non-linearity of the series and suggest the applicability of the popularized NARDL.

4.3. Unit Root

The results of the regular unit root tests, DF-GLS, shown in Table 4 below indicate that the unit root null could not be rejected at 5% for all variables tested at a level. But following the first differencing, we are able to debunk the null hypothesis of unit root (1). It is very well-founded that the traditional linear unit root test has lower power while non-linear effects represent the method of producing the results of the series. Due to the higher degree of variability and spillage of these datasets conventional unit root research may result in misleading findings. In this research, we will also perform a newly designed unit root test that integrates nonlinearities into the system for estimating the nonlinear stationarity of variables in the series. In contrast, the results of the KSS root

unit experiments are presented in Table 4, which shows that the KSS test do not reject the null hypothesis for all parameters at level, instead, it rejects at first difference. Therefore, after the first difference I (1), our variables became nonlinear stationary.

Table-4. Stationarity test of unit root.

VARIABLES	DF-GLS	KPSS
LGDP	-1.623	-1.145
LFD	-1.782	-2.831
LCPI	-2.642	-3.18
LFGU	-1.231	-3.274
ΔlGDP	-4.221*	-4.252*
ΔlFD	-4.371*	-5.523*
ΔlCPI	-3.121**	-4.193*
ΔlFGU	-3.151**	-5.262*

4.4. Optimal Lag Selection Criteria

The use of optimum lag selection criteria when choosing an acceptable lag is critical in coping with recent econometric approaches, as may be the case in the present research. Five conditions for the choice of orders in the table 5 below are considered when determining the length lag. The criteria for the lowest value give us the optimal lag (Farouq et al., 2020; Jakada et al., 2020).

Table-5. Lag Selection Summary.

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-11.246	17.259	0.034	5.970	8.514	4.374
1	-63.815	47.404	0.612	2.430	2.907*	2.932
2	-11.312	31.831*	0.195*	2.226*	3.235	2.352*
3	-15.086	12.032	0.216	2.378	3.970	3.102
4	-21.128	19.263	0.192	2.072	2.153	3.934

Note: * indicates lag order selected by the criterion.

4.5. Co-integration Test

Table 6 below displays the Threshold Autoregressive (MTAR and TAR) models. We approximate the M-TAR by changing the differential speed. With HQC vectors showing TAR and M-TAR versions having an optimum latency of 2. BIC and AIC both demonstrate that the momentum concept is better suited to Nigeria. The findings of the M-TAR and the TAR showed that we can reject the null hypothesis of $\rho 1 = \rho 2 = 0$ at the 1% significance level. As a result, inflation, financial development, financial globalization uncertainty and economic growth are asymmetrically co-integrated. The research tests the null hypothesis with standard F-statistics (Enders & Granger, 1998).

The symmetrical modification may not have dismissed the null hypothesis in both the M-TAR and the TAR measurements. The result shows that, in accordance with the M-TAR and TAR requirements, there is no symmetrical transition between inflation, financial developments, financial globalization uncertainty and economic growth. That being said, the TAR threshold model opposes both the null expectation of a long-term relationship and the accompanying symmetrical change at a 1% significance level. This implies that the variables listed above are co-integrated with a major asymmetric modification. This provides empirical proof of the existence of an asymmetrical threshold for the long-term relationship between the variables. As such, these factors are asymmetrically interdependent, rendering it exceedingly difficult for investors to achieve sufficient portfolio diversification.

Table-6. Cointegration asymmetric results.

	TAR	T-Statistics	Momentum TAR	T-Statistics
ρ^1	-0.582*	4.279	-0.458*	5.518
ρ^2	-0.524*	3.797	-0.279*	4.103
γ^1	0.754*	3.264	0.389*	4.523
γ^2	0.345*	3.286	0.395*	4.438
Tau	0.000		0.000	
F-Joint $\rho^1 = \rho^2 = 0$ $\Phi/_{\phi M}$	3.512*	4.211	4.189*	8.637
F-equal $\rho^1 \neq \rho^2 \neq 0$	0.892*	0.254	0.352*	3.352

In addition, we note that the rate of change to the long-term balance tends to be statistically important in Table 7. Following this, the model meets the convergence criterion.

This means that only 28% (Zminust−1 coefficient) of speed would be needed for the model to return to its balance in the case of deviations from the lower regime.

While the higher regime disequilibrium term, takes approximately 54% speed of adjustments to revert to its long-run equilibrium in the event of any deviation. As such, we can conclude that the speed of adjustment is quicker in the higher regime.

Table-7. MTAR error correction model.

Dependent variable: LGDPt			
Variables	**Coefficients**	**Standard error**	**p-value**
ΔLFD_t	0.458* [3.418]	0.134	0.000
$\Delta LCPI_t$	0.410** [3.417]	0.041	0.000
$\Delta LFGU_t$	0.350* [6.050]	0.058	0.000
$ZPLUS$	-0.542* [-5.531]	0.098	0.000
$ZMINUS$	-0.289* [-3.482]	0.083	0.000

Table-8. Short Run NARDL.

Variable	Coefficient	Estd.Error	t-Statistics
LFD_t^+	-0.584*	0.164	3.561
LFD_t^-	-0.254*	0.058	4.379
$LCPI_t$	0.308*	0.101	3.049
$LFGU_t$	-1.548	5.024	0.308
F-Statistics	239.42[0.002]		
R-Squared	0.53		
Adjusted R-Squared	0.46		

Long Run NARDL

Variable	Coefficient	E std. Error	t-Statistics
LFD_t^+	-0.245	0.052	4.712
LFD_t^-	-0.324*	0.051	6.324
$LCPI_t$	0.351*	0.105	3.342
$LFGU_t$	-1.843	4.364	0.422

4.6. Estimation

In this section, we present the result summary of the estimation as described in the Table 8 below, where the positive shocks of FD variable appear significantly and negatively affects the Nigerian productivity growth, and the corresponding negative shocks of the FD variable indicates also a negative and significant relationship. While, inflation turns out to be significantly positive in relation to the economic growth, whereas, the financial globalization uncertainty displays insignificant relationship.

First, we note that financial progress, inflation, and financial globalization instability account for 53% (R2 = 0.53) of economic growth. As a consequence, financial progress, inflation, and financial globalization volatility account for 53 per cent of economic growth, and the error correction term in the model describes the remainder of the difference in economic growth (43 percent). A positive shock to financial development has a detrimental and substantial impact on economic growth (a significant coefficient of -0.245), suggesting that any positive shock to financial development is hindering economic growth in Nigeria following (Shahbaz, Van Hoang, Mahalik, & Roubaud, 2017). During the economic expansion of Nigeria's financial system in the 1990s following the introduction of the almighty "structural adjustment programme" (SAP), that relaxed most of the modus operandi of carrying out Nigerian banking business (Ojukwu-Ogba, 2009) many Nigerian banks adopted a simple monetary policy aimed at increasing credit distribution to the private sector at discounted rates. This strategy has given citizens (e.g. individuals and enterprises) access to financial capital to reduce their consumption and investment practices. In this case, the negative coefficient shown above thus means that the credit provided to the citizens by the banking sector has not been adequately invested. Individuals may have purposely spent and expended borrowed monies for unproductive spending and investment practices. This mismanagement in the use of loans decreases the future growth of the Nigerian economy.

On the other hand, negative shocks in financial development are adversely related to economic growth (a coefficient of -0.324). This result means that any disruptive financial shock serves a reinforcing purpose in Nigeria's long-term economic growth. If a simplistic monetary policy (for example, encouraged by the Central Bank) contributes to an inflationary condition, commercial banks are forced to lift interest rates (borrowing costs) across both consumer and investment lending. At around that, in order to preserve market stability, commercial banks are often asked to raise the interest rate on banking deposits. The amount of credit given to different economic sectors is diminished by this traditional tight monetary policy (e.g., households and business firms). Furthermore, this clarification shows that a negative shock to financial sector growth will create predictable logic in the minds of customers and investors, thus restricting further bank lending. Therefore, the potential efficient usage of loans issued by the banking sector continues to become even more conservative. As a matter of fact, real production and development in the economy are improved. The outcome further indicates an insignificant association with the FGU following the outcome stated by Farouq et al. (2020). Although inflation, as stated by Ademola and Badiru (2016) is reasonably positive, inflation is increasing as the economy expands. The reason for this is that the price of goods that greatly influence the economy of Nigeria is not dictated domestically, but rather from outside, and does not appear to impact the general price level in the country as production rises.

5. CONCLUSION

In estimating the relationship between financial development and economic growth, thereby integrating inflation and financial globalization uncertainty into the production function of the Nigerian economy, this paper used the endogenous augmented output function. The research used annual data set from 1980 to 2019. Furthermore, the study applied threshold Autoregressive co-integration and nonlinear autoregressive distributed lag techniques to examine the asymmetric cointegration between the variables, as well as the degree of their relationship. The empirical findings suggest strong evidence for the existence of an asymmetric cointegration between the scrutinized variables.

If we were to focus entirely on symmetrical research, we would not be able to infer that a positive financial development shock hampers economic growth, while a negative financial development shock boosts domestic economic efficiency. In such scenarios, we propose that Nigeria's Monetary Policy Committee (MPC) should encourage both public sector and appointed commercial banks to proceed their credit allotment to productive activities only by strengthening the guidelines on credit allocation for risky debts that they have generated mostly in the economy. If such a strategy proceeds in the right direction, it is unlikely that the monetary stimulus of these banks beyond the ethical monetary policy system will undermine Nigeria's long-term economic development. From a policy viewpoint, this finding also indicates that policymakers in Nigeria should closely track the proper distribution of financial capital across a variety of overlapping consumption and market operations to mitigate negative growth implications, such as increasingly stretched public sector assets and planned commercial banks.

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