








# “Banking system stability: A prerequisite for financing the Sustainable Development Goals in Nigeria”

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# BANKING SYSTEM STABILITY: A PREREQUISITE FOR FINANCING THE SUSTAINABLE DEVELOPMENT GOALS IN NIGERIA

## Abstract

The banking system, which has been the fulcrum of funding for Nigeria's economy, is plagued by instability in the face of a growing amount of non-performing loans. This is examined in the current milieu of the need for funding the Sustainable Development Goals (SDGs). Using a number of proxies for SDGs 8 and 9, annual time series data covering 1992 to 2019 were used with variables such as GDP per capita, commercial banks' loans to small-scale enterprises, banking system stability indicators and liquid assets to total assets of banks. The study utilized the Autoregressive Distributed Lag. Findings showed that banking system stability has a significant positive effect on funding the SDGs 8 and 9 beyond the five per cent level of significance within the study period. Non-performing loans remained negative throughout the study. The result suggests that banking stability would enhance funding of the SDGs, and banks would be stable if they finance the SDGs. The policy implication explains the importance of banks actively pursuing opportunities to build sustainable enterprises and developing strategies that will enable their core banking business to be more venture-driven rather than consumer-oriented. In conclusion, there is a need to completely eliminate or reduce the quantum of non-performing loans from the system and establish a regulatory framework that will facilitate its expected role of intermediation in the economy profitably and successfully.

## Keywords

credit to the private sector, non-performing loans (NPLs), total deposits, loans, bank funding

## JEL Classification

G21, O16, O47

## INTRODUCTION

The banking system in Nigeria continues to experience unimpressive and unstable financial conditions, mainly due to the hugely increasing portfolio of non-performing loans (NPLs), which is transferred from one year to another and written off without sufficient recovery efforts (Oleribe & Taylor-Robinson, 2016). This leads to capital and shareholders' fund (SHF) erosion, impairment of liquidity, poor asset quality and consequent reduction in profitability and solvency levels. These conditions have consequently necessitated the monetary authorities initiating several banking reforms aimed at addressing the problems of unstable and unsound banks in the country. According to Bebeji (2013), despite several banking reforms in Nigeria, the problems of banking instability caused by non-performing loans seem endless as the soundness of more banks continues to be threatened, so that near failure and collapse would have been recorded had it not been for the Central Bank's intervention. The case of Polaris (former Skye) Bank is instructive where the Central Bank of Nigeria (CBN) had to finance up to the tune of 700 billion (about USD 2 billion) to keep it from failing.

Antoniades et al. (2019) confirmed that the main contributors to the financial crunch experienced by the banking system in Nigeria were non-adherence to prudential guidelines, incorrect financial policy and extreme risk-taking. Although the assumption is that the banking system flourishes and survives more on risk-taking, the risks faced by banks must be efficiently managed to prevent failure and collapse (Enders & Remig, 2014; Grober, 2007). However, stability in the banking system is attained when the banking system has the ability to withstand shocks arising from internal and external economic imbalances or any kind of volatility in their business operations.

The financial system regulators are aware of the overwhelming negative consequences of loss of confidence in the banking system (Ingves, 2016; Thomson, 1992). Hence, regulators worldwide rate banking stability as a top supervisory and regulatory policy objective. Perhaps, after South Africa and Egypt, Nigeria is next with a growing banking sector in Africa. Unlike the developed economies, significant issues in the literature that are often underreported are the factors that determine the banking system stability in emerging economies, owing to the fact that developed economies have more sophisticated financial structures than those economies yet to mature (Ozili, 2018, 2019; Okey et al., 2019).

The Sustainable Development Goals agenda was fully incorporated into the economic and environmental sustainability agenda, alongside the aspirations for progressive societies. The SDGs are more committed and ambitious, in particular in seeking to eradicate rather than diminish hunger, poverty and as a world-wide agenda. The 17 SDGs are to be nationally owned and are already universally accepted (Jeucken, 2001). There is also a great deal of energy and momentum surrounding the achievement of these goals with national ownership and a will to bring together the public sector (government), private sector, civil society and individuals to achieve the goals with financing targets.

While the public capital is scarce in supply, private finance is constrained by uncertainty, and risk and return requirements. There is a need for serious improvement of managing financial complexities of banks (Nwachukwu, 2014; Soludo, 2004). Furthermore, the banking system through its intermediation role can mobilize funds that account for part of the investment and funding the SDGs (Ziolo et al., 2018). The questions are: Do banks see or understand their role in the financing need for the accomplishment of the SDG objectives? Will the hostile business environments hinder banks from effectively carrying out this funding responsibility? How will the regulatory authorities ensure that complying with this funding role will not lead to infringement of the regulatory requirements? Finally, are deposit money banks (DMBs) in Nigeria ready to finance SDGs?

The answers to the outlined queries are key for effective development of the strategies that will ensure a sound and sustained banking system and ensure a successful and efficient mobilization of adequate capital that will be used in financing SDGs throughout its duration without a threat to the system. Generally, only about 48% of SDGs investment requirements can actually be covered in emerging economies. For example, in 2016, Multilateral Development Banks (MDBs) reportedly mobilized a total of USD163.6 billion in private co-funding with low-income economies representing 4% (USD 5.9 billion). Middle-income economies were a significant amount of 40% (USD 65.2 billion), while high-income economies alone represent 56%, (USD 92.5 billion). The estimate revealed that the funding gap is above USD 2.5 trillion for all emerging economies and about USD 1.3 trillion specifically for African countries (Adams, 2017; Bordon & Schmitz, 2015; Akintoye & Opeyemi, 2014; Jaiyesimi, 2016; Kharas et al., 2014; Haigh, 2012; Jeucken, 2001). This study aims to contribute to the achievement of the Sustainable Development Goals, especially SDGs 8 and 9, in Nigeria by demonstrating the ability of the banking system, through their intermediation role, to finance the SDGs while maintaining the required level of stability and soundness.

# 1. LITERATURE REVIEW

The stability of the banking system connotes a system that is at its utmost performance level and functions without being impaired or degraded by disruptions or volatility from its external and/or internal environment (Adams, 2017). Besides, banking stability is mostly considered a continuum, especially in terms of being consistent with multiple combinations of the fundamental elements of finance (Novotny-Farkas, 2016). Globally, the investment required to attain the SDGs are huge, with the majority of the emerging economies, specifically because of their poor infrastructural development, thereby, making the scale of existing financial flows insufficient (Pisano et al., 2012; Sadiq & Mushtaq, 2015). The only channel for closing the resulting funding gap for the attainment of SDGs' objectives is via a sustained stability in the banking system, which will be able to provide and stand the pressure of finance requirements (Stenberg et al., 2017; Weber, 2014).

## 1.1. Stability and sustainability of the banking system towards funding the SDGs

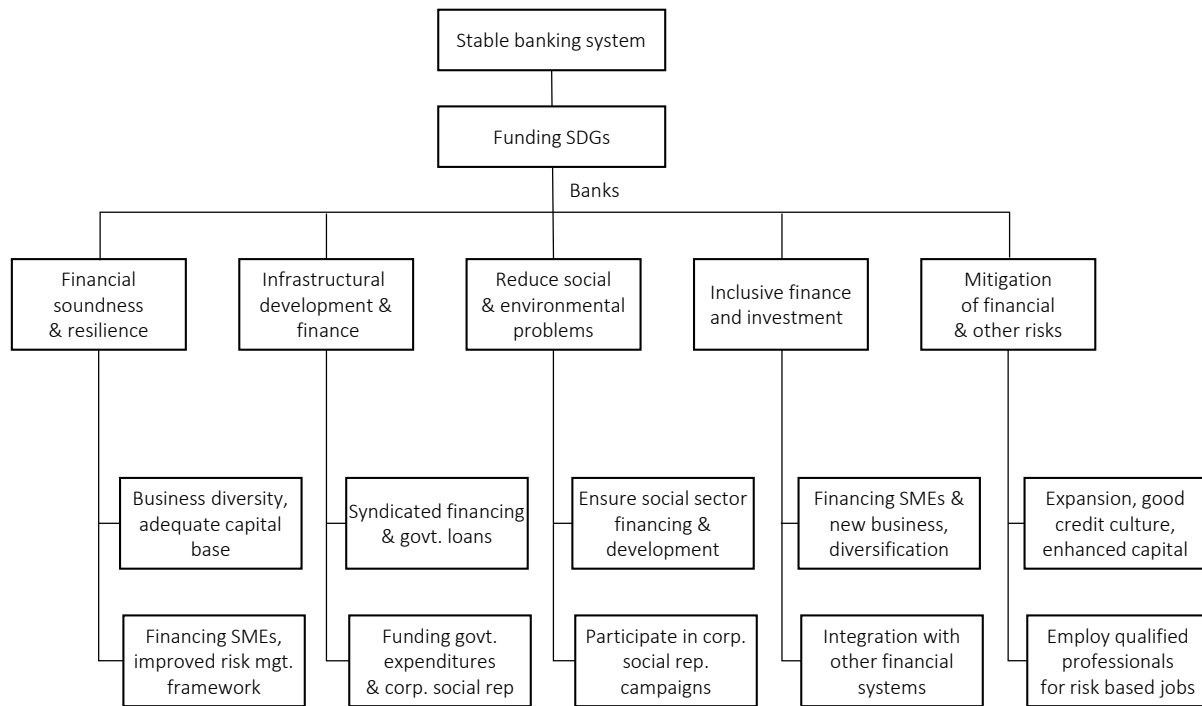
Banks implement sustainable banking in two facets: daily internal operations (management of their risks and exposures, opportunities, costs and the branch operations) and external relations with their customers, investors, funding of projects, etc. (Wiek & Weber, 2014). A survey revealed that less than a quarter of banks in Nigeria had low engagement with sustainable banking principles while the others have none (Ahmed *et al.*, 2015). To show their commitment, the banks highlight the sustainable banking principles on public domains and platforms (Antoniades et al., 2019). Supranational financial bodies have identified threats to the stability of the banking system and have taken several approaches to minimize their potential adverse impacts on the system. In 2001, the Basel Committee on Banking Supervision introduced "Know Your Customer" as critical to protecting the soundness, integrity and safety of banking systems (Akintoye & Opeyemi, 2014; Egharevba, 2007). Such a banking system would guarantee a sustainable and reliable financial intermediation, as well as have the capacity to provide access to credit and payment systems to its

customers, help businesses and household to transfer financial resources and would contribute to the continuous economic growth and sustainable development of the economy (Duffie, 2019; Babajide & Olokoyo, 2017). Due to the economic recession episodes that the country experienced within the last three decades, the fragility of her financial and banking system has been brought to fore of public discourse by policy makers, regulators and academics (Adeleye et al., 2018).

This study complements previous literature on banking system stability and SDGs by throwing more light on the interaction between the stability of the banking system and funding of the SDGs. New knowledge and understanding in this area of research is of great interest, since previous literature on financing SDGs were mainly on developed economies (Noor & Pickup, 2017; Pisano et al., 2012; Kharas et al., 2014), while emerging economies are neglected. Therefore, this study fills the gap by examining the link between banking stability and financing the SDGs in an emerging economy. In addition to the fact that there is dearth of literature on the association between banking stability and financing sustainable development goals in Nigeria, some literature focused on sustainable finance (Haigh, 2012) and not how to raise or mobilize capital to fund the SDGs. This is very interesting to note because the existing literature (for instance, Osabohien et al., 2020; Oleribe & Taylor-Robinson, 2016; Nwachukwu, 2014) highlighted financing individual SDGs but failed to examine where to access funding that will enable the successful achievement of SDGs by 2030. In the light of the above, it becomes necessary and important to examine to what extent the banking system is able to sustainably support the funding of the SDGs while maintaining the required stability, and in the process of testing – the capacity and strength of the banking system. However, financing the banks themselves to perform this task presents specific and pertinent issues (Eke et al., 2020).

## 1.2. The link between the banking system and the SDGs

The SDGs of interest to this study are 8 and 9. SDG 8 is particularly concerned with the funding of the real economy for at least 7% growth



**Figure 1.** A stable banking system and SDG funding framework

with full productive employment that emphasizes real growth rate for an employed person. SDG 9 focuses on infrastructure development, innovation and industrialization. Banks need to tune up to be sustainably involved in SDG 9 as they have been involved in SDG 8 as matter of practice. However, three key aspects are noticeable in the link between sustainable development and the banking system. The first involves the environmental regulations introduced that affect the banking system in several ways. The second issue concerns credit risk management over which the banking system has continued to be reactive rather than proactive regarding challenges with respect to non-performing loans growth. The third is with respect to the stakeholders' pressures as it deals with the bank's reputational risk (Baranes, 2009; Egede & Lee, 2007; Thompson & Cowton, 2004).

Figure 1 provides a framework for a stable banking system and SDG funding, showing key operational activities in which banks must be involved consistently to remain sustainable in order to successfully provide sufficient funding for the SDGs up to 2030.

### 1.3. Review of the empirical literature

The first discussion is on banking stability, while the second is on funding the SDGs. Dwumfour (2017) examined banking stability in sub-Saharan Africa. Using Z-score to proxy stability, the result showed that crisis and high percentage of foreign banks reduce bank stability, while diversification positively affects stability. The results support largely the competition-fragility view. Therefore, the less the competition amongst banks during crises periods, the more banks achieve stability. Similarly, Ozili (2019) used aggregate data to analyze the determinants of banking stability. The result revealed that the level of non-performing loans, bank efficiency and regulatory capital are the major determinants of banking stability in Nigeria. Toader et al. (2018) studied the influence of corruption on banking stability in European emerging markets. The result indicates that lower levels of corruption impact positively bank stability leading to reduced credit losses with more realistic credit growth. The result showed further that the stability of banks operating in the countries that have not adopted corporate governance have higher impact of corruption. In addition, Sere-

Ejembi et al. (2014) adopted a combination of various macro-fundamentals and financial soundness indicators after constructing a banking system stability index (BSSI) for Nigeria. The findings showed that banking system stability indicators (BSSI) could act as an early warning sign to indicate fragility of the banks that could be used as a complimentary regulatory policy instrument for detecting potential threat to the banking system.

In terms of funding the SDGs, Ziolo et al. (2018) examined financial stability and how SDGs can be financed. The result showed that SDG funding is not short-term but a sophisticated and long-term product that is determined by various economic and non-economic elements. The study further revealed that the choice of a particular source of finance and instruments impacts both the efficiency of public expenditure and the stability of the economic system.

Furthermore, Sadiq and Mushtaq (2015) investigated major roles Islamic finance play in achieving the SDGs. Findings showed that from financial stability viewpoint, there is a need for the financial system to focus more on generating organizational diversity, switch to portfolios with higher amounts of equity-based funding and establishment of new equity-based financing institutions. Weber et al. (2010) investigated the role played by environmental orientation and sustainability in managing commercial bank risks. The result showed that sustainability could be used as a measure to forecast a debtor's financial performance and enhance the rating predictive validity. Similarly, Usman and Tasmin (2016) analyzed the importance of Islamic micro-finance for achieving the SDGs. The result showed that Islamic micro-finance has the potential to develop human capital towards empowering self-reliance, social cohesion knowledge and skill acquisition. Adetiloye et al. (2020) and Kharas et al. (2014) investigated financing the post-2015 SDGs. The study grouped the global development finance sources into three groups, namely: public finance, private finance and concessional public funding. The results showed that financing the SDGs should be better at a country level. There has been ample research on SDGs throughout the literature, but few refer to any developing country in detail. This is what is attempted in this study.

## 2. RESEARCH METHODS

The stability of the banking system is measured as a composite index, derived from a standardized process and weighted mean of three indices, which includes sub-index of economic climate, banking soundness and bank vulnerability to externalities (Cheang & Choy, 2010). Novotny-Farkas (2016) and Sere-Ejembi et al. (2014) reported certain stability indicators that were used to construct a Banking System Stability Indicators (BSSI) based on the framework of the International Monetary Fund-Financial Stability Indicators (IMF-FSIs). This study employed some of these BSSI indicators to proxy banking system stability covering the period of 1992 to 2019. The period chosen allows the testing of the capacity of the banking system for a reasonable length of time for resilience to fund the SDGs. The variables used for measuring both the banking stability index and SDGs (8 and 9) were sourced from the World Development indicators (WDI) database.

**Table 1.** Description of variables, proxies, justification and a priori

Sources: Authors' compilation (2020).

Description of variables	Literature support	A priori
GDPPC – GDP per capita	Carree et al. (2007)	> 0
CBLSE – Commercial Banks Loans to Small Scale Enterprises	Oke and Aluko (2015), Aliyu and Bello (2013)	> 0
BSSI – Banking System Stability Indicators	Sere-Ejembi et al. (2014)	> 0
LATA – Liquid Assets to Total Assets	Jayakumar et al. (2018)	> 0
ROA – ROA, Net income to assets	Jayakumar et al. (2018), Fernández et al. (2016)	> 0
TLTD – Total Loans to Total Deposits of DMBs	Jayakumar et al. (2018)	> 0
LCPS – Credit to Private Sector	Akinlo & Oni (2015)	> 0
FND – Financial Deepening	Olawumi et al. (2017)	> 0
TNTL – Total Non-Performing Loans to Total gross Loans of DMBs	Shijaku (2016)	> 0
EATA – External Assets to Total Assets	Jayakumar et al. (2018), Sere-Ejembi et al. (2014)	> 0

The study was estimated using an Autoregressive Distributed Lag (ARDL) model developed by Pesaran et al. (2001) and Pesaran and Shin (1998). ARDL is used mainly where the combination of

variables are stationary at both levels  $I(0)$  and first difference  $I(1)$ . ADF unit root tests for stationarity of the variables validates the submissions by Kutosoyiannis (1997) and Johansen (1991) that time series data have unit root. The study used the Breusch-Pagan test as a post valuation test to assess the degree of variation and level of freedom among the regressors, while the parameter stability test was used to check the suitability of a well-detailed ARDL model. Derivation of banking system stability index for Nigeria was adopted following Sere-Ejembi et al. (2014).

$$BSSI_t = \omega_1 BSI_t + \omega_2 BVI_t + \omega_3 ECIVI_t, \tag{1}$$

$$\sum_{p=1}^3 \omega_p = 1,$$

where  $\omega_p$  – weight attached to a single sub-index indicating its comparative importance.

Statistical normalization transforms the indicators to a mutual scale with a zero mean, and its standard deviation equals one. The standard deviation is the scaling factor, and the model is as shown below. Using the statistical method, the BSSI is obtained by computing the weighted averages of the three sub-indices that emerged from the normalization process, namely:

$$Z_t = \left( \frac{X_t - \mu}{\sigma} \right), \tag{2}$$

where  $X_t$  depicts the value of the indicators ( $X$ ) during the period  $t$ ,  $\mu$  represents the mean, and  $\sigma$  indicates the standard deviation.

The BSSI is developed through weighting:

$$BSSI_t = \omega_s \sum_{i=1}^8 \theta_{si} z_{is} + \omega_v \sum_{i=1}^7 \theta_{vi} z_{iv} + \omega_c \sum_{i=1}^3 \theta_{ci} z_{ic}, \tag{3}$$

$$\sum_{pr=s,v,c} \omega_r = 1,$$

where  $z_{ir}$  represents values of the banking stability indicators that are statistically normalized;  $s$  connects to the BSSI, while  $c$  refers to ECI and  $v$  refers to BVI. The weight of the individual statistically normalized indicator in each sub-index:

$$\theta_{ri} = \frac{\mu_i}{\sum_{i=1}^r \mu_i}, \tag{4}$$

where  $r = \{s, v, c\}$ ;  $\mu_i$  represents responses that reverted high in during the consolidated responses from U and FGD, which depicts the correct number of indicators in each sub-index.

Thus:

$$BSSI_t = \sum_{i=1}^8 \theta_{si} z_{is}, \tag{5}$$

$$BVI_t = \sum_{i=1}^7 \theta_{vi} z_{iv}, \tag{6}$$

$$BCI_t = \sum_{i=1}^3 \theta_{ci} z_{ic}. \tag{7}$$

The adapted model is stated as follows:

$$SDGs_{it} \text{ 8 \& 9} = BSSI, \tag{8}$$

$$SDGs_{it} \text{ 8 \& 9} = f(\text{Banking System Stability Indicators}), \tag{9}$$

$$SDGs_{it} \text{ 8 \& 9} = GDPPC_{it} + CBLSE_{it} + f(LATA + LATA + ROA + TLTD + TNTL + EATA), \tag{10}$$

$$GDPPC_{it} = \alpha_1 + \beta_1 LATA_{it} + \beta_2 ROA_{it} + \beta_3 TLTD_{it} + \beta_4 TNTL_{it} + \beta_5 EATA_{it} + \epsilon_{it}, \tag{11}$$

$$CBLSE_{it} = \alpha_2 + \beta_1 LATA_{it} + \beta_2 ROA_{it} + \beta_3 TLTD_{it} + \beta_4 TNTL_{it} + \beta_5 EATA_{it} + \epsilon_{it}, \tag{12}$$

Following Pesaran and Shin (1998) we specify the unrestricted [ECM (-1)] as thus;

$$\Delta GDPPC_{t-1} = \beta_0 + \sum_{i=1}^p \beta_1 \Delta GDPPC_{t-1} + \sum_{i=1}^p \beta_2 \Delta Y_{t-1} + \beta_1 GDPPC_{it} + \beta_2 Y_{t-1} + \epsilon_{it}, \tag{13}$$

$$\Delta CBLSE_{t-1} = \beta_0 + \sum_{i=1}^p \beta_1 \Delta CBLSE_{t-1} + \sum_{i=1}^p \beta_2 \Delta Y_{t-1} + \beta_1 CBLSE_{it} + \beta_2 Y_{t-1} + \epsilon_{it}, \tag{14}$$

where *GDPPC* and *CBLSE* (the indicators of SDGs) represent the dependent variable vector, *Y* denotes the regressors (the banking system stability indicators), *p* implies the lagged structure,  $\Delta$  represents the variation in terms,  $\beta_1$  and  $\beta_2$  indicate the long-run coefficients,  $\alpha_1$  and  $\alpha_2$  are the short-run coefficients, and  $\varepsilon_t$  represents the stochastic error term.

Explicitly, the models are estimated as follows:

$$\begin{aligned} \Delta GDPPC_{t-1} = & \beta_0 + \sum_{i=1}^p \phi_j \Delta LATA_{t-1} + \\ & + \sum_{i=1}^p \lambda_j \Delta ROA_{t-1} + \sum_{i=1}^p \alpha_j \Delta TLTD_{t-1} + \\ & + \sum_{i=1}^p \sigma_j \Delta TNT_{t-1} + \sum_{i=1}^p \partial_j \Delta EATA_{t-1} + \varepsilon_{it}, \end{aligned} \tag{15}$$

$$\begin{aligned} \Delta CBLSE_{t-1} = & \beta_0 + \sum_{i=1}^p \phi_j \Delta LATA_{t-1} + \\ & + \sum_{i=1}^p \ddot{e}_j \Delta ROA_{t-1} + \sum_{i=1}^p \dot{a}_j \Delta TLTD_{t-1} + \\ & + \sum_{i=1}^p \sigma_j \Delta TNT_{t-1} + \sum_{i=1}^p \partial_j \Delta EATA_{t-1} + \varepsilon_{it}, \end{aligned} \tag{16}$$

where  $\Delta$  indicates the first-difference operator and *p* is the maximum lag order. The existence of co-integration amongst variables is tested using the *F*-statistics. The coefficients:  $\phi$ ,  $\sigma$ ,  $\alpha$ ,  $\lambda$ ,  $\beta$ ,  $\partial$  and  $\alpha$  that match the dynamic forces of the short-run model, however  $\delta_1$ ,  $\delta_2$ ,  $\delta_3$ ,  $\delta_4$ , and  $\delta_5$  represent the long-run association.

Hence,  $H_0$ :  $\delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = 0$  (shows the null hypothesis, of nonexistence of a long-run association between the variables used in this study).

However,  $H_1$ :  $\delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_5 \neq 0$  (shows the alternative hypothesis of a long-run link amongst the variables).

Therefore, as co-integration is present, long-run measurement will be determined, which is stated as:

$$\begin{aligned} GDPPC_{it} = & \beta_0 + \delta_1 LATA_{it} + \delta_2 ROA_{it} + \\ & + \delta_3 TLTD_{it} + \delta_4 TLTD_{it} + \delta_5 EATA_{it} + \varepsilon_{it}, \end{aligned} \tag{17}$$

$$\begin{aligned} CBLSE_{it} = & \beta_0 + \delta_1 LATA_{it} + \delta_2 ROA_{it} + \\ & + \delta_3 TLTD_{it} + \delta_4 TLTD_{it} + \delta_5 EATA_{it} + \varepsilon_{it}. \end{aligned} \tag{18}$$

In an effort to identify the correct ARDL model, Liew (2004) used a selection lag criterion, the Akaike Information Criterion. According to Liew (2004), this type of information criterion could be used if the sample size is below 60. This is a maximum lag of 2 as established by Pesaran et al. (1999). After this, the study models the short-run equations derived from the ECM:

$$\begin{aligned} \Delta GDPPC_{t-1} = & \beta_0 + \sum_{i=1}^p \phi_j \Delta LATA_{t-1} + \\ & + \sum_{i=1}^p \lambda_j \Delta ROA_{t-1} + \sum_{i=1}^p \alpha_j \Delta TLTD_{t-1} + \\ & + \sum_{i=1}^p \sigma_j \Delta TNT_{t-1} + \sum_{i=1}^p \partial_j \Delta EATA_{t-1} + \varepsilon_{it}, \end{aligned} \tag{19}$$

$$\begin{aligned} \Delta CBLSE_{t-1} = & \beta_0 + \sum_{i=1}^p \phi_j \Delta LATA_{t-1} + \\ & + \sum_{i=1}^p \lambda_j \Delta ROA_{t-1} + \sum_{i=1}^p \alpha_j \Delta TLTD_{t-1} + \\ & + \sum_{i=1}^p \sigma_j \Delta TNT_{t-1} + \sum_{i=1}^p \partial_j \Delta EATA_{t-1} + \varepsilon_{it}. \end{aligned} \tag{20}$$

The short-run model coefficients are usually constants that explain the underlying forces of the model and highlight meeting point of the model at  $\partial$ . This indicates that the re-parameterization of errors generated at a specific period is corrected in a subsequent period, while the long-run association tests will be inconclusive where *F* statistic lies between the upper and lower bounds.

### 3. RESULTS AND EMPIRICAL ANALYSIS

#### 3.1. Data description and estimation methods

The study used annual time series data capturing the domestic and global financial crisis, including several periods of structural reforms in Nigeria.



**Table 2.** List of variables and descriptive statistics

Source: Authors' computation (2020).

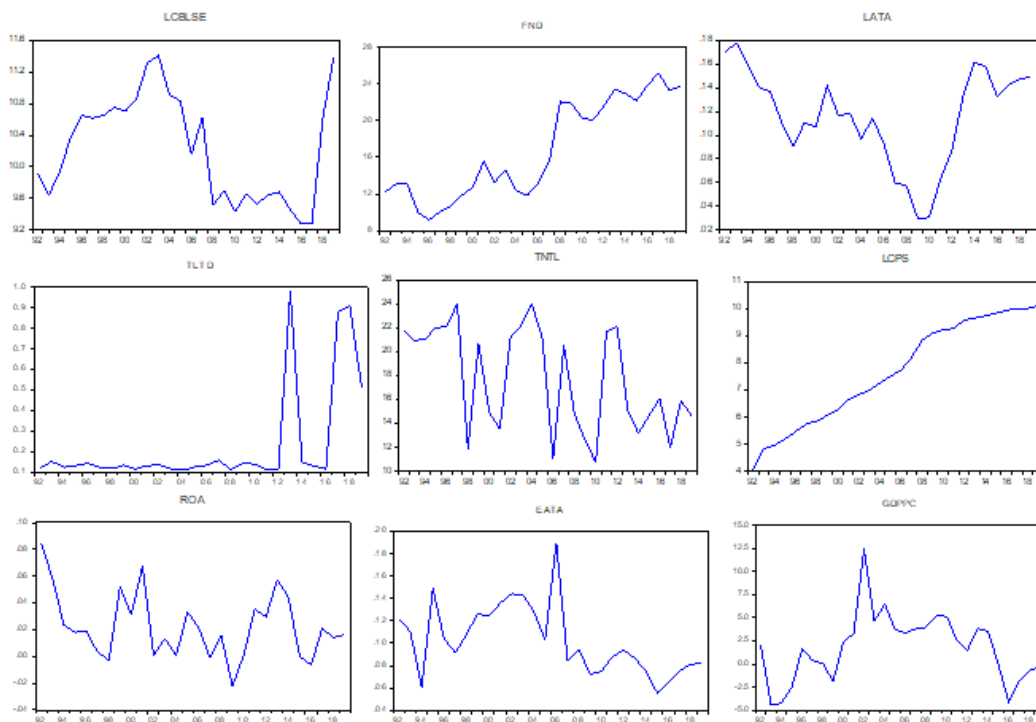
Variables	Mean	Std. dev.	Max.	Min.	Median
LCBLSE	10.23530	0.674324	11.40952	9.282464	10.26995
GDPPC	1.780077	3.689517	12.45747	-4.457078	2.222482
LATA	0.115593	0.040467	0.177879	0.029778	0.115593
EATA	0.102399	0.031513	0.189361	0.055657	0.102399
ROA	0.022421	0.024850	0.084215	-0.022192	0.018391
TLTD	0.226366	0.256830	0.980000	0.109000	0.226366
LCPS	7.682186	1.931792	10.12354	4.062561	7.626611
FND	16.78277	5.360881	25.15527	9.151674	15.11082
TNTL	17.75143	4.405631	24.05000	10.76000	18.33000

Table 2 represents the descriptive statistics of the variables. Banks' loans to small-scale enterprises had an average growth rate of 10.24%, while the average rate of growth of GDP per capita was 1.8%. The mean of total non-performing loans to total gross loans and financial deepening indicate a double-digit value – 17.78% and 16.8, which portray the linkage between bank stability and funding SDGs. The mean of credit to private sector is 7.7, while the mean values of external assets to total assets, return of assets, liquid assets to total assets and total loans to total deposits are 0.10%, 0.02%, 0.12% and 0.23%, respectively. These values are low, compared to the mean value of commer-

cial banks' loans to small-scale enterprises. This indicates that banks' stability must be consistently sustainable in order to provide funds needed for the SDGs.

Figure 2 depicts the annual trend data of LCBLSE and GDPPC, which are indicators of SDGs, and FND, LATA, TLTD, TNTL, LCPS, ROA and EATA, which are indicators of the banking system stability. The graphs show that the trends depict various patterns. This shows that the rate at which sustainable development was being financed cannot be said to be consistent. This trend analysis revealed a high level of variation of Nigeria's bank-

Source: Authors' computation (2020).



**Figure 2.** Trend of banking stability and SDGs

**Table 3.** Correlation matrix

Source: Authors' compilation (2020).

Variables	LCBLSE	GDPPC	EATA	LATA	ROA	FND	LCPS	TLTD	TNTL
LCBLSE	1.0000	–	–	–	–	–	–	–	–
GDPPC	0.3177	1.0000	–	–	–	–	–	–	–
EATA	0.5176	0.3090	1.0000	–	–	–	–	–	–
LATA	0.0832	–0.4755	0.0072	1.0000	–	–	–	–	–
ROA	–0.0603	–0.1681	0.2500	0.5027	1.0000	–	–	–	–
FND	–0.3687	0.1325	–0.5099	–0.2667	–0.3260	1.0000	–	–	–
LCPS	–0.5394	–0.0389	–0.6148	–0.0803	–0.1323	–0.9111	1.0000	–	–
TLTD	–0.1069	–0.1422	–0.2688	0.2625	0.1157	0.5283	0.4602	1.0000	–
TNTL	0.3384	–0.0158	0.1875	0.1711	0.1401	–0.3101	–0.5080	0.1401	1.0000

ing stability during the post global financial crisis of 2009 that resulted in the failure and liquidation of some Nigerian banks. The graphs show that the variation continued throughout the study period.

Table 3 shows the correlation analysis of the variables used to check the likelihood of the existence of multicollinearity in the ARDL result. The correlation coefficients result of the indicators of SDGs are in agreement with the *a priori* expectation.

Table 4 depicts the unit root test. The result shows that commercial banks' loans to small enterprises, gross domestic product per capita, liquid assets to total assets, total non-performing loans to total gross loans and external assets to total assets seem not to reject the null hypothesis “no stationary” at levels, whereas return on assets and total loans to total deposits were stationary at levels  $I(0)$ . However, after numerous re-statements on differencing and the length of lag, the series were seen

to have finally rejected the null hypothesis at first difference  $I(1)$ . This implies that the first difference of the series is *mean reverting* and stationary. Hence, commercial banks' loans to small scale enterprises, gross domestic product per capita, liquid assets to total assets, financial deepening, total non-performing loans to total gross Loans, Credit to Private Sector and external assets to total assets are integrated of order  $I(1)$ . Thus, this argument stimulates the co-integration test to evaluate whether or not the linear grouping of the considered stability and SDGs indicators yields any stationary residual.

Table 5 shows the order of the ARDL models I & II selected by AIC for the co-integration test. The results indicate that computed F-statistics for both models are higher than the upper bound critical values. Thus, the null hypotheses of no co-integration at the 5% significance level is rejected. This supports the idea of a stable and unique long-run

**Table 4.** ADF unit root tests for the variables at levels and first differences

Source: Authors' compilation.

Variables	Test statistics	Critical value	Remark	Test statistics	Critical value	Remark	Order of integration
	At level			At first difference			
LCBLSE	1.3945	2.9762*	Non stationary	4.5502*	2.9810*	Stationary	$I(1)$
GDPPC	2.4190	3.5875*	Non stationary	3.8985*	2.9862	Stationary	$I(1)$
LATA	1.6443	2.9762	Non stationary	4.0632*	2.9810	Stationary	$I(1)$
EATA	1.8798	2.9810	Non stationary	9.1494	2.9810	Stationary	$I(1)$
ROA	2.9862	4.4096*	Stationary	N.A	N.A	N.A	$I(0)$
LCPS	1.3945	2.9763	Non stationary	4.5502	2.9810	Stationary	$I(1)$
FND	0.6542	2.9762	Non stationary	4.4900	1.9544	Stationary	$I(1)$
TLTD	–2.9980	3.9638*	Stationary	N.A	N.A	N.A	$I(0)$
TNTL	1.5118	2.9980	Non stationary	1.9556	6.9017*	Stationary	$I(1)$

Note: \*\* and \* mean significance at 5%.

**Table 5.** ARDL bounds test result for co-integration relationship

Source: Authors' computation (2020).

Dependent variables/model	Functions				F-statistics	
<b>MODEL I ARDL (1, 2, 2, 0, 1)</b>					<b>76.94155**</b>	
<b>MODEL II ARDL (2, 2, 2, 2, 2)</b>					<b>46.33162**</b>	
Significance level	1%		5%		10%	
Integration order	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
Model I – Critical bound values	2.73	3.9	2.17	3.21	1.92	2.89
Model II – Critical bound values	2.96	4.26	2.32	3.5	2.03	3.13

Note: \*\*\*, \*\* and \* depict rejection of null hypothesis at 1%, 5% and 10% significance levels, respectively.

relationship between banking stability and SDGs funding. This long-run link is in tandem with the findings of Gangi et al. (2019), Ziolo et al. (2018) and Bordon and Schmitz (2015) who reported a long-run link between banking stability and funding SDGs.

## 4. DISCUSSION

Tables 6, 7 and 8 present the long-run appraisal, the short-run analysis, and the diagnostic and stability tests. Table 6 reveals in model I that external assets to total assets, financial deepening, credit to private sector and total non-performing loans to total gross loans have a positive and significant impact on the SDG 8 funding in Nigeria at the 5% critical level. Whereas liquid assets to total assets (proxy for SDG 9), return on assets and liquid assets to total assets bore a negative but significant influence at a 5% critical level. Similarly, model II shows that external assets to total assets, liquid assets to total assets and credit to private sector have a positive and significant impact on SDG funding at 0.1 and 0.05. Credit to private sector, ROA, liquid assets to total assets and total non-performing loans to total gross loans have a negative and

significant influence on SDG funding at 0.1 and 0.05 confidence levels. Largely, this shows that 10% change in external assets to total assets, financial deepening, credit to private sector and total non-performing loans to total gross loans can positively increase SDG funding by 162.13%, 0.28%, 0.86% and 0.20%, respectively. For model II, a 10% change in external assets to total assets, liquid assets to total assets and credit to private sector will positively improve SDGs funding by 24.12%, 9.63% and 0.31%, respectively. This result is in line with Bordon and Schmitz (2015), Sadiq and Mushtaq (2015) and Pisano et al. (2012) that banking stability is a key factor that can drive sustainable development funding in an economy.

The direct relationship of liquid assets to total assets, return on assets and liquid assets to total assets is an indicator of banking stability, which turned out to be negative and significant for model I. In model II, return on assets, credit to private sector, liquid assets to total assets and total non-performing loans to total gross loans have a negative significant relationship with SDGs funding. The effect is that Nigeria's banking system requires a huge variety of sustainable products and a market for diversification and expansion of

**Table 6.** Long-run tests: Model I and II

Source: Authors' computation (2020).

Variables	MODEL I			MODEL II			
	Regressors	Coefficient	t-statistics	Prob.	Coefficient	t-statistics	Prob.
EATA		162.1331	94.9392	0.0001	24.1177	21.6842	0.0021
FND		0.2782	8.2372	0.0144	-0.1236	-6.1571	0.0254
LATA		-19.7615	-21.9772	0.0021	9.6252	19.7913	0.0025
LCPS		0.8642	11.7337	0.0072	0.3145	7.1357	0.0191
ROA		-130.9991	-35.2487	0.0008	-24.8112	-12.5584	0.0063
TLTD		-7.3569	-46.7042	0.0005	-1.1804	-4.2353	0.0515
TNTL		0.2956	20.0656	0.0025	-0.0250	-3.01642	0.0946

**Table 7.** Short-run tests: Model I and II

Source: Authors' computation (2020).

Variables	MODEL I			MODEL II		
	Coefficient	t-statistics	Prob.	Coefficient	t-statistics	Prob.
C	0.934424	0.274391	0.0000	1.066633	0.572049	0.0004
D(EATA)	30.92438	7.082166	0.0120	-45.51151	9.466897	0.0049
D(FND)	-0.386934	0.125572	0.0369	-1.088903	0.177113	0.0017
D(LATA(-1))	-45.1061	14.7495	0.0377	4.068103	39.96114	0.9229
D(LCPS)	2.582977	1.569745	0.1752	34.10079	2.680163	0.0001
D(ROA)	-28.81657	14.51080	0.1180	239.5842	48.93090	0.0045
D(TLTD)	-2.087904	0.659310	0.0340	14.47029	1.354968	0.0001
D(TNTL)	-0.106778	0.037904	0.0480	-0.021266	1.057273	0.7256
ECM(-1)	-0.76053	0.325071	0.0194	-0.793910	2.67918	0.0492
R <sup>2</sup>	0.743322	F-statistic	-	R <sup>2</sup>	0.68289	13.71620
Adjusted R <sup>2</sup>	0.697312	Prob. (F-statistic)	-	Adjusted R <sup>2</sup>	0.657312	0.00630
Log likelihood	49.61169	Durbin-Watson stat.	2.0218	Log likelihood	51.21157	2.332155

businesses in order to remain stable to fund the SDGs. In addition, the positive influence of FND and LCPS shows that there is a need for enabling business and operating environments that propels business development and growth to aid enhancement of Nigeria's banking stability. Thus, there is a need to drive business strategies that foster an efficient business environment that will boost the SDG agenda in Nigeria.

The short-run dynamics estimations in Table 7 shows both negative and positive associations between the lags of the regressors. The coefficient values for the ECM(-1) for both models infer that the result is in conformity with expectation, since it is negative and significant. The values -0.76053 and -0.793910 suggest that the speed of adjustment towards long-run equilibrium for both models are 76% and 79%, respectively. This means that about 76% divergence, due to the equilibrium error in the previous year, is corrected in the next period for model I, while in

model II, about 79% divergence due to the equilibrium error in the previous year is corrected in the next period. Hence, it can be established that error correction towards the long-run dynamic for both models is quick. Similarly, R<sup>2</sup> values of 0.743322 and 0.68289 imply that each model is a good fit as over 74% and 68% variations in SDGs funding is explained by the explanatory variables in model I, while 68% of variations in SDG funding is explained by the explanatory variables in models I and II. Even where the effects of the insignificant estimators are removed, the adjusted R<sup>2</sup> values 0.697312 and 0.657312 suggest that both models are still very good. The results also show that the ECM model is not spurious because the intercept values of 0.934424 and 1.066633 are lesser than the Durbin-Watson values of 2.021890 and 2.332155 for the models.

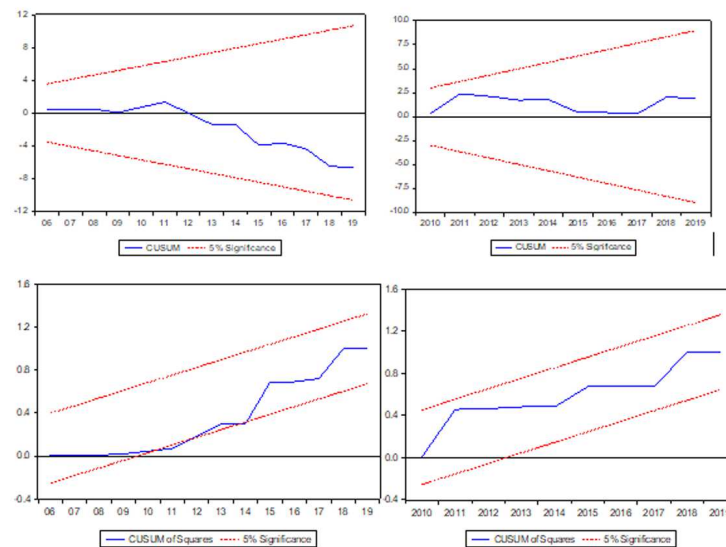
Table 8 and Figure 3 present the results of the stability and diagnostic tests. The estimated models passed all the diagnostic tests, which indicate that

**Table 8.** Diagnostic and stability tests for models I and II

Source: Authors' computation (2020).

Test statistics	Dependent variables	
	I	II
Serial correlation	0.699115 (0.739401)	0.293395 (0.983087)
Normality Test	0.272765 (0.877509)	0.524658 (0.769258)
Heteroskedasticity Breusch-Pagan-Godfrey	2.472177 (0.0568)	0.913114 (0.5768)
CUSUM	Stable	Stable
CUSUM Q	Stable	Stable
ECM (-)	-0.0794 (0.3568)**	-0.3501 (0.2108)**

Note: The probability values for the diagnostic and stability tests are in parentheses.



**Figure 3.** CUSUM and CUSUM of Squares Stability Tests – Model I and II

the error terms have similar variance and that they are uncorrelated and normally distributed. Cumulative sum of squares and cumulative re-

sults fall within the critical bounds at the 5% significance level, which means that all parameters are stable over study periods.

## CONCLUSION AND RECOMMENDATIONS

This paper aims to examine the ability of banks to finance key SDG areas, especially SDG 8 and 9, while maintaining the required stability. Proxies for the SDGs were credit to the private sector, loans to small businesses (for SDG 8), while total loans to total deposits were proxied for SDG9. An analysis was conducted using panel data for 1992 to 2019. The study employed a composite index derived from a standardized process and a weighted mean of three indices, including a sub-index of economic climate, banking soundness and bank vulnerability to externalities for banking system stability indicators. In addition, the panel data with two different models were analyzed using the Autoregressive Distributed Lag (ARDL). Several diagnostic and stability tests were used to confirm the results. The test results show that the banking system can contribute to the SDG funding with banking system stability achieved and sustained. Although, the effects of return on assets on its own seems not to have enhanced sustainable development funding, the extent of responsiveness of sustainable development to the variants of ROA for both models seems to be inelastic. This implies that a proportionate variation or change in Nigeria's banking system stability would lead to a more or additional proportionate change in financing SDGs. The tests revealed that banking system stability has a significant and positive link with financing SDGs. This suggests that as banking system stability improves in Nigeria, it will enhance the capacity of the banking system generally to successfully finance SDGs throughout the estimated period. Thus, the degree of bank soundness and the consistent long-term stability are important contributing factors to successful funding of SDGs in Nigeria. Based on the results of the estimation, this study concludes that banking system stability in Nigeria can enhance the funding of the SDGs and still be stable for the performance of its total intermediation functions in the economy. A novelty of these results is that despite its seeming fragility, banks can sustainably fund SDGs 8 and 9 if it can take care of non-performing loans.

This study recommends the following: First, the banking system has to actively pursue opportunities for more innovative products allowing the bank to actually create a blended or mixed value return, which

consists of both financial and social returns through proactive search for new ways of financing and sustainable investment opportunities. Second, it should develop strategies that will allow their core banking business to be incorporated with impact investment strategies. Third, it should create organizational diversity shifting to portfolios with greater proportions of equity-based financing. This is to allow more businesses to benefit from banks' finance. This will improve and accelerate economic growth that can improve the living standards of citizens. The CBN in conjunction with the NDIC, Bankers Committee and other organizations, should create a regulatory framework that will facilitate the rapid consolidation of the banking system to successfully fulfill its role in financing the SDGs.

## AUTHOR CONTRIBUTIONS

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## REFERENCES

- Adams, C. A. (2017). *The Sustainable Development Goals, integrated thinking and the integrated report*. Glasgow: Institute of Chartered Accountants of Scotland. Retrieved from [https://integratedreporting.org/wp-content/uploads/2017/09/SDGs-and-the-integrated-report\\_full17.pdf](https://integratedreporting.org/wp-content/uploads/2017/09/SDGs-and-the-integrated-report_full17.pdf)
- Adeleye, I., Ngwu, F., Iheanachor, N., Esho, E., Oji, C., Onaji-Benson, T., & Ogbachie, C. (2018). Banking on Africa: can emerging pan-African banks outcompete their global rivals? In *Africa's competitiveness in the Global economy* (pp. 113-136). Palgrave Macmillan, Cham. Retrieved from <https://www.springerprofessional.de/en/banking-on-africa-can-emerging-pan-african-banks-outcompete-their-global-rivals/15354498>
- Adetiloye, K. A., Adegboye, F. B., & Akinjare, V. A. (2020). Sustainable financial access for female entrepreneurs in the micro, small and medium enterprises sector in Nigeria. *Cogent Social Sciences*, 6(1), 1823600. <https://doi.org/10.1080/23311886.2020.1823600>
- Ahmed, H., Mohieldin, M., Verbeek, J., & Aboulmagd, F. (2015). *On the SDGs and the role of Islamic finance*. The World Bank.
- Akinlo, A. E., & Oni, I. O. (2015). Determinants of bank credit growth in Nigeria 1980–2010. *European Journal of Sustainable Development*, 4(1), 23-23. <https://doi.org/10.14207/ejsd.2015.v4n1p23>
- Akintoye, V. A., & Opeyemi, O. A. (2014). Prospects for Achieving Sustainable Development through the Millennium Development Goals in Nigeria. *European Journal of Sustainable Development*, 3(1), 33-33. <https://doi.org/10.14207/ejsd.2014.v3n1p33>
- Aliyu, S. M., & Bello, G. B. (2013). An assessment of the contribution of commercial banks to the growth of small and medium scale enterprises in Nigeria. *International Journal of Research in Social Sciences*, 2(4), 47-55. Retrieved from <https://www.semanticscholar.org/paper/AN-ASSESSMENT-OF-THE-CONTRIBUTION-OF->

- COMMERCIAL-TO-Aliyu-Bello/  
be135b73d992fdaa113c9bd3452ae-  
5acd36354a1
8. Antoniadis, A., Widiarto, I., & Antonarakis, A. S. (2019). Financial crises and the attainment of the SDGs: an adjusted multidimensional poverty approach. *Sustainability Science*, 15, 1683-1698. <https://doi.org/10.1007/s11625-019-00771-z>
  9. Babajide, A. A., & Olokoyo, F. O. (2017). Assessment of Financial Stability in Emerging Economies: Evidence from Nigeria. In *Global Financial Crisis and Its Ramifications on Capital Markets* (pp. 191-207). Springer, Cham. [https://doi.org/10.1007/978-3-319-47021-4\\_15](https://doi.org/10.1007/978-3-319-47021-4_15)
  10. Baranes, A. (2009). Towards Sustainable and Ethical Finance. *Development*, 52(3), 416-420. <https://doi.org/10.1057/dev.2009.47>
  11. Bebeji, A. (2013). Consolidation and asset quality of banks in Nigeria. *International Journal of Business and Management Innovation*, 2(2), 12-20. Retrieved from [http://www.ijbmi.org/papers/Vol\(2\)2/Version-1/B221220.pdf](http://www.ijbmi.org/papers/Vol(2)2/Version-1/B221220.pdf)
  12. Bordon, I., & Schmitz, B. (2015). *Financial stability as a precondition for the financing of sustainable development in emerging and developing countries* (Briefing Paper No. 23/2015). German Development Institute. Retrieved from [https://www.die-gdi.de/uploads/media/BP\\_23.2015.pdf](https://www.die-gdi.de/uploads/media/BP_23.2015.pdf)
  13. Carree, M.A., Van Stel, A. J., Thurik, A.R., & Wennekers, S. (2007). The relationship between economic development and business ownership revisited. *Entrepreneurship and Regional Development*, 19(3), 281-291. Retrieved from <https://papers.tinbergen.nl/07022.pdf>
  14. Cheang, N., & Choy, I. (2010). *Aggregate Financial Stability Index for an Early Warning System*. Research and Statistics Department, Monetary Authority of Macao.
  15. Duffie, D. (2019). Prone to fail: the pre-crisis financial system. *Journal of Economic Perspectives*, 33(1), 81-106. <https://doi.org/10.1257/jep.33.1.81>
  16. Dwumfour, R. A. (2017). Explaining banking stability in Sub-Saharan Africa. *Research in International Business and Finance*, 41, 260-279. <https://doi.org/10.1016/j.ribaf.2017.04.027>
  17. Egede, T., & Lee, R. (2007). Bank Lending and the Environment: Not Liability but Responsibility. *The Journal of Business Law*, 8(1), 868-883. Retrieved from <http://orca.cf.ac.uk/id/eprint/66382>
  18. Egharevba, M. E. (2007). Restructuring the Nigerian state for sustainable development: The value challenge. *IFE Psychologia*, 15(2), 143-163. Retrieved from <http://eprints.covenantuniversity.edu.ng/id/eprint/579>
  19. Eke, P. O., Adetiloye, K. A., & Adegbite, E. O. (2020). An analysis of bond market liquidity and real sector output in selected African economies. *E&M: Economics and Management*, 23(4), 166-182. <https://doi.org/10.15240/tul/001/2020-4-011>
  20. Enders, J. C., & Remig, M. (Eds.) (2014). Theories of sustainable development: An introduction. In *Theories of sustainable development*. Routledge. <https://doi.org/10.4324/9781315757926>
  21. Fernández, A. I., González, F., & Suárez, N. (2016). Banking stability, competition, and economic volatility. *Journal of Financial Stability*, 22, 101-120. <https://doi.org/10.1016/j.jfs.2016.01.005>
  22. Gangi, F., Meles, A., D'Angelo, E., & Daniele, L. M. (2019). Sustainable development and corporate governance in the financial system: Are environmentally friendly banks less risky? *Corporate Social Responsibility and Environmental Management*, 26(3), 529-547. <https://doi.org/10.1002/csr.1699>
  23. Grober, U. (2007). *Deep roots: A conceptual history of 'sustainable development' (Nachhaltigkeit)* (WZB Discussion Papers No. P2007-002). WZB Berlin Social Science Center. Retrieved from <https://www.econstor.eu/handle/10419/50254>
  24. Haigh, M. (2012). Publishing and defining sustainable finance and investment. *Journal of Sustainable Finance & Investment*, 2(2), 88-94. Retrieved from <https://www.tandfonline.com/doi/abs/10.1080/20430795.2012.688797>
  25. Ingves, S. (2016). Implementing the Regulatory Reform Agenda: The Pitfall of Myopia. In *The New International Financial System: Analyzing the Cumulative Impact of Regulatory Reform* (pp. 37-46). [https://doi.org/10.1142/9789814678339\\_0002](https://doi.org/10.1142/9789814678339_0002)
  26. Jaiyesimi, R. (2016). The challenge of implementing the SDGs in Africa: The way forward. *African Journal of Reproductive Health*, 20(3), 13-18. Retrieved from <http://www.bioline.org.br/pdf?rh16029>
  27. Jayakumar, M., Pradhan, R. P., Dash, S., Maradana, R. P., & Gaurav, K. (2018). Banking competition, banking stability, and economic growth: Are feedback effects at work? *Journal of Economics and Business*, 96(3), 15-41. <https://doi.org/10.1016/j.jeconbus.2017.12.004>
  28. Jeucken, M. (2001). *Sustainable finance and banking: The financial sector and the future of the planet* (pp. 23-57). London: Earthscan Publications Ltd.
  29. Johansen, S. (1991). Estimation and Hypothesis Testing of Cointegration Vectors in Gaussian Vector Autoregressive Model. *Econometrica*, 59(6), 1551-1580. <https://doi.org/10.2307/2938278>
  30. Kharas, H., Prizzon, A., & Rogerson, A. (2014). *Financing the post-2015 Sustainable Development Goals: A rough roadmap*. Overseas Development Institute, London. Retrieved from <https://cdn.odi.org/media/documents/9374.pdf>
  31. Kutpsoyiannis, A. (1997). *Theory of Econometrics*. Hampshire Macmillan Press Ltd.
  32. Liew, V. K.-S. (2004). Which lag length selection criteria should we employ. *Economics Bulletin*, 3(33),

- 1-9. Retrieved from <http://www.accessecon.com/pubs/EB/2004/Volume3/EB-04C20021A.pdf>
33. Noor, Z., & Pickup, F. (2017). The role of Zakat in supporting the SDGs. *Baznas and UNDP Brief Series*.
34. Novotny-Farkas, Z. (2016). The interaction of the IFRS 9 expected loss approach with supervisory rules and implications for financial stability. *Accounting in Europe*, 13(2), 197-227. <https://doi.org/10.1080/17449480.2016.1210180>
35. Nwachukwu, P. O. (2014). Funding education for sustainable development in Nigeria: Challenges and the way forward. *Journal of Education and Practice*, 5(20), 51-56. Retrieved from <https://www.iiste.org/Journals/index.php/JEP/article/view/14243>
36. Oke, M. O., & Aluko, O. A. (2015). Impact of commercial banks on small and medium enterprises financing in Nigeria. *IOSR Journal of Business and Management*, 17(4), 23-26. Retrieved from <http://www.iosrjournals.org/iosr-jbm/papers/Vol17-issue4/Version-1/D017412326.pdf>
37. Okey, N., Precious, O., & Onyema, J. I. (2019). Financial soundness of deposit money banks in Nigeria: The camels model approach. *Journal of Finance and Marketing*, 3(1), 1-8. Retrieved from <https://www.alliedacademies.org/articles/financial-soundness-of-deposit-money-banks-in-nigeria-the-camels-model-approach.pdf>
38. Olawumi, S. O., Lateef, L. A., & Oladeji, E. O. (2017). Financial deepening and bank performance: A case study of selected commercial banks in Nigeria. *Journal of Mathematical Finance*, 7(3), 519-535. <https://doi.org/10.4236/jmf.2017.73028>
39. Oleribe, O. O., & Taylor-Robinson, S. D. (2016). Before SDGs (SDG): why Nigeria failed to achieve the millennium development goals (MDGs). *The Pan African Medical Journal*, 24(2), 15-45. <https://doi.org/10.11604/pamj.2016.24.156.8447>
40. Osabohien, R., Adeleye, N., & De Alwis, T. (2020). Agro-financing and food production in Nigeria. *Heliyon*, 6(5), 40-55. <https://doi.org/10.1016/j.heliyon.2020.e04001>
41. Ozili, P. K. (2018). Banking stability determinants in Africa. *International Journal of Managerial Finance*, 14(4), 462-483. Retrieved from <https://ideas.repec.org/a/eme/ijmfpp/ijmf-01-2018-0007.html>
42. Ozili, P. K. (2019). *Determinants of Banking Stability in Nigeria* (MPRA Paper No. 94092). Retrieved from <https://mpra.ub.uni-muenchen.de/94092/>
43. Pesaran, M. H., & Shin, Y. (1998). *An autoregressive distributed-lag modelling approach to cointegration analysis* (pp. 371-413). Cambridge University Press. <https://doi.org/10.1017/CCOL521633230.011>
44. Pesaran, M. H., Shin, Y. & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(3), 289-326. <https://doi.org/10.1002/jae.616>
45. Pesaran, M. H., Shin, Y., & Smith, R. P. (1999). Pooled mean group estimation of dynamic heterogeneous panels. *Journal of the American Statistical Association*, 94(446), 621-634. Retrieved from <https://www.tandfonline.com/doi/abs/10.1080/01621459.1999.10474156>
46. Pisano, U., Martinuzzi, A., & Bruckner, B. (2012). *The financial sector and sustainable development: Logics, principles and actors* (ESDN Quarterly Report No. 27). European Sustainable Development Network. Retrieved from [https://www.esdn.eu/fileadmin/ESDN\\_Reports/2012-December-The\\_Financial\\_Sector\\_and\\_Sustainable\\_Development.pdf](https://www.esdn.eu/fileadmin/ESDN_Reports/2012-December-The_Financial_Sector_and_Sustainable_Development.pdf)
47. Sadiq, R., & Mushtaq, A. (2015). The role of Islamic finance in sustainable development. *Journal of Islamic Thought and Civilization*, 5(1), 46-65. <http://admin.umt.edu.pk/Media/Site/UMT/SubSites/jitc/FileManager/JITC%20Spring%202015/04-Role%20of%20Islamic%20Financial%20Institutions.pdf>
48. Sere-Ejembi, A., Udom, I. S., Salihu, A., Atoi, N. V., & Yaaba, B. N. (2014). Developing banking system stability index for Nigeria. *CBN Journal of Applied Statistics*, 5(1), 49-77. Retrieved from <https://www.econstor.eu/bitstream/10419/144780/1/861766113.pdf>
49. Shijaku, G. (2016). Banking stability and its determinants: A sensitivity analysis on methodological changes. *The Economic Review*, 3(1), 18-30.
50. Soludo, C. C. (2004). Consolidating the Nigerian banking industry to meet the development challenges of the 21st century. *BIS Review*, 43, 1-6. Retrieved from <https://www.bis.org/review/r040727g.pdf>
51. Stenberg, K., Hanssen, O., Edejer, T. T. T., Bertram, M., Brindley, C., Meshreky, A., Rosen, J. E., Stover, J., Verboom, P., Sanders, R., & Soucat, A. (2017). Financing transformative health systems towards achievement of the health SDGs: a model for projected resource needs in 67 low-income and middle-income countries. *The Lancet Global Health*, 5(9), 875-887. [https://doi.org/10.1016/S2214-109X\(17\)30263-2](https://doi.org/10.1016/S2214-109X(17)30263-2)
52. Thompson, P., & Cowton, C. J. (2004). Bringing the Environment into Bank Lending: Implications for Environmental Reporting. *The British Accounting Review*, 36(2), 197-218. <https://doi.org/10.1016/j.bar.2003.11.005>
53. Thomson, J. B. (1992). Modelling the bank regulator's closure option: a two-step logit regression approach. *Journal of Financial Services Research*, 6(1), 5-23. Retrieved from <https://link.springer.com/article/10.1007/BF01046114>
54. Toader, T., Onofrei, M., Popescu, A. I., & Andries, A. M. (2018). Corruption and banking stability: Evidence from emerging economies. *Emerging Markets Finance and Trade*, 54(3), 591-617. <https://doi.org/10.1080/1540496X.2017.1411257>
55. United Nations. (2014). *Report of the Intergovernmental Committee*



- of Experts on Sustainable Development Financing*. New York. Retrieved from <https://www.un.org/esa/ffd/wp-content/uploads/2014/12/ICESDF.pdf>
56. United Nations. (2015). *Outcome document of the Third International Conference on Financing for Development: Addis Ababa Action Agenda*. New York. Retrieved from <https://www.un.org/africarenewal/sites/www.un.org.africarenewal/files/N1521991.pdf>
57. Usman, A. S., & Tasmin, R. (2016). The Relevance of Islamic Micro-finance in achieving the Sustainable Development Goals. *International Journal of Latest Trends in Finance and Economic Sciences*, 6(2), 1115-1125. Retrieved from [https://www.um.edu.mt/library/oar/bitstream/123456789/72132/1/The\\_relevance\\_of\\_islamic\\_micro\\_finance\\_in\\_achieving\\_the\\_sustainable\\_development\\_goals.pdf](https://www.um.edu.mt/library/oar/bitstream/123456789/72132/1/The_relevance_of_islamic_micro_finance_in_achieving_the_sustainable_development_goals.pdf)
58. Weber, O. (2014). The financial sector's impact on sustainable development. *Journal of Sustainable Finance & Investment*, 4(1), 1-8. <https://doi.org/10.1080/20430795.2014.887345>
59. Weber, O., Scholz, R. W., & Michalik, G. (2010). Incorporating sustainability criteria into credit risk management. *Business Strategy and the Environment*, 19(1), 39-50. <https://doi.org/10.1002/bse.636>
60. Wiek, A., & Weber, O. (2014). Sustainability challenges and the ambivalent role of the financial sector. *Journal of Sustainable Finance & Investment*, 4(1), 9-20. <https://doi.org/10.1080/20430795.2014.887349>
61. Ziolo, M., Ghoul, M. B. G. B., & Aydın, H.İ. (2018). Financial stability vs. sustainable development and its financing. In *Regaining Global Stability after the Financial Crisis* (pp. 88-107). IGI Global. Retrieved from <https://www.igi-global.com/chapter/financial-stability-vs-sustainable-development-and-its-financing/202072>