

Financial Openness and Financial System Stability: Evidence from Nigeria

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ABSTRACT

The overall economic outlook for both the global and domestic economies in the short to medium-term remains uncertain as the effects of supply chain disruptions occasioned by the Russian-Ukraine crisis, elevated global instability. The lingering impact of the Covid-19 pandemic, as well as the broad shocks to foreign capital flows following rate hikes by most advanced economies continue to dampen growth expectations both in Nigeria and worldwide. Hence, this study examined the nexus between financial openness and financial system stability in Nigeria. Annual time series data were sourced from the Central Bank of Nigeria and World Development Indicators. Financial system stability index was calibrated using the Principal Component Analysis (PCA), while financial openness was captured by de' factor and de' jure approaches. The study applied the bound testing and granger causality estimation techniques for data analysis. A long run relationship was found among the variables in the estimated model. From the study, it was revealed that financial openness has a positive and significant impact on financial system stability in Nigeria. Predicated on the findings, the study recommends that credit expansionary policies by the apex bank should be vigorously pursued in order to increase credits to private sector as the engine of growth, while lowering the rate of interest on loans and advances. The repositioning of the capital markets should be the focal driver of policy makers and monetary authorities. Tighter monetary policy stance to contain inflationary pressures should be undertaken by the central bank while financial regulators should continuously monitor existing and emerging foreign exchange risks, and vulnerabilities to the financial system with a view to deploying appropriate macro and micro prudential tools to mitigate the risks.

Keywords: Financial System Stability, Financial Openness, ARDL, PCA, Nigeria

1.0 Introduction

A well-developed financial system is an important driver of economic growth due to its role in the mobilization of domestic savings, promotion of information sharing, boosting the efficiency of resource allocation, as well as facilitating the management and diversification of risk, thereby spurring real sector growth (Nwosu, Itodo & Ogbonnaya-Orji, 2021; Uдах & Odey, 2016). The general belief is that a more developed financial system is more stable, and more open. This is based on the fact that deep and liquid financial systems, with varied instruments tend to absorb more shocks than a shallow one (Anthony, Jonathan, Ogbuabor & Anthony-Orji, 2016; Ingwe, Ada & Angiating, 2014). The effects of the recent global financial crisis, motivated interest in re-assessing the implications of financial development, and by consequence, financial openness for sustainable financial stability. This is because the crisis originated from developed economies which have large and robust financial sectors.

Against the backdrop of highly uncertain, and at times, worsening financial and economic conditions, the Central Bank of Nigeria has implemented several financial sector reforms over the years, aimed at boosting the sector's operational efficiency, and its ability to effectively deliver financial intermediation, among others. In the quest for a stable financial system and economic growth, many factors are identified as very crucial to growth generation. Among these factors is financial openness, drawing from economic theory built on models of competitive and efficient market that opined that financial openness foster financial system stability and economic growth (Fratzscher & Bussiere 2004; Oyovwi, 2013; Ada, Akan, Angioha & Enamhe, 2021). Though, its role in history of economic thought is a subject of controversy. The classical school of thought posits its neutrality in real output determination while the Keynesian and Monetarist schools of thoughts believe that financial indicators will affect the real sector. Their argument centres on the link between developments in the financial market and credit flow (Ingwe, Ada & Adalikwu, 2013). Increased/decreased credit flows resulting from lending rate will increase/decrease the real sector with an increase/decrease in domestic investment, domestic consumption and government expenditure. Happenings in the world economy have lent credence to the Monetary/Keynesian postulates. Financing is needed to fulfil the potential for growth. If there is a shortage, the potential is said to be underutilized. It is suggested that financial openness prevents the congestion when the real side of the economy is in need of finance (Oti, Odigbo & Odey, 2016). Therefore, the relief in accessing finance can contribute to financial system stability and economic growth.

1.1 Statement of the problem

Global inflationary pressures heightened during the review period, driven by the disruptions to supply chains, resulting in tightening global financial conditions as most central banks pursued aggressive monetary policy stance. Other ramifications include declining global trade and growing risks to financial stability, as well as restrictions on financial and capital flows.

In Nigeria, the economy had continued its recovery, albeit at a slower pace, as GDP grew by 3.32 per cent in the first half of 2022, compared with 4.02 per cent in the second half of 2021. The growth was driven by the non-oil sector, specifically, the services and agriculture sub-sectors. The performance of these sub-sectors was due to the sustained and targeted interventions by the fiscal and monetary authorities to enhance stability in the financial system after the prolonged

global crisis and COVID-19 pandemic. Total credit to the private sector continued to grow during the period under review, with increased lending to the real sector and households, in line with the Central Bank's policies to encourage lending to key sectors of the economy. The exchange rate remained unstable owing to weak foreign exchange liquidity in the system, particularly from non-oil sources. The apex bank continued the implementation of various regulatory and supervisory measures, including the Global Standing Instruction (GSI) and Guidelines for Credit Guarantee Companies, to moderate risks and promote the soundness and stability of the banking system in the short to medium term. These measures reinforced the health and resilience of the Nigerian banking system as it remained safe, sound and relatively stable (Financial System Report, 2022; Oti, Effiong & Odey, 2017).

The Nigerian economy is expected to sustain its growth trajectory, owing to the continued rise in oil prices, rebound in manufacturing activities, and sustained policy support. However, persisting security challenges and infrastructure deficit are major headwinds that could undermine the outlook for financial system stability and economic growth potentials of the nation. Hence, the main objective of this study is to examine the nexus between financial openness and financial system stability in Nigeria.

REVIEW OF RELATED LITERATURE

2.1 Theoretical underpinning

This study is anchored on the financial liberalization thesis by McKinnon (1973) and Shaw (1973). In their seminal works, McKinnon (1973) and Shaw (1973) provided models of economic growth, in which the growth and liberalization of the financial system were shown to boost the rate of economic expansion and financial system stability. This has largely formed the theoretical basis for the policy decisions and financial reforms adopted by many developing countries aimed at improving the mobilization of capital and efficiency of financial intermediation (Maxwell, 1989). Fundamentally, the argument linking financial system stability to financial openness is that a well-developed financial system, by minimizing information and transactional costs, would help enhance the efficiency of financial intermediation, through which funds are transferred from surplus units (savers) to deficit units (investors) (Chukwu & Agu, 2009).

Theoretically, a divide could be said to exist on the relationship between financial system stability and financial openness. In the endogenous growth literature, financial openness is viewed largely as a necessary pathway to improving the efficient allocation of savings to growth-spurring investment activities. Most often referred to as the "supply-leading" hypothesis, this strand of thought asserts that financial development, a key feature of which is financial openness, is positively related to financial system stability and economic growth. In contrast, the "demand-following" view is aligned with the Keynesian view of financial openness, which states that financial development moves in tandem with changes in the real sector and is the result of increased government expenditure. In this case, an increase in government expenditure is expected to translate to increased demand and income, thereby raising the demand for money, and subsequently, promoting financial development. As such, causality is seen to run from economic

growth to financial development, wherein increasing rate of economic expansion is expected to boost demand for financial services, thereby causing the financial sector to develop.

2.2 Empirical studies

Sere-Ejembi *et al* (2014) attempted to develop banking system stability index for Nigeria. The authors constructed a Banking System Stability Index (BSSI) for Nigeria using a selected set of statistical normalized FSI and macro-fundamentals from 2007-2012. The study posits that the index will serve to signal and warn financial regulators and authorities of potential vulnerability to the system. The study adopts the IMF-FSI's to form the framework for the construction of the BSSI and groups the indicators into three, namely: Banking Soundness Index (BSI), Banking Vulnerability Index (BVI) and Economic Climate Index (ECI). The resultant index captures the episodes of crises in the system over the study period and recommended the BSSI be used as an early mechanism of signaling fragility and as a complimentary method in detecting potential threat in the financial system and take preemptive measures in averting financial crisis. The authors adopted the weighted average method as their constructing mechanism. The resulting index serves as a measurement of the stability of the NFS. The financial sector comprises several other segments that wield influence in the system. Given that the banking industry is the dominant sector in the NFS owing to increase in financial technology and globalization, the systemic risks posed by other sectors in the system cannot be overlooked or ignored. As such, the BSSI was inadequate to measure FSSI for Nigeria.

Udom *et al* (2015) in their study on composing an index to support monetary and financial stability analysis in Nigeria, built a composite financial system stability index (FSSI) or a 'onestop-shop' stability indicator that warns and signals to a potential financial crisis in the Nigerian Financial System. The study achieved this by constructing a financial stability index from three categories of the financial system that includes the banking sector, the capital market and insurance sector. The study is basically an extension of Sere-Ejembi *et al.* (2014) that constructed a banking stability index for the NFS. The study aimed at constructing an FSSI using the weighted average method instead of a BSSI because the financial system comprises more than just the banking sector and argues that evaluating financial stability with only data for the banking sector may lead to bias and results that may prove misleading and inadequate. Considering that the IMF's core FSI, the study employs only the use of CAR as a gauge for bank stability. Given that the banking industry is considered as the most important sector in the financial system the use of only CAR may prove to be inadequate especially as other indicators for measuring banking stability are available.

Creel *et al.* (2013) in a paper on financial stability and economic performance investigated the nexus between both variables and expressed the pertinent need to include indicators for financial depth in evaluating financial stability. The data employed composed of 27 EU member states as of 2011 and the duration spans from 1998-2011. The research adopts three different categories of indicators that serve as proxy for micro and macro elements of financial stability. They are; the Composite Indicator of Systemic Stress (CISS) provided by the ESCB, cumulative macro-prudential ratio for banks of each nation and indicators of financial stability index built with the aid of the Principal Component Analysis (PCA). The study discovers that financial stability has a significant and positive effect on all response variables selected for the study.

Yusifzada *et al* (2015) in their study on financial intermediation and economic growth, employed a panel data covering 118 countries from 2004-2011 argued that none of the aspects of financial development adequately evaluates the complexity of the financial system alone as most researches do. The study goes further to construct a financial development index using the PCA from all four aspects of the financial system mentioned. With respect to financial stability, the study reveals that while financial stability is necessary for economic growth, however, an excessively high stability index although ensures a sound financial system triggers a reversal in economic growth because it results in underutilization of financial assets and resources in the economy.

Njang, Omini, Bekun and Adedoyin (2020) evaluated the influence of financial system stability on economic growth in Nigeria from 1986 to 2016. Employing the use of Principal Component Analysis (PCA), the study constructs a Financial System Stability Index (FSSI) as measurement for financial stability. The indicators used in building the index capture three sectors of the Nigerian Financial System (NFS). The three sectors cover the banking sector, the capital market, the external sector and include a fourth component representing financial depth. The resulting index serves as a single qualitative measure for evaluating the level of stability in a nation's financial system and proves capable of warning of an eminent financial crisis. Employing the use of four macroeconomic indicators, the index is then regressed against the Nigerian economic growth rate with an aim of discovering the short-run and long-run dynamics existing between both variables. The findings disclose that financial stability in Nigeria may be high and has resulted in the underutilization of financial assets thus hampering sustainable economic growth in Nigeria.

Nwosu, Itodo and Ogbonnaya-Orji (2021) examined financial deepening, financial system fragility and economic growth in Nigeria since the 2007/2008 global financial crisis. Utilizing quarterly data from 2007Q1-2018Q4, the study employed a non-linear co-integrating ARDL model in assessing the relationship between financial deepening, financial fragility and economic growth in Nigeria. Findings suggest the existence of a positive relationship between financial deepening and growth, but a non-linear relationship between financial system fragility and economic growth.

METHODOLOGY

3.1 Research Design

The study adopted an ex-post-facto research design; as it focuses on utilizing already existing variables that cannot be manipulated. The analytical tools employed include unit root tests, bound testing co-integration test and autoregressive distributive lag (ARDL) model. In this study, we employed two different measures of financial openness according to Ozdemir and Erbil (2008) who used the de facto and de jure measures of financial openness. The de facto measure of financial openness can be used as a variable to measure the actual observed outcomes of the enforcement of existing regulations on financial flows. This measure is price-based. The second category is the de jure measure of financial liberalization. De jure measures are quality based measures which

concentrate on events such as changing regulations and the response of the monetary authorities to financial flows.

3.2 Model Specification

The empirical model for this study is anchored on the financial liberalization thesis by McKinnon (1973) and Shaw (1973). In their seminal works, McKinnon (1973) and Shaw (1973) provided models of economic growth, in which the growth and liberalization of the financial system were shown to boost the rate of economic expansion. This has largely formed the theoretical basis for the policy decisions and financial reforms adopted by many developing countries aimed at improving the mobilization of capital and efficiency of financial intermediation. Fundamentally, the argument linking financial sector development to growth is that a well-developed financial system, by minimizing information and transactional costs, would help enhance the efficiency of financial intermediation, through which funds are transferred from surplus units (savers) to deficit units (investors) (Chukwu & Agu, 2009). In this study, we employed two different measures of financial openness according to the work of Ozdemir and Erbil (2008) who used the de facto and de jure measures of financial openness. The model is specified as follows:

$$FSSI = f(DJFO, DFFO, CPS, MKTCAP, INTR, EXR, INFL) \quad 3.1$$

$$FSSI = \psi_0 + \psi_1 LDJFO_t + \psi_2 LDFFO_t + \psi_3 LCPS_t + \psi_4 LMKTCAP_t + \psi_5 INTR_t + \psi_6 EXR_t + \psi_7 INFL_t + \varepsilon_t \quad (3.2)$$

Where: where: $\psi_1 \dots \psi_7$ = Parameter estimates L = natural log operator μ = error term the above equation also has the following variables: FSSI= financial system stability index (proxy for financial system stability), CPS=Credit to the private sector: This captures the improvements in the banking sector. It is expected that improvements in financial intermediation will affect financial system positively (Levine 2008) INTR= Real Interest; interest rate liberalization, according to McKinnon-Shaw hypothesis, leads to increase in savings then increase in investments and ultimately leading to increase in financial system stability. MKTCAP= Market capitalization; this represents the total market capitalization of All Shares traded on the floor of the Nigerian Capital Market within the period under review. Capital Market liberalization has been emphasized in the literature as one of the core areas of financial liberalization. Thus, we expect a positive relationship between capital market liberalization and financial system stability. Beck *et al.* (2000) in their study outline three key stock market indicators in measuring size, activity, and efficiency. The ratio of stock market capitalization to GDP (MKTCAP) measures the size of the stock market because it aggregates the value of all listed shares traded in the stock market. They emphasize that one can assume that the size of the stock market is positively correlated with the ability to mobilize capital and to diversify risk. To measure stock market liquidity/activity and efficiency, they also used the value of stock traded to GDP variable and Turnover Ratio respectively. DJFO= De jure Financial Openness measured by Chinn-Ito Index. We use this index because of its wide acceptability and it is available for a long period for over 182 countries of the world including Nigeria. The construction of the Chinn-Ito index is based on the first principal component of four binary variables in IMF's Annual Report on Exchange Arrangements and Exchange Restrictions

and it takes higher values for more open financial regimes. These four variables are defined as follows: K1 is the variable that indicates the presence of multiple exchange rates; K2 is the variable that indicates restrictions on current account transactions; K3 is the variable that indicates the restrictions on capital account transactions; and K4 is the variable that indicates requirements of the surrender of export proceeds. DFFO = Financial Openness de facto measures. Here we use total capital flow as a ratio of GDP to capture our degree of de facto Financial Openness. The sum of FDI, portfolio investments and other investments make up the capital flows. According to the World Bank, “Gross private capital flows are the sum of the absolute values of direct, portfolio, and other investment inflows and outflows recorded in the balance of payments financial account, excluding changes in the assets and liabilities of monetary authorities and general government”. In line with the endogenous theory, we also expect a positive relationship since this variable also captures capital stock/ effects of external investment inflows. EXR=Real Exchange Rate; We expect a negative relationship with financial system stability since a rise in foreign currency against the local currency affects foreign exchange demand which equally affects capital imports and exports, investments and growth; INFL= inflation rate which captures macroeconomic instability in the system and is expected to be negatively related with financial system stability. The *a priori* expectation is stated as: $\Psi_0, \Psi_1, \Psi_2, \Psi_3, \Psi_4, \Psi_5, \Psi_6,$ and $\Psi_7 < 0$.

3.3 Constructing Financial System Stability Index (FSSI) for Nigeria

The FSSI is computed using the Principal Component Analysis (PCA), which is one of the most frequently used multivariate data technique. The PCA is chosen among other methods due to its tendency to reduce the dimensionality of a data set whilst retaining much of the variability in the data set. More so, the PCA overcomes multicollinearity issues that usually occurs when simultaneously introducing several financial variables that are highly correlated amongst each other (Brave & Butters, 2011). For the Banking Industry, the study employs the IMF’s core FSI as a measure of stability in the money market. They are, Capital Adequacy Ratio (CAR), Asset Quality (AQ), Liquidity Ratio (LQR), Return on Asset (ROA) and Return on Equity (ROE) (International Monetary Fund, 2006). For the Capital market, the paper uses All Share Index (ASI), which measures the performance of companies listed on the Nigerian Stock Exchange. For the External sector, the ratio of Money Supply to Foreign Reserve (MS/FR) was used. It measures the reserve adequacy of the financial system in the event of an external shock/vulnerability (Njang *et al.*, 2020). Hence, the expression can be given as:

$$FSSI = [(CAR, AQ, LQR, ROA, ROE) + ASI + MSFR] \quad (3.3)$$

$$FSSI = BS + CM + ES \quad (3.4)$$

ANALYSIS AND DISCUSSION OF RESULTS

4.1 Data Presentation

A trend analysis of the financial stability index for Nigeria computed using the Principal Component Analysis (PCA) is shown in figure 1 below. As earlier explained the PCA is chosen among other methods due to its tendency to reduce the dimensionality of a data set whilst retaining much of the variability in the data set. More so, the PCA overcomes multicollinearity issues that usually occurs when simultaneously introducing several financial variables that are highly correlated amongst each other. The variables used in computing the index includes; Capital Adequacy Ratio, Asset Quality, Liquidity Ratio, Return on Asset, Return on Equity, all share index as well as the ratio of money supply to foreign reserves was used. The financial stability index trajectory has experience upward and download movement without assuming a steady path as depicted below. The indices have experienced negative trends averaging 1.38 percent between 1981 and 2003. It increases positively on average of 1.03 percent between 2004 and 2013, and rise further with the average trend of 2.69 percent between 2014 and 2021.

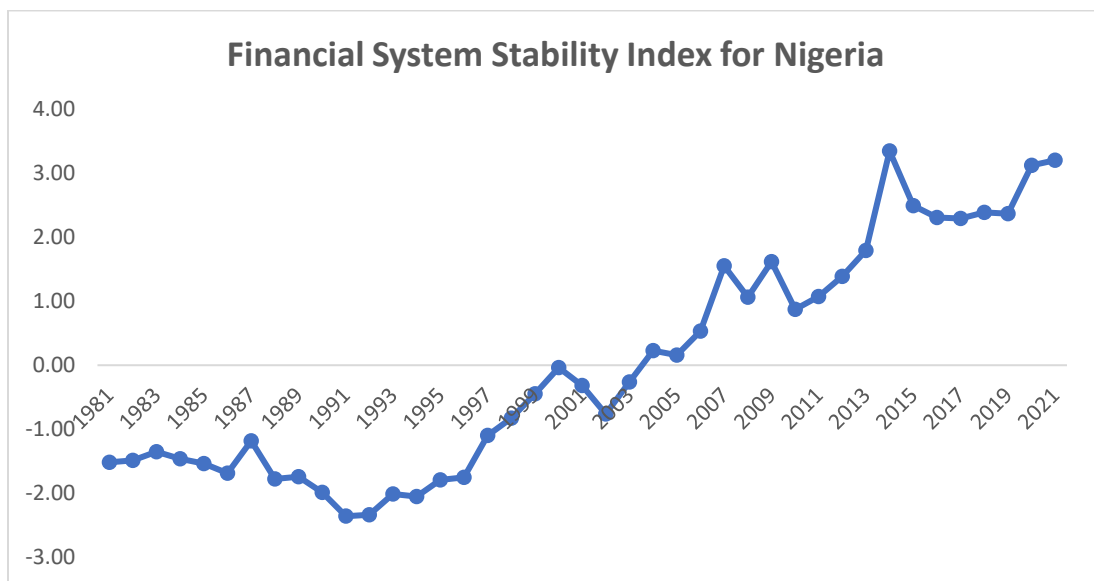


FIG. 1: Trend of financial system stability index for Nigeria, 1981-2021.

Source: Researchers' computation, 2023.

4.2 Presentation and analysis of econometric results

Table 1

Result of Principal Component Analysis (PCA)

Eigenvectors (loadings):

<i>Variable</i>	<i>PC 1</i>	<i>PC 2</i>	<i>PC 3</i>	<i>PC 4</i>	<i>PC 5</i>	<i>PC 6</i>	<i>PC 7</i>
<i>CAR</i>	0.361218	-0.162777	0.417161	-0.751622	0.059354	0.099636	0.301025
<i>LQR</i>	0.245759	0.614806	-0.044626	-0.041772	0.731861	-4.75E-05	-0.149194
<i>ASQ</i>	0.054494	0.160095	0.876550	0.425444	-0.093008	-0.075211	-0.088031
<i>ROA</i>	0.365315	-0.478948	-0.065289	0.482032	0.396381	0.185876	0.457022
<i>ROE</i>	0.420075	0.416144	-0.145991	0.119542	-0.470254	0.617666	0.110032
<i>ASI</i>	0.507316	0.162725	-0.170324	0.074463	-0.271688	-0.752486	0.203828
<i>MSFR</i>	0.488740	-0.375287	-0.032530	-0.011265	-0.011587	0.046035	-0.785400

Researcher's computation, using Eviews 9

The essence of the computation of the PCA is to generate the index of financial stability for the Nigerian Financial System. From the above results, it can be observed that most of the values are closer to one implying that the Nigerian financial system is adjusting to equilibrium and hence the possibility of being stable in the near future if prudential monetary policies are pursued is guaranteed.

4.3 Result of Kaiser's Measure of Sampling Adequacy

Given the PCA computed results, the study further tested the sampling adequacy of the seven variables isolated for building the financial system stability index (FSSI). This is achieved by employing the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. The KMO compares the partial correlations between variables and supports the relevance of employing the PCA on the selected variables used in constructing the index (Creel *et al.*, 2013). The KMO stipulates that a value closer to 1.0 imply that a PCA is useful within the data set. However, should the value fall below the benchmark of 0.50, then the result of the PCA is not useful within the data set (Bozovic & Smolovic, 2016). Hence, given the sampling adequacy of 0.937734, it means that our sample is adequate and consistent.

Kaiser's Measure of Sampling Adequacy

	MSA
ASQ	0.848721
ASI	0.505729
CAR	0.063079
LQR	0.089013
MSFR	0.529726
ROA	0.552907
ROE	0.206241

Kaiser's MSA **0.937734**

4.4 Unit root test results

The Augmented Dickey Fuller and the Philip-Perron unit root tests were conducted to examine the stationarity condition of the variables. As indicated in table 2, all the variables were stationary after first differencing in both ADF and PP tests. In other words, the variables are integrated of order one (i.e., I (1)). Conversely, only inflation (INFL) was stationary at levels I (0) using both criteria. Where some of the variables are I (0) while others are I (1) one suggests the problem of unit root in the equation.

Table 2

ADF and Philip-Perron unit root test results

<i>Variables</i>	<i>ADF</i>			<i>PP</i>		
	<i>Level</i>	<i>1st Difference</i>	<i>Order of integration</i>	<i>Level</i>	<i>1st Difference</i>	<i>Order of integration</i>
<i>FSSI</i>	-0.033226	-7.503365**	<i>I(1)</i>	-0.395801	-7.557101**	<i>I(1)</i>
<i>DJFO</i>	-1.430403	-5.766272**	<i>I(1)</i>	-1.485993	-5.749150**	<i>I(1)</i>
<i>DFFO</i>	-2.100372	-7.383015**	<i>I(1)</i>	-2.029011	-7.383015**	<i>I(1)</i>
<i>CPS</i>	-1.074168	-5.848173**	<i>I(1)</i>	-0.956508	-6.923159**	<i>I(1)</i>
<i>MKTCAP</i>	-1.587582	-7.095058**	<i>I(1)</i>	-1.320570	-9.325018**	<i>I(1)</i>
<i>INTR</i>	-1.876505	-3.822757**	<i>I(1)</i>	-0	-7.956707**	<i>I(1)</i>
<i>EXR</i>	3.109276	-3.494631**	<i>I(1)</i>	3.601090	-3.423543**	<i>I(1)</i>
<i>INFL</i>	-3.010847	-	<i>I(0)</i>	-3.879184	-	<i>I(0)</i>

Source: Researcher's computation, 2023, using Eviews 9.

Note: Mackinnon critical values for ADF and PP at 1, 5 and 10% levels are -3.60, -2.93 and -2.60 respectively. ** means significant at 5 level.

4.5 Bound test results

From the bound testing result reported in Table 3, long run relationship exists amongst the variables in the estimated equation, given that the value of the F-statistic is greater than the critical value at five per cent level in both the upper and the lower bounds. Therefore, the null hypothesis of absence of co-integration are rejected, while the study proceeds to estimate the long run coefficient of the equation.

TABLE 3

Co-integration test results

<i>Equation</i>	<i>K</i>	5% critical value			<i>Outcome</i>
		<i>F-Stat</i>	<i>I(0)</i>	<i>I(1)</i>	
<i>FSSI (DJFO, DFFO, CPS, MKTCAP, INTR, EXR, INFL)</i>	7	4.19	2.32	3.5	<i>Co-integration</i>

Note: K =number of parameters

Source: Researcher's computation, 2023.

4.6 Granger causality test results

From table 4, on the nexus of financial openness and financial system stability, a unidirectional causality was found between de' jure financial openness and financial stability index, while a bidirectional causality was found between de' facto financial openness and financial stability index.

Table 4

Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
<i>DJFO does not Granger Cause FSSI</i>	40	0.95541	0.3347
<i>FSSI does not Granger Cause DJFO</i>		3.01626	0.0908
<i>DFFO does not Granger Cause FSSI</i>	40	1.28224	0.2648
<i>FSSI does not Granger Cause DFFO</i>		1.61939	0.2111

4.7 ARDL Co-integration Results

The long run results of financial openness and financial system stability is reported in table 5a. From the results and in consonance with theoretical expectation, a positive relationship exists between de' jure *financial openness (DJFO)* and *financial system stability index (FSSI)*. The value of the coefficient of 0.861 implies that an increase in *financial openness* by 1 percent will result in an increase in *financial system stability* by 0.861 percent. The p-value indicates that DJFO is statistically significant at five percent level. This simply implies that financial openness has a significant impact on the stability of the Nigerian financial system in the long run. A positive relationship equally exists between de' facto financial openness (DFFO) and financial system stability index (FSSI), but statistically insignificant. Hence, a 1 per cent increase in de' facto financial openness will result to about 0.010 percent increase in financial system stability in the long run. The relationship between credit to private sector (CPS) and financial system stability index is positive and significant in the long run which is consistent with a priori expectations. Therefore, a 1 per cent increase in credit to private sector, which measures financial deepening will lead to an increase in financial system stability by 0.060 percent. The relationship between market capitalization as a ratio of gross domestic product (MKT CAP), measuring financial depth and financial system stability index is positive and statistically significant in the long run which is consistent with a priori expectations. Therefore, a 1 per cent increase in market capitalization as a ratio of gross domestic product, measuring financial depth and financial system stability will lead to an increase in financial system stability by 0.046 percent. However, interest rate (INTR) has a negative but significant relationship with financial system stability index in the long run. The magnitude of the coefficient shows that a 1 percent increase in interest rate in the long run will

lead to a 0.066 percent decrease in financial system stability, *ceteris paribus*. Exchange rate (EXR) and financial system stability index are positively related in the long run, and statistically significant. Therefore, a 1 per cent increase in exchange rate will lead to about 0.0058 per cent increase in financial system stability. The relationship between inflation rate and financial system stability index is positive but statistically insignificant in the long run. A 1 percent rise in inflation will increase financial system stability index by 0.017 percent.

The short run results of financial openness and financial system stability is reported in table 5b. From the results and in consonance with theoretical expectation, a positive relationship exists between *de jure* financial openness (DJFO) and financial system stability index (FSSI). The value of the coefficient of 0.596 implies that an increase in *financial* openness by 1 percent will result to an increase in financial system stability by 0.596 percent. The p-value indicates that DJFO is statistically significant at five percent level in the short run. This simply means that financial openness has a significant impact on the stability of the Nigerian financial system in the short run. A positive relationship equally exists between *de facto* financial openness (DFFO) and financial system stability index (FSSI) at current and one period lag, and statistically significant. It became negative after second period lag. Hence, a 1 per cent increase in *de facto* financial openness will result to about 0.021, 0.0021 and 0.042 percent increase/decrease in financial system stability index, respectively in the short run. The relationship between credit to private sector (CPS) and financial system stability index is positive and significant in the short run which is consistent with *a priori* expectations. Therefore, a 1 per cent increase in credit to private sector will lead to an increase in financial system stability by 0.055 percent in the short run. The nexus between market capitalization as a ratio of gross domestic product (MKTCAP) and financial system stability index is equally positive and statistically significant in the short run which is consistent with economic theories. Therefore, a 1 per cent increase in market capitalization as a ratio of gross domestic product will lead to an increase in financial system stability by 0.043 percent. However, interest rate (INTR) has a negative but statistically significant relationship with financial system stability index in the short run. The magnitude of the coefficient shows that a 1 percent increase in interest rate in the short run will lead to a 0.060 percent decrease in financial system stability. Exchange rate (EXR) and financial system stability index are positively related in the short run, and statistically significant. Therefore, a 1 per cent increase in exchange rate will lead to about 0.0053 per cent increase in financial system stability. The relationship between inflation rate and financial system stability index is negative and statistically insignificant in the short run at current, first and second periods lag. Hence, a 1 percent rise in inflation rate will decrease financial system stability index by 0.0043, 0.0130 and 0.0070 percent, respectively.

The error correction mechanism (ECM) has the correct sign and size. The ECM coefficient of -0.918262 indicates that, it takes about 92 percent for the short run disequilibrium to adjust to the long run equilibrium within the year. The t-statistic of -6.31419 showed that the error correction term is statistically significant at 5 percent level of significance. The R-squared value of 0.586507 and the value of R-squared adjusted of 0.564580 indicates that about 56 percent of total variation in the financial system stability index is explained by the various measures of financial openness, credit to private sector, market capitalization, interest rate, exchange rate and inflation rate, and about 44 percent was unexplained which may be accounted for by other factors not included in the model. The F-statistic of about 12.08035 shows that all the variables in the model are together as

a group statistically significant which means that the model has a good fit. The Durbin-Watson (D-W) statistic of 2.14997 indicates no autocorrelation in the model.

TABLE 5a

Long run coefficients of financial openness and financial system stability.

Dependent variable: FSSI

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob.</i>
DJFO	0.861314	0.344507	2.500137	0.0204
DFFO	0.010380	0.006842	1.517010	0.1435
CPS	0.060910	0.020986	2.902431	0.0083
MKTCAP	0.046835	0.013565	3.452768	0.0023
INTR	-0.066266	0.028512	-2.324124	0.0297
EXR	0.005817	0.000959	6.063460	0.0000
INFL	0.017202	0.010523	1.634746	0.1163
C	-0.776346	0.405801	-1.913120	0.0688

TABLE 5b

Short run dynamics result of financial openness and financial system stability.

Dependent variable: D (FSSI)

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob.</i>
<i>D(DJFO)</i>	<i>0.596188</i>	<i>0.325728</i>	<i>1.830324</i>	<i>0.0808</i>
<i>D(DFFO)</i>	<i>0.021745</i>	<i>0.010657</i>	<i>2.040482</i>	<i>0.0535</i>
<i>D(DFFO(-1))</i>	<i>0.002176</i>	<i>0.012173</i>	<i>0.178715</i>	<i>0.8598</i>
<i>D(DFFO(-2))</i>	<i>-0.042725</i>	<i>0.009888</i>	<i>-4.321007</i>	<i>0.0003</i>
<i>D(CPS)</i>	<i>0.055931</i>	<i>0.024036</i>	<i>2.326982</i>	<i>0.0296</i>
<i>D(MKTCAP)</i>	<i>0.043007</i>	<i>0.011624</i>	<i>3.699942</i>	<i>0.0013</i>
<i>D(INTR)</i>	<i>-0.060849</i>	<i>0.025247</i>	<i>-2.410157</i>	<i>0.0247</i>
<i>D(EXR)</i>	<i>0.005342</i>	<i>0.001224</i>	<i>4.364038</i>	<i>0.0002</i>
<i>D(INFL)</i>	<i>-0.004376</i>	<i>0.005469</i>	<i>-0.800117</i>	<i>0.4322</i>
<i>D(INFL(-1))</i>	<i>-0.013080</i>	<i>0.006929</i>	<i>-1.887733</i>	<i>0.0723</i>

$D(INFL(-2))$	-0.007023	0.006429	-1.092436	0.2865
$ECM(-1)$	-0.918262	0.144349	-6.361419	0.0000

**$R\text{-Squared} = 0.586507$; $R\text{-Squared Adjusted} = 0.564580$; $F\text{-Stat.} = 12.08035$
 $DW = 2.14997$.**

4.8 Discussion of findings

The study explored the nexus between financial openness and financial system stability in Nigeria from 1981-2021 adopting the autoregressive distributive lag model. From the study, it was revealed that financial openness has contributed positively to the stability of the Nigerian financial system. The two measures of financial openness such as de' jure and de' facto financial openness have significantly impacted on the stabilization of the Nigerian financial system. The findings negate the views of Njang *et al.* (2020) who opined that financial stability in Nigeria has resulted in the underutilization of financial assets thus hampering sustainable financial system stability and hence economic growth.

5.0 Conclusion and Recommendations

The study concludes that financial openness has significant impact on the stability of the Nigerian financial system, and hence should be encouraged. The study therefore recommends the apex bank should implement financial system stability index as a complimentary test to be used alongside the stress tests in predicting and ensuring a stable financial system and as such, be a recurrent feature in her Financial Stability Reports. The federal government through financial authorities must give attention to other aspects of financial development like depth, inclusion and efficiency as opposed to stability alone in ensuring sustainable economic growth in Nigeria. Financial stability is necessary to stimulate economic growth but by itself is not sufficient to sustain that growth, as higher stability index leads to underutilization of financial assets and reversal in economic growth. The impact of financial openness on financial stability in Nigeria is positive and significant. Hence, any further increase of any of the variables included in core FSI (relating to banks) will continue to translate to enhancement of more financial resources which will further stimulate the Nigerian financial system. In sum, the goal of financial authorities must be to attain a robust financial openness that will enhance optimum level of financial stability in the country. In line with the findings, this paper argues that it is important that CBN credit expansion policies be implemented in such a way that more credits are allocated to the private sector, as the engine of economic growth. This can be done by lowering interest rate and hence promote the stability of Nigeria financial system. This may be in the form of identifying the low-risk sectors and encouraging banks to increase their lending to those sectors. Policy makers and monetary authorities should ensure that capital markets in Nigeria are strategically developed and repositioned such that they are incorporated and integrated into the financial system and the economy as a whole. The results indicate that the level of market capitalization in Nigeria is positively related with financial system stability. Thus, there is need to continue the drive towards maximizing the growth potentials of the Nigerian Stock Markets by adequately ensuring that they keep providing funds to investors for long term investment, business and development projects. To contain inflationary pressures the central bank should continue with tighter monetary policy

stance. Financial regulators need to continuously assess and monitor existing and emerging foreign exchange risks, and vulnerabilities to the financial system with a view to deploying appropriate macro and micro prudential tools to mitigate them. The government should continue to remove barriers to capital account transactions with every sense of objectivity, economic management dexterity and in line with global best practices.

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