BANKING SYSTEM FRAGILITY IN NIGERIA: HANGING ON THE PRECIPICE?

Peter Akinyemi Kayode [(1)], Foluso Ololade Oluwole [(2)]

[(1,2)] Adekunle Ajasin University, Nigeria

[(1)] **akinyemipeter252@gmail.com**

Abstract

The health of a country's banking system is a key determinant to the development of the country. A fragile banking system portends danger not only to the financial system but the entire economy. This study investigates the state of the Nigerian banking system in terms of stability or fragility from 1981 to 2020. We used the banking system fragility index (BSFI) proposed by Kibritçioğlu (2003) to analyze Nigerian banking industry aggregate data from three risk areas: credit, market and liquidity. We estimated that out of the 40 years examined, the banking system was fragile for 23 years given their BSFI less than 0 while it was not fragile for 17 years with BSFI = 0 or greater.

We found that most of the years when the Nigerian banking system was fragile were periods of relaxed monetary policies, deregulation and credit expansion. Secondly, the years of banking system stability were when the county's banking system was subjected to stiff regulation and consolidation. Given the number of years that the system was fragile, we observed that sustained economic growth and development requires that the banking system remain strong as long as possible, and that the Nigerian situation could not promote this important objective. We recommend that the financial regulatory authorities put in place more stringent policies as banks are more fragile during the deregulation of the banking industry.

Keywords: Banking system fragility; precipice; BSFI.

هشاشة النظام المصرفي في نيجيريا: هل ستنتهي؟

كايود ، بيتر أكينيمي [1]، OLUWOLE ، Foluso Ololade [2]

قسم الخدمات المصرفية والمالية ، جامعة Adekunle Ajasin ، Akungba-Akoko ، نيجيريا [1،2]

akinyemipeter252@gmail.com [1]

الملخص

تعد صحة النظام المصرفي للبلد محددًا رئيسيًا لتطور البلد. ينذر النظام المصرفي الهش بالخطر ليس فقط على النظام المالي ولكن على الاقتصاد بأكمله. تبحث هذه الدراسة في حالة النظام المصرفي النيجيري من حيث الاستقرار أو الهشاشة من 1981 إلى 2020. ستخدمنا مؤشر هشاشة النظام المصرفي (BSFI) الذي اقترحه Kibritçioğlu (2003) لتحليل البيانات الإجمالية للصناعة المصرفية النيجيرية من ثلاثة مجالات للمخاطر: الائتمان والسوق والسيولة. قدرنا أنه من بين 40 عامًا تم فحصها ، كان النظام المصرفي هشًا لمدة 23 عامًا نظرًا لأن BSFI أقل من 0 بينما لم يكن هشًا لمدة 17 عامًا مع BSFI = 0 أو أكبر.

وجدنا أن معظم السنوات التي كان النظام المصرفي النيجيري فيها هشًا كانت فترات من السياسات النقدية المتساهلة ، حرير وتوسيع الائتمان. ثانيًا ، كانت سنوات استقرار النظام المصرفي عندما خضع النظام المصرفي للمقاطعة لتنظيم صارم وتوحيد. نظرًا لعدد السنوات التي كان فيها النظام هشًا ، لاحظنا أن النمو الاقتصادي المستدام والتنمية يتطلبان بقاء النظام المصرفي قويًا لأطول فترة ممكنة ، وأن الوضع النيجيري لا يمكن أن يعزز هذا الهدف المهم. نوصي بوضع السلطات التنظيمية المالية في مكانها الصحيح سياسات أكثر صرامة لأن البنوك تكون أكثر هشاشة أثناء تحرير الصناعة المصرفية.

Received 18/06/2022 Revised 11/10/2022 Accepted 24/10/2022

1. Introduction

A strong and stable financial system is a necessity for economic growth of countries, and a low or no fragility banking state facilitates efficiency and improves productivity in other economic sectors (Yunyi, 2019). Macroeconomic theory explains financial fragility as the vulnerability of a financial system or industry to crises instigated by shocks and downturns. The banking system, by the nature of its operations, is the most susceptible to fragility, especially in developing countries, hence the constant stiff regulatory framework is placed on it. Notwithstanding the clamour for financial system liberalization in many countries, monetary authorities embark on stiff regulation of the banking system to ensure its stability, competitiveness, customers' deposit protection, liquidity and reduction of information asymmetry in the system (Barth & Capiro, 2018; Jegede, 2014). Although operators in the financial system develop self-regulatory measures for the industry, such measures lack necessary legal support and are without penalty for default. Hence, there are more effective regulations which attract greater compliance that are provided by the government through its financial system regulatory agencies (Sobodu and Akiode,

1998).

Attempts to reduce banking system fragility are encapsulated in different approaches depending on socio-economic, political, religious, cultural and legal environment in which the banks are operating. However, in general terms, such approaches usually involve a combination of entry controls, capital adequacy, operations control, monitoring, costs control, competition and safety among others (Rajan & Zingales, 2003; Barth et *al,* 2007; Beck & Levine,2003).

The private theory of bank regulation forecasts that increased capital base requirement for banks reduces agency cost problem between banks and their depositors since increased capital base would lower the risk of failure and reduce fragility. Succinctly, this theory posits that bank regulation reduces the possibility of customers taking higher risk because of the presence of deposit insurers. In the overall view of the theory, banking stiff system regulation promotes some degree of stability in the system, improve their performance and aligns the interest of bank shareholders with that of their customers. The pro-government bank regulation school believes that strengthening regulatory authorities' powers will also lead to better banks' corporate governance, which in turn will facilitate improved performance and stability of the banks Barth *et al* (2006).. The extent to which regulatory policies have helped banks to overcome fragility, especially in developing countries like Nigeria remains debatable.

The question of whether big-sized banks perform better than small-sized ones in Nigeria has been addressed in literature. Amenawo *et al* (2018) argued that with the consolidation and recapitalization of Nigerian banks (2004 – 2005), the banking industry was expected to be more resilient, stable and efficient. However, empirical evidence showed that this was a tall dream to achieve. Are bigger banks likely to be less fragile than smaller ones because the former might be more closely monitored by the regulatory authorities? This is also debatable as noted by Ofong and Riman (2018) who argued that this is a mere hypothesis that needs to be constantly empirically verified. The authors stated that there are literatures that support the notion that big-sized banks are somehow tacitly shielded by the so-called policy of "too big to fail" scenario where small-sized banks cannot have the privilege to operate. It is also believed that big banks can easily diversify their risks among portfolios that small banks are not opportune to benefit from.. This is one of the reasoning behind banks' consolidation exercise in Nigeria. If this were to be true, the Nigerian banking system would have been stronger than what it is presently.

The soundness of banks is dependent on both bank-specific and macroeconomic factors. There are also industry-specific factors that may arise from contagions effects and externalities (Gonzalez-Hermosil *et al.,* 1997). One major macro-variable which is capable of creating shocks on banks in oil producing countries is crash in the international price of oil as noted by Raji (2017). For example, after the oil price crash of 1998, 28 of domestic banks had survival issues while 10 folded up in 2009 in Nigeria. Added to this is the problem associated with non-performing loans which rose to about 15% in 2017 from 6% recorded in 2015. Another major shocker to Nigerian banks was the introduction of Treasury Single Account (TSA) by the Buhari administration in 2015 when all government revenue (mainly from oil and value added tax) were deposited to a single account kept at the Central Bank of

Nigeria (CBN). Raji (2017) noted that it took Nigerian banks considerable time before they could adjust to the withdrawal of government fund from their vaults to the CBN. Despite the withdrawal of more than N3 trillion of government fund from the banking system, the system still survived, at least, after the initial shock. Makanjuola (2015, cited in Ungersboeck, 2020) stated that in early 2000s, some key structural reforms were carried out in the Nigerian banking system in effort to strengthen the sector, including the attempt to salvage the fragmented banking from fragmentation (Alford, 2010).

How had the Nigerian banking system faired in the last four decades? This is the focus of this study. Although ample literature exists on financial system fragility and bank failures particularly in developing countries, empirical studies on metrics and signs of bank fragility have considered both bank-specific and macroeconomic variables as indicators of bank strength or weakness from individual perspectives. Single studies that address combined effects of bank signal variables with respect to credit, liquidity and market risks in Nigeria are, to our best knowledge, rare. This study therefore examines the strength and/or fragility of the Nigerian banking industry from the three main risk dimensions listed. While the liquidity risk concerns the volume of deposits, credit risk arises from domestic credit granted to the private sector by the banking system and market risk concerns foreign exposures in terms of foreign liabilities in the domestic banking system.

This study examines the state of the Nigerian banking system since 1980 till 2020 to ascertain whether it has been fragile or strong. The null hypothesis guiding this research is that the Nigerian banking system has not been fragile over these years. Using the model of banking system fragility index estimation proposed by Kibritcioglu (2003), this study provides a novel insight into the stability and fragility trends of the Nigeria banking system from 1981 t0 2020. Apart from making interesting reading to the researcher, policy makers will find these trends useful in matching their subsequent policies vis-à-vis their goal of financial system stability.

2. Literature Review

2.1. A Brief on the Nigerian Banking System

The origin of banking in Nigeria is traceable to the establishment of the African Banking Corporation in 1892. This bank has since metamorphosized to First Bank of Nigeria PLC. The Nigerian banking space has witnessed reforms over the years, chief among which are the banking sector consolidation/ recapitalization exercise of 2004/2005 and the establishment of the "Asset Management Corporation of Nigeria (AMCON)" in 2009 when the banking system was experiencing a downturn. The consolidation exercise reduced the number of commercial banks in Nigeria from 89 to 25 due to the directive of the Central Bank of Nigeria (CBN) requiring the commercial bank to shore up their capital base from N2 billion to N25 billion. Whereas some banks were acquired, others merged with bigger ones. The consolidation period also witnessed the improved liquidity position of the banks through the collection of large deposits from government agencies.

Furthermore, the establishment of AMCON in 2009 was done to acquire commercial banks' non-

performing loans and to recover them from debtors, using the provisions of the "International Financial Reporting Standards (IFRS)." The CBN (2010) reported that the establishment of AMCON also brought the modification of the Universal Banking system that existed before then in which banks were reclassified into development, commercial, and merchant. The AMCON reform also led to drastic adjustments in the corporate governance of banks, in terms of the dismissal or replacement of their CEOs.

Ford (2020) posited that though the years of political instability adversely affected the Nigerian banking industry, there were reforms aimed at strengthening the industry at the beginning of the new millennium. However, Ford noted that for many years, efforts to establish locally owned banks proved abortive due to the lack of institutional framework and expertise needed for efficient running. More locally owned banks were later established on the advice of the Central Bank of Nigeria. Ford observed that the initial problem that beguiled the Nigerian banking system in the late 1990s was not that there were not enough banking institutions, but that the existing banks were undercapitalized, hence weak and vulnerable. During the same periods, not much supervision was placed on the activities of bank executives and operations. Cases of non-performing loans, illiquidity, and fraud became pervasive.

According to the CBN (2010), the government, sensing danger, put some reforms to reinforce confidence in the banking system and strengthen the industry. The "Nigerian Deposit Insurance Corporation (NDIC) was established in 1988 to ensure depositors' funds in the banks and prevent deposit runs, thereby reducing liquidity and stability risks. The CBN subsequently tightened its regulatory oversight functions on banks, providing stiffer sanctions for defaulters. Ford (2020) opined that, in recent times, technological innovations have helped the Nigerian banking system less reliant on physical branches for penetration. Banking mobile apps and other digital banking services have become more popular.

Nevertheless, the perception of the Nigerian banking industry globally has remained poor due to the unfavourable indices from the industry. The Nigerian Finder (2020) reported that as of December 2020, there were 26 commercial and 860 micro-finance banks, 5 development banks and 64 finance houses in Nigeria.

The trend in the basic banking system stability determinants in Nigeria is depicted in Figure 1. These determinants are risk-related variables: credit to domestic private sector (CPS - a measure of credit risk), foreign sector liabilities (FOL - a measure of foreign market risk) and volume of deposit (DEP - a measure of liquidity). Between 1981 and 1999 there was no significant difference among the three variables as shown in Figure 1. However, credit to private sector and foreign liabilities increased sharply more than deposits thereafter. Nevertheless, whereas domestic private sector credit and foreign liabilities exhibited some up-and-down features after 2009, the volume of deposit has consistently been on the increase. This is not to conclude that increases in any of these variables portend a healthy banking industry in Nigeria as this study confirms.

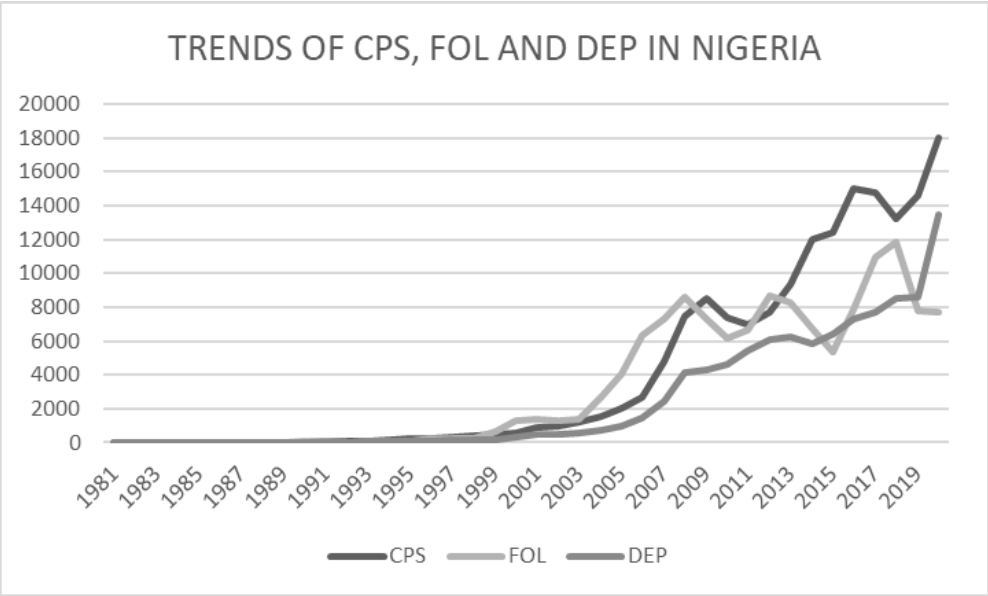

Figure 1: Basic Variables in Nigerian Banking System Stability

Source: Author's (2022)

2.2 Banking System Fragility

The fragility or stability of a banking system is determined an estimation of the banking system fragility index (BSFI). Kibritçioğlu (2003) defined the BSFI as 'the average standardized values of credit risk proxy, exchange rate risk proxy and liquidity risk proxy". The author categorized bank fragility periods into high and medium fragility. A highly fragile banking system has its BSFI lies between -0.5 and less while a medium fragile banking system has a BSFI between 0 and -0.5. Loloh (2014) categorized states of banking sector into two broad groups: risk taking and fragility. The two groups are however measured by estimated fragility index. The author split banking system risk taking behaviour into (i) normal risk-taking where the BSFI = 0; (ii) medium risk taking where the BSFI lies between 0 and 0.5 and (iii) excessive risk taking where the BSFI lies between 0.5 and 1. Furthermore, a banking system is adjudged to stable without fragility if the BSFI = 0; have medium fragility if the BSFI is less than 0 but greater than -0.5. Finally, a BSFI of -0.5 and above indicates a highly fragile banking system.

Loloh (2014) described the difference between banking system fragility and stability as illustrated in Figure 2.

Figure 2: Financial Stability Loop

Source: Loloh (2017)

As shown in Figure 1, when the banking system is relatively stable, operators can become risk loving because of the seeming boom in the financial market. Over time, the bubble may start busting and the banking system becomes fragile. Two possibilities come up: either the system experiences a shock or not. the former situation provides an opportunity for quick recovery while the latter leads to a banking system crisis. A banking system experiencing a crisis needs urgent policy action that will resolve the crisis. Such policy actions, which can re-direct the system back to recovery, will involve a high degree of risk aversion by operators in the system. Thereafter the system can return to stability as operators observe some moderate risk aversion behaviour. However, Loloh (2017) noted that a banking system can be fragile over time without drifting to crisis, depending on how regulatory authorities and market players react and manage the prevailing situation.

Different authors have assumed different reasons for banking system's fragility and crisis. Krugman (1998) and Zheng (2003) argued that overstatement and moral hazard are factors responsible for banks' problems. Han (2002) put the blame on the government's overbearing influence on the banking system. Yet there are those who adduced excessive indebtedness and information asymmetry as possible causes of bank fragility.

There are several reasons in the literature given for the banking system crisis, although in varied forms, the reasons share similar elements. Claessens and Kose (2013) listed sudden reforms, bank runs, banking system deregulation, macroeconomic disruptions, excess risk due to credit boom, institutional weaknesses, panics and contagion as some of these factors. According to Ayşegül (2021), early theories of bank crisis posit that bank runs and panic withdrawals are two major reasons for bank crises (Friedman & Schwartz, 1963). Banking is a business based on confidence but when people's expectations are

not met, or negative economic circumstances become pervasive, panic withdrawal is inevitable, and banks may be in liquidity problem. Such a situation may elicit assets liquidation to be able to discharge potential or actual losses. This scenario will undoubtedly lead to the fragility in the banking system.

Another school of thought on what causes bank fragility or crisis argues that asset structure deterioration is responsible for bank runs. Laeven and Valencia (2018) suggested that an economic boom creates a higher degree of optimism about future returns, hence, tends to obtain more bank credits for investment in expectation of high returns. However, a sudden economic slowdown can also cause a significant decline in the volume of credit available for investment which may make previous credit difficult to repay. Here, the banking system becomes fragile and vulnerable. Another school posited that banking system fragility will arise when banks maintain assets of poor quality caused by instability in extant macroeconomic variables, badly executed reforms policy somersaults, corruption, and fraud.

A third strand of theories on bank crises relates to the boom-induced crisis caused by asset bubbles and credit expansion. Asset bubbles are irregular increases in asset prices, which causes serious damage when they fall (Mishkin, 2008), this school states that excessive increase in stock and estate prices usually precedes banking crisis. Factors such as deficit financing by the government, expansionary monetary policy, stock price bubbles and rising debt can lead to a decrease of the quality banks' assets over time. The global economic and financial downturns of 2008 attest to the learning of this theory.

2.3 Empirical Literature

Varied metrics are used by authors to measure banking system fragility. Whereas some use the ratio of non-performing loans (NPLs) to total loans, others use variables such as deposit volume – credit ratio. Yet, other use profitability ratios. Kedira et *al* (2018), Iftikhar (2015) and Shen and Chen (2008) used NPLs, NPLs are loans that are doubtful or impaired. To these authors, a low NPLs ratio is a signal of a stable and sound banking system.

In the years before the global financial meltdown, Ungersboeck (2020) stated that Nigerian banks rapidly expanded credit to the private sector. The banks specifically pumped credits into the economy through the financing of oil and gas investments and increased margin loans. The author noted that the spiral increase in credits could not be sustained with the advent of the global financial crisis. As the global meltdown set in, the stock market crashed, oil prices slumped, and there was a high incidence of non-performing loans, resulting in the depletion of banks' balance sheets and some degree of illiquidity in the banking system.

Enebeli-Uzor and Ifelunini (2021) assessed the diversity and stability of the Nigerian financial system using the Hirschman Herfindahl (HH) Index, Principal Component Analysis (PCA), Simpson Index, Simple Regression as well as Granger causality modeling. The authors analyzed the quarterly banking sector data between 2006 and 2015 in an attempt to develop "an Aggregate Financial Stability

Index" that reflects the state of the financial system. First, the study found that diversity in the financial system aided its stability. Second, the study found that financial system stability and diversity bi-directionally caused each other. The authors, therefore, advocated a more diversified portfolio for banks if they want to remain stable, on one hand, and stricter regulation of the Nigerian banking system.

Kedir (2018) used panel data of 433 banks drawn from 46 countries in Africa to examine banking system fragility in the continent between 1997 and 2012. Using the dynamic generalized moment's method (GMM) to analyze selected bank-specific variables (NPLs, bank size in terms of assets, equity/asset ratio, loan growth ratio, and cost/income ration), and macroeconomic variables. The authors found that these two sets of variables are key determinants of banking system fragility. While past NPLs had a positive and significant effect on the present NPLs, loan growth negatively affected them, but economic growth also led to increased NPLs. Furthermore, equity/asset ratio and size (log of assets) had a negative effect on NPLs implying that these two variables reduce bank fragility. These findings agree with Iftikhar (2015) in a global banks-based study on banking system fragility. Ayşegül (2021) studied the early warning systems (EWSs) on bank fragility among selected Islamic banks in an attempt to predict bank fragility in the countries. The study used data from 81 banks drawn from 12 countries from 2008 to 2018. Results of the research showed that BSFIs were powerful predictors of the banking sector crisis.

Factor such as corruption has been cited as one of the causes of bank fragility. Bolarinwa and Soetan (2019) studied the effect of corruption on the profitability of 111 banks from 33 African countries, including Nigeria (for countries with high corruption index) and 56 banks from 10 developed countries with low corruption index between 2011 and 2018. Using the Generalized Method of Moments (GMM), the study found that corruption is a main influencer of profitability in both developed and developing countries. In the African countries selected, the corruption was found to weaken profitability while the reduction of corruption index in the developed countries spurred banks' profitability. Using the threshold regression modeling approach, Ben-Ali et al (2020), in a study of 38 countries in Africa, observed that between 2000 and 2017 corruption contributed significantly to bank fragility in the selected countries. Like Bolarinwa and Soetan, these authors found that low-income countries with high corruption index have a greater significant effect of corruption on their banks' stability than high-income countries.Kayode and Adaramola (2018), in an examination of size – performance effect of Nigerian banks, submitted that size did not significantly contribute to a better bank performance, rather it impaired it, especially with respect to the number of branches and employees. The study observed that Nigerian banks operated sub-optimal size structures which adversely affected their profitability. In a study conducted by Aliero and Ache (2017) to investigate the determinants of banking system failure in Nigeria, the authors used the auto-regressive distributed lag (ARDL) and Granger causality to examine the relationship between exchange rate, interest rate, capital adequacy ratio, non-performing loans and liquidity ratio and bank failure between 1970 and 2013. The study found that these variables exerted a significant effect on bank failure in the long-run. A bi-directional causality between the variables and bank failure was also discovered.

Fowowe (2010) examined the effect of liberalization on the state Nigerian banks from 1980 to 2002 to establish whether the exercise led to the fragility of the banking system. The author found that the liberalization of the Nigerian banking system contributed significantly to the fragility of the system during the period of study.

This study is structured in sections. Section one introduces the study, capturing the background, motivation and the focus of the study while section two contains a brief on the Nigerian banking system, the concept of banking system fragility and empirical literature. Section three outlines the research methodology while section four contains the analysis of data. Finally, section five summarizes the study and provides some policy recommendations based on the findings of the study.

3. Methodology

We sourced aggregate banking system specific annual data from the Statistical Bulletin of the Central Bank of Nigeria for a 40-year period (1981 to 2020). The dataset extracted included those of credit to domestic private sector, total deposit of the banking system and foreign liabilities in the domestic banking system. For the purpose of lagging, we used the data of 1981 to 2020. We adopt the model of banking system fragility index estimation by Kibritcioglu (2003), but changed the abbreviations, to analyze the data of Nigerian banking industry from 1981 to 2020.

The model is expressed as:

$$BSFI_t = \frac{\left[\frac{CPS_t - \mu CPS}{\delta CPS}\right] + \left[\frac{DEP_t - \mu DEP}{\delta DEP}\right] + \left[\frac{FOL_t - \mu FOL}{\delta FOL}\right]}{3} \quad \ldots\ldots\ldots\ldots \text{(i)}$$

Where:

BSFI = Banking system fragility index

CPS = Total credit to domestic private sector

DEP = Total deposit in the banking system

FOL = Total foreign liabilities

t = time

μ = arithmetic mean

δ = standard deviation

However, since fragility depends on changes over time, the variables in equation (i) will be measured in changes between the present and previous years so that:

$$CPS_t = \frac{(CPS_t - CPS_{t-1})}{CPS_{t-1}} \quad \text{..... (ii)}$$

$$DEP_t = \frac{(DEP_t - DEP_{t-1})}{DEP_{t-1}} \quad \text{.....(iii)}$$

$$FOL_t = \frac{(FOL_t - FOL_{t-1})}{FOL_{t-1}} \quad \text{.....(iv)}$$

The value of BSFI can be negative or positive. The more negative the BSFI, the more fragile the banking system is and vice versa.

4. Results and Discussions

The data analyzed here are contained in Appendix 1. We used equations (ii) – (iv) to estimate the values of CPS, FOL and DEP and equation (i) to estimate the banking system fragility index for 1981 – 2020. The comprehensive calculation is done in Appendix 2. The behaviour of BSFI over the study period is described in Figure 2 and Table 1

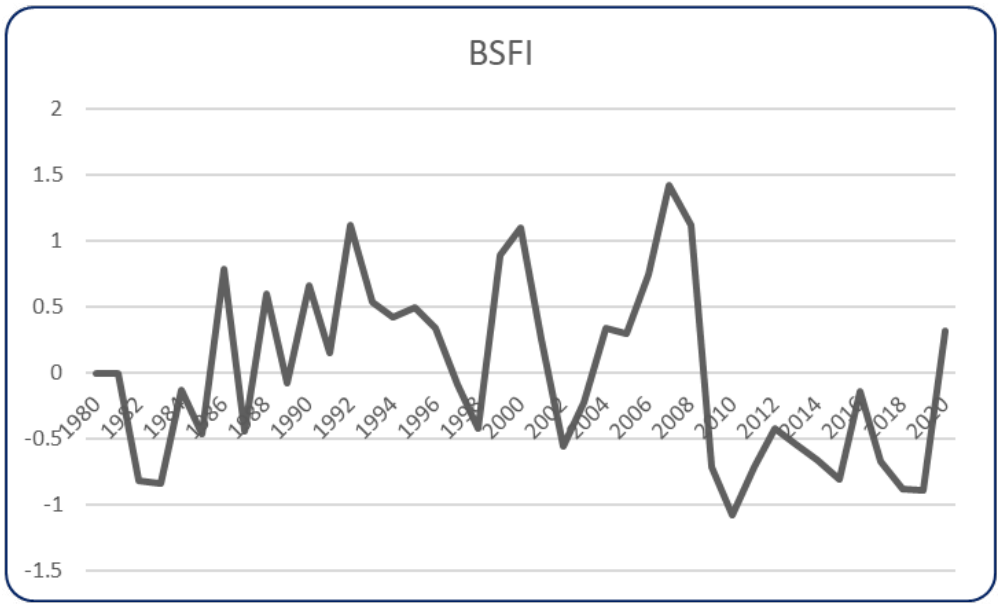

Figure 2: Nigerian Banking System Fragility Index (1981-2022)

Source: Author's (2022)

Table 1: Fragility Periods and Characteristics

S/N	YEAR(S)	AVERAGE BSFI	STATE	POSSIBLE REASONS/EVENTS	REMARKS	Source
1	1981 - 1987	-0.5810	Fragile	SAP, Banking System Liberalization,	The introduction of the Structural Adjustment Programme brought a Shock to the banking system	Fowowe (2011) Omankhanlen (2012)
2	1988	0.6005	No Fragility (Strong)	Relaxation of restrictions on bank portfolio	Slight, short-lived recovery	Omankhanlen (2012)
3	1989	-0.0745	Fragile	More deregulation of the banking system	Low fragility due to guided deregulation	Ford (2020)
4	1990-1996	0.4609	No Fragility (Strong)	Tight monetary policies such as review of banks capital adequacy standards, accounting procedure reforms	Increased monitoring and regulations, yet increased risk taking	Omankhanlen (2012)
5	1997-1998	-0.2562	Fragile	Pre-democratic elections spending, expansion of credit and rise in cases of non-performing loans	Fragility caused by previous years rise in risk taking, credit expansion to oil and gas sector	Ungersboeck (2020); Raji (2017)
6	1999 - 2001	0.7484	No Fragility (Strong)	Advent of new democratic government with programmes and policies that strengthened the banking system, re-entrance of foreign owned banks	The banking system recovered temporarily	Ford (2020); Omankhanlen (2012)
7	2002-2003	-0.3939	Fragile	Relaxed monetary policy, e.g. introduction of universal banking model	Expansionary monetary policy led banks to expand credit, including excessive risk-taking	Makanjuola (2015) Omankhanlen (2012)
8	2004-2008	0.78472	No Fragility (Strong)	Consolidation of banking system; banks were re-capitalized leading to the emergence of mega-banks	This was a period of unprecedented reform in the Nigerian banking system	Alford (2010); Amenawo *et al* (2018),
9	2009-2019	-0.68488	Fragile	Global financial and economic shock and its aftermath. AMCON was then set up to bail out the banks, some degree of liberalization, universal banking abolished	The entire financial system collapsed, starting from the stock market and later to other sectors of the economy	Ungersboeck (2020) Omankhanlen (2012)
10	2020	0.3158	No Fragility (Strong)	COVID-19 era, banks did not give much credit during this period	Not many activities were recorded during the COVID-19 quagmire by banks.	Awosusi & Kayode (2021). Flogel & Gartner (2020)

Source: Author's (2022)

All BSFIs below 0 imply that the banking system is fragile while BSFIs = 0 implies that the system is not fragile. However, BSFIs above 0 suggest that the banking system is not fragile but strong/ stable. This latter scenario may also mean that the banking system is high in risk-taking.

From Figure 2, the BSFIs were negative from 1982 to 1987, stable in 1988 with positive BSFI and reverting to negative (fragility) in 1989. The system remained strong and stable from 1990 to 1996 with an average BSFI of 0.4605. A two-year fragile era was witnessed by the banking system in 1997 and 1998 when an average BSFI of -0.2562 was recorded. There was no fragility in the banking system from 1999 to 2001 with an average BSFI of 0.7484 while the period 2002 to 2003 witnessed banking system fragility (BSFI = 0.3939).

From 2004 to 2008 the banking system was strong when the BSFI was 0.78472. This period fell within the banking system consolidation era in Nigeria when recapitalization, restructuring and mergers/ acquisitions enabled the system to become stable and strong. However, the boom experienced in the Nigerian banking system was soon overshadowed by excessive risk-taking in the system and the global economic crisis. Between 2009 and 2019, the banking system witnessed a prolonged period of fragility (average BSFI = -0.68488). The no-fragility recorded in 2020 (BSFI = 0.3157) was most probably due to the inactiveness of the system during the shutdown occasioned by the COVID-19 pandemic. The total number of years when the Nigerian banking system was in a fragile state is 22 (56%) out of the 39 years covered in the study. This is rather a high number for a banking system that ought to be strong all through the years.

4.1 Discussion of Findings

This study examined the episodes in the Nigerian banking system from 1981 to 2020 in order to ascertain its health in terms of strength or fragility. A banking system is adjudged to be fragile if it is vulnerable to systemic and macroeconomic occurrences to such an extent that the occurrences pose a high risk to the continued health of the banking system. We used the Kibritcioglu (2003) technique to estimate the banking system fragility index for each of the years under study. We extracted secondary data of the banking system (credit to private sector, foreign liabilities in the domestic banking system and total deposits in the banking system) from the Annual Statistical Bulletin of the Central Bank of Nigeria.

We graphed and tabulated the Nigerian banking system fragility indices during the study period. Results of our analysis revealed that out of the 40-year period examined, the banking system was fragile for a total of 23 years, representing 57.8% while the system was strong for 17 years (42.5%).

The null hypothesis guiding this research is that the Nigerian banking system has not been fragile over the years. Findings from the study reveal the contrary as the system has been fragile for a greater part of the period. Given that the system should not be fragile for as many years as possible for it to remain

in stable, strong and contribute reasonably to economic development, the Nigerian banking system has been, for a greater part of its existence, hanging on the precipice based on the findings. The seemingly strong state of the banks in 2020 could be attributable to the absence of banking activities for a greater part of the year due to the general lockdown caused by the COVID-19 pandemic. The system would, most probably have been fragile if the banks operated freely throughout the year.

A closer look at the period-by-period analysis of the banking sector fragility in Nigeria reveals that most of the periods when the sector experienced fragility were characterized by expansionary monetary policy, liberalization/deregulation of the financial system, expansion of credits and the global financial meltdown. The years 1981 to 1987, 1989 and 2002 to 2003 when the banking sector became fragile were the periods of liberalization, SAP, deregulation and relaxation of extant monetary policies. This finding is consistent with Fowowe (2011) and Kedir (2018). The year 2009 was characterized by the effect of the global financial meltdown and the aftermath continued until the end of 2019 when COVID-19 pandemic brought the banking sector into some level of inactiveness.

On the other hand, the study reveals that periods when the Nigerian banking sector was characterized by amending extant banking laws to accommodate improved banks' portfolio (1988), tight monetary policy (1990-1996), entrance of foreign banks into the domestic banking space (1999-2001), the bank consolidation exercise (2004-2008) and the COVID-19 induced lull in banking activities in 2020. We observe that banking system stability is a characteristic of tight monetary policy and regulation of the banking system while its fragility is more pronounced during the deregulation of the financial system.

5. Conclusion and Recommendations

This study estimated the fragility indices of the Nigerian banking sector since 1981 to 2020 in order to ascertain the extent to which the sector has been stable or fragile during the years. Based on results obtained, it was observed that deregulation, expansionary monetary policies and increased spending fueled banking system fragility and tight/restrictive monetary policies, consolidation and the COVDI-19 pandemic might have aided the stability of the sector. It was also observed that the Nigerian banking system is still vulnerable and hanging on a fragile edge. Although the Nigerian banking system boasts to be "one of the most robust banking systems in Africa" (Enebeli-Uzor & Ifelumini, 2021), results from this study reveal that it is still bedeviled with fragility. This finding is not only significant for operators in the domestic banking sector and the government, but also important for the international trade partners and investors. If a fragile banking system boasts of being more robust than others in the African continent, it connotes that the other countries banking systems are equally weak and fragile.

We recommend that financial system regulatory authorities roll out more stringent monetary and banking policies or at most, a well-guided, mild deregulation. The periods of fragility are associated with relaxed monetary policies and deregulation of the banking system; hence, bankers should also be wary of excessive risk taking in a booming banking period as such inevitably leads to fragility in the years ahead. This study advocates further research into banking sector fragility in Nigeria in subsequent years, particularly with respect to the post-first wave of the COVID-19 pandemic.

References

Alford, A. (2010). Nigerian banking reform: Recent actions and future prospects, Article on The Implementation of The Banking Sector Consolidation Agenda and Reforms Introduced During the Crisis,. Available from: https://papers.ssrn.com/sol3/ papers.cfm?abstract_id=1592599

Aliero, H. M. & Ache, P. (2017). Determinants of bank failure in Nigeria: An empirical investigation, *Nigerian Deposit Insurance Corporation Quarterly, 31(12)*, 43-62

Awosusi, C.T. & Kayode, P. A. (2021). The COVID-19 rages on: How did Nigerian banks' stock react? *Asian Journal of Economics, Business and Accounting, 21*(18): 17-29, DOI: 10.9734/AJEBA/2021/v21i1830494

Ayşegül A. E. (2021). Constructing fragility indices for Islamic banks: Definition impact on the predictive power of an early warning system, Ph.D Dissertation, Hacettepe University Graduate School of Social Sciences, Ankara,

Barth, J. R. *et al* (2007). Rethinking bank regulation: Till angels govern. *Economica, New Series* 74(293): 177–179.

Barth, J. R. *et al.* (2006). Bank regulation and supervision: What works best? *Journal of Financial Intermediation* 13: 205–248.

Barth J. R. & G. Caprio, J. (2018). 'Regulation and supervision in financial development' in Beck T. and R. Levine (2018), 'Handbook of Finance and Development', 394–418.

Beck, T. & Levine, R. (2003). Legal institutions and financial development', World Bank Policy Research Working Paper No. 3136, Washington, Available at: http://econ.worldbank.org/files/29888_ wps3136.pdf

Ben-Ali, M. S. et al (2020). How does corruption undermine banking stability? A threshold nonlinear framework, *Journal of Behavioral and Experimental Finance, 27*, https://doi.org/10.1016/j.jbef.2020.100365.

Bolarinwa, S. T. & Soetan, F. (2019). The effect of corruption on bank profitability, *Journal of Financial Crime, 26*(3), 753-773, DOI 10.1108/JFC-09-2018-0102

Central Bank of Nigeria (2010). An overview of current banking sector reforms and the real sector of the Nigerian economy, *Economic and Financial Review* 48(14), 31-54.

Claessens, S. & Kose, M. A. (2013). Financial crises explanations, types, and implications. *IMF Working Papers*, *13*(28), 1. doi:10.5089/9781475561005.001.

Enebeli-Uzor, E. S & Ifelunini, A. I. (2021). Assessment of Nigeria's financial services sector stability and diversity, *African Economic Research Consortium, Policy Brief No. 754, Available*

at: www.aercafrica.org.

Flogel, F. & Gartner, S. (2020). The COVID 19 pandemic and relationship banking in Germany: Will regional banks cushion an economic decline or is a banking crisis looming? Tijdschrift Voor Economische En Sociale Geografie, 2020;111(3):416–433. Available:https://doi.org/10.1111/tesg.12440

Ford, N. (2020). Nigerian banking at 60, *African Business,* Accessed on June 10, 2022, Available at:https://african.business/2020/10/finance-services/nigerian-banking-at-60/

Friedman, M. & Schwartz, A. J. (2017). A monetary history of the United States, 1867-1960. *Modern Economic Classics-Evaluations Through Time,* doi:10.4324/9781315270548-21

Fowowe, B. (2010). Financial liberalisation and financial fragility in Nigeria, *Central Bank of Nigeria Economic and Financial Review, 48*(*1*), 71-92.

Gonzalez-Hermosil, L.O *et al.* (1997). Determinants of banking system fragility: A case study of Mexico, IMF *Staff Papers,* 44(3), 1-20.

Han, J. (2000). *Banking System Stability.* China Financial Publishing House, 22-35.

Iftikhar, S. F. (2015). Financial reforms and financial fragility: A panel data analysis. *International Journal of Financial Studies*, 3, 84–101. doi:10.3390/ijfs3020084

Jegede, C.A. (2014). Banking sectors reform in Nigeria: Implications and challenges. *Journal of Policies and Development Studies* 9 (1): 248–257.

Kayode, P. A & Adaramola, A. O. (2018). Size – performance nexus in the Nigerian banking industry: A causal analysis, *International Journal of Management Studies, Business and Entrepreneurial Research*, 3(2,), 158-186; http://www.casirmediapublishing.com

Kedira, A. M. *et al.* (2018), Bank fragility in Africa: GMM dynamic panel data evidence, *Transnational Corporations Review,* 1-21, https://doi.org/10.1080/19186444.2018.1 475105

Krugman, P. (1998). What happened to Asia? Available at www.mit.edu./people/Krugman, 1999-12-24.

Laeven, L. & Valencia, F. (2018). Systemic banking crises revisited. *IMF Working Papers*, *18*(206), 1. doi:10.5089/9781484376379.001

Loloh, F. W. (2017). *M*easuring banking sector fragility for an early warning system in Ghana, Financial Stability Department, Bank of Ghana, Working Paper, WP/BOG-2014/09, 1-23, Available at: https://www.researchgate.net/publication/315375193.

Makanjuola Y. (2015). Banking reform in Nigeria, the aftermath of the 2009 financial crisis., Palgrave Macmillan London, https://doi.org/10.1007/978-1-137-49353-8, cited in Ungersboeck (2020)

Mishkin, F. S. (2008). How should we respond to asset price bubbles? *Banque de France Financial Stability Review*, *12*, 65–73

Offiong, A. I. & Riman, H. M. (2018). Contemporary banking policies and the fragility of the Nigerian banking sector, *International Journal of Banking and Finance Research*, 4(3), 18-29

Omankhanlen, A. E. (2012). The financial sector reforms and their effect on the Nigerian economy, *Economy Transdisciplnary Cognition, 15*(2), 45-57.

Raji, R. (2017). Nigeria's banking system remains fragile, *African Business,* October 30th, 2017, https://african.business/2017/10/finance-services/nigerias-banking-system-remains-fragile/ accessed June 2, 2022

Rajan, R. G. & Zingales, L. (2003). *Saving capitalism from the capitalists: Unleashing the power of financial markets to create wealth and spread opportunity*. New York: Crown Business.

Shen, C., & Chen, C. (2008). Causality between banking and currency fragilities: A dynamic panel model. *Global Finance Journal*, 19, 85–101; doi: 10.1016/j.gfj.2007.11.003

Sobodu, O. O. & Akiode, P. O. (1998), Bank performance and supervision in Nigeria: Analysing the transition to a deregulated economy', *African Economic Research Consortium*, 1–62.

The Nigerian Finder (2022). Banking system in Nigeria: How everything works, Accessed on June 10, 2022. https://nigerianfinder.com/banking-system-in-nigeria/

Ungersboeck, P. (2020). The global financial crisis in Nigeria: AMCON's banking sector recapitalization Preliminary Yale Program on Financial Stability (YPFS) Discussion Draft Available on: https://ypfsresourcelibrary.blob.core.windows.net/fcic/YPFS/

Yunyi, W. (2019). The banking fragility index panorama in China, Research Association of Interdisciplinary Studies Conference Proceedings, August 19-20: DOI: 10.5281/zenodo.3386244

Zheng, M. (2003). The relationship between fragility of the banking system and market-oriented reforms in China, *Economic Issues in China* (3): 45-52.

Appendix 1: Nigerian Banking System Data

A	B	C	D
YEAR	CPS (N'bn)	FOL (N'bn)	DEP (N'bn)
1980	NA	NA	NA
1981	9.6705	2.585	4.8809
1982	11.611	0.888	5.1807
1983	12.238	0.501	5.8556
1984	12.895	1.111	6.3435
1985	14.139	1.418	7.0462
1986	18.3	5.368	6.6498
1987	21.893	3.701	7.998
1988	25.473	9.492	10.668
1989	29.644	22.52	10.188
1990	35.437	43.91	15.589
1991	42.079	56.05	22.049
1992	79.959	35.78	33.264
1993	95.53	63.56	49.924
1994	151	56.22	65.349
1995	211.36	108.7	79.469
1996	260.61	238	95.904
1997	319.51	234	125.41
1998	372.57	247	142.25
1999	455.21	666.3	202.15
2000	596	1275	345
2001	855	1348	448.02
2002	955.76	1282	503.87
2003	1212	1388	577.66
2004	1534.4	2645	728.55
2005	2007.4	4098	946.64
2006	2650.8	6308	1497.9
2007	4784.3	7340	2456
2008	7444.7	8629	4174.4
2009	8529.6	7325	4283.4
2010	7367.6	6195	4639.2
2011	6972.4	6644	5407.2
2012	7672.7	8716	6068.5
2013	9343.1	8262	6256.3
2014	11986	6744	5834.7
2015	12448	5325	6377.2
2016	14984	7852	7316.1
2017	14767	10977	7697.4
2018	13227	11839	8494.6
2019	14602	7825	8625.8
2020	18024	7717	13481

Source: Authors (2022)

Appendix 2: Estimation of BSFI

A	B	C	D	E	F	G	H	I	K	L	M	N	O	P	Q
YEAR	CPS-LAST YR	FOL-LAST YR	DEP-LAST YR	RCPS	RFOL	RDEP	cps-mean	fol-mea	dep-mea	H/SD	I/SD	J/SD	TO-TAL	BSFI	VERDICT
1980	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-
1981	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-
1982	1.9409	-1.697	0.3	0.2007	-0.656	0.0614	-0.0283	-1.03504	-0.1812	-0.1345	-1.475	-0.838	-2.4477	-0.8159	HIGH FRAGILITY
1983	0.6264	-0.387	0.675	0.0539	-0.435	0.1303	-0.1751	-0.81402	-0.1124	-0.8315	-1.16	-0.52	-2.5112	-0.8371	HIGH FRAGILITY
1984	0.6575	0.6093	0.488	0.0537	1.2152	0.0833	-0.1753	0.8366	-0.1593	-0.8325	1.1921	-0.737	-0.3773	-0.1258	MEDIUM FRAGILITY
1985	1.2437	0.3077	0.703	0.0964	0.277	0.1108	-0.1326	-0.10156	-0.1319	-0.6296	-0.145	-0.61	-1.3844	-0.4615	MEDIUM FRAGILITY
1986	4.1609	3.9494	-0.396	0.2943	2.7844	-0.056	0.0653	2.40581	-0.2989	0.30993	3.4282	-1.383	2.3555	0.7852	HIGH FRAGILITY
1987	3.5926	-1.667	1.348	0.1963	-0.311	0.2027	-0.0327	-0.68921	-0.0399	-0.1553	-0.982	-0.185	-1.322	-0.4407	MEDIUM FRAGILITY
1988	3.58	5.7919	2.67	0.1635	1.5652	0.3338	-0.0655	1.18657	0.09117	-0.3111	1.6908	0.4217	1.8015	0.6005	NO FRAGILITY
1989	4.1714	13.032	-0.48	0.1638	1.3729	-0.045	-0.0653	0.99428	-0.2876	-0.3099	1.4168	-1.33	-0.2236	-0.0745	MEDIUM FRAGILITY
1990	5.7927	21.386	5.401	0.1954	0.9494	0.5301	-0.0336	0.57085	0.28746	-0.1596	0.8135	1.3297	1.9835	0.6612	NO FRAGILITY
1991	6.6424	12.135	6.46	0.1874	0.2764	0.4144	-0.0416	-0.10222	0.17176	-0.1975	-0.146	0.7945	0.4514	0.1505	NO FRAGILITY
1992	37.88	-20.27	11.21	0.9002	-0.362	0.5086	0.6712	-0.74021	0.26597	3.1875	-1.055	1.2303	3.363	1.121	NO FRAGILITY
1993	15.571	27.781	16.66	0.1947	0.7765	0.5009	-0.0343	0.39788	0.2582	-0.1628	0.567	1.1943	1.5985	0.5328	NO FRAGILITY
1994	55.471	-7.339	15.43	0.5807	-0.115	0.309	0.3516	-0.49406	0.06632	1.66996	-0.704	0.3068	1.2727	0.4242	NO FRAGILITY
1995	60.358	52.443	14.12	0.3997	0.9328	0.2161	0.1707	0.55421	-0.0266	0.81066	0.7897	-0.123	1.4775	0.4925	NO FRAGILITY
1996	49.255	129.32	16.43	0.233	1.1901	0.2068	0.004	0.81147	-0.0358	0.01906	1.1563	-0.166	1.0096	0.3365	NO FRAGILITY
1997	58.899	-3.963	29.51	0.226	-0.017	0.3077	-0.003	-0.39525	0.06503	-0.0144	-0.563	0.3008	-0.2768	-0.0923	MEDIUM FRAGILITY
1998	53.062	13.026	16.84	0.1661	0.0557	0.1343	-0.063	-0.32293	-0.1084	-0.299	-0.46	-0.501	-1.2604	-0.4201	HIGH FRAGILITY
1999	82.631	419.23	59.9	0.2218	1.697	0.4211	-0.0072	1.31841	0.17843	-0.0344	1.8787	0.8254	2.6697	0.8899	NO FRAGILITY
2000	140.8	608.75	142.8	0.3093	0.9137	0.7066	0.0803	0.53507	0.46399	0.38125	0.7625	2.1462	3.2899	1.0966	NO FRAGILITY
2001	259	72.538	103	0.4346	0.0569	0.2986	0.2055	-0.3217	0.05596	0.9761	-0.458	0.2588	0.7765	0.2588	NO FRAGILITY
2002	100.76	-65.34	55.85	0.1179	-0.048	0.1247	-0.1112	-0.42708	-0.118	-0.528	-0.609	-0.546	-1.6823	-0.5608	HIGH FRAGILITY
2003	256.23	106.02	73.79	0.2681	0.0827	0.1465	0.0391	-0.29591	-0.0962	0.18553	-0.422	-0.445	-0.6811	-0.227	MEDIUM FRAGILITY
2004	322.45	1256.4	150.9	0.2661	0.9051	0.2612	0.037	0.52647	0.01855	0.17585	0.7502	0.0858	1.0119	0.3373	NO FRAGILITY
2005	472.91	1453.8	218.1	0.3082	0.5497	0.2993	0.0792	0.17111	0.05669	0.37598	0.2438	0.2622	0.8821	0.294	NO FRAGILITY
2006	643.46	2209.4	551.3	0.3206	0.5391	0.5823	0.0915	0.16048	0.33968	0.43467	0.2287	1.5712	2.2346	0.7449	NO FRAGILITY
2007	2133.4	1031.9	958.1	0.8048	0.1636	0.6396	0.5758	-0.21501	0.39696	2.73449	-0.306	1.8362	4.2643	1.4214	NO FRAGILITY
2008	2660.4	1289.4	1718	0.5561	0.1757	0.6997	0.3271	-0.20292	0.45703	1.55321	-0.289	2.114	3.3781	1.126	NO FRAGILITY

2009	1084.9	-1304	109.1	0.1457	-0.151	0.0261	-0.0833	-0.52975	-0.2165	-0.3956	-0.755	-1.002	-2.152	-0.7173	HIGH FRAGIL-ITY
2010	-1162	-1130	355.7	-0.1362	-0.154	0.083	-0.3653	-0.53281	-0.1596	-1.7346	-0.759	-0.738	-3.2321	-1.0774	HIGH FRAGIL-ITY
2011	-395.2	448.6	768	-0.0536	0.0724	0.1656	-0.2827	-0.30618	-0.0771	-1.3424	-0.436	-0.357	-2.1354	-0.7118	HIGH FRAGIL-ITY
2012	700.29	2071.9	661.3	0.1004	0.3119	0.1223	-0.1286	-0.06674	-0.1203	-0.6107	-0.095	-0.557	-1.2625	-0.4208	MEDIUM FRAGIL-ITY
2013	1670.4	-453.5	187.8	0.2177	-0.052	0.031	-0.0113	-0.43062	-0.2117	-0.0537	-0.614	-0.979	-1.6466	-0.5489	HIGH FRAGIL-ITY
2014	2642.5	-1518	-421.6	0.2828	-0.184	-0.067	0.0538	-0.5623	-0.31	0.25551	-0.801	-1.434	-1.9799	-0.66	HIGH FRAGIL-ITY
2015	462.48	-1420	542.5	0.0386	-0.211	0.093	-0.1904	-0.58912	-0.1497	-0.9044	-0.839	-0.692	-2.4362	-0.8121	HIGH FRAGIL-ITY
2016	2536.3	2527.6	938.9	0.2037	0.4747	0.1472	-0.0253	0.09612	-0.0954	-0.12	0.137	-0.441	-0.4244	-0.1415	MEDIUM FRAGIL-ITY
2017	-217.4	3125.2	381.3	-0.0145	0.398	0.0521	-0.2435	0.01942	-0.1905	-1.1566	0.0277	-0.881	-2.0102	-0.6701	HIGH FRAGIL-ITY
2018	-1540	861.34	797.3	-0.1043	0.0785	0.1036	-0.3333	-0.30013	-0.1391	-1.5829	-0.428	-0.643	-2.6539	-0.8846	HIGH FRAGIL-ITY
2019	1375.1	-4013	131.1	0.104	-0.339	0.0154	-0.1251	-0.7176	-0.2272	-0.5939	-1.023	-1.051	-2.6675	-0.8892	HIGH FRAGIL-ITY
2020	3421.9	-107.8	4855	0.2343	-0.014	0.5629	0.0053	-0.39237	0.32023	0.02526	-0.559	1.4812	0.9474	0.3158	NO FRA-GILITY

Source: Authors (2022)