



WHAT DRIVES BANKING STABILITY? EMPIRICAL EVIDENCE FROM ECOWAS COUNTRIES

Mustapha A. Akinkunmi¹

¹Brickfield Road Associates Limited. 16, Akin Adesola Street, Victoria Island, Lagos, Nigeria



ABSTRACT

Article History

Received: 19 September 2017

Revised: 12 December 2017

Accepted: 18 December 2017

Published: 27 December 2017

Keywords

Stability

Institutional quality

Fixed effect.

The study investigated the drivers of banking stability in ECOWAS countries. The results show that the stability in the banking sector is mainly influenced by the banking spread (Net Interest Margin-NIM). However, it finds that crises in the banking sector pose a negative influence on stability. In addition, the result reveals that high percentage of foreign banks reduces stability in the banking industry. The impact of income diversification has a positive influence on stability even though the effect is weak. Similarly, the impact of more concentrated banking industry on stability is positive but insignificant.

1. INTRODUCTION

All economic agents need a sound banking system to effectively and efficiently carry out their economic activities. Banks serves as a channel of transmitting surplus funds to deficit units. They also perform the role of quality controlling in well-functioning economies in areas of capital seeking, higher returns and improved growth. Owing to this, bank regulators have been paying more serious attentions on ensuring a stable banking system especially after the recent global financial crises. This constrains central banks in attaining their policy objectives as the banking system battles with the global shock. In addition, the impact of monetary policy on the economy is channeled through the sector. Therefore, the sector is considered as one of the key sectors in the economy (Klomp and De Haan, 2014).

In most developing economies like Nigeria, the banking sector is considered as the major source of risk for the entire financial system. Thus, securing financial stability in those countries largely depends on the stability of the banking sector. The adverse effect of the recent global financial crises on the industry leads to calls for more regulatory and policy directions on ensuring a stable banking system. Quite a number of research have examined the drivers of financial stability by including competition, foreign entry, efficiency, size, profitability etc. Most focus on utilizing one or two drivers of stability. In addition, majority of these studies have specifically paid attentions to advanced countries (Beck *et al.*, 2013).

This study provides its uniqueness from past studies in the following: First is the use of a country-level dataset, which offer a comprehensive understanding of factors that influence the stability of the entire banking sector. Furthermore, the entire stability can better be evaluated at the aggregate level rather than at the micro spectrum. Therefore, assessment of the bank stability is carried out using aggregate variables in ECOWAS countries. Second

is that the study examines banking crises in each commercial bank as well as approaches employed to mitigate the crises. Third, it applies Z-score for measuring banking stability. Fourth, it examines the impact of institutional quality of the stability of the industry. Fifth, it employs a fixed-effect estimation technique to ensure robust results. Sixth, it investigates all these links concomitantly as well as their effect on stability. Up to now, little or scanty research has been done in this aspect.

The remaining of the study is segmented into five sections. Section Two reviews the latest works on banking stability while methodology is presented in Section Three. Section Four describes the nature and source of data. Empirical results are reported and discussed in Section Five while Section Six is concluding remarks.

2. REVIEW OF LATEST WORKS

2.1. Foreign Entry and Banking Stability

Several studies examined the effects of foreign banks on the bank stability in emerging economies during the financial crisis period. For instance, Schmidt (2009) revealed that foreign banks experience higher competition and lower profits when compared to indigenous banks. Claessens *et al.* (2001) found that the evidence of increased efficiency and increasing vie after the entry of foreign banks into emerging markets. Similar result is also revealed in Koutsomanoli-Filippaki *et al.* (2009) for their country-specific studies.

Giannetti and Ongena (2009) concluded that the response of domestic banks to the entry of foreign banks is to reduce their own lending. Similarly, Gormley (2010) finding shows a regular fall in domestic bank loans as the foreign banks entered into Indian banking industry. Based on this, it will be more interesting to investigate how the entry of foreign banks influences the stability of Nigeria's banking sector.

2.2. Bank Competition and Banking Stability

Inconclusive results are emanated from the relationship between competition and stability. The two major perspectives on the competition-stability nexus are "the competition fragility perspective" and "the competition-stability perspective". Studies such as Keeley (1990); Boyd *et al.* (2006); Beck *et al.* (2013); Kasman and Kasman (2015) believe that competition adversely influences bank stability. Their view is that higher competition reduces banks' market power and profit margins. This triggers banks to engage in more risky activities in order to stay in business. This risk exposure negatively affects the bank stability. For example, Boyd *et al.* (2006) examined the link between stability and competition for 2500 small rural banks in the US and 2700 banks from 134 developing countries. With the use of HHI as a measure of competition and Z-score as bank risk, they found a significant inverse relationship between competition and stability in both samples. Similarly, Maudos and Amparo (2005) supports the competition-fragility view when employing Lerner indexes as a measures of market power. Beck *et al.* (2013) investigates the relationship between bank competition and bank stability by including other variables like market, regulatory and institutional features. They finds that a rise in competition poses a huge influence on bank instability in economies with stricter activity restrictions, lower systemic fragility, better developed stock exchanges, more generous deposit insurance and more effective systems of credit information sharing.

However, the proponents of "the competition-stability perspective" believe that competition really enhances stability. They postulated that higher competition triggers a reduction in interest rates. With competition in the sector, banks mitigate moral hazards and adverse selection in their loan disbursement through a careful technique. This action limits default rates, and thus strengthen stability. Uhde and Heimeshoff (2009) employed an aggregated dataset of 25 EU countries to examine the influence of market concentration on financial soundness. They found an adverse connections between banking market concentration and financial soundness in EU. In the same vein, Kasman and Carvallo (2014) estimated cost and revenue efficiency scores, financial stability scores(Z-scores) and competition scores(Lerner indexes and Boone indicators) for 272 commercial banks in fifteen Latin American countries over the sample period, 2001-2008. Their findings indicate that more competition creates a room for

greater financial stability (when the revenue efficiency score is applied). [Kasman and Kasman \(2015\)](#) investigated the influence of competition and concentration on bank stability in Turkey by utilizing the Boone indicator and the efficiency-adjusted Lerner index as measures for competition, while bank stability is captured with nonperforming loans(NPL) ratio and Z-scores. Their results reveal that competition adversely affects the NPL ratio but positively influences the Z-score. The similar results were revealed when the quadratic measures of competition are utilized. In the light of this, this study analyses how competition influences the level of stability in the ECOWAS region.

2.3. Income Sources and Banking Stability

Dynamic natures of income sources for banks have been considered as a crucial factor that influences the stability. For instance, [Demirguc-Kunt and Huizinga \(2010\)](#) postulated that income diversification is regarded as a key contributing factor to banks fragility as banks rely more on fee-based income. [Busch and Kick \(2009\)](#) reveal that commercial banks in Germany experience more stability in their fee income between 1995 and 2007. [Ashraf and Goddard \(2012\)](#) utilized a dataset of commercial banks in the US for the period 2001-2009. They discovered that banks with declining growth of loan portfolio have higher probability of diversifying their income stream through involving in more fee-based activities. [Stiroh \(2004\)](#) employed a quarterly dataset of US banks from 1984 to 2001 and found that banks with greater dependence on non-interest income confronted with the issue of higher risk and lower risk-adjusted returns. Similarly, [Demirguc-Kunt and Huizinga \(2010\)](#) supports the evidence of Stiroh and concludes that higher fee income is attached with some potential risk diversification gain but at miniature levels.

2.4. Institutional Quality and Banking Stability

Financial sector development needs a proper legal and regulatory framework. Therefore, many past studies examined the impact of institutional quality on financial development. For example, [Porta et al. \(1997\)](#) pointed out that larger and better developed financial markets are based on appropriate legal systems that provide protection for investors against expropriation. [Girma and Shortland \(2008\)](#) as well as [Huang \(2010\)](#) found that political institutions positively affect financial development. Similarly, [Bhattacharyya \(2013\)](#) suggested that democratization triggers a more market-based financial system, whereas [Beck and Levine \(2003\)](#) identified the relevance of institutions in terms of financial development. Studies such as [Demirguc-Kunt and Huizinga \(2010\)](#); [Klomp and De Haan \(2014\)](#) postulated that institutional quality also affects the degree of financial fragility in the country. They revealed that better institutions particularly those that enforce and secure property, incentivize banks to manage their risks in financial and contractual deals. In addition, strong institutions protect investors and trigger banks to behave uprightly in handling their risks. [Klomp and De Haan \(2014\)](#) employed a dataset of 371 banks from developing countries from 2002 to 2008 to investigate the impact of bank regulation and supervision on banking risk. Their results indicate that stricter regulation and supervision mitigate banking risk and their impact relies on the level of development. Therefore, they regarded regulation and supervision as the appropriate measures to achieve financial stability. However, [Barth et al. \(2004;2008;2012\)](#) concluded that strengthening official supervision encourages corruption in bank lending and reduces bank development as well as enhances inefficiency of financial intermediation.

2.5. Bank Concentration and Banking Stability

Another stream of past research focuses on the connection between bank size and stability. Two different hypothesis arise for this stream namely “concentration-stability” and “concentration-fragility” hypotheses. The concentration-stability hypothesis states that the higher the concentration, the more the bank stability, because size enhances better diversification that mitigates risks and allows banks to improve their activities with less capital and less stable funding. In addition, the larger banks enjoy a comparative advantage in market-based activities (see [Laeven et al. \(2014\)](#)). Similarly, [Boyd et al. \(2004\)](#) concluded that larger banks increases profits and mitigates

financial fragility in concentrated banking system by providing huge capital protection against external macroeconomic and liquidity shocks.

On the other hand, the proponents of the concentration-fragility hypothesis argue that larger banks in a concentrated market reduces stability. They explained this using the moral hazard problem, in which larger banks are considered as 'too big to fail' given government support. To Mishkin (1999) a rise in bank size aggravates the moral hazard puzzle for the manager whose belief is focus of receiving government support(in form of central banks' bail out to financially distressed large banks). Therefore, larger banks relies on the bailout subsidies in case of bank distress (Laeven *et al.*, 2014). In addition, owing to the possession of market power in the hand of larger banks, they place higher loan interest that force borrowers to carry out risky projects in order to meet the mandate of the loan payment, and thus this may increase default risks. Mirzaei *et al.* (2013) pointed out that managerial inefficiency in a concentrated banking market triggers high operational risk. Similarly, Fu *et al.* (2014) empirically analyzed the link between concentration and financial fragility, by utilizing a dataset of 14 Asian Pacific countries. They found that greater concentration exacerbates financial fragility, and that lower pricing power increases bank risk exposure. Pak and Nurmakhanova (2013) investigated how market power affects credit-risk taking and stability in Kazakhstan. Their findings show that increased market power has a significant negative impact on credit-risk taking but a significant positive influence on bank stability in Kazakhstan. They concluded that impact is not linear (when bank size exceeds some threshold, size directly influences returns volatility).

2.6. Banking Access and Banking Stability

Increasing banking access can boost growth and stability in the banking sector, because a rise in branch banking widens access to finance which encourages more diversified banks' loan portfolios. This leads to mitigate the banks' risk exposure, and thus enhances stability. Inconclusive results are empirically revealed. For example, Carlson and Mitchener (2006) found that branch banking increases the level of competition and triggers exit from the banking system, using a datasets of national banks in the 1920s and the 1930s. They also concluded that the consolidation enhances the entire system without improving the branch banks themselves, and suggested the effect of branch banking on competition is more significant compared to geographical diversification for bank stability. The upward trend in the ECOWAS region supports their evidence. Hence, it becomes important to investigate the influence of increasing access through branch banking on the banking stability in the region.

3. METHODOLOGY

This study utilizes country specific data for 8 ECOWAS¹ countries from 2004 to 2013.

3.1. Model Specification

Its general model is expressed as follows:

$$Y_{it} = \delta X_{it} + v_{it} \quad 1$$

Where Y_{it} denotes $1 \times k$ vector of observations on the explained variable, X_{it} represents $1 \times k$ vector of observations on the independent variable, v_{it} is the idiosyncratic error term. Subscript i and t refer to the country

¹ Benin, Burkina Faso, Ghana, Mali, Niger, Nigeria, Senegal, Togo

specific unit and time dimension respectively, while δ is $k \times 1$ vector of parameters to be estimated on the independent variables.

The study applies fixed-effect regression technique to estimate the following simplified model:

$$BAS_{it} = \delta_0 + \delta_1 NIM_{it} + \delta_2 NON_{it} + \delta_3 CON_{it} + \delta_4 FOR_{it} + \delta_5 BOO_{it} + \delta_6 ACC_{it} + \delta_7 INF_{it} + \delta_8 CRI_{it} + \delta_9 QUA_{it} + \varepsilon_{it}$$

$$\varepsilon_{it} = \alpha_i + \mu_t + e_{it} \quad 2$$

Where **BAS** denotes the stability indicators² (Z-score). **NIM** is the net interest margin; **NON** is the ratio of non-interest income to total income; **CON** is the level of concentration; **FOR** denotes the percentage of foreign banks of the total banks; **BOO** is the Boone indicator used as a proxy for the level of competition. **ACC** represents banking access measured by the number of commercial bank branches per 100,000 adults while **INF** is the log of the average consumer price index for a year. **CRI** captures the banking crises with the value of 1 for crisis in the banking sector and 0 otherwise; and **QUA** is the institutional quality variable measured by civil liberties. The disturbance term ε comprises unobserved country specific effect α_i , time-specified fixed effect μ_t , and the country-specific time variant effect e_{it} .

3.2. Variables Description

3.2.1. Explained Variables

3.2.1.1. Bank Stability

Z-score: is the probability of default of a country's banking system. It also compares the buffer of a country's banking system (capitalization and returns) with the volatility of those returns. It is computed as:

$$\frac{ROA + (\frac{E}{A})}{SD(ROA)}$$

Where ROA is return on assets, E denotes equity, A is assets while SD represents the standard deviation. Data on Z-score are obtained from the World Bank Global Financial Development Database (GFDD). The value of Z-score ranges between 0 and 1. Higher values of Z-score indicate higher stability.

3.2.2. Explanatory Variables

3.2.2.1. Net Interest Margins (NIM)

Is utilized to understand the effect of banking spread with respect to banks' traditional activities on stability. Either a positive or negative relationship is expected between NIM and stability. Therefore, the non-linear relationship needs to be checked. The GFDD is the data source.

² Due to non-availability of sufficient data on other stability indicators (Non-performing loans, regcar), the study uses Z-score to capture stability.

3.2.2.2. Non-Interest Income to Total Income (NON)

This is included in the model in order to comprehend whether non-traditional activities of banks can trigger either stability or instability. Theoretical expectation is either positive or negative. Data on NON are derived from the GFDD.

3.2.2.3. 5-Bank Asset Concentration (CON)

Measures assets of five largest commercial banks as a share of total commercial banking assets. The GFDD is the data source.

3.2.2.4. Foreign Entry (FOR)

Captures the percentage of the number of foreign-owned banks to the number of the total banks in a country. A bank is considered to be a foreign bank if 50 percent or more of its shares are owned by foreigners. Its data are obtained from the GFDD.

3.2.3.5. Boone Indicator (BOO)

Is used to measure the degree of competition, and is computed as the elasticity of profits to marginal costs. The more negative the Boone indicator, the higher the degree of competition, vice versa. Its data are sourced from the GFDD. It is expected to have a negative influence on stability.

3.2.3.6. Banking Access (ACC)

Its higher values reveal more access. Thus, it is expected that increasing banking access enhances stability. The GFDD is the source of its data.

3.2.3.7. Inflation (INF)

Is the log of the average consumer price index per year. Data is obtained from the GFDD.

3.2.3.7. Banking Crises (CRI)

Is explored to understand the extent to which stability in the ECOWAS region is influenced by banking crises. Dataset is derived from the GFDD.

3.2.3.7 Institutional Quality (Qua)

Is captured by Civil Liberties data available at the Freedom House. Its values range from 1 to 7 with higher values indicating worst institutions. A negative link is expected between civil liberties and Z-score.

3.3. Estimation Method

This study utilizes fixed-effect regression model with the aid of OLS estimator to examine the drivers of banking stability in the ECOWAS region.

4. DESCRIPTIVE STATISTICS AND DATA SUMMARY

This section presents a summary statistics of all the concerned variables in terms of a country and year.

4.1. Descriptive Statistics

As reported in Table 1, BAS (Z-score) exhibits a wide variation for countries in the ECOWAS region (-12.02 to 13.26). The banking system (BAS) seems to be volatile over the sample period but the FOR exhibits the highest volatility of 30.16 (see table 1). On the other hand, foreign bank accounts for about 59.95 percent of banks in the

region. This reflects the need to investigate this variable. The mean attached to QUA is 3.18, indicating either moderately protect almost all civil liberties or strongly protect some civil liberties while neglecting others. This outcome is similar to the result of Dwumfour (2017) except that the maximum value of Z-score is higher in his study of sub-Saharan Africa.

Table-1. Summary of Descriptive Statistics

| Statistics | ACC | BAS | BOO | CON | CRI | FOR | INF | NIM | NON | QUA |
|-------------|--------|--------|--------|---------|--------|---------|--------|--------|---------|--------|
| Mean | 3.20 | 7.05 | -0.04 | 74.19 | 0.06 | 59.95 | 4.52 | 6.02 | 45.14 | 3.18 |
| Median | 3.12 | 6.88 | -0.05 | 75.85 | 0.00 | 67.00 | 4.58 | 5.48 | 43.13 | 3.00 |
| Maximum | 6.51 | 13.26 | 0.39 | 100.00 | 1.00 | 100.00 | 4.90 | 16.81 | 75.20 | 5.00 |
| Minimum | 0.41 | -12.02 | -0.17 | 36.11 | 0.00 | 0.00 | 3.83 | 2.15 | 28.12 | 2.00 |
| Std. Dev. | 1.69 | 3.72 | 0.07 | 18.53 | 0.24 | 30.16 | 0.19 | 2.75 | 10.72 | 0.98 |
| Skewness | 0.16 | -1.93 | 2.45 | -0.27 | 3.61 | -0.53 | -1.33 | 1.43 | 0.81 | 0.30 |
| Kurtosis | 1.97 | 11.30 | 16.12 | 2.03 | 14.07 | 1.94 | 5.54 | 5.41 | 3.42 | 2.03 |
| Jarque-Bera | 3.89 | 279.29 | 653.45 | 4.13 | 582.46 | 7.57 | 45.14 | 46.52 | 9.23 | 4.34 |
| Probability | 0.14 | 0.00 | 0.00 | 0.13 | 0.00 | 0.02 | 0.00 | 0.00 | 0.01 | 0.11 |
| Sum | 255.84 | 563.76 | -3.35 | 5935.06 | 5.00 | 4796.00 | 361.86 | 481.83 | 3611.04 | 254.00 |
| Obs. | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 |

Source: Author's computation based on World Bank Global Financial Development Database (GFDD)

4.3. Country's Mean Analysis

From Table 2, the mean statistics of Z score per country is examined in order to overview each country's features. In terms of stability, Cape Verde has the most stable with the Z-score of 22.91, followed by Benin with 12.07. Nigeria being the largest economy in Africa places the least country in terms of stability (Z-score =0.84) far less than the sub-region average of 7.25.

Table-2. Z-score per country

| Country | Country Code | Mean | Std. Dev. | Obs. |
|---------------|--------------|---------------|---------------|------------|
| Benin | BEN | 12.0671 | 1.0174 | 10 |
| Burkina Faso | BFA | 6.6476 | 1.1278 | 10 |
| Cape Verde | CPV | 22.9086 | 2.1106 | 6 |
| Gambia, The | GMB | 6.5555 | 1.0588 | 10 |
| Ghana | GHA | 6.2230 | 0.8536 | 10 |
| Guinea | GIN | 5.7046 | 2.2217 | 10 |
| Guinea-Bissau | GNB | 4.6926 | 1.6889 | 6 |
| Liberia | LBR | 5.2706 | 3.0419 | 9 |
| Mali | MLI | 9.1440 | 1.4301 | 10 |
| Niger | NER | 8.9866 | 1.3718 | 10 |
| Nigeria | NGA | 0.8370 | 5.3097 | 10 |
| Senegal | SEN | 6.7247 | 0.6024 | 10 |
| Sierra Leone | SLE | 5.0115 | 0.7632 | 10 |
| Togo | TGO | 5.7457 | 1.6873 | 10 |
| All | | 7.2482 | 4.7141 | 131 |

Source: Author's computation based on World Bank Global Financial Development Database

4.4. Country's Risk (Standard Deviation) Analysis

Risks in terms of the standard deviation of the Z-score are analyzed. As observed in Table 2, Nigeria has the highest risk of stability, followed by Liberia, while Senegal has the lowest.

4.5. Test of Multicollinearity

Table 3 presents the result of the correlation matrix employed to test the presence of multicollinearity among the concerned explanatory variables. As shown in the table, all the correlation coefficients take less than 0.6 in absolute term. This indicates absence of multicollinearity issues since they are below 0.70, as concluded in Kennedy

(2008). However, the problem between CRI and BOO is addressed by removing the BOO variable from the estimation model.

Table-3. Pairwise Correlation matrix-ECOWAS

| | ACC | BOO | CON | CRI | FOR | INF | NIM | NON | QUA |
|-----|-------|-------|-------|-------|-------|-------|-------|------|------|
| ACC | 1.00 | | | | | | | | |
| BOO | -0.04 | 1.00 | | | | | | | |
| CON | -0.37 | 0.22 | 1.00 | | | | | | |
| CRI | 0.46 | 0.29 | -0.23 | 1.00 | | | | | |
| FOR | -0.53 | -0.14 | -0.11 | -0.33 | 1.00 | | | | |
| INF | 0.16 | 0.28 | -0.16 | 0.24 | 0.24 | 1.00 | | | |
| NIM | 0.25 | -0.43 | -0.38 | 0.07 | -0.07 | -0.37 | 1.00 | | |
| NON | -0.13 | 0.37 | 0.50 | -0.07 | -0.23 | 0.10 | -0.66 | 1.00 | |
| QUA | 0.05 | 0.24 | 0.22 | 0.33 | -0.48 | 0.13 | -0.30 | 0.39 | 1.00 |

Source: Author's computation

5. EMPIRICAL RESULTS AND DISCUSSION

The study analyzed the factors that influence stability in ECOWAS region by using Z-score as a measure of stability, and other variables identified in the previous studies as drivers of stability. It utilizes the fixed effect regression model. The estimation diagnostics of cross-section dependence test indicate an independence.

5.1. Drivers of Banking Stability in ECOWAS

As presented in Table 4, the results indicate that NIM significantly and positively affects the stability at 1 %. This implies that higher profit margins lead to a more stable banking system in a concentrated market. Put differently, it could indicate that the higher the NIM, the higher the efficiency of the bank, hence leading to increased stability. Similarly, the NON variable has a positive but insignificant effect in the model. This reflects that banks in the ECOWAS region diversify the source of their incomes by engaging in non-traditional activities in order to improve stability but the impact is not strong.

CON poses a positive but insignificant impact on stability in the region. This result backs the concentration-stability view, noted in the literature. However, inflation has a significant positive influence on stability, implying that banks in ECOWAS properly predict inflation and adjust their service charges accordingly. This supports the theory of Perry (1992) which states that inflation positively determines bank stability when it is anticipated and considered in the pricing process. In the same vein, the crises dummy exhibits a significant negative impact on stability. This implies that periods of banking crises affect the banking stability adversely. This confirms to the well-documented evidence in the literature.

Table-4. Panel fixed effect Estimates

| Dependent Variable: BAS | Coefficient |
|-------------------------|-------------|
| Constant | -40.53*** |
| Independent Variables | |
| ACC | -1.08*** |
| CON | 0.01 |
| FOR | -0.006 |
| NIM | 0.89*** |
| NON | 0.05* |
| QUA | 0.99** |
| INF | 8.84*** |
| CRI | -8.16*** |

Note: *** 1%, ** 5%, * 10% significant levels.

The institutional quality variable (QUA) indicates that poor institutional framework enhances the stability of the banking system. This supports the view of Barth *et al.* (2012) that strengthening official supervision triggers corruption in bank lending and reduces bank development as well as enhances inefficiency of financial intermediation. Foreign entry into the ECOWAS region poses a negative link with stability but the impact was not significant. However, the increased banking access significantly and adversely affects stability. The diagnostic estimation result of cross-sectional dependence test is reported in the Appendix I.

6. CONCLUDING REMARKS

Numerous studies have examined the determinants of bank stability in advanced economies. These studies commonly utilized micro data on the bank level. This study contributes to the existing studies by providing an empirical-based evidence which has received less attention, by investigating the drivers of stability in the ECOWAS region. In addition, it employs country-level data in order to give more understanding of the various factors that influence stability in the whole banking sector. The study utilizes a Z-score to measure stability because of insufficient data for the other measures in the sample period. Based on the fixed-effect estimation technique, the results show that banking spread (NIM) is a key driver of stability in the ECOWAS region. In addition, crises in the banking sector significantly reduces stability. Thus, banks have to work on enhancing their NIM in order to alleviate the effect of crises on stability. However, percentage of foreign banks in the industry has to be effectively controlled as too many foreign banks pose a threat to stability.

The study finds that more concentration during crisis periods can help improve stability. Non-interest income to total income (NON) used as a proxy for diversification, positively and insignificantly affects stability. This implies that banks in the region can diversify the source of their incomes in order to mitigate the adverse effects during crisis periods.

Funding: This study received no specific financial support.

Competing Interests: The author declares that there are no conflicts of interests regarding the publication of this paper.

REFERENCES

- Ashraf, D. and J. Goddard, 2012. Derivatives in the wake of disintermediation: A simultaneous equations model of commercial and industrial lending and the use of derivatives by US banks. *International Journal Bank Account Finance*, 4(3): 250–271. [View at Google Scholar](#) | [View at Publisher](#)
- Barth, J.R., G. Caprio and R. Levine, 2004. Bank regulation and supervision: What works best? *Journal of Financial Intermediation*, 13(2): 205–248. [View at Google Scholar](#) | [View at Publisher](#)
- Barth, J.R., G. Caprio and R. Levine, 2008. Bank regulations are changing: For better or worse & quest. *Comparative Economic Studies*, 50(4): 537–563. [View at Google Scholar](#) | [View at Publisher](#)
- Barth, J.R., G. Caprio and R. Levine, 2012. The evolution and impact of bank regulations. World Bank Policy Res Working Paper No. 6288.
- Beck, T., O. De Jonghe and G. Schepens, 2013. Bank competition and stability: Cross-country heterogeneity. *Journal of Financial Intermediation*, 22(1): 218–244. [View at Google Scholar](#) | [View at Publisher](#)
- Beck, T. and R. Levine, 2003. Legal institutions and financial development. NBER Working Papers No.10126, National Bureau of Economic Research, Inc.
- Bhattacharyya, S., 2013. Political origins of financial structure. *Journal of Comparative Economics*, 41(4): 979–994. [View at Google Scholar](#) | [View at Publisher](#)
- Boyd, J., G. De Nicolo and A. Jalal, 2006. Bank risk taking and competition revisited: New theory and new evidence. Washington, DC: Working Paper WP/06/297 International Monetary Fund.

- Boyd, J.H., G. De Nicoló and B.D. Smith, 2004. Crises in competitive versus monopolistic banking systems. *Journal of Money Credit Bank*, 36(3): 487–506. [View at Google Scholar](#) | [View at Publisher](#)
- Busch, R. and T. Kick, 2009. Income diversification in the German banking industry. Discussion Paper No. 09/Banking and Financial Studies.
- Carlson, M. and K.J. Mitchener, 2006. Branch banking, bank competition, and financial stability. *Journal of Money, Credit and Banking*, 38(5): 1293–1328. [View at Publisher](#)
- Claessens, S., A. Demirguc-Kunt and H. Huizinga, 2001. How does foreign entry affect domestic banking markets? *Journal of Banking & Finance*, 25(5): 891–911. [View at Google Scholar](#) | [View at Publisher](#)
- Demirguc-Kunt, A. and H. Huizinga, 2010. Are banks too big to fail or too big to save? International evidence from equity prices and CDS spreads. CEPR Discussion Papers, Centre for Economic Policy Research.
- Dwumfour, R.A., 2017. Explaining banking stability in Sub-Saharan Africa. *Research in International Business and Finance*, 41(C): 260–279. [View at Google Scholar](#) | [View at Publisher](#)
- Fu, X.M., Y.R. Lin and P. Molyneux, 2014. Bank competition and financial stability in Asia pacific. *Journal of Banking & Finance*, 38(1): 64–77. [View at Google Scholar](#) | [View at Publisher](#)
- Giannetti, M. and S. Ongena, 2009. Financial integration and firm performance: Evidence from foreign bank entry in emerging markets. *Review of Finance*, 13(2): 181–223. [View at Google Scholar](#) | [View at Publisher](#)
- Girma, S. and A. Shortland, 2008. The political economy of financial development. *Oxford Economic Paper*, 60(4): 567–596.
- Gormley, T.A., 2010. The impact of foreign bank entry in emerging markets: Evidence from India. *Journal of Financial Intermediation*, 19(1): 26–51. [View at Google Scholar](#) | [View at Publisher](#)
- Huang, Y., 2010. Political institutions and financial development: An empirical study. *World Development*, 38(12): 1667–1677. [View at Google Scholar](#) | [View at Publisher](#)
- Kasman, A. and O. Carvallo, 2014. Financial stability, competition and efficiency in Latin American and Caribbean banking. *Journal of Applied Economics*, 17(2): 301–324. [View at Google Scholar](#) | [View at Publisher](#)
- Kasman, S. and A. Kasman, 2015. Bank competition, concentration and financial stability in the Turkish banking industry. *Economics Systems*, 39(3): 502–517. [View at Google Scholar](#) | [View at Publisher](#)
- Keeley, M.C., 1990. Deposit insurance, risk, and market power in banking. *American Economic Review*, 80(1): 1183–1200. [View at Google Scholar](#)
- Kennedy, P., 2008. *A guide to econometric*. 6th Edn., Malden: Blackwell Publishing.
- Klomp, J. and J. De Haan, 2014. Bank regulation, the quality of institutions and banking risk in emerging and developing countries: An empirical analysis. *Emerging Market Finance Trade*, 50(6): 19–40. [View at Google Scholar](#) | [View at Publisher](#)
- Koutsomanoli-Filippaki, A., E. Mamatzakis and C. Staikouras, 2009. Banking inefficiency in central and Eastern European countries under a quadratic loss function. *Emerging Markets Review*, 10(3): 167–178. [View at Google Scholar](#) | [View at Publisher](#)
- Laeven, L., L. Ratnovski and H. Tong, 2014. Bank size and systemic risk: Some international evidence. Mimeo: International Monetary Fund.
- Maudos, J. and N. Amparo, 2005. Explaining market power differences in banking: A cross-country study. WP-E, Instituto Valenciano de Investigaciones Económicas.
- Mirzaei, A., T. Moore and G. Liu, 2013. Does market structure matter on banks' profitability and stability? Emerging vs. Advanced economies. *Journal of Banking & Finance*, 37(8): 2920–2937. [View at Google Scholar](#) | [View at Publisher](#)
- Mishkin, F.S., 1999. Lessons from the Asian crisis. *Journal of International Money and Finance*, 18(4): 709–723. [View at Google Scholar](#) | [View at Publisher](#)
- Pak, O. and M. Nurmakhanova, 2013. The effect of market power on bank credit risk-taking and bank stability in Kazakhstan. *Transition Studies Review*, 20(3): 335–350. [View at Google Scholar](#) | [View at Publisher](#)
- Perry, P., 1992. Do banks gain or lose from inflation? *Journal of Retail Banking*, 14(2): 25–30. [View at Google Scholar](#)

- Porta, R., F. Lopez-de-Silanes, A. Shleifer and R.W. Vishny, 1997. Legal determinants of external finance. *Journal of Finance*, 52(3): 1131-1150. [View at Google Scholar](#) | [View at Publisher](#)
- Schmidt, N.F., 2009. Foreign bank entry: The stability implications of greenfield entry vs. Acquisition. Working Paper London School of Economics.
- Stiroh, K., 2004. Diversification in banking: Is noninterest income the answer? *Journal of Money, Credit and Banking*, 36(5): 853-882. [View at Google Scholar](#) | [View at Publisher](#)
- Uhde, A. and U. Heimeshoff, 2009. Consolidation in banking and financial stability in Europe: Empirical evidence. *Journal of Banking & Finance*, 33(7): 1299-1311. [View at Google Scholar](#) | [View at Publisher](#)

BIBLIOGRAPHY

- Demirgüç-Kunt, A. and E. Detragiache, 1997. The determinants of banking crises: Evidence from developed and developing countries. Finance and private sector division, world bank research department. Washington, DC: International Monetary Fund.

Appendix-I.

Residual Cross-Section Dependence Test
 Null hypothesis: No cross-section dependence (correlation) in residuals
 Equation: Untitled
 Periods included: 10
 Cross-sections included: 8
 Total panel observations: 80
 Cross-section effects were removed during estimation

| Test | Statistic | d.f. | Prob. |
|--------------------------|-----------|------|--------|
| Breusch-Pagan LM | 37.67279 | 28 | 0.1048 |
| Pesaran scaled LM | 1.292581 | | 0.1962 |
| Bias-corrected scaled LM | 0.848137 | | 0.3964 |
| Pesaran CD | 0.776679 | | 0.4373 |

Views and opinions expressed in this article are the views and opinions of the author(s), International Journal of Business, Economics and Management shall not be responsible or answerable for any loss, damage or liability etc. caused in relation to/arising out of the use of the content.