UNIVERSITY OF CAPE COAST

EFFECT OF INSTITUTIONAL QUALITY ON STABILITY OF BANKS IN

SUB-SAHARAN AFRICA

SWANZY FRED SAFORO

2022

UNIVERSITY OF CAPE COAST

EFFECT OF INSTITUTIONAL QUALITY ON STABILITY OF BANKS IN

SUB-SAHARAN AFRICA

BY

SWANZY FRED SAFORO

Dissertation submitted to the Department of Finance of the School of Business,College of Humanities and Legal Studies, University of Cape Coast, in partial fulfillment of the requirements for the award of Master of Business Administration in Finance.

AUGUST, 2022

## DECLARATION

**Candidate's Declaration**

I hereby declare that this dissertation is the result of my original research and that no part of it has been presented for another degree in this university or elsewhere.

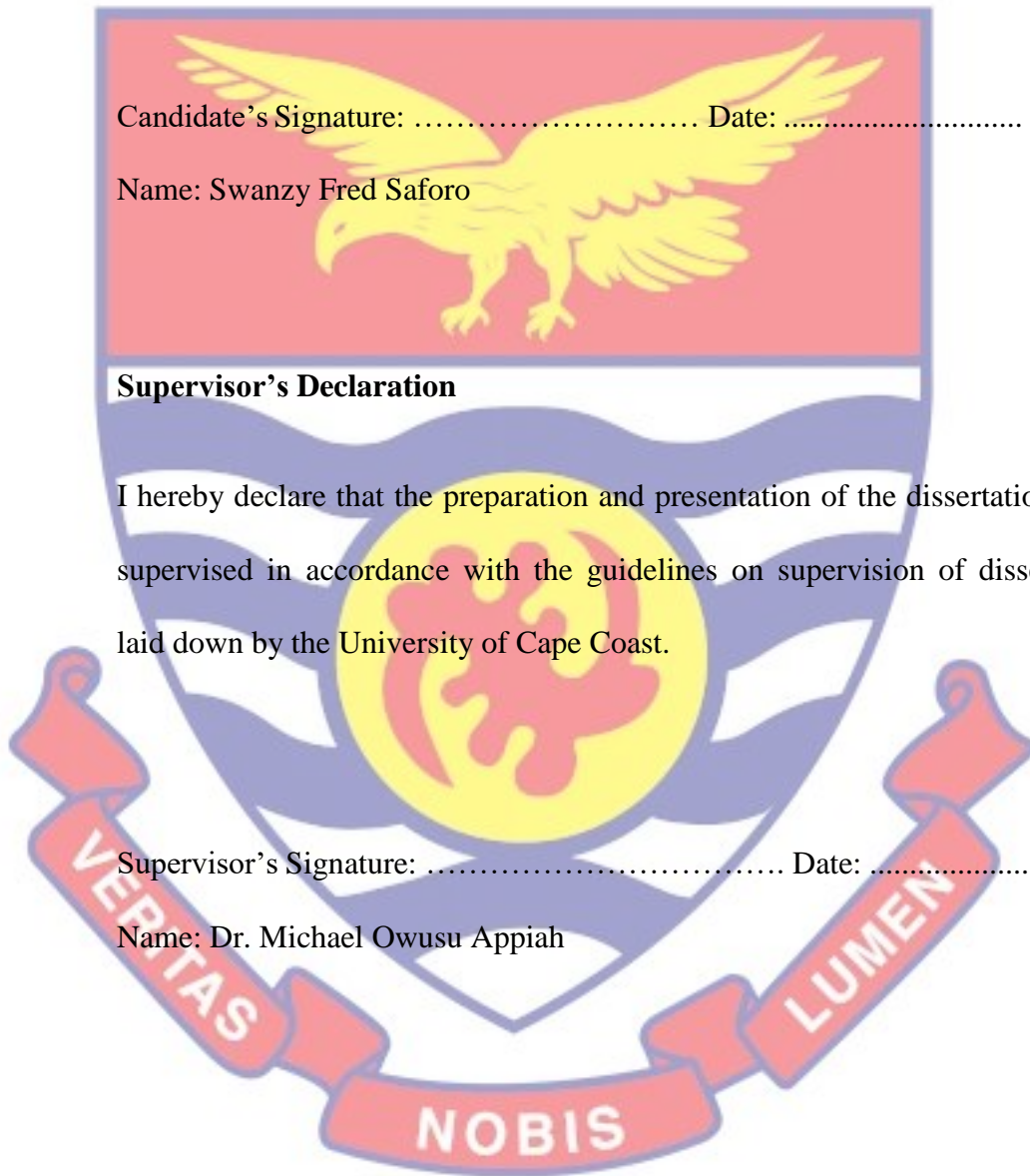Candidate's Signature: …………………… Date: .............................

Name: Swanzy Fred Saforo

**Supervisor's Declaration**

I hereby declare that the preparation and presentation of the dissertation were supervised in accordance with the guidelines on supervision of dissertation laid down by the University of Cape Coast.

Supervisor's Signature: …………………………. Date: .............................

Name: Dr. Michael Owusu Appiah

# ABSTRACT

The study investigated the relationship between institutional quality and stability of banks in Sub-Saharan Africa using unbalanced panel data from 48 countries from 2007 to 2017. Two proxies were used for bank stability, namely Z-score (insolvency risk) and NPL (credit risk), and institutional quality was the main variable of interest. The study used five control variables, and the analysis relied on secondary data collected from 2002 to 2017. The fixed and random effects estimations were used for objectives one and two, while the panel Granger causality test was used for objective three. The study revealed a negative effect of institutional quality on bank stability. The quality of public and civil service, as well as its independence from political pressures, as well as the quality of policy formulation and implementation, have all been compromised, which has a negative impact on the financial system and reduces the stability of banks in Sub-Saharan Africa.

Furthermore, good institutions play a vital role in ensuring that loan default rates are minimized, which reduces credit or portfolio risk for the financial system in Sub-Saharan Africa. It was established that causalities between stability and institutions were established, which suggests that the level of regulations and institutional laws are basically due to the level of accompanying risk. The study recommended that regulatory authorities should take into consideration the impact of various governance mechanisms on the risk profile of financial institutions in Sub-Saharan Africa.

## ACKNOWLEDGMENTS

I express my gratitude to my supervisor, Dr. Michael Owusu Appiah of the Department of Finance, UCC, for his professional guidance, advice, encouragement, and goodwill with which he guided this work. I am grateful.

Finally, I wish to thank my family and friends for their support, especially my program mates.

iv

## DEDICATION

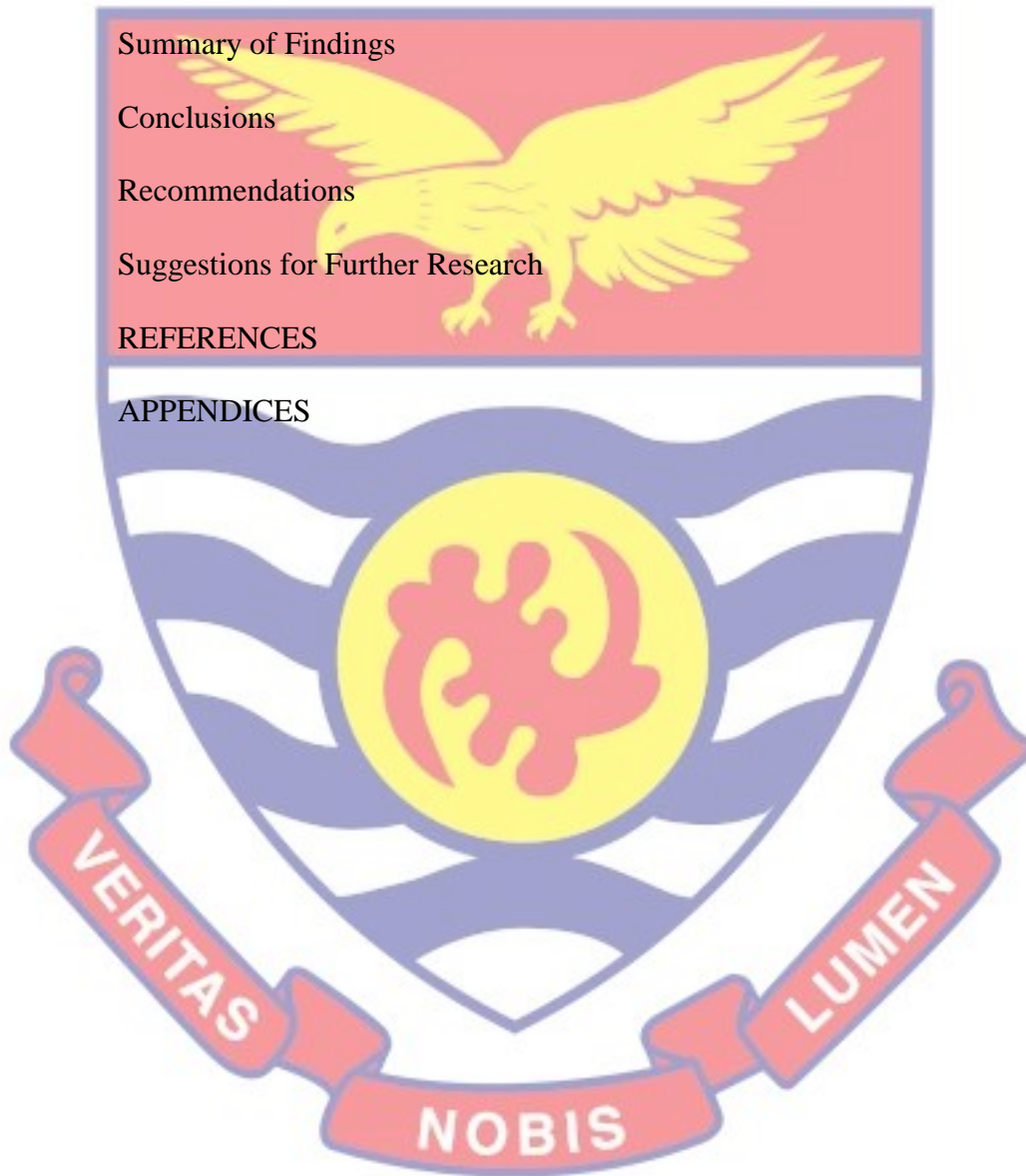I dedicate this work to my family.

v

**TABLE OF CONTENT**

# LIST OF TABLES

**LIST OF FIGURE**

x

# CHAPTER ONE

# INTRODUCTION

Since the 1990s, Sub-Saharan Africa has been among the world's fastest-growing economies. The financial sector is considered one of the key sectors in an economy. The acceleration in economic growth has been accompanied by an expansion of access to financial services, particularly commercial banks, which have been traditionally, and remain, the backbone of financial systems in Africa. The financial industry forms the greater portion of the sectoral contribution of GDP in Africa. Increasing debt in the household and corporate sectors has left financial institutions in some countries exposed to borrowers with high debt-service burdens. Bank stability has become an issue, especially after the 2008-09 global financial crisis in which research reports suggest that good corporate governance can reinforce banks' stability and shape risk-taking behaviour. To reinforce bank's stability, the role of the institutional quality is essential in leading to the stability of banks specifically and the financial institution in general. Many believed that the formal and informal institutions, which differ across countries and influence the internal and external operating environment of financial institutions, lead to their fragility. It is, therefore, imperative to study how institutional structures impact bank stability in Sub-Saharan Africa.

**Background to the Study**

Bank stability can be viewed as the state or the ability of the financial system to absorb shocks. A financial system can be said to be stable where there are not excessive volatilities or crises. Therefore, stability of banks is "a condition in which the financial system comprising financial intermediaries,

1

markets and market infrastructure is capable of withstanding shocks and the unraveling of financial imbalances, thereby mitigating the likelihood of disruptions in the financial intermediation process which are severe enough to significantly impair the allocation of savings to profitable investment opportunities" (European Central Bank Report, 2007). The stability of the financial system is required to stimulate investor confidence.

The financial system comprises financial markets and financial institutions.In the developed part of the world, both these aspects dominate the financial system. This is different in the case of Africa with few exceptions. Admittedly, the empirical findings of Sulemana, Dramani & Oteng-Abayie (2018) have attested that with exception of South Africa which has a well-developed financial system with both financial markets and financial institutions dominating almost a fair proportion, the remaining parts of Africa are either bank-based financial system, as in most countries in Africa, or market-based financial system, except countries like Ghana, Kenya, Mauritius and Nigeria which have a relatively developed financial market alongside the financial institutions. Mathenge and Nikolaidou (2018), posited that most of the empirical work on financial structure and growth focuses on developed countries because of the availability of data and the existence of functional stock markets unlike in Sub-Saharan Africa (SSA) given their nonexistent stock markets in many countries in the region. They stated again that stock markets in SSA are relatively new, with the majority established after 1989, referring to Yartey and Adjasi (2007). Also, Mlachila (2017) emphasized that African financial systems are bank dominated and that the role of non-bank financial institutions is increasing especially in Southern Africa. Mlachila

2

(2017), therefore, stated that financial systems in Africa are reduced to banks often because of a lack of data. Hence, it is not surprising that most studies on the financial sector in Africa are bank-focused.

The importance of stability to the financial sector coupled with the global financial crises in 2008-09 has instigated the need for studies among researchers into explaining whether bank stability has any link with some economic concepts. There have been foreign studies on bank stability. In Smets (2018), it was inferred from the 2008-09 financial crises that the monetary policy framework focused primarily on maintaining price stability is not enough condition for bank stability, and that the soundness and safety of financial institution is also not enough to guarantee for the stability of the financial system. Therefore, Smets (2018) argued that the degree to which price-stability oriented monetary policy framework should be considered in setting bank stability objectives depends on the effectiveness of macroprudential policy in maintaining bank stability, the effect of monetary policy on risk-taking and bank stability, and the risk that bank stability considerations undermine the credibility of the central bank's price stability mandate.

Similarly, Woodford (2012), in his study on inflation targeting and bank stability, argued that monetary policy may affect the severity of risks to bank stability and that it is possible to generalize an inflation-targeting framework to take account of bank stability concerns alongside traditional stabilization objectives. This supports the earlier assertions of De Grauwe and Gros (2009), Leijonhufvud (2009), and Giavazzi and Giovannini (2011) who argued that inflation targeting was not an approach to bank stability following

3

the global financial crises.

This present study seeks to find the correlation between institutional qualityand bank stability in Sub-Saharan Africa. Following the views of prior studies on the lack of data on the financial markets of SSA's financial system, to do this, bankstability in Sub-Saharan Africa will base on the banking sector. A review by Nyantakyi and Sy (2015) suggests that the competitiveness of Africa's banking industry is as those in Latin America and the Caribbean, and not very different from the competitive environment in high-income Organisation of Economic Co- operation and Developments (OECD) countries. Sub-Saharan Africa has seen notable trends, particularly in the banking industry since the nineties. Notable are trends in financial depth, financial access, ownership structure, and the emergence and expansion of Pan-African Banks (PABs).

The banking sector in SSA has expanded steadily over the past decade. Depth and coverage of financial systems (measured by financial development indicators as private sector credit to GDP; broad money to GDP) improved over the period 2000 to 2013. Notwithstanding the improvements, financial development inSSA still lags behind other developing countries like those in Latin America and the Caribbean (Mecagni, Marchettini & Maino, 2015). More so, a review by Nyantakyi et al. (2015) saw that SSA has the shallowest financial depth among other regions as North Africa, Latin America & Caribbean, and OECD countries. According to them, difficulties in establishing borrowers' ability and willingness to repay loans, and lack of legal support for creditor rights limits banks' lending schemes, contributing to shallow financial development (McDonald & Schumacher, 2007). Amidst

4

the improvement in the access to financial service in SSA in recent years due to financial innovation leading to financial inclusion, SSA is still observed to have lagged behind other developing regions like Latin America & the Caribbean, and OECD countries. The widespread mobile money service expansion by way of technological innovation in Africa has facilitated payments and has alleviated certain economic and social pressures, enhancing the financial system. However, aside from mobile money operation which is doing well in Africa, other innovations in the banking sector are less prevalent (Nyantakyi et al., 2015).

It is analyzed in Nyantakyi et al. (2015) that Africa experience, on average, one systemic banking crisis per year between 1970 and 2012 as compared to 2.4 for the rest of the world. "Africa experienced 43 systemic banking crises between the mid-seventies to the mid-nineties (56 in the rest of the world) but since then, the continent registered a single systemic crisis (in Nigeria in 2009) against 47 in the rest of the world", (Nyantakyi et al., 2015). This is said to reflect stability in the banking industry in Africa. However, an explanation for the stability is that: Africa was less integrated into the global financial market in the mid-nineties so the financial crises had no impact on Africa's banking system. It is not surprising that Mecagni et al. (2015) saw bank stability indicators to reflect soundness and efficiency in the banking industry of SSA considering data from 1996 to 2013.

In their search, they found that nonperforming loans (on average) for all SSA Low- Income Countries (LICs) fell drastically in the periods 1996-99; 2003 and 2012-13 from 9.4% to 9.1% and then to 7% respectively. That of Middle-Income Countries (MICs) for the same period fell from 9.2% to 8.3%

5

then 7.8%. Compared with developing countries in other regions, SSA banks' capital-to-total asset ratio, another indicator of bank stability in the banking industry, stood at 11% for MICs and 14% for LICs showing that developing country in SSA is a comfortable lead over other developing countries in other regions when compared to the 8% minimum risk-weighted capital adequacy ratio (CAR) according to Basel I and Basel II, implemented by most countries. However, Ozili (2018) argued that Africa's banking crises were caused by government-related problems both in banking and in the regulatory systems, unlike those experienced outside.

It is obvious that several measures such as price regulation, inflation, and technological innovation have been deployed to enhance the stability of banks but it seems the banking sector is still volatile. However, in resolving the instability of the banking sector, institutional quality has been proposed in this study to assess its impact on bank's stability. According to Essid, Boujelbene, and Plihon (2014), weak institutional factors weaken the banking system and trigger crises or instability in the banking sector. This implies that when the institutional factors are strengthened, it will result in stabilizing the banking sector. Also, Law et al. (2012), confirmed that institutional quality indicators improve financial development. This brings to light an area of research that researchers can delve into to explain the effect of institutional factors on bank stability.

**Statement of the Problem**

The effect of institutional quality on the stability of banks is an ongoing debate for both academics and policymakers. Several empirical studies have been conducted to investigate the effects of various types of

6

institutional structures on bank stability (Agoraki, Delis, & Pasiouras, 2011; Barth, Caprio, & Levine, 2013; Anginer & Demirguc-Kunt, 2014). For example, Dwumfour (2017) argued that a weak regulatory environment reduces bank stability (Z-score). Also, Fang, Hasan, and Marton (2014) posited that the bank's financial stability increases substantially after countries reform their legal institutions.  Also, van Rossum (2013) argued that reduced levels of regulation are associated with reduced bank risk. Also, Ofoeda, Abor, and Adjasi (2012) posited that there is a positive relationship between regulatory pressure and the risk-weighted assets of non-bank financial institutions.

Also, Barth, Caprio, and Levine (2012) found that strengthening official supervision triggers corruption in bank lending and reduces bank development as well as enhances the inefficiency of financial intermediation, which reduces bank stability. However, the empirical conclusions on the different types of institutional structures on the stability of banks remain mixed. They are conflicting and inconclusive. Thus, the direct relationship between institutional structures, credit risk, and the stability of banks remains unclear in the empirical literature.

It is empirically established by a number of studies that institutional quality has a positive relationship with financial institution stability. For example, Abdessatar and Rachida (2013) discovered that improved institutional quality can help reduce financial tensions and stabilize financial markets. Law et al. (2012), in their search for institutional quality, governance, and financial development, concluded that all institutional quality indicators improve financial development. It has also been found that: institutional

7

quality matters for stock market development (Gani & Ngassam, 2008); institutional factors affect the financial depth and access to financial services more than asset quality and profitability measured by NPL and ROE (Anayiotos & Toroyan, 2009); political stability and institutional credibility attract FDI into SSA (Cleeve, 2012); indicators such as control of corruption, political stability, and government effectiveness matter for the influence of FDI on economic growth in SSA (Ajide, Adeniyi & Raheem, 2014); and institutional quality has a positive significant effect on SSA economic growth (Effiong, 2015).

Africa has also proved to have a positive effect on stability in the financial sector. It was found in Essid, Boujelbene, and Plihon (2014) that weak institutional factors weaken the banking system and trigger crises and that political stability, voice and accountability, and respect for the rule of law are relevant institutional characteristics that when strengthened will ensure bank stability. In their quest to find the effect of institutional quality on the relationship between banking stability and marketization in Iran, they concluded that an improvement in Iran's institutional quality could improve the relationship between marketization and banking stability. Interestingly, no empirical studies published in the literature have examined the relationship between institutional quality and banking stability in SSA.

However, examining the relationship between institutional quality and banking stability will serve as a guide for policy direction and an extension of the empirical literature. Different from previous studies, this study seeks to fill this lacuna by examining the relationship between institutional qualities and banking stability in SSA.

8

**Purpose of the Study**

This study seeks to investigate the relationship between institutional qualityand bank stability in Sub-Saharan Africa.

**Research Objectives**

The research would be guided by the following objectives:

1. To examine the effects of institutional quality on insolvency risk in Sub-Saharan Africa.

2. To examine the effects of institutional quality on credit risk in Sub-SaharanAfrica.

3. *To examine the direction of causality between institutional quality and bankstability in Sub-Saharan Africa.*

**Research Hypotheses**

The following hypotheses were formulated for this study:

$H_1$: Institutional quality positively influences insolvency risk (Z-score).$H_2$: Institutional quality reduces credit risk (NPL).

$H_3$: Institutional quality and bank stability (Z-score/ NPL) granger cause each other.

**Significance of the Study**

The study would add to existing knowledge and be a reference point for further research. Its findings would help the government and policymakers on decisions regarding intensifying institutional checks and quality. The findings would again help users know whether or not a relationship exists, and if yes; the direction of the relationship.

More so, the results would support policy-makers and law enforcement agencies in creating an environment where laws are applied fully to ensure

9

bank stability in Sub-Saharan Africa. The findings and recommendations would arouse curiosity in this area as researchers would try to dig deeper, especially for those whomay be interested in conducting further studies on this phenomenon.

**Delimitations of the Study**

Banks play a significant role in the financial system of various economies because they are essential in the development process of market economies. This study focuses on the effect of institutions on the bank stability of Sub-Saharan Africa. This study was conducted in Sub-Saharan Africa by including all 48 countries in the sub-region.

Current studies usually use bank-specific data on bank stability but this study used only country-level aggregate data on the dependent variable. Furthermore, recent studies have provided different measures of bank stability but this study uses two widely measure of bank stability, Z-score, and non-performingloans to total loans.

**Organisation of the Study**

The study is grouped into five chapters. Chapter one started with the general introduction of the study which includes the background, statement of the problem, the objectives of the study, hypotheses, significance of the study, delimitations, and organisation of the study. Chapter two reviewed various theories and related studies on the relationship between institutional quality and bank stability in Sub-Saharan Africa. Chapter three focused on the research methods while chapter four covered the results and discussion of the empirical data. The summary, conclusions, and recommendations of the study were presented in chapter five.

## CHAPTER TWO

## LITERATURE REVIEW

### Introduction

The focal point of this chapter is to review some relevant theories and empirical studies on the relationships between institutional quality and bank stability. This chapter is structured into two main sections. The first section presents and discusses theoretical literature on institutional quality and its linkage to bank stability. The second section presents a review of the empirical literature on the relationship between institutional quality and bank stability as well as the conceptual framework to show the possible relationships that exist between the variables of interest. Empirical gaps were also presented in this chapter.

### Theoretical Review

The theories underpinning this study are the new institutional economics and the agency theory. This section discusses the theoretical underpinnings of the study based on the objectives. Specifically, the study reviews the agency theory and, the new institutional economics. These theories explain how institutional quality and bank stability relate.

### New Institutional Economics (NIE)

Over the course of the 1990s, the World Bank's policy recommendations for developing nations shifted from a viewpoint that placed an emphasis on a minimal state, as represented by the Washington Consensus, to one that placed an emphasis on a state that is much more active and effective. Through the privatization of public enterprises and sharp cuts in social spending, the World Bank promoted trade and investment liberalization,

11

domestic market deregulation, fiscal restraint, and a reduction in the size and role of the state throughout the 1980s and early 1990s. But in the middle of the 1990s, the bank realized the significance of the state and began to make the case that institutions are crucial to development. As a result, it started to promote the creation of state institutions that would encourage economic growth and efficiency. It gave special attention to a number of "second-generation" reforms that sought to improve capital markets, banking laws, and judicial systems, as well as to make bureaucracies more effective and client-focused. It also decentralized political, fiscal, and administrative authority from the federal to subnational levels of government.

According to Burki and Perry (1998), the bank's main justification for these reforms was that "good institutions are critical for macroeconomic stability in today's world of global financial integration; good macro [economic] policy is not enough." Massive social protests against the destructive effects of the bank's structural adjustment policies, as well as the bank's own admission that its policies had failed to significantly reduce poverty and had actually contributed to growing inequality, were among the political and economic forces that combined to push World Bank policy recommendations beyond the neoliberal orthodoxies.

The emphasis here is on the theoretical underpinnings of the bank's recommendation for a more activist, effective state, which are found in a body of literature known as the new institutional economics. A new institutional economics perspective has emerged in the World Bank's publications since the late 1990s, particularly in the bank's 1997 and 1999/2000 World Development Reports and numerous focused studies (Cameron, 2004)

12

The new instructional economic assumptions have recognized that the role of institutions is critical for the stability of macroeconomic indicators, including financial stability. It is obvious that the good performance of macroeconomic policies is never enough for the stability of these indicators. This implies that the role of institutions is key when it comes to the stability of financial institutions, including the banking sector. Thus, for the stability of the banking sector in midst of the global crisis, the role of institutions cannot be left out. Hence, the theory postulates a positive relationship between institutional quality and banking stability.

**Agency Theory**

Due to the principle of corporate persona principle, firms, both public or private, are managed by a group of experts known as managers (agents) on behalf of providers of resources or investors (principal) who have a differing interest. The agency theory is premised that managers are hired as the agents of the shareholders to run the business of the corporation for the principals' benefit. The agent receives gratification for their performance as long as it is consistent with the principal's interest (Obińska-Wajda, 2016). If the principal and the agent are utility maximizers, there is every reason to assume that the agent won't always act in the principal's best interest (Jensen & Meckling, 1976). The agency theory is dominant and preaches the doctrine that the sole objective of management is to maximize shareholder value. Studies have shown that the principal-agent conflict could be mitigated through the implementation of sound corporate governance structures (Eisenhardt, 1989).

Both the principal and the agent have different beliefs and interests which give rise to the agency problem. This holds that managers would not act

13

to maximise the returns to shareholders unless appropriate governance structures are implemented in the large corporation to safeguard the interests of shareholders (Jensen et al., 1976). The agency problem is characterized by three main problems; information asymmetry, moral hazard, and adverse selection (Obińska-Wajda, 2016; Gbettey, 2017). Obińska-Wajda (2016) stipulates that information asymmetry, in theory, could be illustrated in the fact that the agent knows more than the principal about their behaviour which causes the principal to bear an additional cost of monitoring and controlling to make sure that the agent acts on their behalf.

"Moral hazard refers to lack of effort on the part of the agent" (Eisenhardt, 1989). This problem occurs when the agent is shirking (Obińska-Wajda, 2016). It means that one part of the relationship (the agent) does not behave according to the contract or agreement, so the agent acts in their interest. Mishkin (1999) argued that banks in concentrated markets could become too-big-to-fail, which gives rise to a moral hazard problem on the part of bank managers.

Adverse selection relates to the misrepresentation of the agent's abilities. The main problem, in that case, is the principal's inability to verify the agent's claims. Adverse selection arises because the principal cannot completely verify the agent's claim (Eisenhardt, 1989). The Agency theory is employed in this study and serves as a theoretical link between institutional quality and bank stability.

Overall, the primary area of financial research taken into consideration here is the issue of agency issues between shareholders and managers. In this literature, bank managers are portrayed as being averse to taking on more risk

14

than is necessary to maximize shareholder value. Agency issues can be linked to early research by Holmstrom (1979), Jensen and Meckling (1976), and many others. Amihud and Lev (1981) introduced the literature to the particular field of risk and incentive compensation. The authors speculate that managers may be motivated to minimize risk in order to protect non-diversifiable human capital in conglomerate mergers that damage shareholder value.

However, if managers minimized their interest and takes risks, it will result in high performance leading to stability of the banks. Thus, theory postulates a negative relationship between the attitude and interest of the managers and stability.

**Empirical Review**

The section seeks to review empirical literature linking institutional qualityand bank stability to find empirical gaps in the literature.

*Institutional quality and bank stability in Sub-Saharan Africa*

Ofoeda et al. (2012), in their findings on *Non-bank Financial Institutions regulation (NBFIs), and risk-taking in Ghana*. The study showed a negativerelationship between minimum capital adequacy requirement and the risks weighted assets of NBFIs, which indicates that, asking NBFIs to keep higher minimum capital adequacy ratio results in reducing their risk-taking. Also, the result indicates a positive relationship between regulatory pressure and risk weighted assets of NBFIs. However, their results found a negative relationship between restrictions on deposits and the risk of insolvency, but their findings suggest that non-deposit-taking NBFIs have higher risk-weighted assets and are more prone to the risk of insolvency than deposit-taking NBFIs.

15

Furthermore, van Rossum (2013) revealed that, reduce levels of regulationmeasured by the financial freedom index of the Heritage foundation are associatedwith reduced bank risk. The effect of stricter capital regulation is unambiguous because it is associated with an increase in banks' non-performing loans and a decrease in banks' probability of default and stock price volatility. He found that no clear evidence for the effect of restrictions on bank activities on bank risk, since more restrictions are associated with an increase in the probability of defaultand a decrease in stock price volatility.

Also, Fang et al. (2014), took advantage of the dynamic nature of institutional reforms in transition economies and explored the casual effects of those reforms on bank risk. In their findings, banks' stability increases substantially after these countries reform their legal institutions, liberalize banking, and restructure corporate governance. They also found out the effects of legal and governance reforms on bank risk may critically depend on the progress of banking reforms. But the alternative risk measures reveal that the increases in bank stability among banks mainly come from the reduction of asset risk. Also, banks tend to have lower ROA volatility and fewer nonperforming loans after reforming the institutional environment.

Nevertheless, the study on explaining banking stability in Sub-Saharan Africa found that a weak regulatory environment reduces stability (Z-score) directly and matters during crisis periods (Dwumfour, 2017). Again Agyemang, Fantini and Ansong (2016) studied unearthing the integral determinants of foreignownership prevalence of companies in Africa: the role of country-level governance.The study found that there is a significant positive association between regulatory quality and foreign ownership prevalence.

16

More so, from the findings of Ozili (2018), government effectiveness, political stability, regulatory quality, and corruption control are determinants of banking stability in Africa and each determinant depends on the banking stability proxy employed and on the period of analysis: pre-crisis, during-crisis or post- crisis.

**Conceptual Framework**

The study developed a conceptual framework based on the hypotheses developed to study the relationship between institutional quality and bank stability in Sub-Saharan Africa. The framework of this study is similar to that of Bermpei, Kalyvas and Nguyen (2018), who studied whether institutional quality conditions the effect of bank regulations and supervision on bank stability.

From Figure 1, the conceptual framework showed that institutional quality has a direct relationship with the stability of banks. The conceptual framework included some country-level macroeconomic indicators and country-level bank control variables in the empirical analysis. These variables are bank size, bank cost to income ratio, bank concentration, bank net interest margin, inflation, and gross domestic product per capita. The study also analysed each of the sub-components of institutional quality *(control of corruption, government effectiveness, political stability and absence of violence/terrorism, regulatory quality, rule of law, and voice and accountability)* as presented in figure 1 below.

17

**Institutional Quality**
- *Control of Corruption*
- *Government Effectiveness*
- *Political Stability and Absence of Violence/Terrorism*
- *Regulatory Quality*
- *Rule of Law*
- *Voice and Accountability*

**Controls**
- *Bank size*
- *Bank cost to income ratio*
- *Bank concentration*
- *Bank net interest margin*
- *Inflation*
- *Gross domestic product per capita*

**Financial Stability**
- *Z-score*
- *NPL*
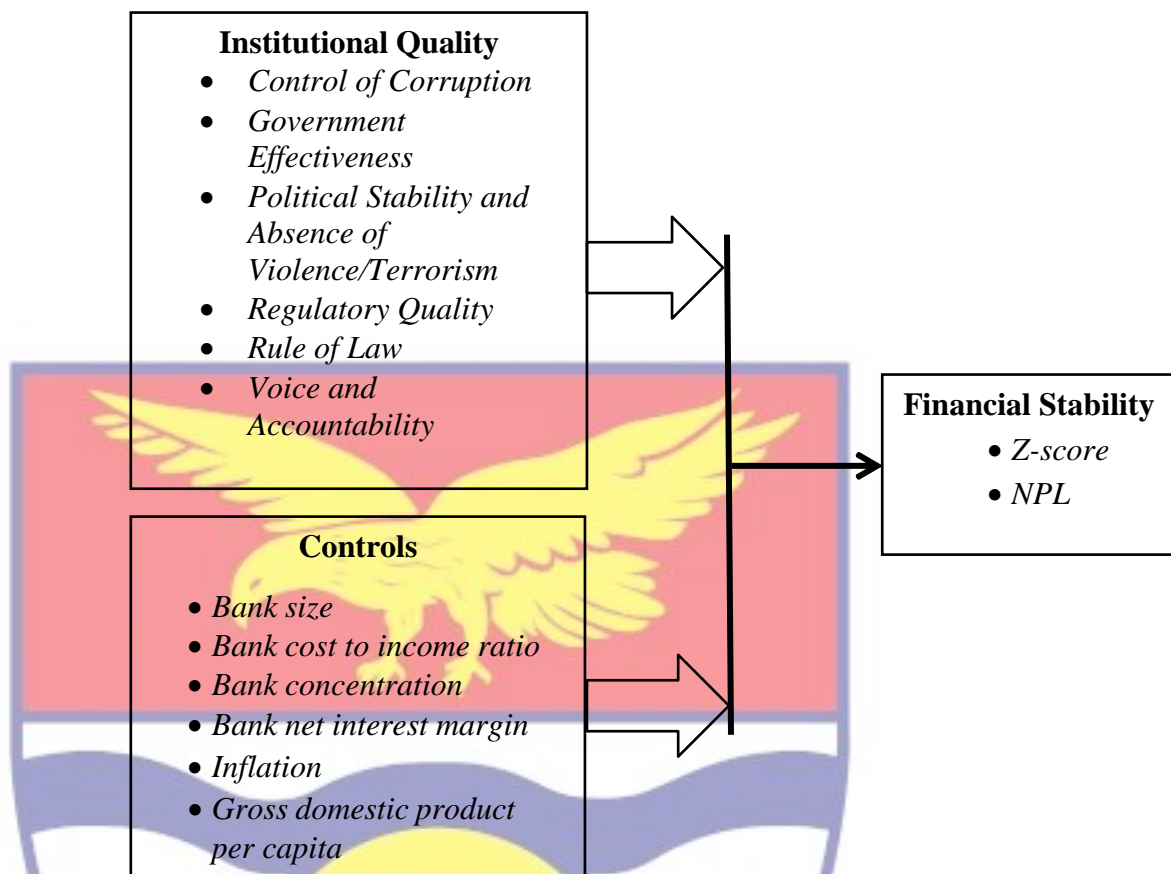
*Figure 1: Conceptual framework.*

Source: Author's Construct

**Chapter Summary**

The chapter reviewed theories that were related to the study. Among the theories reviewed included new institutional economics and the agency theory. The study provided these theories to explain the objectives formulated. Empirical review and hypotheses development were formulated on the relationship between institutional quality and bank stability in Sub-Saharan Africa. The chapter identified some empirical gaps and provided a conceptual framework to explain the various relationships between institutional quality and bank stability in Sub- Saharan Africa. Included in the conceptual framework are the control variables employed in the regression estimations.

18

## CHAPTER THREE

## RESEARCH METHODS

**Introduction**

This chapter looked at the research methods that were employed for this study. It presents the research design, sources of data, model specification, and the justification for the model. The chapter further outlines the research variables and the justification of the same and lastly, explains the estimation techniques employedin this study.

**Research Design**

This study used explanatory research that uses quantitative methods to analyze the relationships between bank stability and institutional quality. The explanatory research design would be employed for several reasons. Ivankova, Creswell, and Stick (2006) concluded that explanatory designs seek an in-depth explanation of the results from quantitative measures. Again, the findings of quantitative research design are more accurate and reliable due to the rigorous nature and could be generalized to represent the view of the entire population (Dudwick, Kuebnast, Jones & Woolcock, 2006).

**Research Approach**

The study adopts the quantitative research approach which is generally associated with the positivist paradigm. It usually involves collecting and converting data into numerical form so that statistical analysis could be made and conclusions are drawn. The quantitative approach suits this study as it addresses the research questions developed into hypotheses to be tested for possible relationships between variables (Amaratunga, Baldry, Sarshar, & Newton, 2002).

**Model Specification**

Some researchers have highlighted theadvantages that come with the use of the panel estimation technique due to the nature of the data over cross-sectional and time-series estimation techniques (Brooks, 2008; Gujarati, 2011). The panel estimation technique helps to control for omitted variables and country-specific effects and also allows for both long and short-run effects thereby overcoming the shortcomings of the cross-sectional and time-series estimation techniques (Stock & Watson, 2001). Gujarati, 2011 posited that combining time-series and cross-sectional observations into panel data gives "more informative data, more variability, less collinearity among variables, more degrees of freedom, and more efficiency". The general form of a panel data model is:

$$\mathbf{Y}_{i,t} = a + Q\mathbf{X}_{i,t} + \mathbf{V}_{i,t} \tag{1}$$

Where:

$i$ denotes the cross-sectional dimension (country) $i = 1\ldots, N$;

$t$ denotes the time-series dimension (year) $t = 1, \ldots\ldots, T_i$

The error term is explained as:

$$\mathbf{V}_{i,t} = \mu_i + \lambda_t + \mathbf{c}_{i,t} \tag{2}$$

If $\mu_i$ are assumed to be fixed parameters, the model is a fixed-effects model. If $\mu_i$ are assumed to be realizations of an independent and identically distributed (i.i.d.). a process with mean 0 and variance $\sigma_\mu^2$, it is a random-effects model.

Whereas in the fixed-effects model, the $\mu_i$ may be correlated with the covariates $\mathbf{X}_{i,t}$, in the random-effects model the $\mu_i$ are assumed to be

20

independent of the $X_{i,t}$. On the other hand, any $X_{i,t}$ that do not vary over $t$ is collinear with the $\mu_i$ and would be dropped from the fixed-effects model. In contrast, the random-effects model could accommodate covariates that are constant over time.

***Model 1 & 2- The relationship between bank stability and institutional quality inSub-Saharan Africa.***

Models 1 and 2 are the regression equations for the objectives of the study, which follows previous empirical research by Bermpei et al. (2018) who examinedwhether institutional quality conditions the effect of bank regulations and supervision on bank stability. The current study would use only country-level aggregate data and regresses bank stability as a function of institutional quality variables, and control variables.

*General Model 1 with ln Z-score  as dependent variable:*

$$lnZ-\text{score}_{i,t} = \beta_0 + \beta_1\text{INST}_{i,t} + \beta_2\text{BANK}_{i,t} + \beta_3\text{COUNTRY}_{i,t} + \mu_i + \lambda_t + c_{i,t} \tag{3}$$

*General Model 2 with NPL as dependent variable:*

$$\text{NPL}_{i,t} = \beta_0 + {}_1\text{INST}_{i,t} + \beta_2\text{BANK}_{i,t} + \beta_3\text{COUNTRY}_{i,t} + \mu_i + \lambda_t + c_{i,t} \tag{4}$$

In equation (3-4), *i,t* stand for country and year, respectively. The variables *ln*Z-score$_{i,t}$ and NPL$_{i,t}$ stand for the natural logarithm of insolvency risk and credit risk respectively which are measures of bank stability. INST$_{i,t}$ stands for the vector of institutional quality variables. Additionally, BANK$_{i,t}$ stands for the vector of thecountry-specific banks' control variables, and COUNTRY$_{i,t}$ is a vector of the country-specific control variables. Finally, $\mu_i$ represents

21

country effects, $\lambda_t$ is a set of year effects, and $\varepsilon_{i,t}$ is the error term. $BANK_{i,t}$ stands for bank size, bank cost to income ratio, bank concentration, bank net interest margin, while $COUNTRY_{i,t}$ stands for inflation and gross domestic product per capita.

**Causality Estimation**

The third and final objective of the study seeks to test the causality of the relationship. Thus, it seeks to investigate possible bi-causality between institutional quality and bank stability in Sub-Saharan Africa. In this study, we used Dumitrescu and Hurlin (2012) to detect Granger causality in panel datasets. In practice, Dumitrescu et al. (2012) run all sets of regressions containing a lag order from 1 to the highest possible number (i.e., such that T > 5 + 3K where K is the lag order and assumed to be identical for all individuals and the panel must be balanced). The most common estimation technique used in literature to investigate causality between two study variables of interest is the Granger-causality which was proposed by Granger (1969). The Granger-Causality estimation technique is easy to run and has been applied in many kinds of empirical studies including Adjei- Frimpong, Gan, and Hu (2013). Granger causality is useful in determining the direction of the relationships. The test based on the model is specified below.

$$\Delta Y_{it} = \alpha_0 + \sum_{i=1}^{p} \beta_{1i}\Delta Y_{it-i} + \sum_{i=0}^{p} \theta_{1i}\Delta X_{it-i} + \mu_{it} \qquad (5)$$

$$\Delta X_{it} = \alpha_0 + \sum_{i=1} \beta_{2i}\Delta X_{it-i} + \sum_{i=0} \theta_{2i}\Delta Y_{it-i} + \mu_{it} \qquad (6)$$

If $X_{it}$ Granger causes $Y_{it}$, then the current values of $Y_{it}$ are determined by the past values of $X_{it-1}$. The test of the null hypothesis $(H_0)$: $\alpha_i = 0$, can be carried out with the F- test.

22

**A Priori Expectations**

Table 1 below depicts the expected signs of the independent variables basedon theoretical and empirical literature discussed in Chapter 2.

**Table 1: A Priori expected signs of the independent variables**

| Variables | Model 1 (*ln*Z-score) | Model 2 (NPL) |
|---|---|---|
| INST | + | - |
| SIZE | + | + |
| BCI | - | + |
| BC | +/- | + |
| BNIM | + | - |
| INF | +/- | +/- |
| GDPPC | + | - |

Source: Field Data (2022)

**Measurement of Variables**

*Bank Stability*

The study used two proxies for bank stability: Z-score and ratio of non-performing loans to total loans (NPL). Country data on bank stability (Z-score & NPL) were obtained from the Global Financial Development Database (GFDD) collected by the World Bank.

*Z-score (Insolvency risk)*

The Z-score is the standard bank stability measure in most empirical studieswhich measure bank insolvency risk (Ashraf, 2017; Houston, Lin, Lin, & Ma, 2010). The Z-score is calculated by the sum of a bank's return on assets (ROA) andthe equity-to-assets ratio (EQAS) over the standard deviation of its return on assets(SDROA). Specifically, Z-score = (ROA + EQAS)/SDROA. A

23

high Z-score would indicate that the banks are more stable because it is inversely related to the probability of bank insolvency, in other words, a high Z-score implies lower insolvency risk or improved bank stability (Lepetit & Strobel, 2013). Moreover, because the Z-score is considered to be highly skewed, the natural logarithm of Z- score (*ln*Zscore) was used, which is normally distributed. Laeven and Levine (2009), Houston et al. (2010), Beck, Jonghe and Schepens (2013), Fernández, González and Suárez (2016), among others, have used the natural logarithm of Z- score (*ln*Zscore) as a proxy for bank insolvency risk to measure bank stability.

*NPL (Credit risk)*

The non-performing loan to total loan ratio is one of the traditional measures of bank credit risk (Fernández et al., 2016; Martinez Peria & Schmukler, 2001; Nier& Baumann, 2006). Non-performing loans to total loans ratio reflect banks' asset quality. It is defined as the ratio of the volume of non-performing loans to the total loans of a bank. NPL measures the credit risk (Iskenderoglu & Tomak, 2013;

Jiménez, Lopez, & Saurina, 2013; Beck, Hesse, Kick & von, 2009).

*Institutional Quality*

This variable is measured by the simple average of six components of Worldwide Governance Indicators namely control of corruption, government effectiveness, political stability and absence of violence/terrorism, regulatory quality, rule of law, and voice and accountability (Kaufman, Kraay, & Zoido-Lobatón, 2001; Law et al., 2012). Control of corruption (CoC) captures perceptions of the extent to which public power is exercised for private gain. COC ranges from

24

-2.5 to 2.5, and higher values indicate higher corruption control. Government effectiveness (GE) captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. GE ranges from -2.5 to 2.5, and higher values indicate higher government effectiveness. Political stability and absence of violence/terrorism (PSAV) measures perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism. PSAV ranges from -2.5 to 2.5, the higher the better. Regulatory quality (RQ) captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. RQ ranges from -2.5 to 2.5, and higher values indicate higher regulatory effectiveness. Rule of law (RL) refers to the perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence. RL ranges from -2.5 to 2.5 with a higher value implying a stronger rule of law. Voice and Accountability (VA) capture perceptions of the extent to which a country's citizens can participate in selecting their government, as well as freedom of expression, freedom of association, and free media. VA ranges from -2.5 to 2.5, and higher values indicate higher voice and accountability (Kaufmann, Kraay, & Mastruzzi, 2011). Data were sourced on Worldwide Governance Indicators (WGI) collected by the World Bank.

*Bank Size*

Ozili (2018) provided an empirical justification for the use of the ratio of private credit of deposit money banks to GDP as a measure of the size of the banking sector (SIZE). The bigger the banking sector, the higher the depth and/or breadth of financial intermediation in the financial system of a country (Ozili, 2018). This study uses the natural logarithm of the ratio of private credit of deposit money banks to GDP to measure the overall size of banks in the country. Data weresourced from the World Development Indicators (WDI).

*Bank Cost to Income Ratio*

The bank cost to income ratio (BCI) variable is measured as the cost-to- income ratio and reflects the efficiency of banks. Ideally, improved BCI in the banking sector would contribute to bank stability; therefore, a lower cost-to-income ratio should correlate with improved bank stability. Related studies also confirm that a lower cost-to-income ratio improves bank profitability when higher profitability correlates with higher stability (Athanasoglou et al., 2008; Olson et al.,2011; Pasiouras et al., 2007). This study uses the natural logarithm of the cost-to- income ratio to measure bank efficiency. Data were sourced from the Global Financial Development Database (GFDD) collected by the World Bank.

*Bank Concentration*

Studies have identified bank concentration to influence bank stability and there are diverse views on the concentration-stability argument (Ozili, 2018). Allen et al. (2004) argued that banks in more concentrated markets would reduce risky lending due to lower competition in the market because they have fewer competitors. Bank concentration (BC) is defined as the ratio

26

of the assets of the three largest commercial banks to total commercial bank assets in a country as used in studies by Dwumfour (2017) and Ozili (2018). This study employs the natural logarithm of bank concentration as a proxy for bank competition. Kasman et al. (2012) stipulated that bank competition negatively affects the NPL ratio but positively related to the Z-score. Data were sourced from the Global Financial Development Database (GFDD) collected by the World Bank.

### Bank Net Interest Margin

Bank net interest margin (BNIM) measures bank profitability (Athanasoglou et al., 2008; Ozili & Uadiale, 2017). Profitable banks have higher BNIM and are more stable than less profitable banks (Dwumfour, 2017; Ozili, 2018). This study employs the natural logarithm of bank net interest margin as a proxy for bank profitability. Data were sourced from the Global Financial Development Database (GFDD) collected by the World Bank.

### Inflation

Finance literature argues that bank performance is responsive to macroeconomic sensitivities (Nguena & Abimbola, 2015). Inflation (INF) is used to control for macroeconomic factors influencing bank stability (Jokipii et al., 2013). Banks could benefit from higher price margins during inflationary periods to increase their profitability which contributes to greater bank stability (Jokipii etal., 2013). This study employs the natural logarithm of the inflation rate as a proxy for monetary instability (Beck, Demirgüç-Kunt, & Levine, 2006). Data were sourced from the World Development Indicators (WDI).

27

*Gross Domestic Product per Capita*

Gross domestic product per capita is a macroeconomic indicator for the standard of living of citizens. The variable is measured as gross domestic product divided by the total population of a country. Following studies like Fofack (2005), Rajan et al (2003), and Salas et al. (2002) argue that an improvement in gross domestic product per capita is an indication of improvement in the standard of living and hence improvement in loan repayment. This study uses the natural logarithm of GDP per capita (GDPPC) to measure the overall level of economic development (Barth et al., 2013). Data were sourced from the World Development Indicators (WDI) spanning from 2002 to 2017. The study used data ending 2017 because of data availability for all countries considered for the study.

**Summary of Variables**

**Table 2: Variable description, measurement, and data sources**

| Variable | Measurement | Data Source |
|---|---|---|
| Bank stability (Insolvency risk) lnZ-score | The natural logarithm of (ROA+EQAS)/SDROA. | GFDD (2002-2017) |
| Bank stability (Credit risk) NPL | (Payment of interest and principal past due date by 90 days or more)/Total grossloans. | GFDD (2002-2017) |
| Institutional quality INST | A simple average of six WGI | WGI (2002-2017) |
| Control of Corruption CoC | Estimates ranging from y −2.5 to 2.5. | WGI (2002-2017) |
| Government Effectiveness GE | Estimates ranging from y −2.5 to 2.5. | WGI (2002-2017) |
| Political Stability and Absence | Estimates ranging from y | WGI (2002- |

| | | |
|---|---|---|
| of Violence/Terrorism PSAV | −2.5 to 2.5. | 2017) |
| Regulatory Quality RQ | Estimates ranging from y −2.5 to 2.5. | WGI (2002-2017) |
| Rule of Law RL | Estimates ranging from y −2.5 to 2.5. | WGI (2002-2017) |
| Voice and Accountability RL | Estimates ranging from y −2.5 to 2.5. | WGI (2002-2017) |
| Bank Size lnSIZE | Natural log of the ratio of private credit of deposit money banks to GDP. | WDI (2002 - 2017) |
| Bank Cost to Income Ratio lnBCI | Natural log of bank cost-to-income ratio. | GFDD (2002-2017) |
| Bank Concentration lnBC | Natural log of the ratio of assets of the three largest commercial banks to total commercial banks assets in a country. | GFDD (2002-2017) |
| Bank Net Interest Margin lnBNIM | Natural log of net interest margin ratio. | GFDD (2002-2017) |
| Inflation lnINF | Natural log of consumer price inflation rate. | WDI (2002 - 2017) |
| GDP lnGDPPC | Natural log of real per capita GDP. | WDI (2002 - 2017) |

Source: Field Data (2022)

**Data Collection Procedures**

This study would employ secondary annual data on bank stability, institutional quality, and other control variables for forty-eight (48) Sub-Saharan African countries. The period of the analysis (2002-2017) would reflect the availability of data on the variables of the study. Some observations are missing forsome years, which would give unbalanced panel data.

**Estimation Technique**

The estimation techniques that would be used in this study are the fixed and random effects regression estimations. For robustness, standard errors would be clustered by country and year. Following McKnight and Weir (2009), the Hausmanspecification test would be used to differentiate between the two estimation methods for testing the hypotheses. The Hausman specification test compares the Fixed Effect and Random Effects models (Hausman, 1978). The decision would be as follows: if there is no correlation between the unique errors and the independent variables, the random effects regression model is suitable. Otherwise, the fixed-effects model was used if there is a correlation between the unique errors and the independent variables.

**Chapter Summary**

This chapter presented the research methods employed in conducting the study. Varied theoretical literature explained the linkage between institutional quality and bank stability. Following these linkages, the study used a VAR model to examine the causal link between institutional quality and bank stability. This study is based on the quantitative approach. Also, the explanatory design was employed as it seeks to explain the relationship between institutional quality and bank stability. The study included 48

countries in Sub-Saharan Africa. The choice between a fixed or random effect

model was due to the decision on the null hypothesis of the Hausman test. The

next chapter, therefore, deals with the estimation and discussions of findings.

# CHAPTER FOUR

# RESULTS AND DISCUSSION

## Introduction

This chapter presents the empirical analysis of the relationship between institutional quality and bank stability in Sub-Saharan Africa. This chapter, therefore, presents and discusses the results of the study. The chapter presents the results of the descriptive statistics of the variables of interest and a correlation matrix to analysis the linear association between the variables which helps to avoid issues of multicollinearity in the regression estimations. Subsequent results are based on the various models discussed in the study. These results are discussed and related to the hypotheses of the study.

## Descriptive Statistics

Table 3 presents the descriptive statistics of both the dependent and explanatory variables. The study presents means, standard deviation, minimums, maximums, skewness, kurtosis, and the observations used for 48 Sub-Saharan African countries.

The study used Z-score and non-performing loans (NPL) ratios as proxies for bank stability. Z-score and NPL display a wide variation for countries in Sub- Saharan Africa *[1.071 - 45.964]* and *[0.964 - 57.000]* respectively. The average Z- score and NPL were 10.851 and 9.747 with volatility measured by the standard deviation of 6.106 and 8.352 respectively. Both Z-score and NPL measure insolvency risk and credit risk displayed a wide distribution with positive skewness values of 1.743 and 1.876 depicting that bank stability moves downward during the period under consideration. The bank stability seems to be volatile over the study period.

32

The institutional quality variable scored an average of -0.672, the weakest country recorded -2.449, whilst the strongest 0.880. This suggests that Sub-Saharan African economies have weaker institutional quality because their average score is closer to -2.5. The study further observed that all indicators of institutional quality are positively skewed except for political stability and the absence of violence/terrorism and regulatory quality. This observation is not strange because institutional quality has been moving downwards during the period of the study.

Control of corruption of the average economy was about -0.649 within the limits of *[-1.869 - 1.217]*. Regarding government effectiveness, the average economy was about -0.786 within the limits of *[-2.484 - 1.057]*, political stability and absence of violence/terrorism had an average economy of -0.555 within the limits of *[-3.315 - 1.200]*, regulatory quality had an average economy of -0.719 within the limits of *[-2.645 - 1.127]*, rule of law had an average economy of -0.723 within the limits of *[-2.606 - 1.077]* whilst voice and accountability had an average economy of -0.602 within the limits of *[-2.226 - 0.979]*. In Sub-Saharan Africa, government effectiveness is the weakest, and political stability and the absence of violence/terrorism are the strongest.

Also, the average private credit of banks (% GDP) of 20.03% was relatively low within the ranges of 0.5% and 160.1%, this shows that financial intermediation in the financial system of Sub-Saharan Africa is relatively low. About 60.3% of bank income was consumed by cost, in general banks in Sub-Saharan Africa are not efficient which affects the general stability of banks. In Sub-Saharan Africa, banks are more concentrated because about

33

75.3% of bank assets belong to the three largest commercial banks. Banks in Sub-Saharan Africa are less profitable due to a very low-interest margin of 7.3%. Real per capita GDP and inflation averaged US$2319.896 and 8.053% respectively and were used to control for economic development and price stability in Sub-Saharan Africa.

**Table 3: Descriptive statistics of key analysis variables**

| Variables | Obs | Mean | Std. Dev. | Kurtosis | Skewness | Min | Max |
|---|---|---|---|---|---|---|---|
| *Z-score* | 672 | 10.851 | 6.106 | 5.821 | 1.743 | 1.071 | 45.964 |
| *NPL* | 302 | 9.747 | 8.352 | 4.805 | 1.876 | 0.964 | 57.000 |
| *INST* | 760 | -0.672 | 0.640 | -0.109 | 0.176 | -2.449 | 0.880 |
| *CoC* | 760 | -0.649 | 0.630 | -0.016 | 0.665 | -1.869 | 1.217 |
| *GE* | 759 | -0.786 | 0.637 | 0.117 | 0.359 | -2.484 | 1.057 |
| *PSAV* | 759 | -0.555 | 0.936 | -0.397 | -0.446 | -3.315 | 1.200 |
| *RQ* | 759 | -0.719 | 0.640 | 0.507 | -0.114 | -2.645 | 1.127 |
| *RL* | 759 | -0.723 | 0.662 | 0.013 | 0.196 | -2.606 | 1.077 |
| *VA* | 759 | -0.602 | 0.757 | -0.796 | 0.043 | -2.226 | 0.979 |
| *SIZE* | 671 | 20.034 | 24.584 | 14.256 | 3.588 | 0.491 | 160.125 |
| *BCI* | 669 | 60.318 | 16.229 | 6.075 | 1.155 | 19.895 | 150.000 |
| *BC* | 556 | 75.289 | 18.461 | -0.855 | -0.340 | 23.324 | 100.000 |
| *BNIM* | 655 | 7.271 | 6.733 | 131.952 | 9.802 | 0.000 | 114.248 |
| *INF* | 684 | 8.053 | 18.049 | 278.962 | 14.514 | -60.496 | 379.848 |
| *GDPPC* | 738 | 2319.896 | 3265.855 | 7.415 | 2.616 | 194.873 | 20532.952 |

Source: Field Data (2022)

Notes: *Z-score* represents insolvency risk, *NPL* is the non-performing loan to total loan ratio, *INST* refers to institutional quality, *CoC* is control of corruption, *GE* is government effectiveness, *PSAV* is political stability and absence of violence/terrorism, *RQ* is regulatory quality, *RL* is rule of law, *VA* is voice and accountability, *SIZE* represents the ratio of private credit of deposit money banks to GDP, *BCI* represents bank cost-to-income ratio (%), *BC* represents the ratio of the assets of the three largest commercial banks to total commercial banks assets in a country, *BNIM* represents net interest margin ratio, *INF* represents consumer price inflation rate. *GDPPC* represents real per capita gross domestic product (GDP).

**Correlation Analysis**

The pairwise correlation among the variables employed in the study was presented in Table 4. Correlation analysis was examined to know whether the relationship among the variables was based on the cross-sections of the

panel data. The results showed varied relationships between the dependent and independent variables. Institutional quality showed a negative relationship with insolvency risk (Z-score). Credit risk showed a negative but significant relationship with institutional quality in Sub-Saharan Africa. All the indicators of institutional quality showed a negative but significant relationship with credit risk (NPL). Political stability also showed a negative but significant relationship with insolvency risk (Z-score) while government effectiveness and regulatory quality showed a positive significant relationship with insolvency risk.

The six individual components of institutional quality (control of corruption, government effectiveness, political stability and absence of violence/terrorism, regulatory quality, rule of law and voice and accountability) showed a very high correlation with institutional quality as these could cause issues of multicollinearity. This study avoids putting the institutional quality indicators together in a model to avoid issues of multicollinearity. Collinearity makes it difficult to distinguish the effect of one variable from the effect of another in the regression model (Adam & Owusu, 2017). The correlation matrix reveals that there were no issues of multicollinearity because of low correlations between the other independent variables as they do not exhibit a correlation coefficient of more than 0.8 which is usually a precursor to collinearity (Adam et al., 2017).

35

**Table 4: Correlation matrix of key analysis variables**

| | lnZ-score | NPL | INST | CoC | GE | PSAV | RQ | RL | VA | lnSIZE | lnBCI | lnBC | lnBNIM | lnINF | lnGDPPC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| lnZ-score | 1 | | | | | | | | | | | | | | |
| NPL | -0.02 | 1 | | | | | | | | | | | | | |
| INST | -0.02 | -0.35* | 1 | | | | | | | | | | | | |
| CoC | -0.07 | -0.26* | 0.88* | 1 | | | | | | | | | | | |
| GE | 0.16* | -0.33* | 0.93* | 0.83* | 1 | | | | | | | | | | |
| PSAV | -0.25* | -0.35* | 0.82* | 0.72* | 0.64* | 1 | | | | | | | | | |
| RQ | 0.21* | -0.32* | 0.90* | 0.74* | 0.90* | 0.58* | 1 | | | | | | | | |
| RL | 0.12 | -0.33* | 0.97* | 0.85* | 0.92* | 0.76* | 0.89* | 1 | | | | | | | |
| VA | 0.03 | -0.26* | 0.80* | 0.54* | 0.71* | 0.53* | 0.71* | 0.74* | 1 | | | | | | |
| lnSIZE | 0.41* | -0.32* | 0.67* | 0.54* | 0.76* | 0.31* | 0.78* | 0.65* | 0.58* | 1 | | | | | |
| lnBCI | -0.27* | 0.25* | -0.42* | -0.29* | -0.42* | -0.34* | -0.37* | -0.44* | -0.35* | -0.26* | 1 | | | | |
| lnBC | -0.33* | -0.01 | -0.10 | 0.07 | -0.19* | 0.21** | -0.26* | -0.13 | -0.31* | -0.19* | -0.02 | 1 | | | |
| lnBNIM | -0.33* | 0.17* | -0.37* | -0.26* | -0.42* | -0.26* | -0.45* | -0.35* | -0.28* | -0.62* | 0.22* | -0.08 | 1 | | |
| lnINF | -0.17* | 0.02 | -0.12 | -0.08 | -0.09 | -0.21* | -0.15* | -0.12 | 0.04 | -0.12 | 0.13* | -0.15* | 0.40* | 1 | |
| lnGDPPC | 0.41* | -0.30*** | 0.53* | 0.45* | 0.56* | 0.46* | 0.51* | 0.55* | 0.31* | 0.52* | -0.49* | -0.03 | -0.58* | -0.29* | 1 |

Source: Field Data (2022)

Notes: *lnZ-score* is the natural logarithm of the Z-score, *NPL* is the non-performing loan to total loan ratio, *INST* refers to institutional quality, *CoC* is control of corruption, *GE* is government effectiveness, *PSAV* is political stability and absence of violence/terrorism, *RQ* is regulatory quality, *RL* is rule of law, *VA* is voice and accountability, *lnSIZE* represents the natural logarithm of the ratio of private credit of deposit money banks to GDP, *lnBCI* represents the natural logarithm ofbank cost-to-income ratio (%), *lnBC* represents the natural logarithm of the ratio of the assets of the three largest commercial banks to total commercial banks assets in a country, *lnBNIM* represents the natural logarithm of net interest margin ratio, *lnINF* represents the natural logarithm of consumer price inflation rate. *lnGDPPC* represents the natural logarithm of real per capita gross domestic product (GDP). * indicate 5% significance level.

**Regression results on the effect of institutional quality on bank stability in Sub- Saharan Africa**

In this section, results from the estimated models were presented and discussed based on the objectives of the study. The discussion of the results and findings are situated in prior empirical studies and theoretical concepts. The section discusses the relationship between institutional quality and bank stability in Sub- Saharan Africa. The regression results are presented in Tables 5 and 6. The study used two dependent variables in separate models thus, Z-score measures insolvencyrisk and NPL which is a proxy for credit risk of the financial system. Models 1 and2 were employed to analyse objectives 1 and 2.

Table 5 presents the individual effects of institutional quality on bank stability (Z-score) in Sub-Saharan Africa. Model 1 in Table 5 depicts the results ofthe effect of institutional quality on bank stability, which is in line with objectives 1 and 2 of the study and the results are presented below.
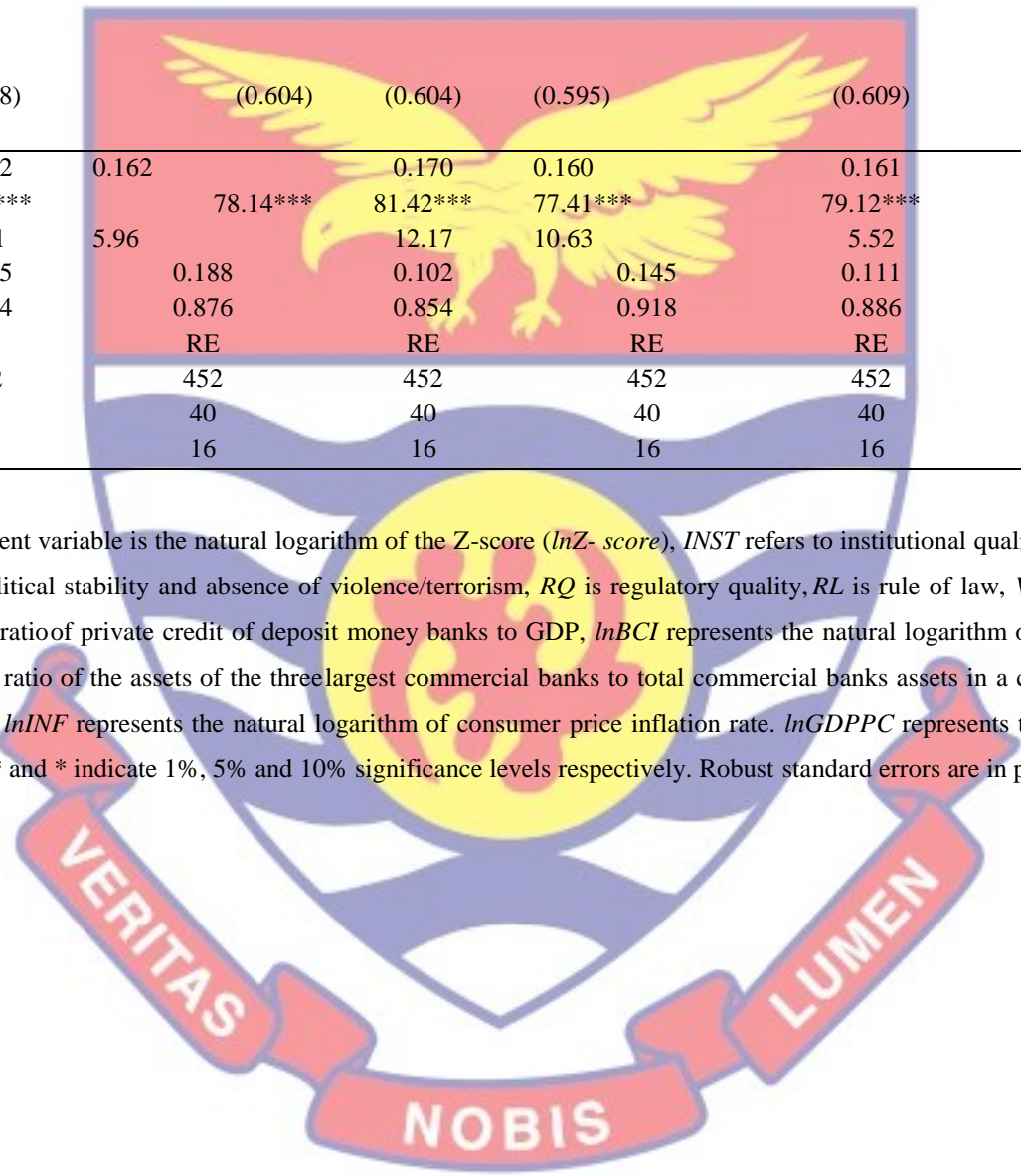
37
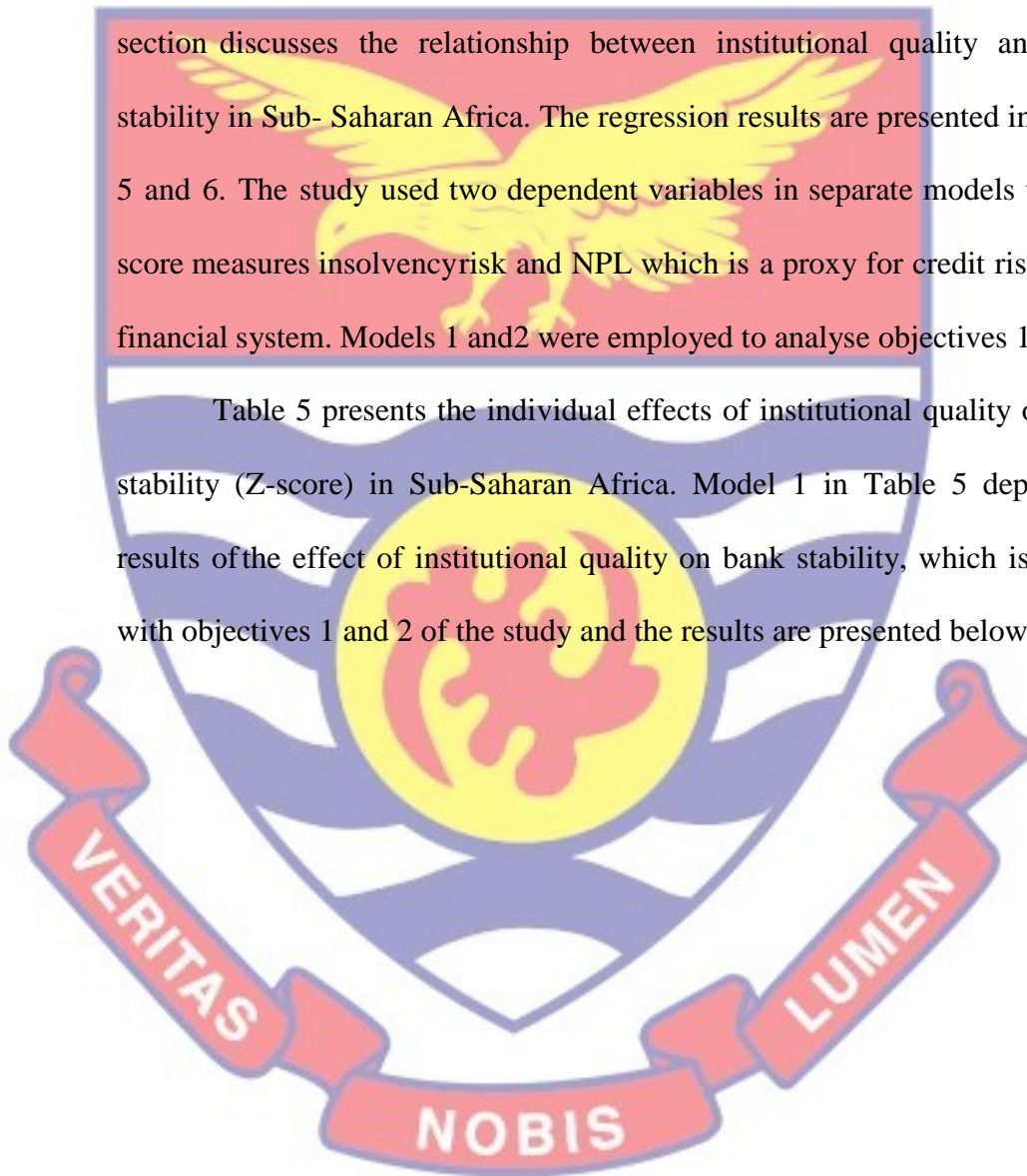
**Table 5: Effect of institutional quality on bank stability (Z-score) in Sub- Saharan Africa**

| Variables | (1) lnZ-score | (1a) lnZ-score | (1b) lnZ-score | (1c) lnZ-score | (1d) lnZ-score | (1e) lnZ-score | (1f) lnZ-score |
|---|---|---|---|---|---|---|---|
| INST | -0.0267 | | | | | | |
| | (0.0532) | | | | | | |
| CoC | | -0.0245 | | | | | |
| | | (0.0426) | | | | | |
| GE | | | -0.0822* | | | | |
| | | | (0.0470) | | | | |
| PSAV | | | | -0.00942 | | | |
| | | | | (0.0227) | | | |
| RQ | | | | | 0.0540 | | |
| | | | | | (0.0482) | | |
| RL | | | | | | 0.0501 | |
| | | | | | | (0.0462) | |
| VA | | | | | | | -0.0673 |
| | | | | | | | (0.0436) |
| **Control var.** | | | | | | | |
| lnSIZE | 0.0573** | 0.0596** | 0.0529* | 0.0584** | 0.0613** | 0.0603** | 0.0602** |
| | (0.0292) | (0.0291) | (0.0291) | (0.0295) | (0.0291) | (0.0291) | (0.0290) |
| lnBCI | -0.14*** | -0.14*** | -0.16*** | -0.140*** | -0.128** | -0.132*** | -0.147*** |
| | (0.0510) | (0.0512) | (0.0513) | (0.0504) | (0.0510) | (0.0505) | (0.0504) |
| lnBC | 0.0437 | 0.0453 | 0.0422 | 0.0423 | 0.0452 | 0.0438 | 0.0317 |
| | (0.0503) | (0.0502) | (0.0501) | (0.0503) | (0.0502) | (0.0502) | (0.0509) |
| lnBNIM | 0.124*** | 0.123*** | 0.123*** | 0.124*** | 0.124*** | 0.123*** | 0.123*** |
| | (0.0237) | (0.0237) | (0.0236) | (0.0240) | (0.0237) | (0.0237) | (0.0237) |
| lnINF | 0.0186* | 0.0187* | 0.0184* | 0.0186* | 0.0206** | 0.0197** | 0.0184* |
| | (0.00991) | (0.00989) | (0.00983) | (0.00993) | (0.00995) | (0.00986) | (0.00984) |
| lnGDPPC | 0.274*** | 0.272*** | 0.292*** | 0.262*** | 0.245*** | 0.245*** | 0.279*** |
| | (0.0638) | (0.0625) | (0.0632) | (0.0610) | (0.0640) | (0.0646) | (0.0622) |
| Constant | 0.282 | 0.295 | 0.204 | 0.374 | 0.462 | 0.483 | 0.293 |

|  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|
|  | (0.608) | (0.604) | (0.604) | (0.595) | (0.609) | (0.617) | (0.601) |
| **Diagnostics** |  |  |  |  |  |  |  |
| R-squared | 0.162 | 0.162 | 0.170 | 0.160 | 0.161 | 0.162 | 0.168 |
| Wald $\chi2$ | 78.07*** | 78.14*** | 81.42*** | 77.41*** | 79.12*** | 79.12*** | 80.63*** |
| Hausman $\chi2$ | 5.31 | 5.96 | 12.17 | 10.63 | 5.52 | 6.83 | 5.03 |
| AR($2$) | 0.185 | 0.188 | 0.102 | 0.145 | 0.111 | 0.174 | 0.113 |
| Hansen | 0.904 | 0.876 | 0.854 | 0.918 | 0.886 | 0.739 | 0.843 |
| Estimation | RE | RE | RE | RE | RE | RE | RE |
| No. of Obs. | 452 | 452 | 452 | 452 | 452 | 452 | 452 |
| No. of grps | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| No. of Pds. | 16 | 16 | 16 | 16 | 16 | 16 | 16 |

Source: Field Data (2022)

Notes: In models (1) - (1f), the dependent variable is the natural logarithm of the Z-score (*lnZ- score*), *INST* refers to institutional quality, *CoC* is control of corruption, *GE* is government effectiveness, *PSAV* is political stability and absence of violence/terrorism, *RQ* is regulatory quality, *RL* is rule of law, *VA* is voice and accountability, *lnSIZE* represents the natural logarithm of the ratio of private credit of deposit money banks to GDP, *lnBCI* represents the natural logarithm of bank cost-to-income ratio (%), *lnBC* represents the natural logarithm of the ratio of the assets of the three largest commercial banks to total commercial banks assets in a country, *lnBNIM* represents the natural logarithm of net interest margin ratio, *lnINF* represents the natural logarithm of consumer price inflation rate. *lnGDPPC* represents the natural logarithm of real per capita gross domestic product (GDP). ***, ** and * indicate 1%, 5% and 10% significance levels respectively. Robust standard errors are in parentheses.

**Institutional quality and bank stability (Z-score) in Sub-Saharan Africa**

Models 1 in Table 5 presents the results on the relationship between institutional quality, and bank stability in Sub-Saharan Africa. The result in model 1 depicts that at a 5 % significance level, institutional quality had a negative but insignificant effect on bank stability in Sub-Saharan Africa. This implies that a unit increase in institutional quality causes a decrease in bank stability measured by Z-score (insolvency risk) by 2.7 percent. This result is contrary to the first hypothesis because it shows a negative effect of institutional quality on bank stability (insolvency risk) in Sub-Saharan Africa. This means the stringent implementation of institutional laws and regulations on financial institutions in Sub-Saharan Africa will give room to undertake activities like charging higher loan rates that will give rise to moral hazard problems on the part of bank managers, reduce profit levels of banks and increase the risk of insolvency (Boyd et al., 2005). The findings of van Rossum (2013) argued that reduced levels of regulations measured by the financial freedom index of the Heritage foundation are associated with reduced bank risk. Ofoeda et al. (2012) also posited that there is a positive relationship between regulatory pressure and risk-weighted assets of NBFIs.

This result is inconsistent with the theoretical position of the new institutional economics of Ronald Coase which argued that economic output is premised on legal, political, development, social, and economic institutions. The result presented in Table 5 is inconsistent with the findings of Dwumfour (2017) in explaining banking stability in SSA posited that if large banks in the concentrated market are well regulated then the stability of the banking system could be ensured.

He also argued that a weak regulatory environment reduces bank stability (Z-score). Also, Fang et al. (2014) argued that bank stability increases substantially after countries reform their legal institutions. Also, Barth et al. (2012) found out that strengthening official supervision triggers corruption in bank lending and reduces bank development as well as enhances inefficiency in financial intermediation.

Table 5 further presents the results from sub-models 1a-1f which seek to examine the individual effect of each indicator of institutional quality on bank stability. Government effectiveness showed a negative but significant effect on bank stability (Z-score) at a 10% significance level. The result indicates that the quality of public service and civil service and the degree of its independence from political pressures, quality of policy formulation and implementation have been compromised and these affect the financial system negatively and reduce the stability of banks in Sub-Saharan Africa. Control of corruption, political stability, and absence of violence/terrorism, and voice and accountability showed a negative but not significant effect on bank stability at 5% significance levels. Regulatory quality and rule of law depicted a positive but not significant effect on the bank stability in Sub-Saharan Africa also at a 5% significance level.

The results are inconsistent with the empirical findings of Bermpei et al. (2018) in studying whether institutional quality conditions the effect of bank regulations and supervision on bank stability in 69 emerging and developing economies from 2004-2013. The study found that control of corruption enhances the positive effect of activity restrictions on stability. Ozili (2018) argued that regulatory quality has a negative influence on bank

41

stability in Africa. Also, Ozili (2018) posited that control of corruption has a positive effect on bank stability measured by Z-score. Also, he found that political stability and absence of violence/terrorism, and voice and accountability are significant determinants of banking stability in Africa which were not significant in this study.

**Institutional quality and bank stability (NPL) in Sub-Saharan Africa**

The results from Table 6 below present the relationship between institutional quality and bank stability in Sub-Saharan Africa. The institutional quality, an index of six variables showed a negative and significant relationship with bank stability in Sub-Saharan Africa measured by NPL in model 2. This shows that a unit increase in institutional quality leads to a 24.5 unit decrease in credit risk. This shows that good institutions play a vital role in ensuring that bank loan defaulters are minimised which reduces credit or portfolio risk of the financial system in Sub-Saharan Africa. For the institutional quality variables in sub-model 2a-2f in Table 6, control of corruption, government effectiveness, political stability and absence of violence/terrorism, regulatory quality, rule of law and voice and accountability showed an inverse and significant relationship with credit risk at 1% significant level.

The results were consistent with the findings of Ozili (2018) who stipulated that the quality of government policy formulation and implementation reduces the probability of loan default in countries in Africa. Also, Ozili (2018) posited that a strong regulatory quality environment can make loan losses less likely by indirectly restricting banks from taking excessive risks.

**Table 6: Effect of institutional quality on bank stability (NPL) in Sub-SaharanAfrica**

| Variables | (2) NPL | (2a) NPL | (2b) NPL | (2c) NPL | (2d) NPL | (2e) NPL | (2f) NPL |
|---|---|---|---|---|---|---|---|
| *INST* | -24.5*** | | | | | | |
| | (3.633) | | | | | | |
| *CoC* | | -10.4*** | | | | | |
| | | (2.314) | | | | | |
| *GE* | | | -16.4*** | | | | |
| | | | (2.743) | | | | |
| *PSAV* | | | | -7.36*** | | | |
| | | | | (1.670) | | | |
| *RQ* | | | | | -11.3*** | | |
| | | | | | (3.046) | | |
| *RL* | | | | | | -14.60*** | |
| | | | | | | (3.140) | |
| *VA* | | | | | | | -7.841** |
| | | | | | | | (3.758) |
| **Control var.** | | | | | | | |
| *lnSIZE* | -0.707 | 0.665 | -2.165 | -0.839 | -0.0506 | -0.261 | 0.0332 |
| | (2.210) | (2.345) | (2.282) | (2.348) | (2.375) | (2.330) | (2.432) |
| *lnBCI* | -3.191 | -0.586 | -2.467 | -1.052 | -0.443 | -2.356 | -0.757 |
| | (2.803) | (2.924) | (2.851) | (2.938) | (2.969) | (2.964) | (3.082) |
| *lnBC* | 3.897 | 5.156** | 4.888** | 3.483 | 5.336** | 6.044** | 3.048 |
| | (2.367) | (2.505) | (2.414) | (2.524) | (2.546) | (2.509) | (2.731) |
| *lnBNIM* | -4.516** | -3.948* | -4.713** | -3.691 | -4.912** | -3.522 | -4.528* |
| | (2.124) | (2.248) | (2.171) | (2.252) | (2.297) | (2.241) | (2.353) |
| *lnINF* | -1.440** | -1.265* | -1.262** | -1.026 | -1.501** | -1.043 | -1.029 |
| | (0.616) | (0.651) | (0.627) | (0.649) | (0.673) | (0.646) | (0.674) |
| *lnGDPPC* | -6.966 | -12.68*** | -9.793** | -15.99*** | -8.403 | -6.878 | -16.66*** |
| | (4.695) | (4.817) | (4.706) | (4.734) | (5.313) | (5.175) | (4.912) |
| Constant | 61.31 | 87.53** | 81.45* | 126.8*** | 59.49 | 47.81 | 131.0*** |
| | (41.40) | (43.50) | (41.82) | (42.85) | (46.65) | (45.56) | (44.66) |
| **Diagnostics** | | | | | | | |
| R-squared | 0.323 | 0.240 | 0.293 | 0.238 | 0.216 | 0.246 | 0.178 |
| F-stats | 12.86*** | 8.51*** | 11.21*** | 8.42*** | 7.46*** | 8.79*** | 5.86*** |
| Hausman χ2 | 37.78*** | 43.00*** | 56.27*** | 28.24*** | 24.47*** | 34.87*** | 24.84*** |
| AR(*2*) | 0.301 | 0.108 | 0.106 | 0.161 | 0.195 | 0.234 | 0.350 |
| Hansen | 0.919 | 0.957 | 0.878 | 0.860 | 0.894 | 0.854 | 0.909 |
| Estimation | FE | FE | FE | FE | FE | FE | FE |
| Observations | 223 | 223 | 223 | 223 | 223 | 223 | 223 |
| Number of A | 27 | 27 | 27 | 27 | 27 | 27 | 27 |
| No. of Pds. | 16 | 16 | 16 | 16 | 16 | 16 | 16 |

Source: Field Data (2022)

Notes: In models (2) - (2f), the dependent variable is the non-performing loan to total loan ratio (*NPL*), *INST* refers to institutional quality, *CoC* is control of corruption, *GE* is government effectiveness, *PSAV* is political stability and absence of violence/terrorism, *RQ* is regulatory quality, *RL* is rule of law, *VA* is voice and accountability, *lnSIZE* represents the natural logarithm of the ratio of private credit of deposit money banks to GDP, *lnBCI* represents the natural logarithm of bank cost-to-income ratio (%), *lnBC* represents the natural logarithm of the ratio of the assets of the three largest commercial banks to total commercial banks assets in a country, *lnBNIM* represents the natural logarithm of net interest margin ratio, *lnINF* represents the natural logarithm of consumer price inflation rate. *lnGDPPC* represents the natural logarithm of real per capita gross domestic product (GDP). ***, ** and * indicate 1%, 5% and 10% significance levels respectively. Robust standard errors are in parentheses.

43

**Effect of control variables used in model 1 and 2**

All the models (1-1f) and (2-2f) in Tables 5 and 6 used in the regression estimations controlled for six control variables (*bank size, bank cost to income ratio, bank concentration, bank net interest margin*, *inflation, and gross domestic product per capita*). Two indicators of bank stability, the natural logarithm of Z- score and NPL were used in each models 1 & 2 respectively.

Bank size which measures the degree of financial intermediation had a positive and significant effect on bank stability measured by Z-score and a negative but insignificant effect on NPL with a coefficient of 0.0573 and -0.707 respectively. This implies that a 1 percent increase in the level intermediation leads to a 5.7 percent increase in bank stability measured by Z-score but an expansion in bank size decreases non-performing loans of banks in Sub-Saharan Africa by 0.707 units. This implies that African countries with large banking sectors tend to have a reduced level of insolvency and credit risk. These findings support the view that an increased level of intermediation and financial activities tend to make the financial system relatively stable. This result is consistent with Boyd and Runkle (1993) and Boyd et al. (2005) who relate indicators of financial failure probabilities to bank size. Boyd et al. (2005) report a positive and significant relationship between bank size and failure probabilities for the United States, Japan, and several European countries. Inconsistent with this result is the finding of Ozili (2017) which suggests that large banks correlate with greater bank instability if excessive competition drives banks to take an excessive risk that could materialise as losses during bad economic times, thereby destabilising the financial system.

44

The bank cost to income ratio showed a significant negative effect on bank stability in model 1 and sub-models 1a-1f at a 1% significant level, this points to the fact that there was enough evidence that the bank cost to income ratio matters for bank stability. The evidence reveals that reduced levels of bank cost to income increase the profit margins of banks thereby reducing the level of instability. This result is consistent with studies that confirm the fact that a lower cost-to-income ratio improves financial profitability when higher profitability correlates with higher stability (Athanasoglou et al., 2008; Olson et al., 2011; Pasiouras et al., 2007). Model 2 and sub-models in Table 6 showed that bank cost to income had a negative but insignificant effect on credit risk which shows that decreases in bank cost to income motivate banks to grant more loans to increase profit levels which leads to borrower moral hazard and eventually causes a rise in the ratio of non-performing loans to total loans. These results are inconsistent with the findings of Ozili (2018) who posited that bank cost to income ratio has a positive effect on credit risk.

Bank concentration showed a positive and insignificant effect on bank stability in both models 1 and 2. The coefficients in sub-models 2a, 2b, 2d, and 2e are significant at a 5% level of significance. This explains that bank concentration does not affect bank stability in Sub-Saharan Africa. From the sub-models in model 2, the concentration of banks has a significant positive impact on bank stability measured by NPL at a 5% level. This implies that higher contraction of banks leads to increased credit risk (NPL). These findings are in line with the findings of Dwumfour (2017) found that bank concentration had a significant negative impact on NPL.

Bank net interest margin which measures banking spread had a

45

positive impact on bank stability in model 1. At a 5% significance level, a 1 percent increase in bank spread would lead to a 12.4 percent increase in bank stability (Z-score) in Sub-Saharan Africa in model 1. Similar results were obtained in the other sub-models 1a-1f. This finding supports the findings of Dwumfour (2017), Akinkunmi (2017), and Athanasoglou et al. (2008), who also found that banking spread measured by net interest margin- NIM is the main determinant of bank stability in Africa. There was varied finding as to the fact that the spread stability relationship is U-shaped (Dwumfour, 2017). From model 2 and sub-models 2a, 2b, 2d, and 2f, bank net interest margin had a significant negative effect on bank stability (NPL) at a 5% level. This shows that a 1 percent increase in profit margins leads to a 4.516 unit decrease in credit risk measured by NPL. This finding supports the finding of Dwumfour (2017) who posited that higher profit margins reduce portfolio risk or improve bank stability (NPL).

In the presence of macroeconomic variables, inflation which controls for price stability in an economy showed a significant positive effect on bank stability in model 1 and a negative effect on credit risk in model 2 at 10% and 5% significance levels respectively. Consistent with this result is the finding of Balutel (2020) who stipulated that a weak macroeconomic environment characterised by high inflation increases the likelihood of banking crises. The result is inconsistent with the findings of Ozili (2018) who stipulated that the inflation coefficient reported an insignificant relationship with bank stability.

The study also found out that enhancement in the standard of living which is measured by gross domestic product per capita had a positive effect on insolvency risk (Z- score) in model 1 and sub-models and a negative

46

relationship with credit risk (NPL). The result is consistent with the findings of Salas et al. (2002) and Rajan et al. (2003) who posited that enhancement in the standard of living reduces liquidity risk which stabilizes banks. This result is similar to the study of Neequaye (2018) who posited that gross domestic product per capita boosts bank stability in Africa. Thus, low real economic growth is strongly correlated with a high probability of banking distress, which reinforces the belief that a fall in the real GDP growth rate is a major cause of banking crisis creation (Balutel, 2020).

**Diagnostics on the regression models**

The results presented some diagnostic procedures on the regression estimations in models 1 and 2. The F test and the Wald $\chi 2$ of explanatory power were used to draw inferences about whether or not the $R^2$ is significantly different from zero. The F test was employed in fixed-effects models whilst the Wald $\chi 2$ was used in the random-effects model to check for explanatory power. From Tables 5 and 6, it is evident that (p-values < 0.05) in both models 1 and 2 and the various sub-models. This shows that the regressors could jointly explain the regressand in both models 1 and 2. The study assessed the adequacy of the model-based using the Hansen OIR and AR2 to test for the validity of instruments and autocorrelation respectively. From the diagnostics shown in Table 5 and 6, all the p-values for the Hansen OIR are greater than 0.1 (Models 1 and 2). Thus, the study fails to reject the null hypothesis that the instruments are valid. Furthermore, the AR2 as shown in Table 5 and 6 also has most of the p-values (Models 1 and 2) above 0.1. Thus, the study concludes that there is no serial correlation. Hausman $\chi 2$ was used to differentiate between fixed effect and random effect models

47

(Hausman, 1978). Model 1 failed to reject the null hypothesis of the random effect model (p-values > 0.05), due to this the random effect model was used in model 1 and its sub-models whiles the fixed effect was used in model 2 and its sub-models due to the rejection of the null hypothesis of the Hausman specification test. The ratio of the number of observations to the numberof regressors included in each model is relatively greater than 15.

**Panel unit root test**

The panel unit root tests were conducted on the data at the levels using a statistical approach. The null hypothesis of the ADF tests is that all panels containunit-roots. The rejection of the null hypothesis means that the series is stationary. Stationary series means that the "statistical properties of the series are constant overtime." The results of the ADF test were reported in Table 7.

**Table 7: Panel unit root test- ADF**

| Test Statistic | lnZ-score | NPL | INST |
|---|---|---|---|
| Inverse chi-squared ($\chi 2$) | 246.7276*** | 99.5585*** | 266.2967*** |
| Inverse normal (Z) | -9.4639*** | -5.8174*** | -9.7146*** |
| Inverse logit (t) | -9.8027*** | -6.0814*** | -10.0200*** |
| Modified inv. chi-squared ($\chi 2$) | 12.5547*** | 7.9501*** | 12.2901*** |
| Lags | 2 | 2 | 2 |
| Order of integration | I (0) | I (0) | I (0) |
| Number of panels | 46 | 29 | 48 |
| AR parameter | Panel-specific | Panel-specific | Panel-specific |
| Panel means | Included | Included | Included |
| Time trend | Not included | Not included | Not included |
| Drift term | Included | Included | Included |

*Ho: All panels contain unit roots Ha: At least one panel is stationary*

Source: Field Data (2022)

Notes: *lnZ-score* represents the natural logarithm of the Z-score, *NPL* is the non-performing loan tototal loan ratio, *INST* refers to institutional quality. ***, ** and * indicate 1%, 5% and 10% significance levels respectively.

From the panel unit root test results presented in Table 7 above, the

null hypothesis of at least one panel is stationary all the variables (lnZ- score, NPL, and INST) in their levels were rejected since the P-values of the ADF statistics were statistically significant at the 1% level of significance. It is therefore evident that the unit root results discussed above depict that the variables are integrated of order zero, $I$ (0) (Dickey & Fuller, 1979; Phillips & Perron, 1988).

**Causality between institutional quality and bank stability in Sub-Saharan Africa**

This study investigated the causality between institutional quality and bank stability measured by insolvency and credit risk. Table 8 reported Dumitrescu et al. (2012) Granger non-causality test results using a series of pairwise panel causality tests between variables such as institutional quality, lnZ-score, and NPL. We explained Table 8 under the null hypothesis that there is no Granger-causality.

At the 1% significance level, we found that lnZ-score and NPL both Granger-cause INST. That is to say, we can predict institutional quality with overall insolvency and credit risk in Sub-Saharan Africa. Said otherwise, the level of regulations and institutional laws are basically due to the level of accompanying risk that is being observed. Generally, risk predicts the level of laws and institutions that would be deployed and implemented in a particular jurisdiction. Also, it could be noted from Table 8 that institutional quality granger cause changes in insolvency risk (lnZ-score) but does not granger cause credit risk (NPL).

49

**Table 8: Granger non-causality test between institutional quality (INST) andbank stability (lnZ-score & NPL) in Sub-Saharan Africa**

| Test Stats | INST → lnZ-score | lnZ-score → INST |
|---|---|---|
| W-barZ-bar | 1.7175 | 5.4688 |
| Z-bar tilde | 2.9143 (0.0036) *** | 5.7898 (0.0000) *** |
| | 1.4938 (0.1352) | 0.8096 (0.4182) |
| | $H_1$: INST does Granger-cause lnZscore for at least one panelvar | $H_1$: lnZscore does Granger-cause INST for at least one panelvar |

| Test Stats | INST → NPL | NPL → INST |
|---|---|---|
| W-bar | 0.0452 | 13.7070 |
| Z-bar | -0.6752 (0.4996) | 4.3711 (0.0000) *** |
| Z-bar tilde | -0.5803 (0.5617) | 1.3394 (0.1804) |
| | $H_1$: INST does Granger-cause NPL for at least one panelvar | $H_1$: NPL does Granger-cause INST for at least one panelvar |

Source: Field Data (2022)

Notes: *lnZ-score* represents the natural logarithm of the Z-score, *NPL* is the non-performing loan tototal loan ratio, *INST* refers to institutional quality. ***, ** and * indicate 1%, 5% and 10% significance levels respectively. The optimal number of lags (AIC): 1 (lags tested: 1 to 3). *Test statistics and p-values reported, p-values are in parentheses ( ).*

This depicts the intuition that institutions can be used as a tool to make vitalchanges to financial fragility in the region. These results produce similar findings as strengthening the quality of the institutional environment reduces the probability of banking crises and keeps the degree of bank stability (Demirgüç-Kunt &Detragiache, 2005). This suggests that the probability of the occurrence of banking crises depends on the quality of the regulation and supervision framework (Belkhir,Ben Naceur, Candelon & Wijnandts, 2020).

**Chapter Summary**

This chapter seeks to analyse the objectives of the study and relate to a wider literature on the relationship between institutional quality and bank stability in Sub- Saharan Africa. Three main hypotheses were tested, hypothesis one and two used the fixed and random-effects models, while hypothesis three which seeks to examine the direction of causality between institutional quality and bank stability employed the Dumitrescu et al. (2012) Granger causality test. The study adopted the fixed and random effects models based on the decision of the Hausman test. Precisely, it was observed that institutional quality negatively affects insolvency risk but reduces credit risk in the financial system. Also, causalities exist between insolvency risk (lnZ-score), credit risk (NPL), and institutional quality (INST). This reinforces the institution-stability nexus as the two interrelate to ensure the efficient functioning of the financial system in Sub-Saharan Africa. The study also found bank size, bank cost to income ratio, bank concentration, bank net interest margin, inflation, and gross domestic product per capita to influence bank stability in the region.

51
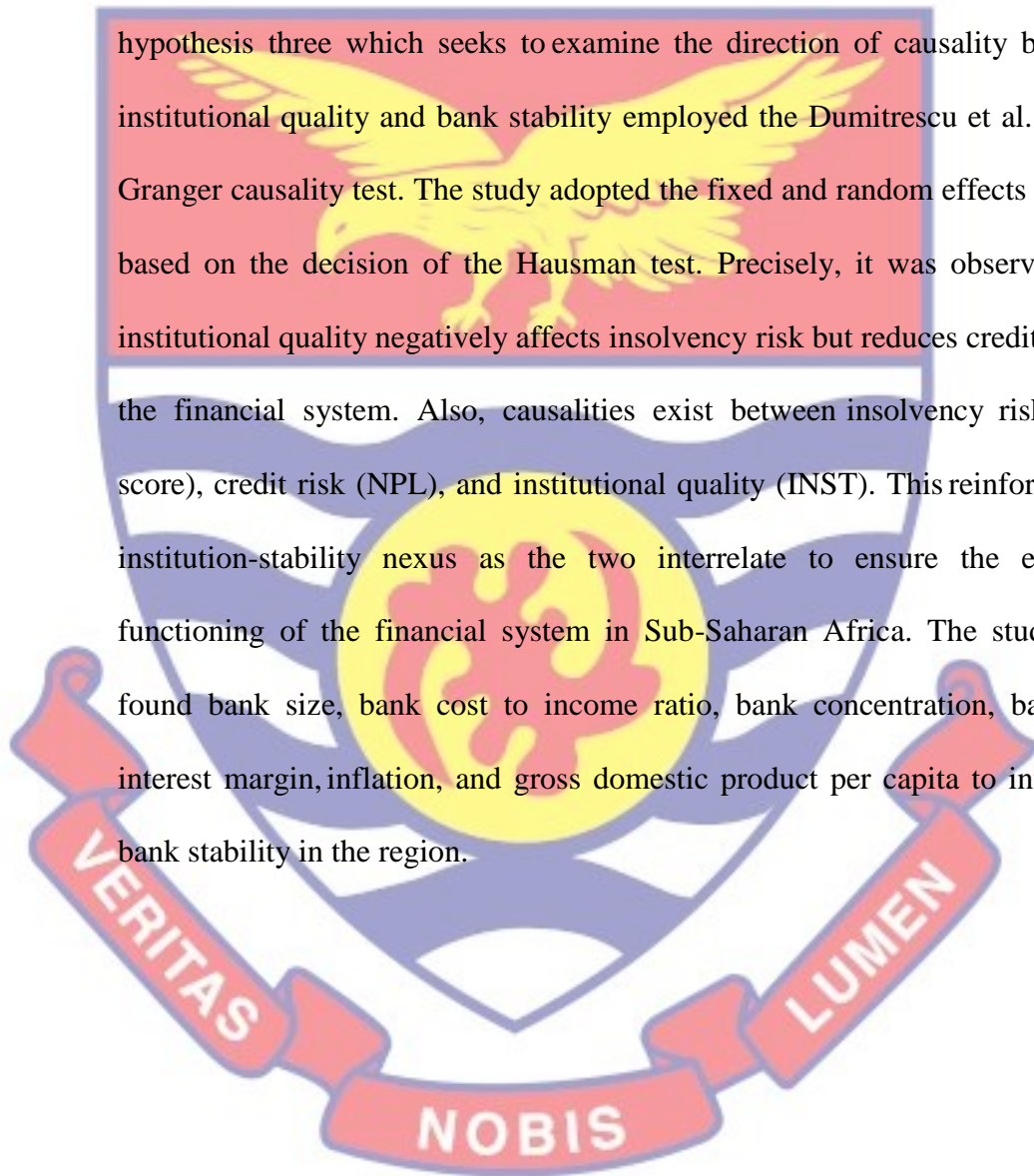
**CHAPTER FIVE**

**SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

**Introduction**

This chapter presents a summary of the study, conclusions, and recommendations on the results of the study. The general objective of the study was to examine the relationship between institutional quality and bank stability in Sub-Saharan Africa. The summary, conclusion, and recommendations are based on the hypothesis and the findings drawn from the analysis and interpretations.

**Summary of Findings**

The study examined the relationship between institutional quality and bank stability in Sub-Saharan Africa using annual panel data from 2002 to 2017. Specifically, it investigated the effects of institutional quality on insolvency risk, effects of institutional quality on credit risk using both the fixed and random-effects models. The study further investigated the direction of causality between institutional quality and bank stability in Sub-Saharan Africa using the panel Granger causality test. The variables employed in the study included insolvency risk, credit risk, institutional quality, bank size, bank cost to income ratio, bank concentration, bank net interest margin, inflation, and gross domestic product per capita. All tests and estimations were conducted using Stata v.14 and Microsoft excel 2016.

The study observed that bank stability is negatively related to insolvency risk, thus increased implementation of laws and regulations reduces the general stability of the financial system in Sub-Saharan Africa. Institutional quality had a negative but insignificant effect on bank stability in

Sub-Saharan Africa. Also, government effectiveness which is a sub-component of the institutional quality variable was found to be the only tool for changing the stability framework in Sub-Saharan Africa.

Credit risk in the financial system was found to decrease in relationship to good institutions in Sub-Saharan Africa. Also, control of corruption, government effectiveness, political stability and absence of violence/terrorism, regulatory quality, rule of law and voice, and accountability showed an inverse and significant relationship with credit risk. The study also found bank size, bank cost to income ratio, bank concentration, bank net interest margin, inflation, and gross domestic product per capita to predict bank stability in Sub-Saharan Africa.

Furthermore, evidence from the panel Granger causality test results indicated that causalities exist between insolvency risk (lnZ-score), credit risk (NPL), and institutional quality (INST). This reinforces the institution-stability nexus as the two interrelate to ensure efficient functioning of the financial system in Sub-Saharan Africa.

**Conclusions**

This result is inconsistent with the theoretical position of the new institutional economics of Ronald Coase which argued that economic output is premised on legal, political, development, social, and economic institutions. The study concluded that stringent institutional structures in Sub-Saharan Africa affect bank stability adversely and supports various empirical findings on the relationship between bank stability and institutions. The study rather found a negative effect of institutional quality on bank stability which is inconsistent with the hypothesis that institutional quality positively affects bank

53

stability in Sub-Saharan Africa.

Also, an inference can be drawn from the results that quality of public service and civil service and the degree of its independence from political pressures, quality of policy formulation and implementation has been compromised and these affect the financial system negatively and reduce the bank stability in Sub-Saharan Africa. Also, good institutions play a vital role in ensuring that loan defaulters are minimised which reduces credit or portfolio risk of the financial system in Sub- Saharan Africa.

Large banking sectors, reduced levels of bank cost to income and an enhancement in the standard of living reduces the general level of instability in the region. Causalities between stability and institutions suggest that the level of regulations and institutional laws are basically due to the level of accompanying risk. This suggests that the probability of the occurrence of banking crises depends on the quality of the regulation and supervision framework.

**Recommendations**

The results of this study have policy implications, and the following recommendations have been proposed. Regulatory authorities should take into consideration the impact of various governance mechanisms on the risk profile of financial institutions in Sub-Saharan Africa. If there would be the existence of bank stability, regulators need to consider the role of institutions for bank stability. Moreover, the results highlight the impact of institutional quality on bank stability in Sub-Saharan Africa as the literature has extensively shown similar evidence for other regions, even when multiple stability proxies were used (Z-score and NPL).

54

Also, this study suggests that the enhancement of control of corruption, and improvement in regulatory quality tend to enhance the stability of the financial system in Sub-Saharan African economies. As a continent that is yet to fully discover its potential, the practice of good governance is particularly useful, as this may not only help ensure the soundness of the financial system but may also aid the continent to attract foreign investors, which would improve economic growth and development. In this respect, efforts by governments across the continent to ensuring sound governance are laudable.

Regulatory authorities should ensure effective and transparent enforcement of laws to stimulate compliance by crafting costs for non-compliance (for instance, legal costs, investigations cost, imprisonment, and fines). Lastly, regulators should ensure strengthening the quality of the institutional environment in the region as it reduces the probability of banking crises and keeps the degree of bank stability.

**Suggestions for Further Research**

A fruitful direction for future research would be to extend this study to other geographical areas as this study only concentrated on Sub-Saharan African countries. Furthermore, this study employed only country-level aggregated data on all the variables, similar studies could be conducted using bank-specific variables.

Finally, further studies could employ other estimation techniques than the one employed in this study. GMM estimation technique could be employed as it addresses issues of endogeneity with panel data estimation.

55

# REFERENCES

Abdessatar, A. T. I., & Rachida, B. E. N. (2013). Institutional quality and financialstress: experience from emerging country. *Studies in Business and Economics*, *8*(3), 4-20.

Adam, A. M., & Owusu, Jnr. P. (2017). *Financial econometrics: An example-based handbook.* Hauppauge, New York: Nova Science Publishers, Inc.

Adjei-Frimpong, K., Gan, C., & Hu, B. (2013). Efficiency and competition in the Ghanaian banking industry: A panel granger causality approach. *Annals ofFinancial Economics*, *8*(1), 1-16.

Agoraki, M. E. K., Delis, M. D., & Pasiouras, F. (2011). Regulations, competition and bank risk-taking in transition countries. *Journal of Financial Stability*, *7*(1), 38-48.

Agyemang, O. S., Fantini, G., & Ansong, A. (2016). Unearthing the integral determinants of foreign ownership prevalence of companies in Africa: Role of country-level governance. *Journal of African Business*, *17*(2), 225-253.

Ahmed, A. D., & Suardi, S. (2009). Macroeconomic volatility, trade and financial liberalization in Africa. *World Development*, *37*(10), 1623-1636.

Ajide, K., Adeniyi, O., & Raheem, I. (2014). Does governance impact on the foreign direct investment-growth nexus in sub-Saharan Africa?. *Zagreb International Review of Economics & Business*, *17*(2), 71-81.

56

Akinkunmi, M. A. (2017). What drives banking stability? Empirical evidence from ECOWAS countries. *International Journal of Business, Economics and Management, 4*(6), 155-165.

Allen, F., & Gale, D. (2004). Competition and financial stability. *Journal of money,credit and banking*, *36*(3), 453-480.

Amaratunga, D., Baldry, D., Sarshar, M., & Newton, R. (2002). Quantitative and qualitative research in the built environment: application of "mixed" research approach. *Work Study*, *51*(1), 17-31.

Amihud, Y., & Lev, B. (1981). Risk reduction as a managerial motive for conglomerate mergers. The bell journal of economics, 605-617.

Anayiotos, G., & Toroyan, H. (2009). *Institutional factors and financial sector development: Evidence from Sub-Saharan Africa*. IMF Working Paper: No.09/258, 1-25.

Anginer, D., & Demirguc-Kunt, A. (2014). Has the global banking system becomemore fragile over time? *Journal of Financial Stability*, *13*, 202-213.

Arestis, P., Demetriades, P. O., & Luintel, K. B. (2001). Financial development and economic growth: the role of stock markets. *Journal of Money, Credit andBanking*, *33*(1), 16-41.

Ashraf, B. N. (2017). Political institutions and bank risk-taking behavior. *Journal of Financial Stability*, *29*(1), 13-35.

Athanasoglou, P. P., Brissimis, S. N., & Delis, M. D. (2008). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. *Journal of International Financial Markets, Institutions and Money*, *18*(2), 121-136.

57

Balutel, D. (2020). Institutional quality and financial instability. *Journal of Public Administration, Finance and Law*, (17), 154-162.

Barth, J. R., Caprio Jr, G., & Levine, R. (2013). Bank regulation and supervision in 180 countries from 1999 to 2011. *Journal of Financial Economic Policy*, *5*(2), 111-219.

Barth, J. R., Caprio, G., & Levine, R. (2012). *The evolution and impact of bank regulations*. The World Bank.

Beck, T., De Jonghe, O., & Schepens, G. (2013). Bank competition and stability: Cross-country heterogeneity. *Journal of Financial Intermediation*, *22*(2), 218-244.

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2006). Bank supervision and corruption in lending. *Journal of Monetary Economics*, *53*(8), 2131-2163.

Beck, T., Hesse, H., Kick, T., & von Westernhagen, N. (2009). *Bank ownership and stability: Evidence from Germany*. VOX CEPRs Policy Portal.

Belkhir, M., Ben Naceur, S., Candelon, B., & Wijnandts, J. C. (2020). Macroprudential policies, economic growth, and banking crises, *IMF Working Paper: WP/20/65,* 1-52.

Bermpei, T., Kalyvas, A., & Nguyen, T. C. (2018). Does institutional quality condition the effect of bank regulations and supervision on bank stability? Evidence from emerging and developing economies. *International Reviewof Financial Analysis*, *59*, 255-275.

Boyd, J. H., & De Nicolo, G. (2005). The theory of bank risk taking and competition revisited. *The Journal of Finance*, *60*(3), 1329-1343.

58

Boyd, J. H., & Runkle, D. E. (1993). Size and performance of banking firms: Testing the predictions of theory. *Journal of Monetary Economics*, *31*(1), 47-67.

Brooks, C. (2008*). Introductory econometrics for finance* (2nd ed.). Cambridge England, New York: Cambridge University Press.

Burki, S. J., & Perry, G. (1998). Beyond the Washington consensus: institutions matter. World Bank Publications.

Cameron, J. D. (2004). The World Bank and the new institutional economics: contradictions and implications for development policy in Latin America. Latin American Perspectives, 31(4), 97-103.

Cleeve, E. (2012). Political and institutional impediments to foreign direct investment inflows to sub-Saharan Africa. *Thunderbird International Business Review*, *54*(4), 469-477.

De Grauwe, P., & Gros, D. (2009). A new two-pillar strategy for the ECB. *CESifoWorking Paper, No. 2818*, 1-18.

Demirgüç-Kunt, A., & Detragiache, E. (2005). Cross-country empirical studies of systemic bank distress: A survey. *National Institute Economic Review*, *192*(1), 68-83.

Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association*, *74*(366), 427-431.

Dudwick, N., Kuehnast, K., Jones, V. N., & Woolcock, M. (2006). *Analyzing socialcapital in context: A guide to using qualitative methods and data*. Washington: World Bank Institute.

Dumitrescu, E. I., & Hurlin, C. (2012). Testing for Granger non-causality in heterogeneous panels. *Economic Modelling*, *29*(4), 1450-1460.

Dwumfour, R. A. (2017). Explaining banking stability in Sub-Saharan Africa. *Research in International Business and Finance*, *41*, 260-279.

Effiong, E. (2015). Financial development, institutions and economic growth: Evidence from Sub-Saharan Africa. *MPRA Paper No. 66085,* 1-25.

Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy ofManagement Review*, *14*(1), 57-74.

Essid, Z., Boujelbene, Y., & Plihon, D. (2014). Institutional quality and bank instability: Cross-countries evidence in emerging countries. *MPRA Paper No. 56251,* 1-25.

European Central Bank (2007). *Annual report*. Retrieved from https://www.ecb.europa.eu/pub/pdf.

Fang, Y., Hasan, I., & Marton, K. (2014). Institutional development and bank stability: Evidence from transition countries. *Journal of Banking & Finance*, *39*, 160-176.

Fernández, A. I., González, F., & Suárez, N. (2016). Banking stability, competition,and economic volatility. *Journal of Financial Stability*, *22*, 101-120.

Fofack, H. L. (2005). Nonperforming loans in Sub-Saharan Africa: causal analysis and macroeconomic implications. *Policy Research Working Paper, (3769):*The World Bank.

Gambacorta, L., Yang, J., & Tsatsaronis, K. (2014). Financial structure and growth.

*BIS Quarterly Review*, 21-35.

60

Gani, A., & Ngassam, C. (2008). Effect of institutional factors on stock market development in Asia. *American Journal of Finance and Accounting*, *1*(2), 103-120.

Gatsi, J. G., & Kyeraa, M. (2016). Effects of non-macroeconomic variables on investor protection in Africa. *Journal of Economics, Business and Management*, *4*(6), 20-30.

Gbettey, C. (2017). *Country-level corporate governance, financial market development and foreign direct investment in Africa.* Unpublished master'sthesis, University of Cape Coast. Cape Coast, Ghana.

Giavazzi, F., & Giovannini, A. (2011). *Handbook of central banking, financial regulation and supervision*. United Kingdom: Edward Elgar Publishing.

Goldsmith, R. W. (1955). Financial structure and economic growth in advanced countries: An experiment in comparative financial morphology. *In Capitalformation and economic growth* (pp. 112-167). Princeton University Press.

Granger, C. W. (1969). Investigating causal relations by econometric models and cross-spectral methods. *Econometrica: Journal of The Econometric Society*, 424-438.

Gujarati, P. D. (2011). *Econometrics by example*. Houndmills, Basingstoke, Hampshire, New York: Palgrave Macmillan.

Haugen, R. A., & Senbet, L. W. (1981). Resolving the agency problems of external capital through options. The Journal of Finance, 36(3), 629-647.

Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica: Journal of the Econometric Society*, *46*(6), 1251-1271.

Hodgson, G. M. (1998). The approach of institutional economics. *Journal of Economic Literature*, *36*(1), 166-192.

Holmström, B. (1979). Moral hazard and observability. The Bell journal of economics, 74-91.

Houston, J. F., Lin, C., Lin, P., & Ma, Y. (2010). Creditor rights, information sharing, and bank risk taking. *Journal of Financial Economics*, *96*(3), 485-512.

Iskenderoglu, O., & Tomak, S. (2013). Competition and stability: An analysis of the Turkish banking system. *International Journal of Economics and Financial Issues*, *3*(3), 752-762.

Ivankova, N. V., Creswell, J. W., & Stick, S. L. (2006). Using mixed-methods sequential explanatory design: From theory to practice. *Field Methods*, *18*(1), 3-20.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305-360.

Jiménez, G., Lopez, J. A., & Saurina, J. (2013). How does competition affect bank risk-taking? *Journal of Financial Stability*, *9*(2), 185-195.

Jokipii, T., & Monnin, P. (2013). The impact of banking sector stability on the real economy. *Journal of International Money and Finance*, *32*, 1-16.

Kasman, S., & Kasman, A. (2015). Bank competition, concentration and financial stability in the Turkish banking industry. *Economic Systems*, *39*(3), 502- 517.

62

Kaufman, D., Kraay, A., & Zoido-Lobatón, P. (2001). Governance Matters II: Updated for 2000-01. *Policy Research Working Paper*, (2772).

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2011). The worldwide governance indicators: methodology and analytical issues. *Hague Journal on the Rule of Law*, *3*(2), 220-246.

Kipkemboi, K., & Bahia, K. (2019). *The impact of mobile money on monetary and financial stability in Sub-Sahara Africa*. GSMA Report.

Laeven, L., & Levine, R. (2009). Bank governance, regulation and risk taking. *Journal of Financial Economics*, *93*(2), 259-275.

Landreth, H., & Colander, D. C. (2005). Historia myśli ekonomicznej (History of Economic Thought). *PWN, Warszawa*.

Leijonhufvud, A. (2009). Out of the Corridor: Keynes and the Crisis. *Cambridge Journal of Economics*, *33*(4), 741-757.

Lepetit, L., & Strobel, F. (2013). Bank insolvency risk and time-varying Z-score measures. *Journal of International Financial Markets, Institutions andMoney*, *25*, 73-87.

Martinez Peria, M. S., & Schmukler, S. L. (2001). Do depositors punish banks for bad behavior? Market discipline, deposit insurance, and banking crises. *TheJournal of Finance*, *56*(3), 1029-1051.

Mathenge, N., & Nikolaidou, E. (2018). Financial structure and economic growth: Evidence from sub-saharan Africa. *Economic Research Southern Africa (ERSA) Working Paper*, *732*.

McDonald, C. A., & Schumacher, L. B. (2007). Financial deepening in Sub-Saharan Africa: Empirical evidence on the role of creditor rights protection and information sharing. *IMF Working Paper: WP/07/203*, 1-25.

McKnight, P. J., & Weir, C. (2009). Agency costs, corporate governance mechanisms and ownership structure in large UK publicly quoted companies: A panel data analysis. *The Quarterly Review of Economics and Finance*, *49*(2), 139-158.

Mecagni, M. M., Marchettini, D., & Maino, M. R. (2015). *Evolving banking trends in Sub-Saharan Africa: Key features and challenges.* International Monetary Fund.

Mishkin, F. S. (1999). Global financial instability: Framework, events, issues. *Journal of Economic Perspectives*, *13*(4), 3-20.

Mlachila, M. (2017). Regional financial integration in Sub-Saharan Africa. *IMF Paper,* 1-14.

Neequaye, M. (2018). *Corporate governance and bank stability in Africa: Income bracket evidence.* Unpublished master's thesis, University of Ghana. Legon, Ghana.

Nguena, C. L., & Abimbola, T. M. (2015). Financial Deepening Dynamics and Implication for Financial Policy Coordination in WAEMU. In *Regional Integration and Policy Challenges in Africa*. Palgrave Macmillan, London.

Nier, E., & Baumann, U. (2006). Market discipline, disclosure and moral hazard in banking. *Journal of Financial Intermediation*, *15*(3), 332-361.

Nyantakyi, E. B., & Sy, M. (2015). The banking system in Africa: Main facts andchallenges. *Africa Economic Brief*, *6*(5), 1-66.

Obińska-Wajda, E. (2016). The new institutional economics-main theories. *E-Finanse*, *12*(1), 78-85.

Ofoeda, I., Abor, J., & Adjasi, C. K. (2012). Non-bank financial institutions regulation and risk-taking. *Journal of Financial Regulation and Compliance*, *20*(4), 433-450.

Olson, D., & Zoubi, T. A. (2011). Efficiency and bank profitability in MENA countries. *Emerging Markets Review*, *12*(2), 94-110.

Ozili, P. K. (2017). Bank profitability and capital regulation: Evidence from listed and non-listed banks in Africa. *Journal of African Business*, *18*(2), 143-168.

Ozili, P. K. (2018). Banking stability determinants in Africa. *International Journalof Managerial Finance*, *14*(4), 462-483.

Ozili, P. K., & Uadiale, O. (2017). Ownership concentration and bank profitability. *Future Business Journal*, *3*(2), 159-171.

Parada, J. J. (2003). Original institutional economics and new institutional economics: Revisiting the bridges (or the divide). *Revista de Economía Institucional*, *5*(8), 92-116.

Pasiouras, F., & Kosmidou, K. (2007). Factors influencing the profitability of domestic and foreign commercial banks in the European Union. *Research in International Business and Finance*, *21*(2), 222-237.

Phillips, P. C., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika*, *75*(2), 335-346.

Rajan, R., & Dhal, S. C. (2003). Non-performing loans and terms of credit of public sector banks in India: An empirical assessment. *Reserve Bank of India Occasional Papers*, *24*(3), 81-121.

Rostamzadeh, P., Samadi, A. H., & Yadegar, Z. (2018). The effect of institutional quality on the relationship between banking stability and marketization: The case of Iran. *Iranian Journal of Economic Studies*, *7*(2), 151-167.

Salas, V., & Saurina, J. (2002). Credit risk in two institutional regimes: Spanish commercial and savings banks. *Journal of Financial Services Research*, *22*(3), 203-224.

Smets, F. (2018). Financial stability and monetary policy: How closely interlinked? *International Journal of Central Banking*, 263-300.

Stock, J. H., & Watson, M. W. (2001). Vector autoregressions. *Journal of Economic Perspectives*, *15*(4), 101-115.

Sulemana, M., Dramani, J. B., & Oteng-Abayie, E. F. (2018). Foreign bank inflows: Implications for bank stability in sub-Saharan Africa. *African Review of Economics and Finance*, *10*(1), 54-81.

van Rossum, W. M. (2013). *Bank regulation and bank risk in Europe: is more stringent bank regulation better?* Unpublished master's thesis, Tilburg University. Tilburg, The Netherlands.

Woodford, M. (2012). *Inflation targeting and financial stability* (No. w17967). National Bureau of Economic Research. *Working Paper 17967, NATIONAL BUREAU OF ECONOMIC RESEARCH,* 1-33.

Yartey, C. A., & Adjasi, C. K. (2007). Stock market development in Sub-Saharan Africa: Critical issues and challenges. *IMF Working Paper: African Department,* 1-33.

# APPENDICES

**Appendix A-** *List of countries in Sub-Saharan Africa*

| SN | Country | SN | Country |
|----|---------|----|---------|
| 1 | Angola | 25 | Liberia |
| 2 | Benin | 26 | Madagascar |
| 3 | Botswana | 27 | Malawi |
| 4 | Burkina Faso | 28 | Mali |
| 5 | Burundi | 29 | Mauritania |
| 6 | Cabo Verde | 30 | Mauritius |
| 7 | Cameroon | 31 | Mozambique |
| 8 | Central African Republic (CAR) | 32 | Namibia |
| 9 | Chad | 33 | Niger |
| 10 | Comoros | 34 | Nigeria |
| 11 | Congo, Democratic Republic of the | 35 | Rwanda |
| 12 | Congo, Republic of the | 36 | Sao Tome and Principe |
| 13 | Cote d'Ivoire | 37 | Senegal |
| 14 | Equatorial Guinea | 38 | Seychelles |
| 15 | Eritrea | 39 | Sierra Leone |
| 16 | Eswatini (formerly Swaziland) | 40 | Somalia |
| 17 | Ethiopia | 41 | South Africa |
| 18 | Gabon | 42 | South Sudan |
| 19 | Gambia | 43 | Sudan |
| 20 | Ghana | 44 | Tanzania |
| 21 | Guinea | 45 | Togo |
| 22 | Guinea-Bissau | 46 | Uganda |
| 23 | Kenya | 47 | Zambia |
| 24 | Lesotho | 48 | Zimbabwe |

Source: WDI

**Appendix B-** *Nonperforming loans in 2004 and 2013 of selected countries in SSA*
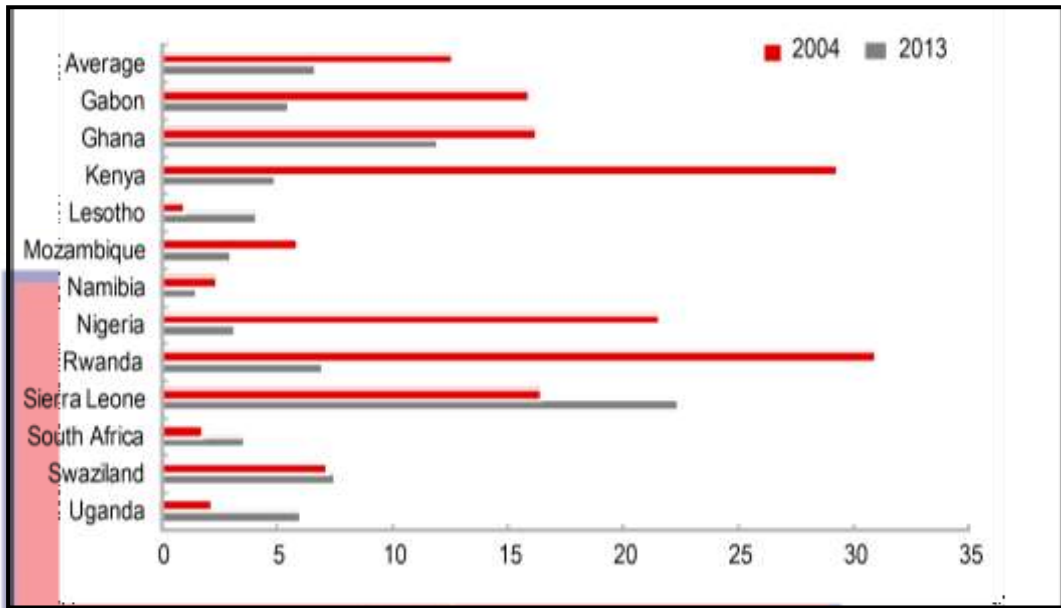


Source: IMF African Department survey (2013)

**Appendix C-** *Trends in institutions of Sub-Saharan Africa*



Source: Field Data (2022)

69