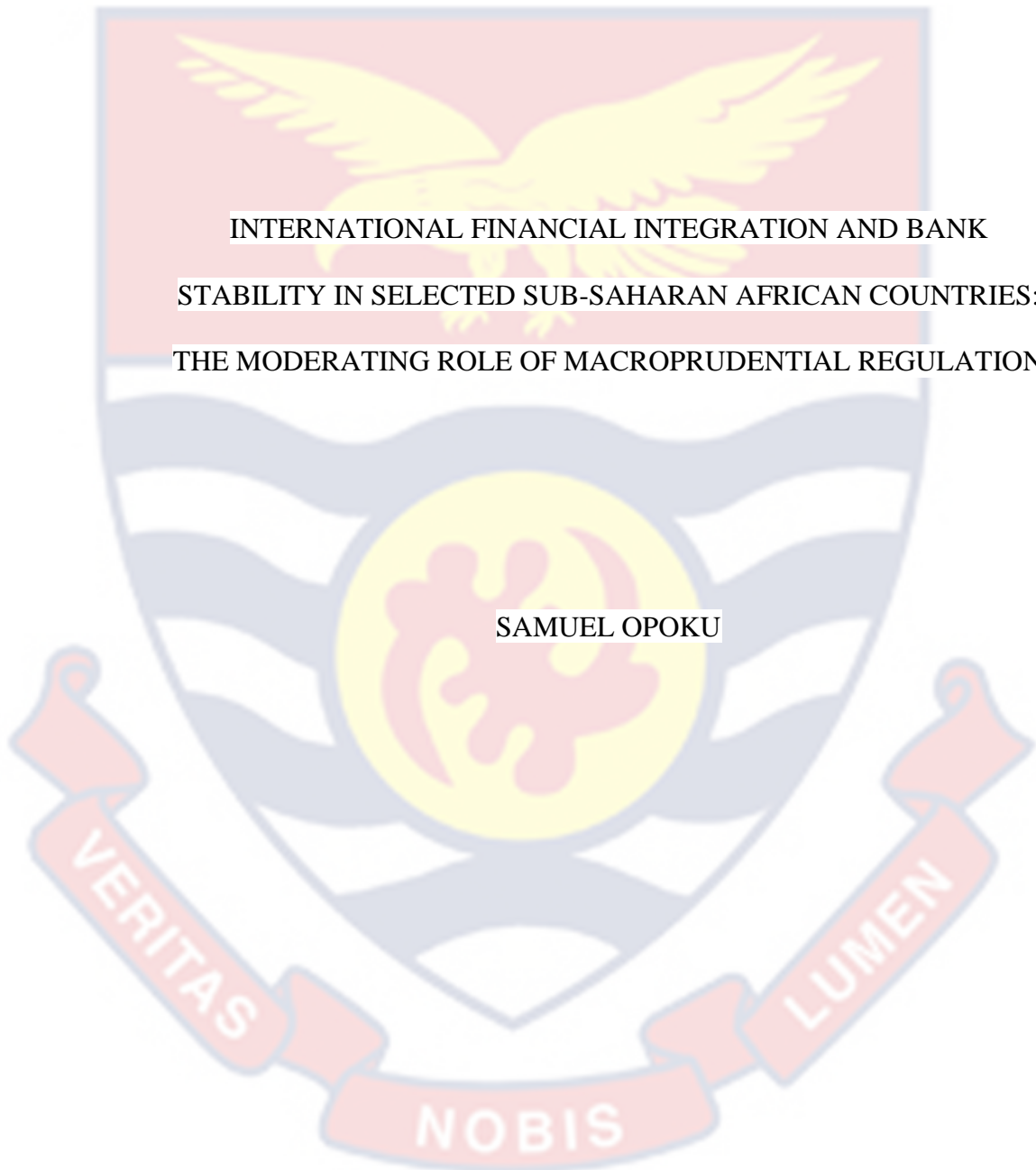UNIVERSITY OF CAPE COAST

INTERNATIONAL FINANCIAL INTEGRATION AND BANK

STABILITY IN SELECTED SUB-SAHARAN AFRICAN COUNTRIES:

THE MODERATING ROLE OF MACROPRUDENTIAL REGULATION

SAMUEL OPOKU

2023

UNIVERSITY OF CAPE COAST
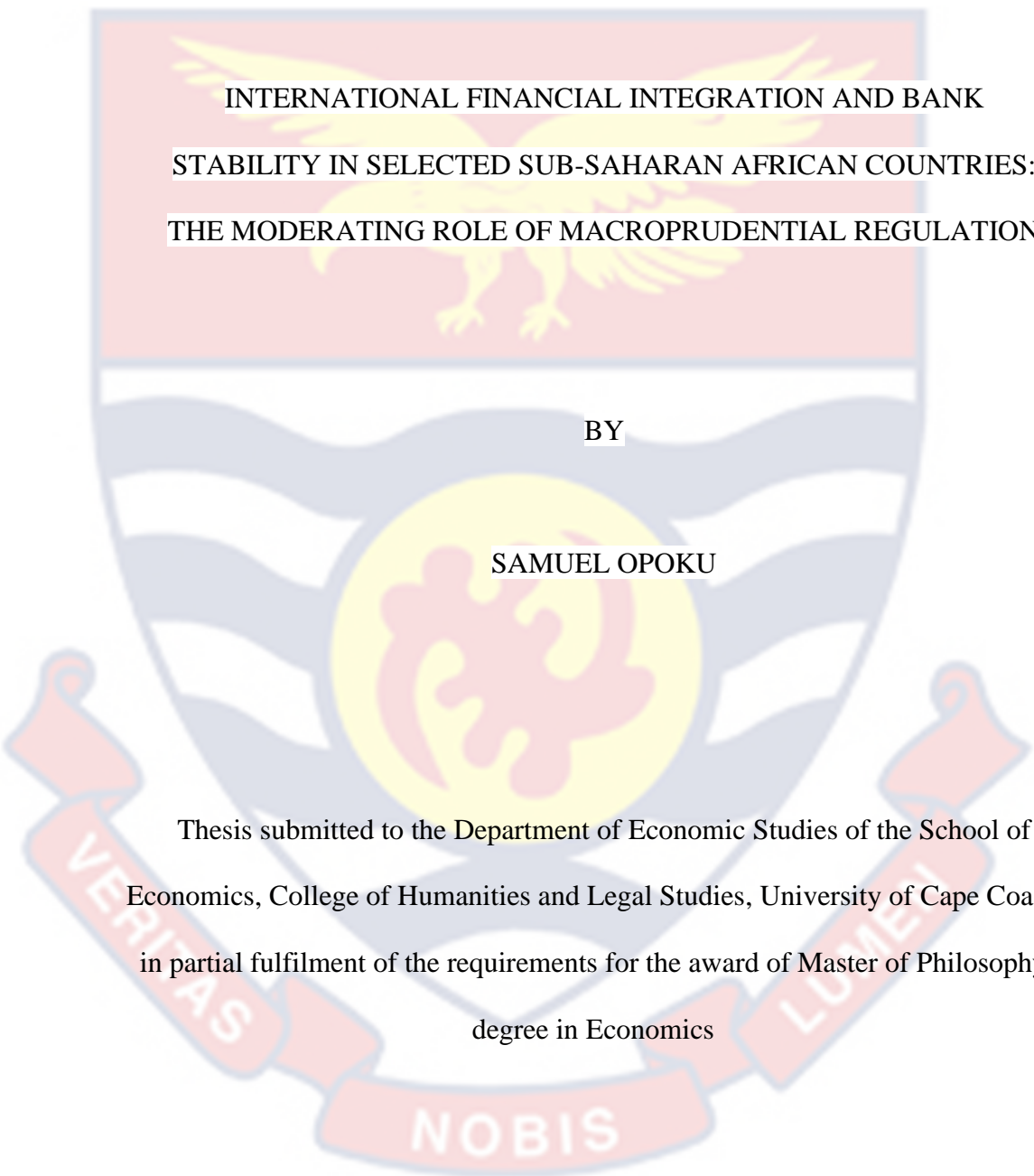
INTERNATIONAL FINANCIAL INTEGRATION AND BANK

STABILITY IN SELECTED SUB-SAHARAN AFRICAN COUNTRIES:

THE MODERATING ROLE OF MACROPRUDENTIAL REGULATION

BY

SAMUEL OPOKU

Thesis submitted to the Department of Economic Studies of the School of

Economics, College of Humanities and Legal Studies, University of Cape Coast,

in partial fulfilment of the requirements for the award of Master of Philosophy

degree in Economics

MAY 2023

DECLARATION

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

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

Name: Samuel Opoku

Supervisors' Declaration

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

Principal Supervisor's Signature………………………...Date…………………

Prof. William Gabriel Brafu Insaidoo

Co-Supervisor's Signature………………………………Date…………………

Dr. Camara K. Obeng

ABSTRACT

This study analyses the effect of international financial integration on banking sector stability in sub-Saharan Africa (SSA) and the moderating role played by macro-prudential regulations. The study employed system Generalised Methods of Moments (GMM) estimation approach on 28 SSA countries over 20-year period spanning from 2000-2020. The study found that international financial integration affects the financial stability of banks in the SSA region. In addition, the study found a significant contributing role of macroprudential regulations in the international financial integration–bank stability nexus of banks within the SSA region. Hence, tighter macroprudential regulations within the SSA region would best compliment the traditional monetary policies in curbing the adverse effects of financial sector instabilities. This study therefore recommends that, policy makers should consider implementing macroprudential measures, such as capital controls, reserve requirements, and limits on liquid assets to deposit short term funds and bank regulatory capital requirements, to manage the impact of cross-border financial transactions and aggregate international capital inflows on bank stability. These measures would help prevent excessive risk-taking and limit the build-up of systemic risks. Also, policy makers should establish robust monitoring and supervisory frameworks to oversee cross-border financial transactions and aggregate international capital inflows. This includes ensuring that banks adhere to international standards and best practices for risk management, including adequate capital buffers, effective risk assessment and monitoring, and compliance with relevant regulations and reporting requirements.

KEYWORDS

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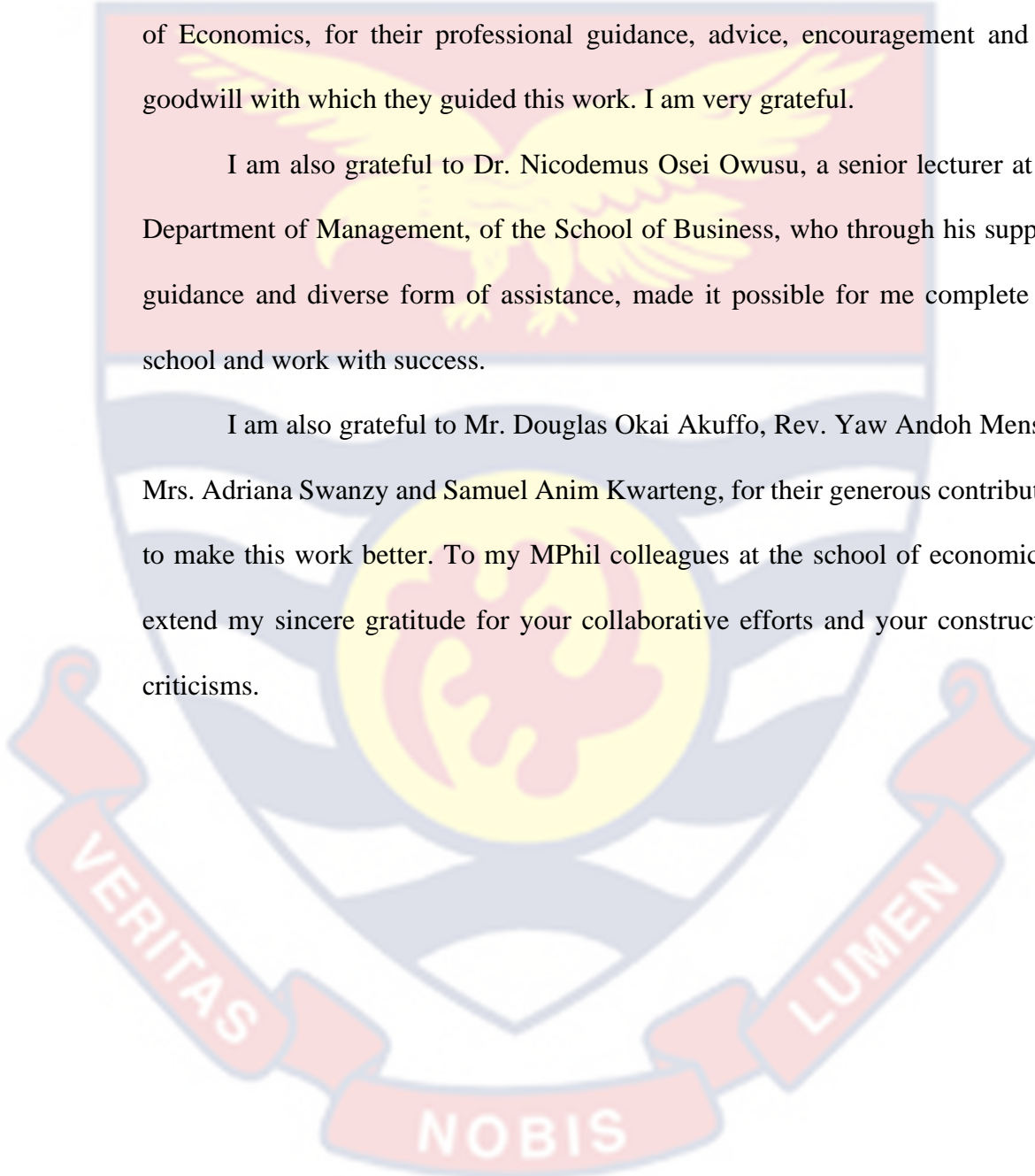
DEDICATION

To my mother, Elizabeth Owusuaa and my beloved, Jessica Owusuaa

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LIST OF ABBREVIATIONS

BCAR   Bank Capital to Liquid Assets Ratio

BRKR   Bank Regulatory Capital to Risk-Weighted Assets Ratio

COR   Control of Corruption

DIR   Deposit Interest Rate

ELD   External Loans and Deposits of reporting banks

GEI   Government Effectiveness Index

GFCF   Gross Fixed Capital Formation

GMM   Generalised Method of Moment

HCI   Human Capital Index

LADSF   Liquid Assets to Deposits and Short-term Funds Ratio

NFI   Net Foreign Capital Inflows

PS   Political Stability

RER   Real Exchange Rate

SSA   Sub-Saharan Africa

TLAR   Total Loans to Assets Ratio

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CHAPTER ONE

INTRODUCTION

Capital flows are thought of as a mixed blessing for developing and emerging economies. While they bring in much-needed foreign capital to supplement domestic finances to support growth and improve resilience, they also expose the economic and financial sectors to external shocks (Kim & Singal, 2000). Whether on balance, the vulnerability of an economy increases or decreases with capital movements, which remains an open empirical question despite a large body of literature (Kose et. al., 2009). These movements within and outside countries tend to influence the stability of the banking institutions, especially within the Sub-Saharan Africa (SSA) regions. This study takes into consideration the effect of international financial integration (cross border financial transactions) on bank stability within the SSA region, and further moderating such relation with macroprudential regulation.

Background to the Study

The Inter-American Development Bank (2015, p.102) defines financial integration as "the process through which a country`s financial markets become more closely integrated with those of other countries or with those in the rest of the world". This definition implies the elimination of barriers for foreign financial sector from some or all countries to operate or offer cross border financial services in others (ibid). When financial links are deepened and broadened within a region comprising of two or more countries that form of integration is referred to as regional financial integration (Wakeman-Linn & Wagh, 2008, p.2). International

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financial integration has become of paramount importance to nations worldwide. The SSA region is no exception to this phenomenon and since its formation has always sought to promote financial integration across all spheres amongst member countries.

Sub-Saharan Africa is a region blessed with vast opportunities and resources, yet many challenges such as poverty persist within the region. Currently, the region is said to be hosting the four fast-growing economies in the world in 2019, namely Ghana, Ethiopia, Rwanda and Cote d'Ivoire (Leke, Signé & Initiative, 2019). Economic growth and stability in sub-Saharan Africa were estimated at 3.18 percent in 2021 and projected to be 3.75 in 2022, as compared to the 3.3 percent, 3.1 percent, 2.7 percent growth rate recorded in 2020, 2019 and 2018 respectively (Manasseh, Abada, Okiche, Okanya, Nwakoby, Offu & Nwonye, 2022). A cursory look at these figures shows that over the years, there has been much growth in GDP within the region.

Historically, financial integration has largely been associated with positive economic growth and a stable banking sector as demonstrated by the works of Sedik and Sun (2012), Zenasni (2015), Klein and Olive (2000), Levine (1997), and Quinn (1997). Further studies by David, Mlachila and Moheeput (2014) and Mishkin (2007) remove ambiguity on the link between financial integration and economic growth by reflecting financial integration as a channel of financial development which leads to economic growth and hence, banking stability.

The economic importance of banking stability has generated strong interest among both academics and policymakers. Unfortunately, they have struggled to

understand the major causes of banking sector stability or instability. In addition, there is no consensus regarding the definition of banking sector/institution stability among academics and policymakers. Some financial sector analysts consider banking sector stability as implying the absence of a crisis in the financial sector and hence the ability of the banking sector to withstand shocks whilst others interpret it as meaning absence of significant fluctuations in liquidity in the money market.

More recent (post-Keynesian) economists have, however, defined financial sector stability in terms of the three components of the financial sector, namely financial sector, financial markets, and financial infrastructure (Vo, Nguyen, Le & Pham, 2019). But in spite of the differences in the interpretation of financial sector stability, it is generally acknowledged that banking sector stability is important for a successful achievement of price stability, moderate long-term interest rates, and economic growth which are important objectives of central banks, and for the overall health of the global economy.

Indeed, several sub-Saharan African countries have experienced financial instability and crises in recent years, which have highlighted the vulnerabilities within their financial sectors. These crises have often resulted in adverse impacts on the overall economic stability and growth prospects of these countries. The occurrence of financial crises in sub-Saharan Africa can be attributed to various factors, including structural weaknesses, policy gaps, external shocks, and governance challenges (Ozili, 2018; Beck & Cull, 2013). Available data from the World Bank's Global Financial Development database point to higher risks of

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instability and insolvency, implying some degree of banking sector instability in the sub region between 2005 and 2008, and between 2015 and 2016 with a z-score ranging from 10.24 to 10.52. Also, the data on liquid assets to deposits and short-term funds ratio reveal a declining trend in the liquidity of assets of banking sector in SSA countries for the period between 2008 and 2017 (from 42.1% to 18.6%), suggesting that banking sector in the sub region have lower liquidity buffers which make them vulnerable to liquidity shocks in the market.

In quest to mitigate these shocks and risks, policy makers have resorted to traditional monetary policies over the period. However, it was discovered that there are two main policy challenges associated with mitigating such risks in open economies, especially as those within the SSA regions (Unsal, 2011). These challenges were associated with the management of capital flows and banking sector vulnerabilities. He maintains that traditional monetary policy measures can be used to adequately counteract the risk of banking instability when there are macro-prudential regulations in place, and hence calls for the need to complement monetary policy with macro-prudential measures.

Baum, Pundit and Ramayandi (2017) examined the relationship between components of gross capital flows and a number of indicators of financial stability for 16 emerging and newly industrialized economies, namely South Africa and 15 other emerging economies from the Americas, Asia and Europe. The authors used a system of seemingly unrelated regression estimators for each financial stability proxy to allow for cross-country comparison. Their findings point to significant differences in the effects of different capital flow measures on the financial stability

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proxies and across economies. The differences in effects of the different types of capital flows across countries are attributed to country-specific financial and macroeconomic characteristics. Hence, it is against this that the study seeks to fill in examining the effect of international financial integration on bank stability through the moderating effect of macroprudential regulations.

Statement of the Problem

The inordinately large costs of the crisis challenged "Jackson Hole consensus", the prevailing orthodoxy which held that central bankers' main task is to keep inflation low and stable and that monetary policy should not attempt to counteract asset price booms (Issing, 2011; Bean et al., 2010; Mishkin, 2010; White, 2009). In so doing, it reopened the so-called "leaning" versus "cleaning" debate, that is, the question of whether it is less costly for a central bank to take measures which prevent financial crises or, instead, to respond by cleaning up after a crisis has materialised, with the Jackson Hole consensus favouring the latter approach. As such, to prevent and mitigate systemic risk is the introduction of macroprudential regulation (Constâncio, 2016). This involves contributing to the safeguarding of financial stability by strengthening the resilience of the financial sector and by smoothing the financial cycle, so as to avoid discontinuities in the financial intermediation process.

Unsal (2011) analyzed the interaction between monetary policy and macroprudential regulations with an open economy DSGE model and found that the resurgence of capital flows to emerging market economies since mid-2009 has been accompanied by two main policy challenges. He maintains that traditional

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monetary policy measures can be used to adequately counteract the risk of financial instability when there are macro-prudential regulations in place, and hence calls for the need to complement monetary policy with macroprudential measures. His study covered emerging markets in the Americas, Europe and Asia. An important policy lesson of the global financial crisis that erupted in 2008 was that the attainment of price stability is insufficient for ensuring financial stability.

International financial integration is primarily centered on various contributions across the borders of a country (Sun, et, al., 2021). However, little attention is given to how this integration is affected by cross-border financial transactions and aggregate international capital inflows. Cross-border financial transactions can have a significant impact on the stability of the banking sector. In today's globalized world, banks are more interconnected than ever before. This increased interconnectivity has led to a rise in cross-border financial transactions, which involve the movement of funds across borders. On the one hand, cross-border financial transactions can provide banks with access to new markets and funding sources, which can improve their profitability and increase their resilience to shocks. This can lead to greater financial stability within the banking sector.

On the other hand, cross-border financial transactions can also pose significant risks to the stability of the banking sector (Lastra & Olivares-Caminal, 2020). For example, large inflows and outflows of capital can create volatility in exchange rates and asset prices, which can affect the value of banks' assets and liabilities. This can lead to losses for banks, which can undermine their financial stability. Moreover, cross-border financial transactions can also expose banks to

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counterparty risk, which is the risk that a trading partner may default on its obligations. This risk can be heightened in times of financial stress, as banks may find it difficult to obtain funding from other banks or financial sector. In addition, cross-border financial transactions can also create regulatory challenges for banks. Different countries have different regulatory regimes, which can create a complex web of regulations that banks must navigate when engaging in cross-border transactions (Sun, et, al., 2021). This can make it difficult for banks to manage their risks effectively, which can lead to financial instability.

Also, aggregate international capital inflows can have a significant impact on the stability of the banking sector (Ali & Iness, 2020). International capital inflows refer to the movement of funds from foreign investors into a country's financial sector. These inflows can come in the form of portfolio investments, foreign direct investment, or borrowing by foreign entities. On the one hand, international capital inflows can provide banks with access to new funding sources, which can improve their liquidity and increase their lending capacity. This can lead to greater financial stability within the banking sector.

On the other hand, international capital inflows can also pose significant risks to the stability of the banking sector. For example, large inflows of capital can create an asset price bubble, leading to a buildup of financial imbalances that can eventually lead to a crisis. Additionally, sudden outflows of capital can lead to a liquidity crunch, which can undermine the stability of the banking sector. Moreover, international capital inflows can also expose banks to currency risk. When funds are invested in a foreign country, the value of the investment can be

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affected by changes in exchange rates. This can lead to losses for banks, which can undermine their financial stability.

Furthermore, international capital inflows can also create regulatory challenges for banks. Banks may face increased regulatory scrutiny from their home country's authorities or the authorities in the country where the capital is coming from (Jones & Knaack, 2019). This can make it difficult for banks to manage their risks effectively, which can lead to financial instability. Aggregate international capital inflows can have both positive and negative effects on the stability of the banking sector. While they can provide banks with access to new funding sources, they can also expose banks to significant risks, such as asset price bubbles, liquidity crunches, and currency risk. As such, it is important for banks to manage these risks effectively in order to maintain stability in the banking sector. Additionally, it is crucial for regulators to monitor and regulate the inflows of international capital to prevent excessive risk-taking by banks and maintain stability in the financial sector.

Hence, this study is an attempt to answer the question of whether cross-border transactions and aggregate international capital inflows contribute to the stability or instability of banks in the SSA, as well as moderating such relationship with macroprudential regulation. It is against this that the study sought to examine the influence of international financial integration, with emphasis on cross border transactions and aggregate international capital inflows and its contribution to the stability of the banks within the SSA. In addition, looking at the role of macro

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prudential regulations nexus international financial integration and banking sector stability.

Purpose of the Study

The purpose of the study was to examine the effect of international financial integration on bank stability in selected SSA countries through the moderating effect of macroprudential regulations.

Research Objectives

The specific objectives were to:

1. Estimate the effect of cross-border financial transactions and aggregate international capital inflows on bank stability in selected SSA countries.

2. Analyse the effect of macroprudential regulation on bank stability in selected SSA countries.

3. Determine the moderating effect of macroprudential regulation on the relationship between international financial integration and bank stability in selected SSA countries

Research Hypotheses

Based on the objectives of the study, the following hypotheses were tested;

For objective one;

H_0: There is no significant relationship between cross-border financial transactions and aggregate international capital inflows on bank stability.

H_A: There is a significant relationship between cross-border financial transactions and aggregate international capital inflows on bank stability.

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For objective two;

H_0: There is no significant relationship between the effect of macroprudential regulation on bank stability.

H_A: There is a significant relationship between the effect of macroprudential regulation on bank stability.

For objective three;

H_0: There is no moderating effect of macroprudential regulation on the relationship between international financial integration and bank stability

H_A: There is a moderating effect of macroprudential regulation on the relationship between international financial integration and bank stability

Significance of the Study

This study is of policy relevance to the SSA countries, considering the fact that financial instability and crises have been frequently experienced in the sub region. Insights gained from the study will enable regulators and supervisors in the financial sector, particularly the banking industry, to identify and appreciate the relevance of evaluating the impact of cross-border financial transactions, the nature of macro-prudential regulations and the easing of monetary requirements on the stability of the bank-dominated financial sector in the sub region.

The role of macroprudential regulations in the attainment of financial stability in a country cannot be underemphasised; this provides the justification for us to know the actual contribution these regulations are making toward the growth of the SSA region. This contributes to the body of empirical literature because it does not only confirm the importance of international financial integration as

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proved by earlier researches but also establish the basis that, over the years the actual contribution to the stability of the financial sector has been very minimal, of which as compared to the addition of these macro prudential regulations. This study provides the basis for further studies on the relationship between international financial integration, bank sector stability and macroprudential regulation within the region.

This research is relevant to policy-makers because the findings provide policy direction anytime, they wish to stimulate the financial sectors to affect stability because it provides empirical prove to the sector that would respond appropriately to achieve the desired goal. Again, for policy decision, it reinstates the importance of strengthening the financial sectors if the countries within the region wish to develop at a faster speed.

Furthermore, this study makes contribution to professionals (Government and Banking institutions and Economists Advisors) in the financial sector as they get informed, the macroprudential regulations necessary to aid in the stability of the financial sector within the sub regions. The study also brings to light the role of cross border transactions which have the essence to contribute to the stability of the banks. Such knowledge apparently will help in knowing which country and sectors to trade with to aid the stability of the financial sector. On the basis of the gap identified the study adds to literature; the critical and most driven issue in the discourse of international financial integration and financial sector stability is not a subject of direction but the moderating forces of macro prudential regulations that

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augment the financial sector stability nexus and the optimal threshold of financial sector operations.

Scope of the Study

Acknowledging existing studies in this discipline which have been done in the two main dimensions; regional blocs, Income level countries, and specific country levels, this present study also probes into the impact of international financial integration on bank stability, in addition, moderating this relationship with macroprudential regulation on regional dimension. The scope of this study is limited to 28 selected sub-Saharan African countries with readily available international financial integration, bank stability and macroprudential regulations data from the updated world development indicators (WDI), international monetary fund (IMF), global financial development indicators (GFDI) and worldwide governance indicators (WGI) databases. On the basis of this scope, the researcher considered a panel data spanning from the period 2000-2020.

Limitations of the Study

The main limitation of the study is data unavailability for some of the countries within the Sub- Saharan region. This made us to drop 19 countries from the analysis. The data span also limits us from employing other techniques such as ARDL panel to serve as robust checking mechanism. The second limitation rests on the over reliance of the sources of data; the reliability and validity of the findings to much extent is contingent on how credible selected variables from WDI, IMF, GFD and AfDB are. Despite these limitations, the results and the conclusions of the study are valid and consistent.

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Structure and Organisation of the Study

The second chapter considered the review of existing theoretical, conceptual and empirical literature in the area of bank stability, international financial integration, and macroprudential regulations. The third chapter discussed some stylised facts about the variables of the study. The fourth chapter discussed the research design with much particular attention on the sample design and the method of estimations employed for the study. The fifth chapter showed the presentation of results and discussions. The sixth and final chapter of the study was organised into summary of findings with conclusion and recommendations and is followed by references and appendices.
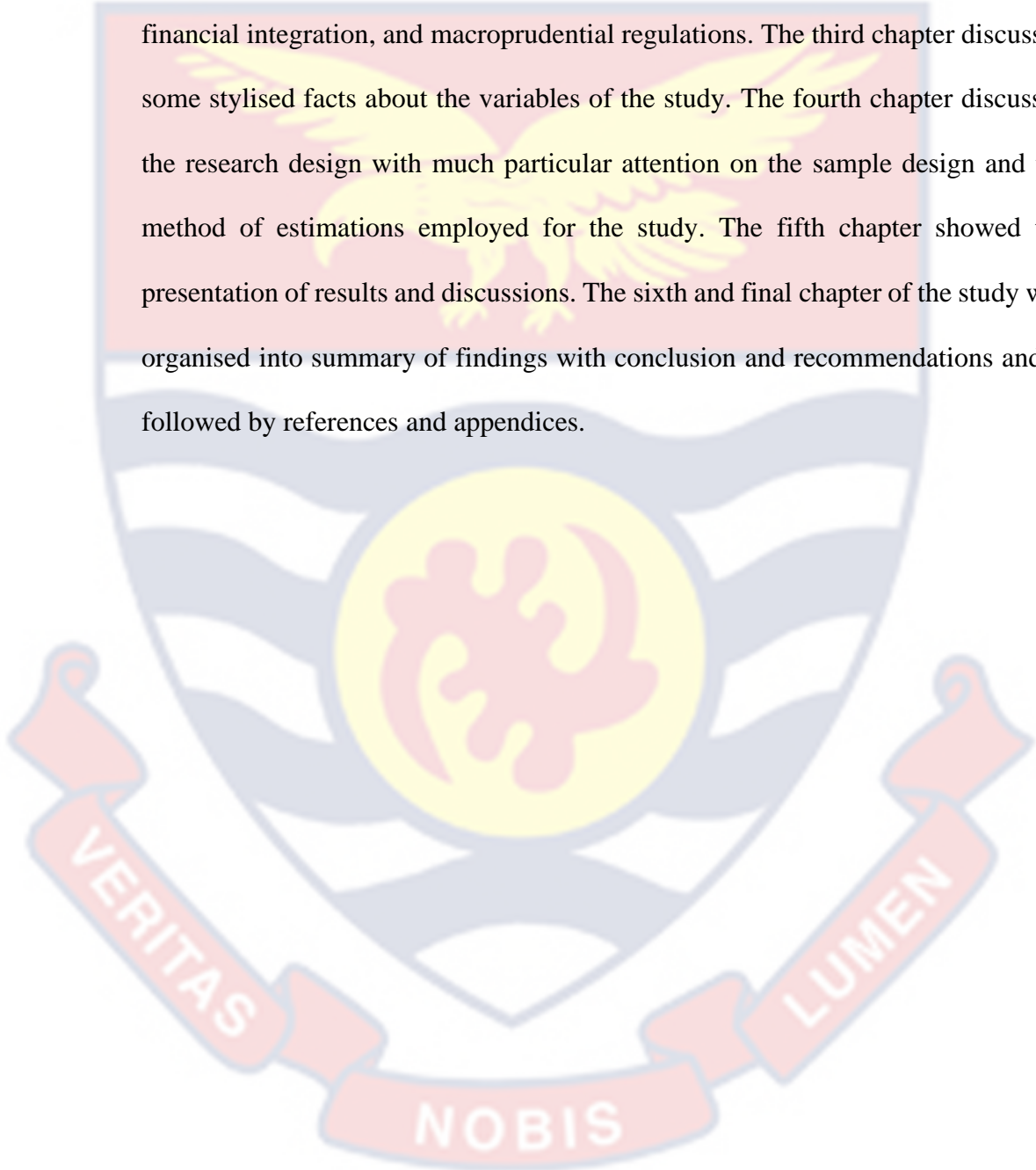
CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter provides a review of the theoretical and the empirical framework on international financial integration, macroprudential regulations, financial sector stability and banking sector stability. The review also showed how these constructs relate in the SSA region setting. This chapter is based on the study's research problem, research objectives and hypotheses. The purpose of the study was to examine the effect of international financial integration on bank stability in selected SSA countries through the moderating effect of macroprudential regulations. The write-up of the chapter began with review of the theory underpinning the study, before addressing the conceptual and empirical issues of international financial integration, macroprudential regulations, and bank stability.

Theoretical Review

The theoretical underpinnings of this study were based on theory of financial integration. This was adopted because it is the closest theory to the study that has formative knowledge of diverse perspectives of how financial instabilities within our economies and how they are dealt with. The identified studies include the following: Agénor (2003); Stavárek et. al., (2011); Fahr and Fell (2017); and Karavitis and Michael (2022).

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Theory of financial integration

The theory of financial integration has been developed over many decades and continues to be refined by economists and scholars today. Some of the early work on financial integration dates back to the 1950s and 1960s, with the emergence of the Bretton Woods system and the growth of international capital flows. However, the concept of financial integration has evolved significantly over time, and the specific contributions of different scholars and economists have been made at various points in history. Therefore, it is difficult to pinpoint a specific year or time period when the theory of financial integration was first propounded.

Financial integration is the process of linking the financial markets of different countries, so that they can function as a single, unified market. The theory of financial integration seeks to explain the benefits and costs of this process. One key benefit of financial integration is that it can increase the efficiency of capital allocation, as capital can flow to where it is most productive. This can lead to higher economic growth and increased welfare. Financial integration can also facilitate risk-sharing, allowing countries to better cope with economic shocks.

However, financial integration also poses some risks. For example, it can increase the risk of contagion, as financial crises in one country can spread more easily to other countries. Financial integration can also lead to a loss of monetary independence, as countries may be forced to follow the monetary policies of larger, more influential countries. Overall, the theory of financial integration suggests that while there are potential benefits to financial integration, it is important to manage

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the risks and to ensure that the process is carefully managed and regulated to minimize negative impacts.

Conceptual Review

International financial integration

Financial integration refers to the process by which financial markets across different countries become more closely linked, allowing for increased flows of capital, information, and financial products between countries. It is often viewed as a positive development, as it can lead to increased economic growth, greater access to investment opportunities, and more efficient allocation of capital. However, it can also create new risks and challenges, particularly for countries with less developed financial systems.

Dias, da Silva, and Dionísio (2019) and Baele, Ferrano, Hordahl, Krylova, and Mannet (2004), argue that the definition of financial integration that purely focuses on the law of one price, fails to capture its full meaning. They argue that a market is financially integrated if all agents with identical characteristics not only face one set of rules when dealing with financial instruments and services, and have equal access to the same set of financial instruments and services, but also face similar treatment when they operate in the market. Hence, deeper financial integration does not require financial structures to be identical across regions. As long as frictions to financial intermediation are minimal, the efficient and optimal allocation of capital can still be achieved. There are many benefits of financial integration.

As Neaime and Gaysset (2018), and Babecky, Komarek, and Komarkova (2010) pointed out, financial integration fosters financial stability. Financial stability is defined as a situation in which the financial sector is capable of directing capital where it earns a viable-risk-adjusted return and is also able to absorb shocks without causing a collapse of financial sector, financial markets and payment systems (Neaime & Gaysset, 2018). This definition embodies three important aspects. The first aspect relates to the fact that a stable financial sector must be able to perform its functions effectively even under the strain of negative shocks. The second one underscores that a stable system has to be capable of taking manageable risks and allocate capital in an efficient way. The last one high-lights the role of proper and accurate assessment and pricing of risks to avert financial crisis in the future.

Macroprudential regulation

Macroprudential regulation refers to the set of policies and tools aimed at ensuring the stability of the financial system as a whole. These policies and tools are designed to address systemic risks that may arise from the behavior of individual banks or other financial institutions. The implementation of macroprudential regulations can have both positive and negative effects on the banking sector stability. One key goal of macroprudential regulation is to prevent the buildup of financial imbalances that could lead to a financial crisis. This can involve measures such as setting limits on the amount of credit that can be extended to a particular sector, requiring higher capital and liquidity buffers for systemically

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important institutions, and implementing stress tests to assess the resilience of the financial system as a whole.

Another goal of macroprudential regulation is to reduce the likelihood of contagion in the event of a financial shock. This can involve measures such as promoting greater transparency in financial markets, improving the ability of regulators to monitor and respond to systemic risks, and enhancing coordination among different regulatory agencies. Macroprudential regulation is typically implemented by central banks or other regulatory authorities, and may involve a range of tools and instruments. These can include setting capital requirements for financial institutions, implementing restrictions on lending and credit growth, and imposing limits on the size and complexity of financial institutions.

Overall, macroprudential regulation is an important tool for promoting financial stability and mitigating systemic risks. It represents a shift away from the traditional focus on individual institutions and towards a more holistic approach to financial regulation, aimed at protecting the financial system as a whole. Macro-Prudential regulation is a holistic approach to first address the build-up of imbalances in the first place; second, defense against downswings of disruptions; and third, identifying risk concentration and interdependencies in the financial sector (International Monetary Fund, 2011). However, the structure of the financial sector itself is a concern to the stability of the system too. Even if this systemic risk is not the consequence of unsustainable risk macro-prudential policy must find ways to save the financial sector from its inherent instabilities. Disruptions in the form of external shocks are amplified within the system and downswings can be

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worse than expected. The identification of interconnectedness and quantification of systemic risk is a crucial part of macro-prudential regulation.

Reinforcing financial stability through macro-prudential regulation can be interpreted as "leaning against" the financial cycle, so that asset bubbles are avoided in the first place (Borio, 2003; 2010). A second interpretation is that macro-prudential regulation should aim at specific problems that naturally occur in times of system wide distress (Hanson *et al.*, 2011). Among them are the mechanisms like fire sales and consequent credit crunches, i.e. disruption of lending to the real economy also known as dis-intermediation. So, there are two interpretations for macro-prudential regulation: broad and specific interventions. However, a regulatory agency's sound judgement whether to intervene necessitates evidence that the financial stability is at stake, i.e. systemic risk is gathering momentum.

Capital-based and liquidity-based instruments are the two components of macroprudential regulations to help enhance the resilience of banks or moderate their extension of credit (Stavárek et al., 2011). Borrower-based instruments ensure the resilience of the balance sheets of banks' borrowers or moderate their demand for credit. Capital-based instruments include cyclical buffers, the countercyclical capital buffer being the best-known among them (Agénor, 2003). If they are binding, the way that activation of these buffers transmits to financial stability objectives is through the creation of a capital shortfall which banks can address by widening their lending spreads, cutting dividends or bonuses, and issuing equity (CGFS, 2012). Such actions by banks should enhance their resilience and, if the

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credit supply curve is shifted to the left by banks adjusting to the measure, this may also have an impact on the financial cycle as well.

Borrower-based instruments include limits on loan-to-value (LTV), loan-to-income (LTI), debt-service-to-income (DSTI), or loan-/debt-to-income (L/DTI) ratios (Karavitis & Michael, 2022). If they are binding, the mechanism through which the activation of borrower-based instruments transmits to financial stability objectives is very different from the transmission mechanism of capital-based instruments (CGFS, 2012). As they constrain borrowers' ability to access credit, these instruments can reduce credit demand. This has a direct impact on the financial cycle, by constraining borrower leverage, and it can also have an indirect impact on asset prices if exposures to them are financed with credit. If they are effective in reducing the probabilities of default of borrowers and the size of losses should borrowers' default, these instruments can also have an impact on the resilience of lenders. Concerning the relative effectiveness in achieving the two financial stability objectives by activating borrower-based instruments, empirical evidence produced by Kuttner and Shim (2013), Cerutti et al. (2015) and Wong et al. (2015) have all shown that these measures have been very effective in reducing credit growth in exuberant periods.

Bank stability

Bank stability refers to a healthy financial sector, though it has different applications in finance, and it is hard to define. Central banks and other financial entities frequently use their definition of financial stability (Luo, Hostetler, Freeman & Stefaniak, 2020). Bank stability could be defined as a situation in which

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the banking sector is able to efficiently promote real economic activities by effectively channelling financial resources from surplus spending units to deficit spending units, and is also capable of disentangling and resolving financial imbalances emanating from shocks (Sawyer, 2021; The World Bank 2016).

The plethora of identified literature on financial sector development suggest that bank instability involves huge costs for an economy due to the fact that it is characterized by increases in the unpredictability or instability of financial market price variables and evident bankruptcy of financial sector. The implications of bank instability are reflected in reduced efficiency of financial resource allocation and increased difficulty with making rational decisions by economic agents. The economic implications of financial instability explains why both practitioners and academics in the field of financial sector developments have developed increased interest in how to promote financial stability and minimize the impact of financial crises.

Impact of international financial integration

Internationally, there is a growing interest in regional and global financial integration of which developing African countries are not left out. Economic theory suggests that financial integration promotes economic growth and enhances welfare by providing opportunities for more efficient allocation of resources, portfolio and risk diversification and allowing higher profitability of investment, as well as by helping to promote domestic financial development, especially in developing countries (Lane & Milesi-Ferretti, 2018). However, the question of whether financial integration truly benefits developing countries and if it does, under what

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conditions, has been hotly debated without any consensus till date. While several authors (Campos, Coricelli & Moretti, 2019; Nasir, Huynh & Tram, 2019) and some international institutions such as the IMF and the World Bank (Coeurdacier, Rey & Winant, 2020; World Bank, 2016) present arguments that favour a positive influence of financial integration, others did not.

Braunstein and Seguino (2018), contends that, since the 1960s, free international capital flows have been associated with a deterioration in economic efficiency (as measured by growth and unemployment). In like manner, Qamruzzaman and Jianguo (2020), noted that "openness to international capital flows can be especially dangerous if the appropriate controls, regulatory apparatus and macroeconomic frameworks are not in place". Also, commenting on the subject after a review of the issues, the then Chief Economist and Director of Research for the IMF, Kenneth Rogoff, noted that "these days everyone agrees that a more eclectic approach to capital account liberalization is required" (Rogoff, 2002).

Access to world capital markets may allow a country to engage in consumption smoothing, by allowing the country to borrow in "bad" times (say, during a recession or a sharp deterioration in the country's terms of trade) and lend in "good" times (say, in an expansion or following an improvement in the country's terms of trade). By enabling domestic households to smooth out their consumption over time, capital flows can therefore increase welfare. This "counter-cyclical" role of world capital markets allows international risk sharing and is fully justified if shocks are temporary in nature (Poncela, Nardo & Pericoli, 2019).

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The ability to draw upon the international pool of resources that financial openness gives access to may also affect domestic investment and growth. In many developing countries, the capacity to save is constrained by a low level of income. As long as the marginal return from investment is at least equal to the cost of capital, net foreign resource inflows can supplement domestic saving, increase levels of physical capital per worker, and help the recipient country raise its rate of economic growth and improve living standards. These potential benefits can be particularly large for some types of capital inflows, most notably foreign direct investment (FDI) (Poncela, Nardo & Pericoli, 2019).

Although the capital inflows that are associated with an open capital account may raise domestic investment, their impact on long-run growth may be limited (if not negligible) if such inflows are used to finance speculative or low-quality domestic investments such as investments in the real estate sector. Low-productivity investments in the non-tradable sector may reduce over time the economy's capacity to export and lead to growing external imbalances (Poncela, Nardo & Pericoli, 2019).

The misallocation of capital inflows may in part be the result of pre-existing distortions in the domestic financial sector (James (n.d)). In countries with weak banks (that is, banks with low or negative net worth and a low ratio of capital to risk-adjusted assets) and poor supervision of the financial sector, the direct or indirect intermediation of large amounts of funds by the banking system may exacerbate the moral hazard problems associated with (explicit or implicit) deposit

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insurance. That is, lenders may engage in riskier and more concentrated (or outright speculative) loan operations.

The large capital inflows induced by financial openness can have undesirable macroeconomic effects, including rapid monetary expansion (due to the difficulty and cost of pursuing aggressive sterilization policies), inflationary pressures (resulting from the effect of capital inflows on domestic spending), real exchange rate appreciation, and widening current account deficits (Inekwe & Valenzuela, 2020). Under a flexible exchange rate, growing external deficits tend to bring about a currency depreciation, which may eventually lead to a realignment of relative prices and induce a self-correcting movement in trade flows. By contrast, under a fixed exchange rate regime, losses in competitiveness and growing external imbalances can erode confidence in the viability and sustainability of the peg and thus precipitate a currency crisis and increase financial instability.

Sources/determinants of bank sector stability/instability

There is a wide range of empirical studies that have investigated the determinants of bank instability. Notable among such studies are the works of Ozili (2018) and the International Monetary Fund [IMF] (2019) for Africa countries. Ozili (2018) examined the main causes of banking instability in 48 African countries covering the period from 1996 to 2015. He used four (4) alternating measures for banking instability, namely: measures or indicators for insolvency risk (using the Z-score), loan loss coverage ratio, non-performing loans to gross loans ratio (for asset quality ratio), and the standard deviation of financial development. The study identified a number of factors as important determinants of instability for

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the 48 selected African countries. The study identified the following factors as key determinants: banking efficiency, foreign bank presence, banking concentration, size of banking sector, government effectiveness, political stability, regulatory quality, investor protection, corruption control and unemployment levels. The study also draws special attention to the significance of institutional quality as a determinant of financial stability in Africa.

The study by the IMF (2019) on the other hand focused on estimating the effect of government domestic payments arrears on financial sector vulnerability (proxied by banks' asset quality) in 30 sub-Saharan African (SSA) countries for the period from 2005 to 2018. The study used the non-performing loans to total gross loans ratio as a measure for banks' asset quality. Other potential explanatory variables included in the regression analysis are: real GDP growth, credit to private sector ratio, real effective exchange rate index, and terms of trade. The study introduced measurable indicators for the following variables in alternating fashion in a step-wise regression: CPI inflation, regulatory capital to risk-weighted assets, returns on assets and foreign currency denominated liabilities ratio. The study found government domestic payment arrears accumulation and returns on assets to have significant influence on financial sector vulnerability in the 30 selected SSA countries: government domestic payment arrears accumulation significantly reduces bank asset quality (and hence increases financial sector vulnerability) whilst returns on assets increases bank asset quality (and hence reduces financial sector vulnerability) in the selected SSA countries.

One of the value additions of this study is the inclusion of an indicator for government domestic payment arrears accumulation as an explanatory variable in the analysis but which was absent in the study for Africa by Ozili (2018). Another value addition is with the use of the financial sector (mainly banking institutions). Z-score as a measure for financial sector instability which was included in the study for countries by the IMF (2019). One advantage with the use of the z-score is its relevance as a measure institutional level stability in a situation where a well-defined market-based data is virtually absent. This is particularly the case for developing financial markets such as what is found in most ECOWAS countries. It also allows for comparison of defaulting risks in different categories of institutions that are confronted with the risk of insolvency.

Also, Diaconu and Oanea (2014) used the banking sector Z-score as a measure of financial stability and found GDP growth and interbank offering rate as the main determinants financial stability of co-operative banks in Romania during the period between 2008 and 2012. Chauhan and Ramesha (2016), on the other hand, used non-performing assets ratio as a measure of financial stability and found growth of credit, growth in stock market index, short term interest rates and selected sectoral GDP growth rates as key determinants of banking and financial sector stability in India for the period between the first quarter of 2000 and the first quarter of 2009.

An extensive exploration of the relevant existing literature (both theoretical and empirical studies) leads us to identify the following measurable indicators (factors) as important potential causes of financial instability and which we

consider in our study: Monetary policy volatility (an indicator for irregular monetary policy); growth in GDP per capita (representing economic prosperity); GDP per capita (as measure of level of development or income); financial integration and liberalization; changes in foreign exchange reserves; financial stability transparency; institutional quality; inflation rate; growth in base money; banking sector profitability; sectoral GDP growth rates; bank lending interest rate; and level (and volatility) of financial development.

Effect of international financial integration on bank stability

An increasingly common argument in favour of financial openness is that it may increase the depth and breadth of domestic financial markets and lead to an increase in the degree of efficiency of the financial intermediation process, by lowering costs and "excessive" profits associated with monopolistic or cartelized markets, thereby lowering the cost of investment and improving resource allocation (Wu, Huang, Chang, Chiou & Hsueh, 2020).

Natsir, Soedarmono, Yudhi, Trinugroho, and Warokka (2019) and Dienillah, Anggraeni and Sahara (2018), for instance, have argued that foreign bank penetration may: improve the quality and availability of financial services in the domestic market, by increasing the degree of bank competition and enabling the application of more sophisticated banking techniques and technology (such as more advanced risk management systems), which may improve efficiency by reducing the cost of acquiring and processing information on potential borrowers; serve to stimulate the development of the domestic bank supervisory and legal framework, if the local foreign banks are supervised on a consolidated basis with their parent;

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enhance a country's access to international capital, either directly or indirectly through parent banks; contribute to the stability of the domestic financial sector (and reduced volatility in capital flows) in periods of financial instability, depositors shift their funds to foreign institutions that are perceived to be more sound than domestically-owned banks, rather than transferring assets abroad and engage in capital flight. In addition, foreign banks may also contribute to an improvement in the overall quality of the loan portfolios of domestic banks because they are less susceptible to government pressure to lend to "preferred" borrowers-as may be the case with domestic financial sector, particularly those in which the state is involved (Marín & Schwabe, 2019).

Although foreign bank penetration can yield several types of benefits, it also has some potential drawbacks as well. First, foreign banks may ration credit to small firms (which tend to operate in the non-tradable sector) to a larger extent than domestic banks, and concentrate instead on larger and stronger ones (which are often involved in the production of tradable) (Léon & Zins, 2020). If foreign banks do indeed follow a strategy of concentrating their lending operations only to the most creditworthy corporate (and, to a lesser extent, household) borrowers, their presence will be less likely to contribute to an overall increase in efficiency in the financial sector. More importantly, by leading to a higher degree of credit rationing to small firms, they may have an adverse effect on output, employment, and income distribution.

Second, entry of foreign banks, which tend to have lower operational costs, can create pressures on local banks to merge in order to remain competitive (Léon

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& Zins, 2020; Yin, 2019). The process of concentration (which could also arise as foreign banks acquire local banks) could create banks that are "too big to fail" as monetary authorities may fear that the failure of a single large bank could seriously disrupt financial markets. Although these potential problems could be mitigated through enhanced prudential supervision or an outright ban on mergers that are perceived to increase systemic risks sharply, they may lead to an undesirable extension of the scope and cost of the official safety net. A too-big-to-fail problem may, in turn, increase moral hazard problems: knowing the existence of an (implicit) safety net, domestic banks may be less careful in allocating credit and screening potential borrowers. Concentration could also create monopoly power that would reduce the overall efficiency of the banking system and the availability of credit. In particular, a high degree of banking system concentration may adversely affect output and growth by yielding both higher interest rate spreads (with higher loan rates and lower deposit rates relative to competitive credit and deposit markets) and a lower amount of loans than in a less concentrated, more competitive system (Loo, 2019).

Third, entry of foreign banks may not lead to enhanced stability of the domestic banking system, because their presence per se does not make systemic banking crises less likely to occur as may happen if the economy undergoes a deep and prolonged recession, leading to a massive increase in default rates and an across- the-board increase in nonperforming loans, and because they may have a tendency to "cut and run" during a crisis (Usman, Syofyan & Nugroho, 2018). To some extent, the latter effect could in principle be mitigated by strengthening

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prudential supervision in domestic markets and improving information sharing between supervisors in industrial and receiving countries. In practice, however, countries have very few options to prevent foreign banks from, say, cutting lines of credit to domestic borrowers in a crisis.

The link between financial integration and stability may be positive or negative depending on the type of channel. For example, financial integration may favour financial stability through improvements in the bank supervisory and legal framework. Financial integration allows for importation of international best-practice in financial regulation and supervision as well as market discipline (Alexander & Fisher, 2018). As a result, local regulatory and supervisory authorities, in countries with under-developed financial sectors, improve their supervisory and regulatory systems in line with best practice in the spheres of securities markets legislation, accounting standards, and corporate governance (Seabrooke & Tsingou, 2021).

In addition, Alvarez (2021) indicates that if foreign banks are regulated on a consolidated basis by authorities in countries of origin, then their presence in local markets will improve regulatory oversight. In that way, the less developed countries will benefit from more sophisticated foreign regulation. Consequently, problems associated with imperfect markets such as agency problems, information asymmetries and adverse selection will be curtailed. The financial sector of the host country will, therefore, derive gains in terms of financial stability. Another channel that leads to a positive relationship between financial integration and stability works through the reduction of volatility of capital flows especially during crisis.

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Financial integration can counter the drainage of capital from a country during crisis periods. This happens when, instead of moving funds abroad, depositors transfer assets to local foreign financial sector that are considered better managed compared to their domestically owned counterparts. This can avert capital flight and minimise the extent of financial crisis (Agenor, 2003). This is true from a developed country perspective whose markets are advanced and well developed.

Lane and Milesi-Ferretti (2018), points to a third channel through which financial integration enhances financial stability. According to the study, foreign banks can improve the quality of lending in the country because their lending behaviour is not influenced by government. Unlike domestically owned banks, foreign banks are insulated from government control when extending credit. Moreover, foreign banks have more sophisticated risk assessment tools that enable them to grant credit to credit-worthy borrowers. As a result, foreign banks are assumed to have better loan-books and this can contribute positively to their financial stability. Financial integration may also come at the cost of financial stability. First, it can destabilise the financial sector by creating financial sector that are "too-big-to-fall". This can arise when foreign banks take control of domestic banks through mergers and acquisitions. This, therefore, increases the concentration of foreign banks in the domestic financial markets.

Sironi (2018), posits that this problem emerges when the monetary authorities become concerned that the failure of a particular bank could precipitate a financial crisis. As a result, the authorities find the failure of such a bank too costly and are willing to bail it out in the event of an imminent failure. This

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behaviour by the authorities may trigger bad behaviour from the concerned institution which may manifest in reckless risk management practices. This, therefore, increases moral hazard, on the part of banks, and may gradually cause financial instability. Therefore, it is imperative that prudential regulation and supervision, proactively, curb unwanted growth of foreign banks by preventing mergers and acquisitions which are likely to cause systemic risks. Second, foreign banks can contribute to financial instability by causing abrupt capital losses.

The trans-national nature of foreign banks makes it easy for them to withdraw capital from countries that are undergoing economic recessions in favour of more stable countries. They may do so because eco-nomic recessions tend to increase default rates and non-performing loans. The abrupt withdrawals of capital from host countries exacerbate financial instability. This underscores the need for appropriate measures to be put in place in order to provide for free entry of foreign banks without jeopardising the stability of the domestic financial sector over time. The third way through which financial integration could impact negatively on financial stability is through reckless lending habits. Reckless lending habits are often a consequence of sudden capital inflows.

The World Bank (2007) indicates that sudden receipts of foreign capital are often accompanied by a decline in the quality of loan portfolios in banks. This situation may be more acute in countries where the regulatory apparatus is weak. Banks that are poorly regulated tend to satisfy their risk appetite by investing in profitable yet risky activities. This surge in bank-lending exposes the financial sector to risk of financial instability which can even initiate a crisis. Babecky et al.

(2010:104) argue that, given the benefits and costs of financial integration, "a fundamental challenge for the regulatory and supervisory authorities is to minimise the negative impacts of financial market integration on financial stability without reducing the benefits of the process." The fourth, and more serious, factor through which financial integration erodes financial stability is contagion. This phenomenon thrives in an environment in which markets of different countries move together.

According to Ahmed and Huo (2021), "if a country is integrated in global financial markets, then financial markets are mechanisms that make asset prices in those markets and other variables move together." Although the co-movement is good when there is a boom, it has serious damaging effects on financial stability when the reverse occurs. Many researchers have spent a lot of time studying contagion, its nature, causes and consequences (Flood & Garber, 1984; Buiter, Corsetti, & Pesenti, 1996; Obstfeld, 1996; Zhang, Wang & Zhu, 2020; Lee, Lu, & Shih, 2018). Hence, there are several theoretical explanations of how contagion occurs. Karolyi (2003) defines contagion as a phenomenon associated with the propagation of market down-side shocks from one country to another. This is usually observed through co-variation in exchange rates, capital flows and stocks prices.

Mabejane (2021) and Allen and Gale (2000) provide some empirical evidence that suggest that due to financial integration, failure of one institution may lead to failure in others through interbank market commitments. They argued that if these commitments are strong between banks in one country, there will be

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systemic risk in the banking sector of that country. However, financial integration makes it possible for such commitments to exist between banks in different countries. Consequently, contagion arises when failure of a bank in one country affects other related banks in different countries.

It is, therefore, not surprising that Camous and Claeys (2020), cautioned that certain initial conditions must be in place before a country decides to embrace financial integration if it has to avoid associated potential risks of crises. In this section, we consider two of the initial conditions, namely; openness to trade and the quality of bank supervision. First, trade openness can reduce both the likelihood and cost of crises associated with financial liberalisation. Openness to trade minimises real exchange rate depreciations as the current account adjusts, and reduces their adverse balance sheet impact thereby reducing the chances of debt defaults and vulnerability to financial crises. Second, sound and effective supervisory and regulatory apparatus can also mitigate the negative effects associated with the volatility of capital flows (Camous & Claeys, 2020).

Therefore, certain types of capital flows may be safer than others depending on what initial conditions are present. For example, foreign direct investment and portfolio flows area safer option than debt flows for an economy where financial and institutional development remains at low. Reversals in capital flows may have serious implications for domestic financial stability. However, the scale of impact differs from country to country due to disparities in macroeconomic policy disciplines between countries (Camous & Claeys, 2020) and the degree of financial integration (Price & Elu, 2014). Camous and Claeys, (2020), observed that, open

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developing countries that grow better are those that, largely, depend on domestic resources and less on foreign capital, to support domestic investment. Price and Elu (2014) find that countries that belonged to the CFAZ suffered more credit contraction due to macroeconomic shocks from the global financial crisis than non-member countries. They conclude that belonging to a currency bloc heightens the impact of global business cycles in sub-Saharan Africa.

Moreover, financial instability can be a repercussion of a strongly integrated system which lacks resilience and flexibility to adjust to adverse shocks such as contagion or systemic risks. The risk of contagion is present in both cross-sectoral and cross-border integration as local banks penetrate foreign markets. The extent of the risk depends on the degree of financial integration which increases the possibility of the spill over of foreign financial crises into local markets (Patra & Panda, 2021). The output costs of financial instability can be quite high. Asongu (2011) argues that financial integration provides a channel through which political risks arising from conflict and political upheavals in one country can spread to other countries.

Effect of macroprudential regulation on bank stability

The ultimate objective of macroprudential policy is to prevent and mitigate systemic risk (Constâncio, 2016). This involves contributing to the safeguarding of financial stability by strengthening the resilience of banks and by smoothing the financial cycle, so as to avoid discontinuities in the financial intermediation process. In addition to the distinction between resilience and moderating the financial cycle, the macroprudential policy objective recognises that there are two

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key dimensions to systemic risk: a cross-section dimension and a time dimension, as explained in Borio (2003) and Borio and Zhu (2012).

Policymakers mainly use regulations in the financial sector to guarantee the bank stability of the industry through adjusted limiting financial capital provision and financial risk (Acharya, 2009). Studies recommend creating incentives in the banking sector, such as prudential regulations and supervision, to develop institutional bank stability (Anginer & Demirguc-Kunt, 2014). Mcroprudential regulations and supervision over banks have shown higher quality loans and lower moral hazard (Shehzad & De Haan, 2015), as well as limiting the engagement of banks in non-interest income activities (Bermpei et al., 2018) and systemic risk (Acharya et al., 2017).

However, other studies have shown concern towards financial sector too big to fail; the 2007-2009 subprime crisis evidenced the risk that these companies represent. Their expectations of being partially restored by economic authorities in case of a crisis (Tabak et al., 2013) compromises the stability of the global financial sector. Hence, regulatory reviews of potential stake-holders agency problems and internal governance are irrelevant, especially for more prominent financial sector (Kasman & Carvallo, 2014) to minimize the chances of financial crisis given their larger size, complexity, and systemic importance.

The financial sector's regulatory framework shows a change in the behaviour of financial sector regarding risk management. Regulations that incorporate capital requirements and supervisory power reduce non-preforming loans and, as a consequence, credit risk (Agoraki et al., 2011). Some financial sector

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tends to be cautious of possible financial implications and financial uncertainties that come from financial regulations (Dam & Scholtens, 2015). These findings and the change of behaviours in the industry have increased the popularity of financial regulations (Barth et al., 2013).

Furthermore, regulatory effectiveness has a secure link with a country's institutional quality. Regulations in countries with weak democratic institutions are associated with higher corruption in the lending process with no similar beneficial effects on stability (Barth et al., 2013). Also, regulations alone have no control over financial crises; policymakers must consider other mechanisms, as well as preventive measures, should be considered at the institutional level (Allen & Gu, 2018). Hence, political stability is essential to increase the benefits of capital regulations and activities restrictions over the bank's stability and developing economies would benefit from capital regulation and special monitoring in terms of bank stability (Bermpei et al., 2018). Moving on, the emergence and the ability to resort to macroprudential regulations as a new policy domain for ensuring stability in the banking institutions within the SSA region.

The cross-section dimension concerns the distribution of risks within the financial sector at any given point in time and how specific shocks to the financial sector can propagate themselves and become systemic. Among other factors, it relates to the size and interconnection of financial sector and markets, and the capacity for contagion through, for instance, direct or perceived exposures to troubled institutions. The time dimension encapsulates the endogenous evolution of financial stability risks over time, including cumulative and pro-cyclical build-

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ups of financial fragility in the boom phase and excessive risk aversion – including runs – in the bust. Different to the stylised depiction of business and financial cycles, the dynamics of the financial sector and of the real economy can reinforce each other. The extent of this interaction will depend on leverage, maturity mismatches and the adequacy of the pricing of risk, all of which vary over time.

In both the cross-section and time dimensions, macroprudential policy distinguishes itself from microprudential supervision as it explicitly takes account of externalities either across financial sector or across time. Through its system-wide approach, macroprudential policy recognises that optimising behaviour on the part of individual financial sector can aggregate to a sub-optimal outcome for the system as a whole. The resilience objective therefore requires a capacity to absorb shocks at the level of the financial sector as a whole. Embedding the time dimension, effective macroprudential policy should also condition the desired degree of resilience on the stage of the financial cycle, building up buffers when risks for financial stability are increasing and releasing them when risks are attenuated.

Relying exclusively on resilience is not, however, sufficient to safeguard financial stability (Barwell, 2017). As the global financial crisis showed, financial imbalances can reach dangerously high levels, overwhelming the financial sector and the real economy when they are ultimately corrected (Jeanne & Korinek, 2016). Since crises in individual countries are infrequent (documented in e.g. Laeven and Valencia (2013), Detken et al. (2014) or Lo Duca et al. (2017)), their costs are challenging to gauge ex ante so that there will always be uncertainty as to whether

a given degree of resilience will be sufficient to absorb a plausible shock (Fell & Schinasi, 2005). By taking a pre-emptive and counter-cyclical stance to smooth the financial cycle, this uncertainty can be attenuated. Dampening the amplitude of the financial cycle in the expansion phase should also attenuate the risk that market pressure to replenish capital in a downturn leads to pro-cyclical deleveraging and undesirable macroeconomic costs.

It is important to recognise that there are complementarities between the two operational objectives of macroprudential policy: an increase in resilience through, for instance, the setting of higher capital requirements for financial sector would tend to reduce risk-taking and encourage more cautious lending behaviour when financial cycles are in an expansionary phase. The evidence indicates that when financial sector has greater resilience, they tend to adjust their balance sheets more smoothly to economic and financial shocks (Adrian & Shin, 2010), thereby contributing to dampening the amplitude of the financial cycle.

This raises an important policy question of whether trade-offs exist between those macroprudential policies that aim at enhancing resilience and those that aim at moderating the financial cycle. For instance, a relevant question is whether greater resilience is needed when the amplitude of the financial cycle is large compared to a situation when it has been dampened by effective activation of cycle-moderating macroprudential policy instruments.

Empirical Review

The empirical review was developed in line with the overall purpose of the study. The relationship that exists among international financial integration, macroprudential regulations and bank stability.

First, Kaminsky (2005) undertook a study which looked at the relationships that exist between international capital flows, financial stability and growth. She brought to the knowledge in literature in that, explosion and dramatic reversal of capital flows to emerging markets in the 1990s have ignited a heated debate, with many arguing that globalization has gone too far and that international capital markets have become extremely erratic. In contrast, others had emphasized that globalization allows capital to move to its most attractive destination, fueling higher growth. Her study re-examined the characteristics of international capital flows since 1970 and summarized the findings of research of the 1990s on the behaviour of international investors as well as the short- and long-run effects of globalization on financial markets and growth. The outcome of his study depicted a significant and strong relation that exited among the three constructs, yet little or no attention is given as such within developing economies.

Aziakpono (2007) examined the effects of financial integration on financial development and economic performance of the SACU countries within a country-specific framework. The study employed four measures of financial integration, two measures of financial development and real per capita output and annual time series from 1970 to 2004 for the analysis. The econometric analyses were carried out using the Johansen cointegration and error correction modelling techniques.

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The effects of financial integration were mixed, but what is apparent is that countries that are more integrated to South Africa produce more discernible evidence of positive effects of financial integration. The paper attributed the weak gains from the official integration arrangement to weak institutional and structural impediments in the countries.

Eozonou (2008) analyzed the relationship between international financial integration and macroeconomic volatility. The study examined empirically the interaction effects between domestic financial sector and international financial integration. The study used GMM-IV estimator to ask (1) whether financial integration has a significant impact on macroeconomic volatility, and (2) whether this relationship depends on the level of financial development. Looking at a panel of 90 countries over the period 1960-2000, the study found that domestic financial conditions matter when assessing the impact of financial integration on consumption growth volatility. More specifically, consumption growth volatility is found to increase with the degree of financial integration in countries with low level of financial development and to decrease in countries with high level of financial development. When measuring domestic financial conditions by the share of private credits to GDP, the threshold level of financial development above which financial integration yields consumption smoothing benefits is estimated to be around 60%-70% GDP.

Various empirical studies have found that the cost of financial instability is high. For example, Hoggarth and Saporta (2001) find that the average fiscal costs of banking resolution across countries are 16% of GDP. For emerging countries, the

figure is 17.5% and for developed countries it is 12%. Although these costs are substantial, they are much lower than the costs, estimated at 23% of GDP, of banking and currency crises occurring together. A proportion of the fiscal costs are transfers, so these figures do not represent the deadweight economic costs.

Diaconu and Oanea (2014) used the banking sector Z-score as a measure of financial stability and found GDP growth and interbank offering rate as the main determinants financial stability of co-operative banks in Romania during the period between 2008 and 2012. Chauhan and Ramesha (2016), on the other hand, used non-performing assets ratio as a measure of financial stability and found growth of credit, growth in stock market index, short term interest rates and selected sectoral GDP growth rates as key determinants of banking and financial sector stability in India for the period between the first quarter of 2000 and the first quarter of 2009.

In another related study, Duuren, Haan and Kerkhoff (2019) used non-performing loans as measure of financial stability and introduced indexes for the level of corruption and government effectiveness as indicators for institutional quality in their study. They identified institutional quality as a condition that the makes financial stability transparency an important determinant of financial stability in a study that covers 110 countries for the period between 2000 and 2011. On the contrary, Vo et al. (2019) used credit growth as a measure of financial stability in a study that covered 17 developing countries and found GDP growth rate, inflation rate, base money growth, change in foreign exchange reserves, lending interest rates, stock market returns and banking sector returns on equity ratio as key determinants of financial instability.

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An extensive exploration of the relevant existing literature (both theoretical and empirical studies) leads us to identify the following measurable indicators (factors) as important potential causes of financial instability and which we consider in our study: Monetary policy volatility (an indicator for irregular monetary policy); growth in GDP per capita (representing economic prosperity); GDP per capita (as measure of level of development or income); financial integration and liberalization; changes in foreign exchange reserves; financial stability transparency; institutional quality; inflation rate; growth in base money; banking sector profitability; sectoral GDP growth rates; bank lending interest rate; and level (and volatility) of financial development.

Again, Baun, Pundit and Ramayandi (2017) sought to examine the relationship between capital flows and financial stability in emerging economies. There is mixed evidence for the impact of international capital flows on financial sector's stability. Their study specifically investigated the relationship between components of gross capital flows and various financial stability indicators for 16 emerging and newly industrialized economies. Departing from panel data methods, for each financial stability proxy, they employed systems of seemingly unrelated regression estimators to allow variation in the estimated relationship across countries, while permitting cross-equation restrictions to be imposed within a country. Their findings suggested that, after controlling for macroeconomic factors, there are significant effects of different gross capital flow measures on the financial stability proxies. However, the effects are not homogeneous across our sample

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economies and across flows. Country-specific financial and macroeconomic characteristics help to explain some of these differences.

Notable among such studies are the works of Ozili (2018) and the International Monetary Fund [IMF] (2019) for Africa countries. Ozili (2018) examined the main causes of banking instability in 48 African countries covering the period from 1996 to 2015. He used four (4) alternating measures for banking instability, namely: measures or indicators for insolvency risk (using the Z-score), loan loss coverage ratio, non-performing loans to gross loans ratio (for asset quality ratio), and the standard deviation of financial development. The study identified a number of factors as important determinants of financial instability for the 48 selected African countries. The study identified the following factors as key determinants: banking efficiency, foreign bank presence, banking concentration, size of banking sector, government effectiveness, political stability, regulatory quality, investor protection, corruption control and unemployment levels. The study also draws special attention to the significance of institutional quality as a determinant of financial stability in Africa.

Also, Cork (2018), investigated the effect of Capital Flows on Key Financial Stability Measures in Jamaica. He opined that, Capital inflows contribute to an economy's development by increasing the availability of funds for new projects, infrastructure development and productivity improvements, and can stimulate economic growth and job creation. However, the free flow of capital in and out of an open economy may also lead to economic destabilization, especially in politically and economically unstable emerging markets. His study examined

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whether sharp capital flow movements, specifically private capital inflow movements, are a significant risk factor for financial stability in Jamaica. A structural vector autoregressive (SVAR) model was used to assess the dynamic relationship between private capital inflows and financial stability, as well as the responsiveness of financial stability indicators to sudden changes in private capital flows. His findings confirm a significant relationship between private capital inflows and financial stability and underscores the need to develop macro-prudential measures to curb possible threats to financial stability.

The study by the IMF (2019) on the other hand focused on estimating the effect of government domestic payments arrears on financial sector vulnerability (proxied by banks' asset quality) in 30 sub-Saharan African (SSA) countries for the period from 2005 to 2018. The study used the non-performing loans to total gross loans ratio as a measure for banks' asset quality. Other potential explanatory variables included in the regression analysis are: real GDP growth, credit to private sector ratio, real effective exchange rate index, and terms of trade. The study introduced measurable indicators for the following variables in alternating fashion in a step-wise regression: CPI inflation, regulatory capital to risk-weighted assets, returns on assets and foreign currency denominated liabilities ratio. The study found government domestic payment arrears accumulation and returns on assets to have significant influence on financial sector vulnerability in the 30 selected SSA countries: government domestic payment arrears accumulation significantly reduces bank asset quality (and hence increases financial sector vulnerability)

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whilst returns on assets increases bank asset quality (and hence reduces financial sector vulnerability) in the selected SSA countries.

One of the value additions of our study is the inclusion of an indicator for government domestic payment arrears accumulation as an explanatory variable in the analysis but which was absent in the study for Africa by Ozili (2018). Another value addition is with the use of the financial sector (mainly banking institutions) Z-score as a measure for financial sector instability but which was omitted in the study for SSA countries by the IMF (2019). One advantage with the use of the z-score is its relevance as a measure institutional level stability in a situation where a well-defined market-based data is virtually absent. This is particularly the case for developing financial markets such as what is found in most SSA countries. It also allows for comparison of defaulting risks in different categories of institutions that are confronted with the risk of insolvency.

Additionally, Unsal (2011) investigated the capital flows and financial stability: monetary policy and macroprudential responses. He discovered that, the resumption of capital flows to emerging market economies since mid-2009 has posed two sets of interrelated challenges for policymakers: (i) to prevent capital flows from exacerbating overheating pressures and consequent inflation, and (ii) to minimize the risk that prolonged periods of easy financing conditions will undermine financial stability. While conventional monetary policy maintains its role in counteracting the former, there are doubts that it is sufficient to guard against the risks of financial instability.

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In this context, there have been increased calls for the development of macroprudential measures, with an explicit focus on systemwide financial risks. The key result was that macroprudential measures can usefully complement monetary policy. Even under the "optimal policy," which calls for a rather aggressive monetary policy reaction to inflation, introducing macroprudential measures is found to be welfare improving. Broad macroprudential measures are shown to be more effective than those that discriminate against foreign liabilities (prudential capital controls). However, these measures are not a substitute for an appropriate monetary policy reaction. Moreover, macroprudential measures are less useful in helping economic stability under a technology shock.

Lessons learnt and issues arising from the review of empirical studies

Most of the studies were carried out in Asia and Europe raising questions regarding the applicability of their findings to developing African economies such as SSA region. In line with that, the findings of the studies vary according to sector and context. The dominant study employed the system of establishing the overall relationship between capital flows and financial stability. The reason cited was to arrive at conclusions applicable to fairly representative proportions of the countries involved in each case. Financial sector stability measures were mainly based on bank z-score and stock price volatility. The role of macroprudential regulations has not been fully assessed, even though support for few studies mentioned it, but in the context of employing both monetary policies with macroprudential regulations. Indicating the need for further research on the concept to exhaust the macroprudential regulation policies (capital based or liquidity component) to which

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best compliments the traditional monetary policy to attain financial stability within the SSA region.

Chapter Summary

This chapter has reviewed the literature based on the objectives and research questions. This literature was reviewed under the following sub-headings. The first section explored the theory underpinning the study. The second section also examined the various concepts for this study which included international financial integration and its determinants, bank stability and its' determinants, macroprudential regulations, and the relationship that exists between these concepts. Finally, the last section focused on empirical literature of the relationship between the constructs of the study.

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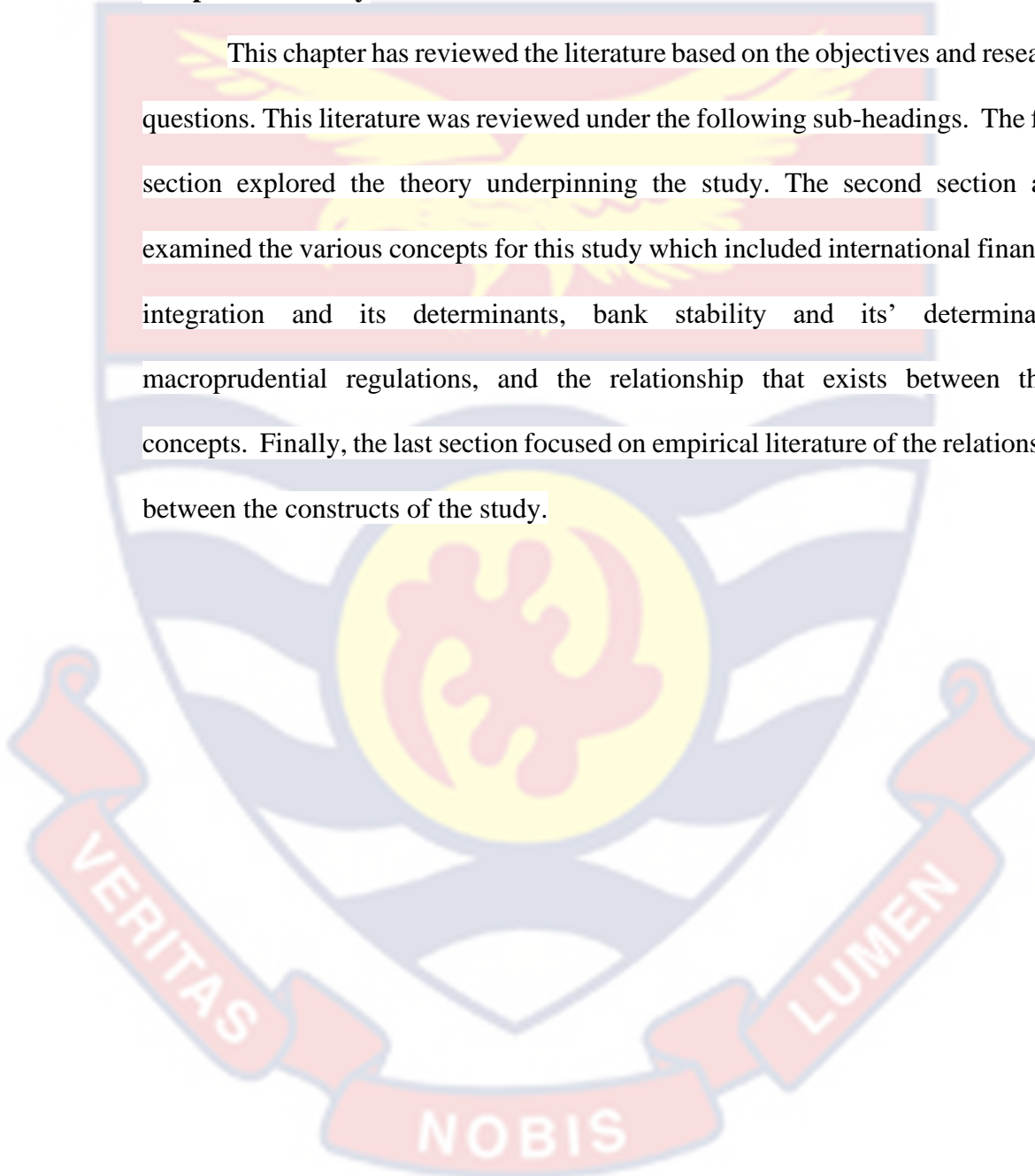
CHAPTER THREE

SOME STYLIZED FACTS ABOUT THE CONSTRUCTS OF THE STUDY

International Aggregate Capital Flows

Capital flows occur as a phenomenon more prominent in open economies since they foster economic activities and the exchange of resources across countries. Capital flows are an essential element of financial globalisation and liberalisation and relate to the cross-border movement of money, financial assets and more generally, technical skills and experience. According to Hoggarth, Jung and Reinhardt (2016), there are four key categories as it pertains to the balance of payments accounting definition of capital flows: foreign direct investment (FDI), portfolio equity, portfolio debt and "other". Capital inflows are helpful to the recipient country/economy since they allow for the interchange of information, technology and investments, which provide prospects for economic growth and development that possibly were unattainable otherwise.

However, excessive capital inflows also referred to as capital inflow surges, are unsustainable as they raise the risk and probability of "sudden stops" and capital flow "reversal", as well as, they pose a risk of credit and asset boom-bust cycles in economies, and hence threatens financial stability. Although not all surges lead to credit booms or asset price bubbles because of domestic policymakers and authorities' initiatives to limit this adverse effect, in the case of the SSA region when experiencing a surge and lending boom simultaneously, it was found to increase the probability of a banking crisis. Excessive inflows can also stretch an economy's ability to adjust macroeconomic policy, generally overwhelm domestic financial markets and distort

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money markets, cause rapid exchange rate appreciation, build-up in DTIs balance sheets, unsustainable drops in risk premia, as well as, disrupt monetary policy.

This is especially a concern in small open economies due to their weak or emerging economies and financial sectors. The danger of boom-bust cycles, and more broadly capital input spikes, require around 6 years to appear. Thus, capital reversals and unexpected pauses together with the particular herding behaviour typically demonstrated by investors, raises the necessity for macro-prudential controls to reduce the risks connected with them. Capital reversals and unexpected pauses, tend to contribute considerably to destabilising currency devaluation, and can lead to credit crunches, a rise in loan defaults, upward pressure on interest rates and overall financial sector stress.

Capital Flows and Financial Sector

Borén (2016) revealed that capital movements in the SSA regions might possibly generate financial instability since there is a strong and negative link between capital imports and non-performing loans. Kaminsky, Reinhardt and Vegh (2004) identified the capital flow cycle to be connected to the business cycle and often impact macroeconomic (and fiscal policy) policies. Their definition of "cyclical features of capital flows" principally focused on whether these flows reinforced or stabilised the business cycle and found that net capital inflows are pro-cyclical in most OECD and emerging nations.

The results of studies by Korinek (2007 & 2010) showed that capital inflow and outflow movements may lead to exchange rate appreciations and depreciations since foreign currency denominated liabilities create the risk of financial amplification, which leads to depreciating exchange rates, deteriorating balance

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sheets and a decline in aggregate demand. In other words, capital inflows and outflows can have an overall destabilizing effect on the economy. Korinek (2010) has addressed the significance capital inflows play in loan crises. He produced evidence that "private money market players grow the stock of capital during booms and as the price of capital rises, this enables them to take on more credit. During busts, the stock of capital becomes less valuable and the capacity to repay declines". The IMF (2012) also concur that inflow surges can play a role in boom-bust cycles, since they feel surges typically overwhelm the receiving country's financial sector and its ability to react using macroeconomic policy. This financial and macroeconomic volatility typically leads to asset price volatility and bubbles, fast exchange rate appreciation, credit booms, unsustainable decreases in risk premia and disruptions to monetary policy transmission.

As it relates to capital inflow surges, Calvo (1998) believes that the ability to accommodate the change in current account deficit is essential to mitigate the risk of a sudden stop of inflows after a surge, and could be cushioned by international reserves as tight monetary policy often aggravates the credit "destruction problem". Korinek (2010) also believes capital influx spikes render recipient nations more sensitive to unfavorable shocks. He thinks that surges frequently produce a boom in borrowing, asset prices and consumption for a while and these booms in the market are inefficient since borrowers' conduct worsens financial instability at an aggregate level.

In respect to "sudden stops" or reversals of inflow surges, most analysts believe that this is where a majority of the danger to financial stability occur.

Dornbusch et al (1995) highlighted, "it is not speed that kills, it is the unexpected stop" as it pertains to capital flow movement. An abrupt cessation of inflows may generate a liquidity squeeze or an overall liquidity shortfall, making it impossible to repay obligations that will then cause pressure in the credit market. Balwin and Giavazzi (2015) feel "the European sovereign debt crisis originated as a classic sudden stop to cross border capital inflows". They postulated that economies in the EU impacted the worst by the sovereign debt crisis, were facing substantial capital account deficits and a spike of capital inflows. Rodrik and Velasco (1999) claimed that countries with significant short-term debt stock are more vulnerable to catastrophic crises when an abrupt cessation of capital inflows occur.

Capital Flows and Developing Economies

The literature typically confirms the substantial association between capital inflows and emerging countries. Pradhan, Balakrishnan, Baqir et al (2011) observed that cyclical and structural reasons have affected the growth in inflows to SSA countries, however, these surges might undermine financial stability especially when they induce extreme asset price fluctuations. Kaminsky, Reinhardt and Vegh (2004) claimed that the capital flows cycle in developing nations is pro-cyclical, therefore moving in unison with the financial cycle and this is known as the "when it rains, it pours" phenomena. They discovered that the source of most debt problems in SSA nations were due to pro-cyclicality, excessive expenditure and borrowing when international capital is "plentiful", as macro-policies tend to be expansionary when inflows are high and contractionary when there are greater outflows.

Musacchio (2012) observed that overenthusiastic foreign investors precipitated the Mexican Financial Crisis, rather than the country's fundamentals, which led to a

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significant surge in numerous types of capital inflows. This led to a loan boom, a boom in the Mexican stock market as well as FDI rise, and consequently the crisis was started when the peso was devalued in December 1994. Consequently, there was herding behaviour of foreign investors, who eventually reversed the capital flows following substantial pressures on the economy. An inadequately regulated banking sector, societal issues and a change in the international monetary policy environment contributed to the economy being exposed to the inevitable financial catastrophe that occurred.

Montes (1998) claimed the financial crisis in East Asia was caused by double liberalization in the system whereas Radelet and Sachs (1999) and Yap (2009) suggested that the crisis was a result of unexpected capital reversals following an inflow surge to the area. Radelet and Sachs (1999) believe that these reversals may result in a BOP crisis, financial panic, bubble collapse, moral hazard crisis and disorderly workout of insolvent debtors. Yap (2009) state that a net private capital inflow surge in East Asia - more specifically Indonesia, Korea, Malaysia, Philippines and Thailand - in early 1997 was followed by a sudden reversal in flows, due to the withdrawal of foreign capital by panicked investors triggered by financial weakness in the Thai economy. This has negative spillover effects on investor opinion in the area harming the more financially weak in East Asia. This reversal accounted for outflows of nearly 10% of pre-crisis gross domestic product (GDP) in 6 months.

Capital Flows and Macroprudential Regulation

The objective of macro-prudential policies is to curtail and prevent systemic risk to the financial sector using any tool or indicator based on macro-financial fundamentals, and can entail the use of existing micro-prudential tools to achieve

financial stability. While prior research has recommended that macro-prudential policy be implemented after all viable macro-economic policy adjustments are made, research does support the use of macro-prudential policies such as limits on loan-to-value and debt-to-income ratios. These policies help to curb excessive lending since they help to build-up resilience to systemic risks from reversals of capital inflows or sudden stops, especially as it relates to domestic bank leverage and credit risks.

Portfolio bond flows and short-term banking flows were determined to be more likely to contribute to systemic hazards. Post-GFC, the employment of macro-prudential instruments to relieve or control these risks to financial stability have become crucial, especially as it pertains to capital flow movement. IMF (2017) emphasized that post-GFC regulatory changes have focused on building up resilience to shocks and that macro-prudential policies can assist nations harness better the advantages of capital flows while limiting the risk. Engel's (2015) established that that there are grounds to justify the application of prudential regulations on capital inflows in order to constrain over borrowing.

Pradhan, Balakrishnan, Baqir et al (2011) concluded that emerging economies in Asia utilised reserve accumulation and currency appreciation to combat risks from influx surges, they also agreed that macroprudential policies and regulations have become significant in handling the risks associated with asset price bubbles and excessive loan expansion. They noted that MPMs were also used to mitigate other risks associated with capital flows and were typically used to meet specific objectives including: (i) to mitigate complications that stemmed from

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inflows to short-term instruments (ii) to limit inflows to local bond markets (iii) to reduce risks within the banking system and the real economy (iv) to limit vulnerabilities from private sector external borrowing and (v) to curb speculative activity in foreign exchange market contributing to exchange rate volatility.

However, Engel (2015) argued that when capital is mobile, governments that implement macro-prudential restrictions on domestic financial sector are exposed to pressure emanating from the global character of international capital markets. He stated that strong global collaboration on macro-prudential policy regulation, together with counter cyclical capital limits on certain aspects of the credit market would lessen sensitivity to the dangers of an open financial sector, especially as it pertains to capital flows. Pradhan, Balakrishnan, Baqir et al (2011) recommended policymakers to strengthen their local financial capital markets to allow them to better absorb increases in capital inflows.

Isakova (2016) finds that deeper capital markets are mainly used to create buffers for the financial sector, especially against unanticipated reversals of flows, and this supports the need to have effective macro-economic policy, capital flow management measures (CFMs), as well as macroprudential policies and regulations, in order to address the issues and vulnerabilities that result from capital inflows. Additionally, Ostry, Ghosh, Habermeier et al (2011) observed that both capital restrictions and MPMs are beneficial in addressing financial stability risks associated with inflow surges, especially as it relates to vulnerabilities on domestic balance sheets. Based on the literature, excessive and unmanaged capital inflows - and the probability for inflows to stop and/or be reversed - into an economy can

have a significant impact on an economy's financial sector, and can be the catalyst of financial crises such as boom-bust cycles in the credit and asset market, as well as currency crises.

Surges of capital inflows in the SSA nations have been found to have large and evident risks to financial stability, along with the overall advantages of capital inflows to these economies. The research suggests that macro-prudential regulation has been effective in managing the systemic risks and vulnerabilities that might develop from capital flow fluctuations. SSA countries have, according to prior studies, traditionally had a considerable association with capital movements in its economy. As such, the facts of this relationship have been established in figures 1,2,3, and 4.

Figure 1 shows wide fluctuations in the net average foreign capital inflows to 28 selected sub-Saharan African countries over the period between 2005 and 2020. More specifically, the lowest point of foreign capital inflows over the proposed study period was in 2007, 2009 and 2020. The graph also indicates that there has been some degree of fluctuations in the level of risk of instability of financial sector in the selected countries averagely with the highest points of risk of institutional instability identified for 2008, 2011, 2018 and 2019. From Figure 1, it is quite difficult to precisely determine the definite relationship between international capital inflows and the risk of financial sectoral instability in the selected countries.

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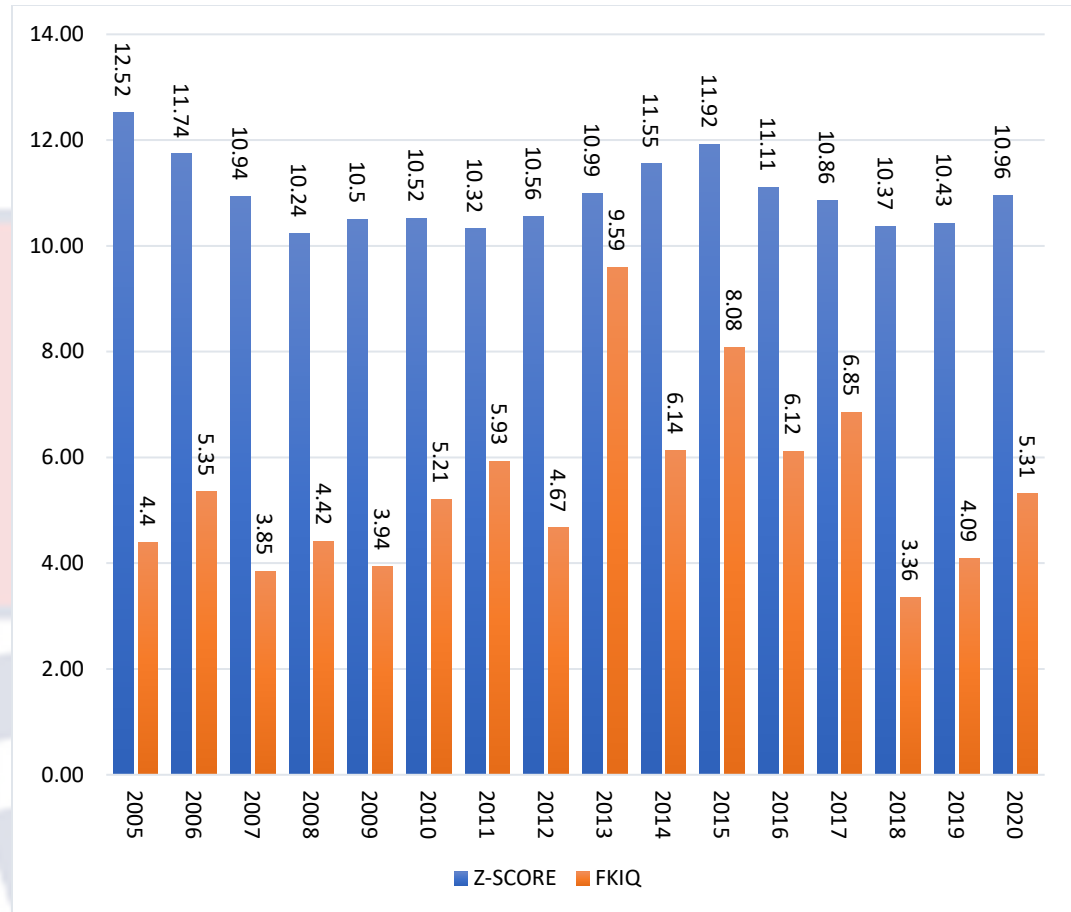
Figure 1: Financial sector stability and net foreign capital inflows (average percentage)

Note: FKIQ denotes foreign capital inflows (% GDP).

Source: Computed by the researcher with data from the World Bank's World Development Indicators database (2022)

Figure 1 showed the average trend in two of the existing macro-prudential regulation instruments (a capital-based instrument and a liquidity-based instrument), namely, the ratio of liquid assets to deposits and short-term funds and the ratio of bank regulatory capital to risk-weighted assets. The graph reveals average reduction in regulations on liquidity requirements overtime but a relative strengthening in regulations regarding capital requirements beyond 2010, possibly revealing a restructuring of macro-prudential regulations in the domestic financial sectors of the 28 selected SSA countries.

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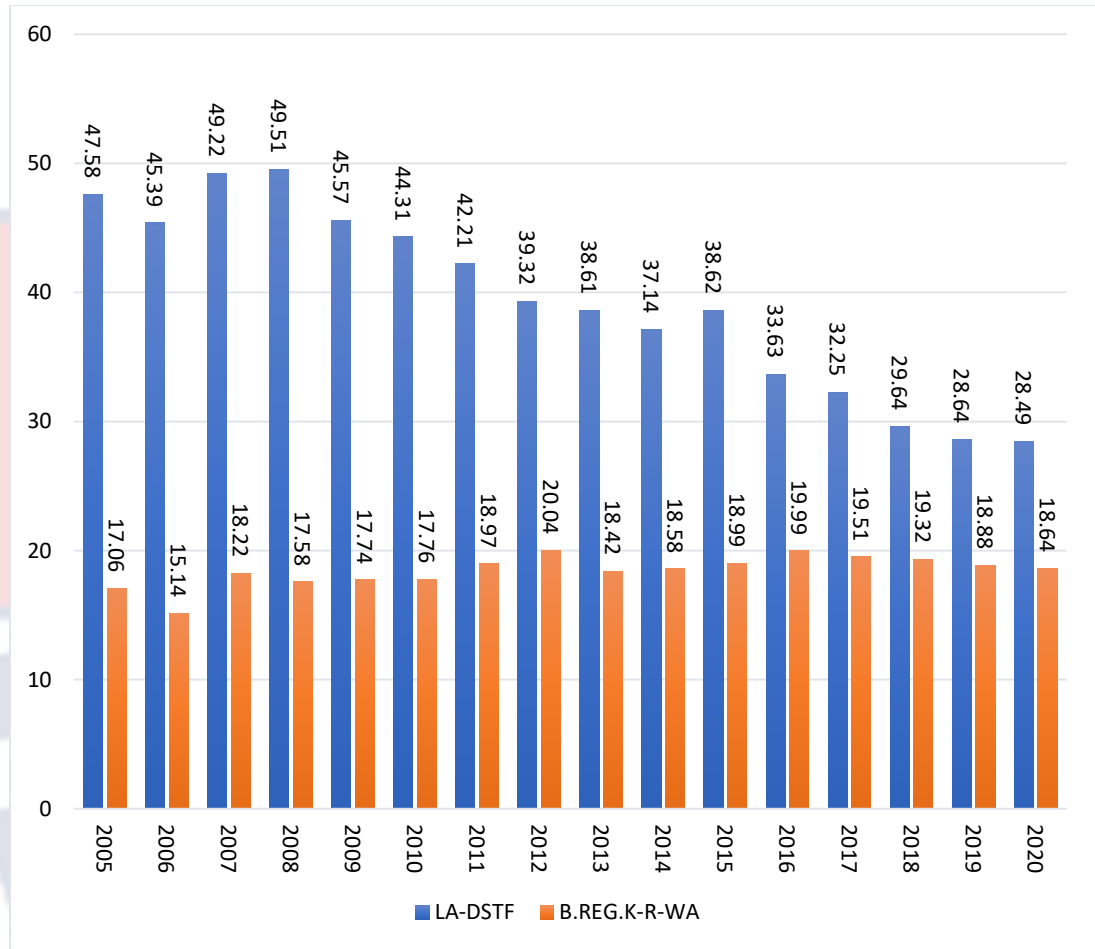
Figure 2: Liquid assets ratio and bank regulatory capital ratio

Note: LA-DSTF denotes liquid assets to deposits and short-term funds ratio (%); B.REG.K-R-WA denotes bank regulatory capital to risk-weighted assets ratio (%)

Source: Computed by the researcher using data from the World Bank's Global Finance Development database (2022)

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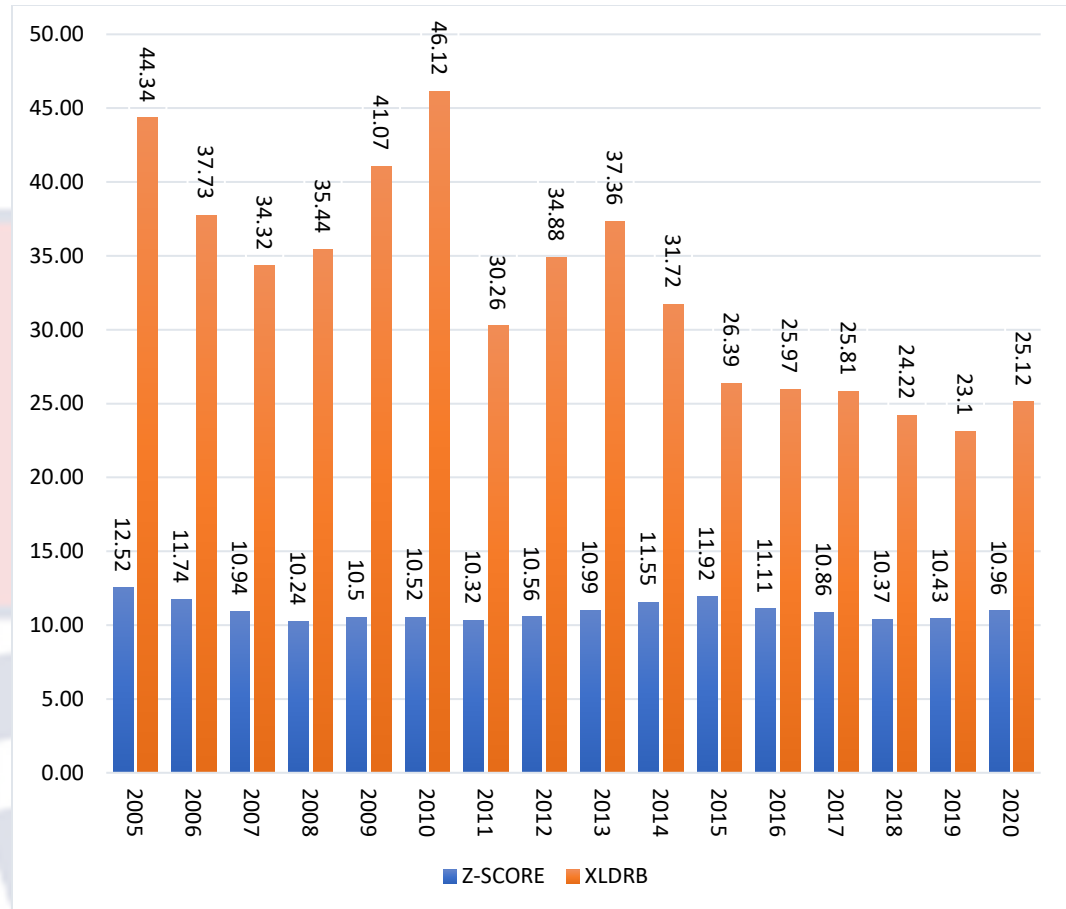
Figure 3: Financial sector stability and external loans and deposits of reporting banks
Note: XLDRB denotes external loans and deposits of reporting banks vis-à-vis the banking sector (% of domestic bank deposits)
Source: Computed by the researcher using data from the World Bank's Global Finance Development database (2022)

Figures 3 and 4 also revealed lower (decreasing) trends in cross-border financial transactions by resident financial (mostly banking) institutions after 2011 compared to the period before 2011 whilst the risk of institutional instability in the financial market of the selected countries in the sub region has fluctuated over the proposed study period.

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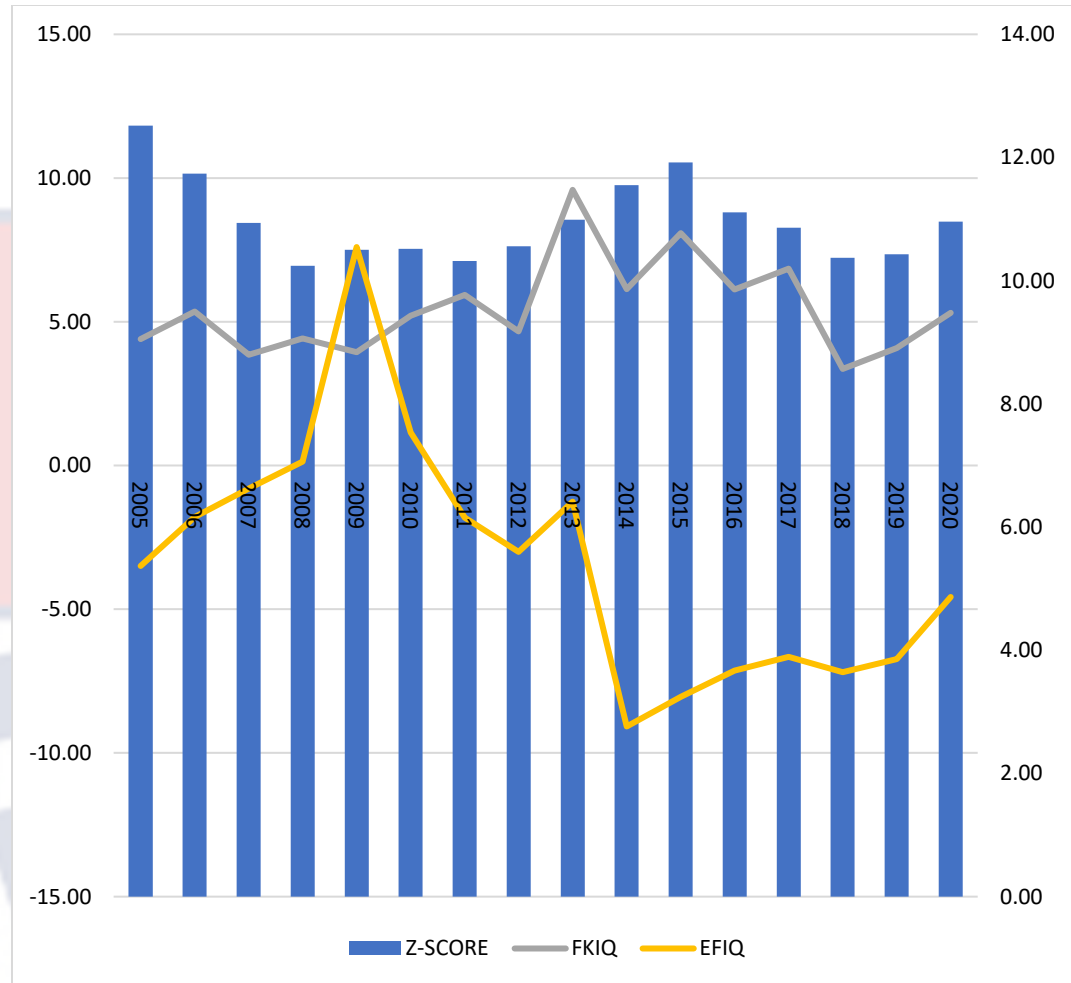
Figure 4: Financial sector stability and international financial integration
Note: FKIQ denotes foreign capital inflows (% GDP); EFIQ denotes financing of net lending to or borrowing from non-residents (expressed % GDP). It shows net acquisition and disposal of financial assets and liabilities.

Source: Computed by the researcher with data from the World Bank's World Development Indicators database (2022)

      The graphs presented in Figures 1 to 4 suggest that fluctuating trends in international capital inflows and the post-2011 lower levels of cross-border financial transactions by financial sector could explain why the average level of risk of instability or insolvency among financial sector in the selected SSA has fluctuated.

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Chapter Summary

This chapter has reviewed the literature based on the objectives and research questions. This literature was reviewed under the following sub-headings. The first section explored the theoretical models underpinning the study and these theories included: monetarist view and the Post Keynesian view. The second section also examined concepts such as International financial integration and its determinants, financial sector stability and its' determinants, the relationship between the concepts. Finally, the last section focused on empirical literature of the relationship between the constructs of the study.
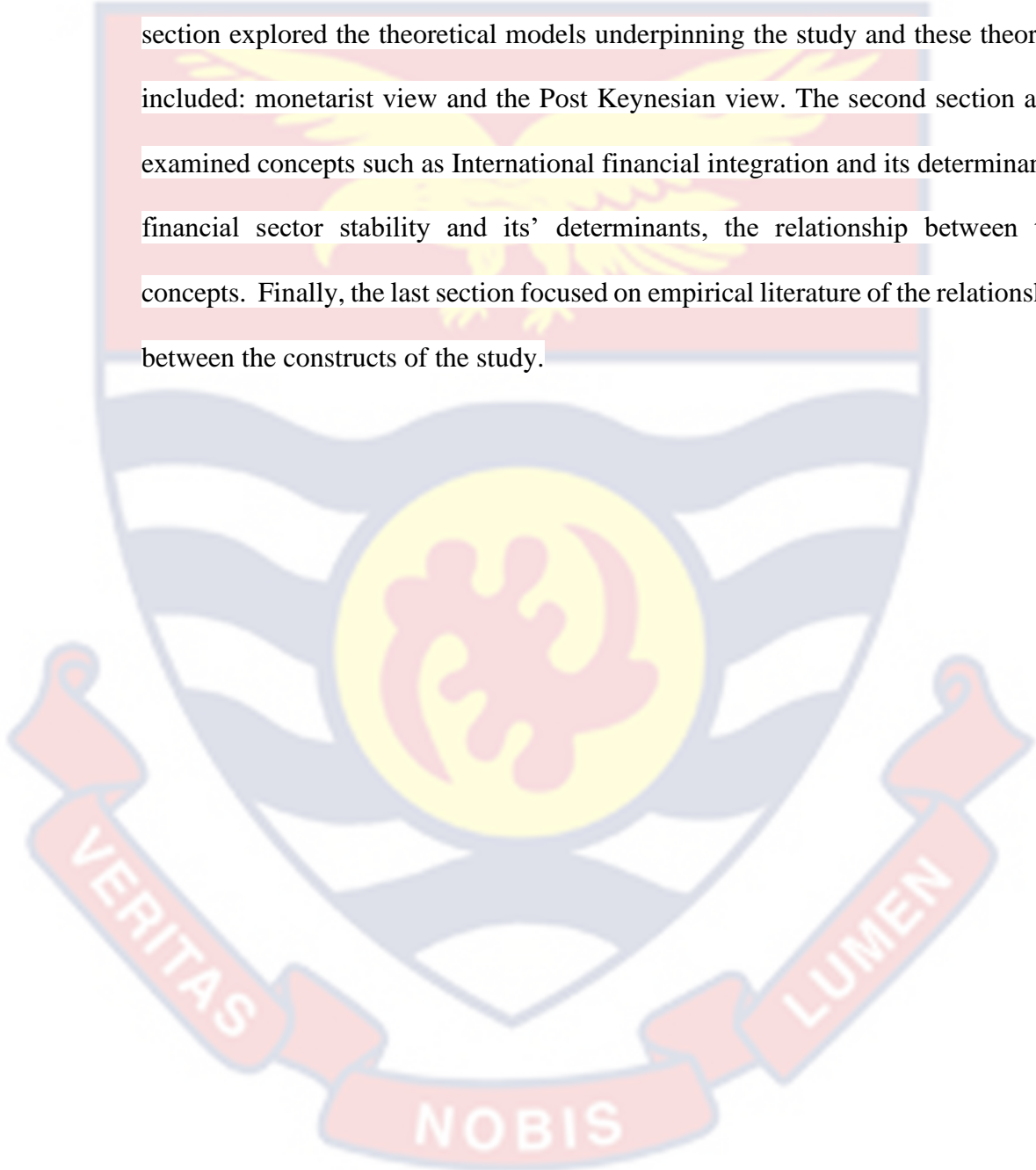
CHAPTER FOUR

RESEARCH METHODS

Introduction

This chapter presents the methodology used to carry out this study. Research methodology articulates how the researcher went about his study and the logic behind each method used. The rationale is to help the researcher to solve the research problem systematically. In view of this, this chapter of the study discusses the procedures followed in carrying out the study. The chapter especially comprises the research philosophy, research approach, research design, model specification, sources, estimation procedure, and summary of the study.

Research Philosophy

According to Guba (1990), this is mostly referred to as paradigms or philosophical assumptions which precede the commencement of a study. Saunders, Lewis and Thornhill (2016) add that the term research philosophy refers to a system of beliefs and assumptions about the development of knowledge. The types of beliefs held by individual researchers based on these factors will often lead to embracing a strong qualitative, quantitative, or mixed-methods approach in their research (Creswell & Creswell, 2018). Saunders et al (2016) identified five major philosophies that have shaped social science research over the years: positivism, critical realism, interpretivism, postmodernism and pragmatism.

This study adopts the positivist approach. According to Saunders et al (2016), positivism relates to the philosophical system that embraces issues that can be scientifically verified and hence provides a basis for generalisation. In the

context of this study, adopting a positivist approach would mean collecting quantitative data on international financial integration, banking sector stability, and macroprudential regulation, and using statistical methods to test hypotheses and establish causal relationships between these variables. This approach could help generate precise and generalizable findings, which can be useful for policymakers and practitioners.

This means that positivists focus on procedures that lead to the generation of facts uninfluenced by human interpretation. It is based on the use of existing theory to develop hypotheses. These hypotheses would be tested and confirmed, in whole or part, or refuted, leading to the further development of theory which then may be tested by further research (Creswell, 2009; Saunders et al, 2016). According to Saunders et al. (2016), and Sekaran and Bougie (2016), positivism give room for objective reality and has the goal of universal truth that deals with human practices in the field of management sciences. It is an appropriate guide for this study given that based on the theory of rational choice, hypotheses will be tested and relationships established.

Research Approach

According to Creswell and Creswell (2016), there are three approaches to research; (a) qualitative, (b) quantitative, and (c) mixed methods. Saunders et al. (2016) provide three significant differences between quantitative and qualitative research methods. The first difference advanced by the authors is that the quantitative research method permits the researcher to isolate and define variables and link them together to frame research hypotheses. However, this is not the case

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with respect to the qualitative research method. The next difference asserted by the authors is that the quantitative research method allows for objectivity with respect to the processes involved in the data collection and analysis. Contrarily, in the qualitative research method, subjectivity is often introduced during data collection procedures and analysis. Employing quantitative approach in this study provides the basis for validity and its generalizability in the prognosis of behavior of selected variables of the study.

This study, therefore, employed the quantitative research approach based on the nature of the study purpose under consideration, specific objectives, hypotheses and the nature of the secondary data to be analysed. In the context of this study, using a quantitative research approach can help measure the extent of international financial integration, banking sector stability, and macroprudential regulation, and assess the strength of their interrelationships. For instance, the use econometric models to estimate the effects of macroprudential regulation on the relationship between financial integration and banking sector stability, controlling for other relevant factors.

Research Design

According to Potwarka, Snelgrove, Drewery, Bakhsh and wood (2019) research design is considered as a set of arrangements made to collect and analyze data in a way that seeks to integrate compliance with the purpose of the research process and economics. Williams (2007) also described the structure of the study as "a system, structure and strategies and an integrated investigation to ensure query inquiry and diversity control" as stated in Zikmund (2000). According to Young

and Javalgi (2007) a master plan that describes the process and methods for obtaining and analyzing the required information is considered a research design.

The study used an explanatory research design as a result of scientific research supporting this research. Explanatory research design is a research approach that seeks to explain the relationships between variables and establish causality by identifying the underlying mechanisms that produce the observed outcomes (Potwarka, Snelgrove, Drewery, Bakhsh & wood, 2019; Zikmund Carr, Babin, & Griffin, 2013). This research design is appropriate for this study titled "international financial integration and banking sector stability, the moderating role of macroprudential regulation".

Model Specification

Estimation Strategy

The study sought to examine the effects of international financial integration on bank stability in SSA. The estimation approach involved the use of a dynamic panel model applied to a panel of data for the 28 SSA countries obtained from a number of sources as outlined in the Table 1. The type of estimation technique adopted for the study depended on a number of diagnostic tests to determine the appropriateness with the use of alternative techniques for the study. The study also covered the period from 2000 to 2020.

Acknowledging the fact that there have been a number of studies in this discipline informed this study to unravel other existing works as guide in choosing variables and models which are conforming to theory. The study chose panel data regression over cross-country regression to overcome cross-country regression

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shortfall which manifests in likely omitted variable bias and to further explore the behavior of our variables of interest across the sample groups (countries).

The empirical model of this study was drawn from studies by Ozili (2018), Chauhan and Ramesha (2016), and Unsal (2017). The empirical model is to be estimated is presented as follows:

$$bs_{it} = a_{it} + b_{jit} \sum_{j=1}^{J} IK_{jit} + c_{qit} \sum_{q=1}^{Q} P_{qit} + d_{it} \sum_{k=1}^{K} m_{kit} + z_{it} \sum_{z=1}^{Z} ins_{it} + \varepsilon_{it}$$

……… (1)

Where:

bs = an indicator for bank stability/instability

IK = set of indicators for international capital/financial flows and cross-border transactions (measures of de facto international financial integration)

P = set of indicators for macroprudential regulation in the financial sector (thus, bank regulatory capital requirements and liquid assets to deposit shot term funds)

m = set of macroeconomic variables to be used as control variables

ins = set of other institutional variables to be used as control variables

ε = the estimated error (disturbance) term

The notations: J, Q, K, Z respectively denote the number of indicators to be used as proxies for: international capital flows and cross-border financial transactions by resident institutions; macro-prudential regulatory instruments; macroeconomic variables and other institutional variables to be introduced in the

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estimation model. The other notations: i and t respectively denote the ith country selected for the study and the study time period.

Research Objective One

$$bs_{it} = \beta_1 bs_{it-1} + \beta_2 NFI_{it} + \beta_3 ELD_{it} + \beta_4 GDP_{it} + \beta_5 RER_{it} + \beta_6 Cor_{it} + \beta_7 PS_{it} + \beta_8 GEI_{it} + U_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(2)$$

Where:

bs = an indicator for bank stability/instability

NFI= indicator for net foreign capital/financial flows (measure of de facto international financial integration)

ELD = indicator for cross-border financial transactions (measure of de facto international financial integration)

GDP = Gross Domestic Product (level and growth)

RER = Real exchange rate

Cor = Control of corruption

PS = Political stability

GEI = Government effectiveness index

U = the estimated error (disturbance) term

Research Objective Two

$$bs_{it} = \beta_1 bs_{it-1} + \beta_2 LADSF_{it} + \beta_3 BRKR_{it} + \beta_4 GDP_{it} + \beta_5 RER_{it} + \beta_6 Cor_{it} + \beta_7 PS_{it} + \beta_8 GEI_{it} + U_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3)$$

Where:

bs = an indicator for bank stability/instability

$LADSF$= indicator for liquid assets to deposit short term funds (measure of macroprudential regulation)

$BRKR$ = indicator for bank regulatory capital requirements (measure of macroprudential regulation)

GDP = Gross Domestic Product (level and growth)

RER = Real exchange rate

Cor = Control of corruption

PS = Political stability

GEI = Government effectiveness index

U = the estimated error (disturbance) term

Research Objective Three

First interaction effect:

$$bs_{it} = \beta_1 bs_{it-1} + \beta_2 LADSF_{it} + \beta_3 BRKR_{it} + \beta_4 NFI_{it} + \beta_5 ELD_{it} + \beta_6 LADSF * NFI_{it} + \beta_7 GDP_{it} + \beta_8 RER_{it} + \beta_9 Cor_{it} + \beta_{10} PS_{it} + \beta_{11} GEI_{it} + U_{it} \ldots\ldots\ldots\ldots(5)$$

Where:

bs = an indicator for bank stability/instability

$LADSF$ = indicator for liquid assets to deposit short term funds (measure of macroprudential regulation)

$BRKR$ = indicator for bank regulatory capital requirements (measure of macroprudential regulation)

NFI = indicator for net foreign capital/financial flows (measure of de facto international financial integration)

ELD = indicator for cross-border financial transactions (measure of de facto international financial integration)

GDP = Gross Domestic Product (level and growth)

RER = Real exchange rate

Cor = Control of corruption

PS = Political stability

GEI = Government effectiveness index

U = the estimated error (disturbance) term

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Second interaction effect:

$$bs_{it} = \beta_1 bs_{it-1} + \beta_2 LADSF_{it} + \beta_3 BRKR_{it} + \beta_4 NFI_{it} + \beta_5 ELD_{it} + \beta_6 BRKR * NFI_{it} + \beta_7 GDP_{it} + \beta_8 RER_{it} + \beta_9 Cor_{it} + \beta_{10} PS_{it} + \beta_{11} GEI_{it} + U_{it} \ldots\ldots\ldots\ldots(6)$$

Where:

bs = an indicator for bank stability/instability

$LADSF$ = indicator for liquid assets to deposit short term funds (measure of macroprudential regulation)

$BRKR$ = indicator for bank regulatory capital requirements (measure of macroprudential regulation)

NFI = indicator for net foreign capital/financial flows (measure of de facto international financial integration)

ELD = indicator for cross-border financial transactions (measure of de facto international financial integration)

GDP = Gross Domestic Product (level and growth)

RER = Real exchange rate

Cor = Control of corruption

PS = Political stability

GEI = Government effectiveness index

U = the estimated error (disturbance) term

Model Diagnostic tests

Panel unit root test

Panel stationarity test is employed to all the variables of the study to examine the order of integration and avoid the biases associated with using non-stationary variables. The researcher applies Fisher's type test on the heterogeneous panel data: Choi (2001) test. The rationale for adopting the Fisher's type is a reflection of the limitations from the Im, Pesaran and Shin (2003) tests (IPS) and

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the Levin, Lin and Chu (2002) test (LLC). According to Choi (2001) the inflexibilities from the IPS and LLC limit their use empirically: (1) both tests demand an indefinite number of groups- all groups are assumed to have the same type of non-stochastic component; (2) the time series factor in the panel expected to be equal for all the cross-section units and to consider the case of unbalanced panels further simulations are required, (3) both the IPS and LLC tests argue that none of the groups have a unit root under the alternative hypothesis.

In resolve the restrictions of LLC and IPS panel unit root tests, Fisher employs the amalgamation of p-values from a unit root test applied to each group in the panel data.

The Sargan Test

In an econometric model, particularly in a dynamic panel model where instrumentation is required, there is likely the problem of over-identification which may arise when the order condition for identification is satisfied in inequality: the number of instruments excluded from the equation exceeds the number of included endogenous variables. To check for the validity of over identifying restrictions, the researcher run the Sargan test which is a j test statistic. With the null hypothesis of the Sargan test indicating that overidentifying restrictions are valid, shows that the failure to reject the null gives a consistent estimate. Notably, rejection of their null may be indicative that the exclusion restrictions for these instruments may be inappropriate.

Data Sources

The study made use of panel annual data for the period of 2000 to 2020. The dataset was sourced from the World Development Indicators (WDI) of the World Bank, Polity IV Project, and World Governance Indicators (WGI) of the World Bank. Due to the unavailability of data, some countries within the Sub-Saharan African region were selected for this study. They included Botswana, Burundi, Cameroon, Chad, Cote d'Ivoire, Ethiopia, Gabon, Ghana, Guinea, Kenya, Madagascar, Malawi, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Seychelles, Sierra Leone, Sudan, Tanzania, Togo, Uganda, Zambia and Zimbabwe. In all, there were 28 countries with data spanning for 21 years. Except for real Gross Domestic Product, population and the institutional variables, all the other variables are expressed as a percentage of GDP.

Table 1: Variables and their expected signs

Variable	Variable name	Measurement	Source	Expected sign
Z-score	Bank Z score	It is calculated using a formula that incorporates several financial ratios or indicators, which are used to evaluate the bank's risk of insolvency or default.	WDI	Positive
NFI	Net foreign capital inflows (% GDP)	It is computed as the sum of net inflows of foreign direct investments, portfolio investments and other investments expressed as share of GDP	WDI	Positive

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ELD	External loans and deposits of reporting banks vis-à-vis the banking sector	It is calculated based on data reported by banks to relevant financial authorities or central banks, as well as other available data sources.	GFD	Positive/ Negative
LADSF	Liquid assets to short-term funds	It is calculated by dividing the total liquid assets of a financial sector by its total deposits and short-term funds.	GFD	Positive
BRKR	Bank regulatory capital to risk-weighted assets ratio (%)	It is calculated by dividing the bank's regulatory capital by its risk-weighted assets, and expressing the result as a percentage.	GFD	Positive
GDPCURRENT	GDP per capita (level and growth)	It is calculated by dividing the total GDP of a country by its population. GDP per capita can be expressed in nominal terms or in real terms, which takes into account inflation.	WDI	Positive
RER	Real exchange rate	It is calculated by adjusting the nominal exchange rate for inflation in both countries.	WDI	Positive/Negative
COR	Control of Corruption	This indicator in the WGI captures perceptions of corruption in the public sector, including bribery, embezzlement, and abuse of power for personal gain.	WGI	Positive

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PS	Political stability index	It is calculated by various organizations and research institutes using a combination of quantitative and qualitative data.	Polity IV Project	Positive
GEI	Government effectiveness index	It is calculated by various organizations and research institutes using a combination of quantitative and qualitative data.	WGI	Positive

Source: Author's computation (2022)

Description/Explanation of variables

The data on bank Z-score was used as an indicator for the risk of bank stability. The choice of the indicator to proxy financial stability is due to their relevance and availability for the sample of SSA economies from the World Bank's Global Financial Development Database. For the time period 2000 to 2020, three categories of annual data were used for the analysis: the two indicators to be used as measures of financial stability; a set of indicators for international capital flows and cross border financial transactions; a set of macro-prudential regulatory measures to reflect capital-based and liquidity-based sector-specific regulatory instruments; and a set of macroeconomic and institutional control variables. The details of the variables are listed as follows:

    a)   **Bank sector stability/instability**

    i.   The Bank Z-score: this indicator is computed as the total sum of the average returns on assets and the equity capital ratio, expressed as a ratio of the standard deviation of the returns on assets of the institutions in the market. It

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measures the overall stability/instability of banks at the institutional level. The Z-score for a bank is a financial metric used to assess the overall health or financial stability of a bank. It is typically calculated using a formula that incorporates several financial ratios or indicators, which are used to evaluate the bank's risk of insolvency or default. The formula for calculating the Z-score for a bank is as follows:

ii.   Computation of BankZscore

Z-score = 1.2A + 1.4B + 3.3C + 0.6D + 0.999E

Where:

A = Capital Adequacy Ratio (CAR) = (Tier 1 Capital / Risk-Weighted Assets)

B = Asset Quality Ratio (AQR) = (Non-performing Loans / Total Assets)

C = Management Quality Ratio (MQR) = (Operating Income / Total Assets)

D = Earnings Quality Ratio (EQR) = (Net Income / Total Assets)

E = Liquidity Quality Ratio (LQR) = (Deposits / Total Assets)

Each of these financial ratios is calculated using values from the bank's financial statements, such as the balance sheet and income statement. The Z-score is a composite measure that combines these ratios to provide an overall assessment of the bank's financial health. In general, a higher Z-score indicates a stronger financial position for the bank, with lower risk of insolvency or default, while a lower Z-score indicates a weaker financial position and higher risk. The specific threshold or interpretation of Z-scores may vary depending on the context and the

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industry norms, and it is important to consider other factors and qualitative information when interpreting the Z-score for a bank.

b)   International capital flows and cross-border financial transactions

i.   The net foreign capital inflows, expressed as a share of GDP was used to capture the effect of international capital or financial inflows on financial stability. The use of the measure was justified by the expectation that capital outflows reduce the availability of funds and as such could impact adversely on the liquidity and solvency of financial sector. Capital inflows, on the hand are expected to increase availability of funds and hence improve on liquidity and solvency. As such, a positive net inflow of international capital has the tendency of reducing the risk of instability of financial sector in the market.

ii.   External loans and deposits of reporting banks vis-à-vis the banking sector (expressed as % of domestic bank deposits). This indicator was used as one the proxies for cross-border financial transactions by resident financial sector.

c)   Macro-prudential regulatory measures

i.   Liquid assets to deposits and short-term funds ratio (%) was used as a proxy measure for liquidity-based instrument of macro-prudential regulations for the financial sector

ii.   Bank regulatory capital to risk-weighted assets ratio (%) was used as an indicator for capital-based instrument of macro-prudential regulations for the financial market.

d)   **Other Macroeconomic and Institutional control variables**. A set of macroeconomic and institutional variables was introduced in the empirical model as control variables. These include the following:

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i.   GDP per capita (level and growth)

ii.   Real effective exchange rate

iii.   Other institutional quality measures, namely level of corruption, political stability and government effectiveness index.

Indicators used as proxy for the Institutional Variable in the Model

Government Effectiveness: This measures the quality of public service, the competence of civil servants, the degree to which a government is free from political pressure, quality of bureaucracy, quality of public policy and government's commitment ability to policies. Government policies and decisions influence the decisions of economic agents in an economy. For example, government decisions and policies on minimum wage, prices, trade openness, tax policies, regulations on capital account and international trade may influence financial sector development. This study, made use of the estimate of government effectiveness constructed by World Governance Indicators of the World Bank. It ranges between -2.5, indicating weak government effectiveness and 2.5 indicating strong government effectiveness. It is expected that an increase in government effectiveness should have a positive effect on growth and financial stability (Asghar, Qureshi & Nadeem, 2015; Effiong, 2016; Berhane, 2018).

Control of Corruption: This measures the extent to which politicians, leaders and other people in public positions used power for their personal gains. Corruption takes many forms, not limited to bribes, favouritism, misuse of influence for personal gains and embezzlements. Corruption limits development in most economies within the sub-region because it lowers the trust of investors to

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invest in these economies. The estimate of control of corruption constructed by World Governance Indicators of the World Bank was used for this study. It ranges between -2.5, indicating a high degree of corruption and hence weak institutions and 2.5 indicating strong institution. Higher control of corruption is expected to have a positive effect on financial stability (Asghar, Qureshi & Nadeem, 2015; Effiong, 2016; Berhane, 2018).

Estimation Procedure

To analyse the relationship between international financial integration, macroprudential regulations and financial stability, there is the need for an estimation technique that will take care of the endogeneity problem associated with financial sector stability and country-specific heterogeneities. In performing panel analysis, there are two main options available namely, static panel and dynamic panel analysis. Based on the nature of the dependent variable (financial sector stability), which normally creates the problem of endogeneity and necessitates the statement of the empirical model in a dynamic form because the current year's stability would be explained by previous year's growth. This requires us to include lagged dependent variable as an explanatory variable in the model.

The study adopted the system GMM for the estimation of the dynamic panel data. The System Generalized Method of Moments (System GMM) is a statistical technique commonly used in econometric analysis to estimate dynamic panel data models. This technique is particularly useful in analyzing the relationship between financial integration, banking sector stability, and macroprudential regulation.

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In the context of the study titled "International Financial Integration and Banking Sector Stability: The Moderating Role of Macroprudential Regulation," System GMM was used to estimate the dynamic panel data model that includes both time-varying macroeconomic variables and country-specific fixed effects. System GMM allows for the estimation of a dynamic panel data model that controls for unobserved heterogeneity across countries and the endogeneity of the explanatory variables. This technique also allows for the estimation of both short-term and long-term effects of financial integration on banking sector stability, while controlling for the potential impact of macroprudential regulation.

Overall, the use of System GMM in this study could provide valuable insights into the complex relationship between financial integration, banking sector stability, and macroprudential regulation, and help policymakers develop effective regulatory policies to promote financial stability in the global economy.

Hansen test for over-identifying restrictions

Arellano and Bond (1991), Arellano and Bover (1995) and Blundell and Bond (1998) suggested that for the result of the GMM estimator to be consistent, the instruments used for the analysis must be valid. The null hypothesis states that the instrumented variables are exogenous and not correlated with the error term. The failure to reject the null, validate the instruments.

Arellano-Bond test for serial correlation

This test helps us to examine the assumption that the errors in the first difference regression are not serially correlated. The AR (2) test for serial correlation is based on the residual of the estimation and it is done by using the

standard covariance matrix of the coefficients. The null states that the errors in the first difference exhibit no second order serial correlation.

Chapter Summary

This chapter explained in details the methodology followed in carrying out the research. The research philosophy of the study, research approach, research design, empirical model, data type and sources, and data analysis were thoroughly discussed. The positivism research paradigm was used as the theoretical foundation of the study. The quantitative research approach was employed for the study. Explanatory research design was adopted to ensure objectivity in the research process.
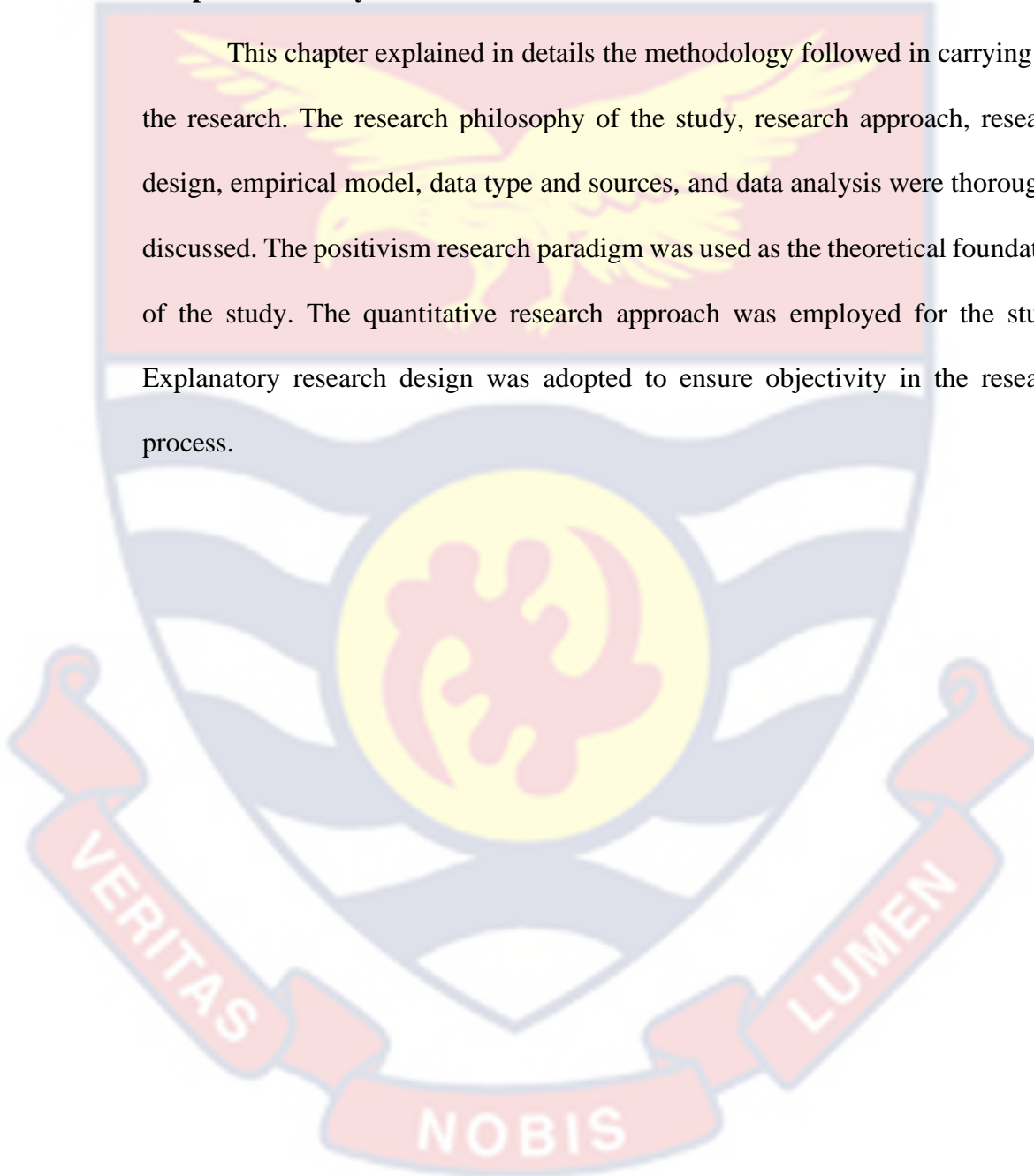
CHAPTER FIVE

RESULTS AND DISCUSSIONS

Introduction

The study was conducted to examine the effect of international financial integration on bank stability through the moderating effect of macroprudential regulation. The previous section provided information in respect of the research methods that were employed in gathering and analysing the data in respect of the specific research objectives. This section provides information in respect of findings and discussions made in respect of the specific research objectives.

Descriptive Statistics

Table 2 presents the descriptive statistics of the variables used for this study, which allows us to assess the distribution of the data. The descriptive statistics shows the number of observations, mean, standard deviation, minimum and maximum values of variables used for the study. The mean value gives the average value of the variables and the standard deviation measures how close or dispersed the values are from the mean. The maximum and minimum values indicate the range of the values used for the study.

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Table 2: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
BANKZSCORE	462	14.403	5.407	0.244	30.795
ELD	504	27.563	25.58	0.726	194.96
NFI	499	3.939	5.125	-4.846	46.275
LOGGDP	504	28.484	2.353	21.724	32.668
BRKR	504	21.078	12.928	0.036	90.832
LADSF	504	38.356	17.661	5.509	105.472
RER	504	941.524	1612.728	0.544	9829.927
PS	504	-0.603	0.919	-2.665	1.200
GEI	504	-0.638	0.575	-1.626	1.057
COR	504	-0.601	0.595	-1.528	1.271

Source: Author's computation (2022)

On the average for the period (2000 to 2020), the mean value of Gross Domestic Product (LOGGDP) for the 28 Sub-Saharan countries used for the study is 28.484. The annual minimum value was 21.724 and maximum value of 32.668 with average variation of 2.353 among the SSA countries used for the study. The extent to which the BANKZSCORE deviates from the mean is 5.407 within the region. Also, the BANKZSCORE, which is a measure used for bank stability on average has a mean value of 14.403. The highest level of BANKZSCORE within the SSA region is 30.795 and the minimum of 0.244 within the region.

With net foreign capital inflows, computed as the sum of net inflows of foreign direct investments, portfolio investments and other investments expresses as a percentage of GDP (NFI), thus a measure of net foreign capital flows on

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average has the minimum and maximum values of -4.846 and 46.275 respectively within the SSA countries used for the study. The mean value for external loans and deposits of reporting banks vis-à-vis the banking sector expressed as % of domestic bank deposits (ELD), as a proxy for cross-border financial transactions by resident financial sector is 27.563 and the variation within the region from the mean is 25.58.

The liquid assets to deposits and short-term funds (LADSF) ratio was used as a proxy to measure the liquidity-based instrument of macroprudential regulations for the bank sector. With the 28 SSA countries used for the study, the average mean value for liquid assets to deposits and short-term funds is 38.356 with variation of 17.661 within the region. The maximum value for liquid assets to deposits and short-term funds is 105.472 and the minimum is 5.509 among the SSA countries. For bank regulatory capital to risk-weighted assets ratio (BRKR), the maximum within the region is 90.832 and the minimum is 0.036, which is also a measure for macroprudential regulation with reference as an indicator for capital-based instrument for the moderating variable. The mean value recorded for real exchange rate (RER) is 0.544 and a variation of 1612.728 within the SSA countries.

This is a clear indication that most countries within the region are doing well in terms of government exchange rates within the sub regions. In this study, corruption (COR) was considered as an institutional quality measure. The mean value for the countries within the SSA region is -0.601 and a variation of 0.595 from the mean. The maximum and the minimum values recorded within the region are 1.217 and -1.528 respectively.

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Government effectiveness index (GEI) as a percentage of GDP has a maximum value of 1.057 as a percentage of GDP and a minimum value of -1.626 within the region. The mean value of government effectiveness index is -0.638 with a variation of 0.575 as a percentage of GDP from the mean value. Political stability has an average value of -0.603 as a percentage of GDP with the maximum and the minimum values of 1.2 and -2.665 all expressed as a percentage of GDP respectively. The deviation from the mean value is 0.919 as a percentage of GDP in the SSA region.

Research Objective one: Effect of Cross Border Financial Transactions and Aggregate International Capital Inflows on Bank Stability

To estimate the effect of cross border financial transactions and aggregate international capital inflows on bank stability in selected SSA countries, a system GMM was employed to estimate whether cross border financial transactions and aggregate international capital inflows have significant relationship with bank stability. The dependent variable representing bank stability was estimated by "bank z score" with independent variable "cross border financial transactions and aggregate international capital inflows" as components of international financial integration. Other relevant control and institutional quality variables including GDP per capita (level and growth), government effectiveness index, real exchange rate, control of corruption, and political stability were included in the estimation to determine the relationship between cross border financial transactions, aggregate international capital inflows and bank stability.

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Table 3: Cross-border Financial Transactions and Aggregate International Capital Inflows on Bank Stability

VARIABLES	Model
L.BANKZSCORE	0.915000*** (0.021)
ELD	0.089680** (2.18)
NFI	0.099300** (0.018)
LOGGDPC	0.144000* (0.076)
RER	0.058119** (0.017)
COR	-0.78700 (-0.576)
PS	-0.314000 (-0.17)
GEI	1.445000** (0.517)
_CONS	-2.977000 (2.977)

No. of Obs	406
F Statistic	5883.705
AR (1)	0.001
AR (2)	0.746
Sargan Test	0.698
Hansen Test	1.000
Groups/Instruments	220/22

t statistics in parentheses

*** $p<0.001$,   ** $p<0.01$, * $p<0.05$,

Source: Author's computation (2022)

The Table 3 presented showed the effects of cross border transactions and aggregate international capital inflows on the bank stability. A unit increase in the previous years' level of stability in the banking sector increases the following year's banking sector stability by 0.9. This effect is statistically significant at 1 percent level of significance. The lag of banking sector stability has a positive influence on itself. This means that previous year's stability has a positive effect of future level of stability in the banking sector in SSA. To the main variable of interest in this

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objective, the results specifically looked at the effect of external loans and deposits (ELD) and aggregate international capital inflows (NFI) on bank stability in SSA using the banking sector Z score as a proxy for banking sector stability.

The Table 3 showed that an increase in the cross-border transactions proxied by external loans and deposits (ELD) increases the bank stability in SSA. Precisely, a unit increase in cross border transactions (ELD) increases SSA banking sector stability by 0.089680. This is statistically significant at 5 percent level of significance. Also, a unit increase in aggregate international capital inflows (NFI) increases SSA banking sector stability by 0.099300. This is also statistically significant at 5 percent level of significance. The effects of the sub-Saharan region GDP on her bank stability are positive. In addition, the effect is also significant at 10 percent level. Real exchange rate is positively related to SSA bank stability at 5 percent level of significance. Per the results, exchange rate increase, increases bank stability.

Corruption and political stability have a negative relationship with bank stability. This shows that even though these effects are insignificant, corruption and political stability in SSA have negatively influenced bank stability in SSA over the period under study. This is not surprising given that, the political processes in SSA have been fairly unstable and corruption has generally been on the rise throughout the period. Government effectiveness index on the other hand has positively affected the bank stability over the period of study. Thus, a unit increase in government effectiveness increases bank stability by 1.445. This is statistically significant at a level of significance of 5 percent.

This corroborates with the findings by Baum, Pundit, and Ramayandi (2017), who in their research titled "capital flows and financial stability in emerging economies", investigated the relationship between quarterly gross capital flows and proxies for financial stability in a cross-country setting. Their study revealed that there are significant effects of gross flows' levels on both the level and volatility of the financial indicators after controlling for a number of macroeconomic factors.

Also, their investigation revealed that the effects of capital flows on financial stability vary quite substantially across countries and, interestingly, across types of flows, which could be affirmed by the results indicated above wit reference to the selected sub-Saharan African countries considered for the study. The variation is found not only in terms of magnitude, but also in the estimated signs of the coefficients: the same type of flows has differing effects in different countries. This might as well be in accordance with the assertion by Guichard (2017), who stated that, growing financial openness and integration around the world brought annual gross cross-border capital flows from about 5% of world GDP in the mid-1990s to around 20% in 2018 and gross external liabilities from 60% to 180% of global GDP. This is so because, banks that engage in cross-border financial transactions, such as international loans, investments, or trade finance, are exposed to risks associated with foreign markets. These risks include currency exchange rate fluctuations, changes in foreign regulatory environments, and political and economic uncertainties in foreign countries. If these risks are not adequately managed, they can affect a bank's stability by leading to financial losses or

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impairments in the value of assets, which could impact the bank's capital adequacy and profitability.

Moreso, cross border financial transactions may also impact a bank's liquidity risk. Banks may face challenges in managing their liquidity needs when engaging in cross-border activities, as cash flows and funding sources may be subject to disruptions due to regulatory changes, economic conditions, or geopolitical events (Ramaswamy, 2022). Inadequate liquidity management can affect a bank's ability to meet its obligations, such as deposit withdrawals or payment obligations, which can undermine its stability. Cross-border financial transactions are subject to various regulatory requirements, including anti-money laundering (AML) and know-your-customer (KYC) regulations, as well as sanctions and tax compliance (Dill, 2021). Failure to comply with these regulations can result in significant penalties and reputational damage for a bank. Additionally, changes in regulatory requirements or increased scrutiny on cross-border transactions can increase compliance costs, which can impact a bank's profitability and stability.

In reference to aggregate international inflows, such as foreign investments or remittances, can also impact bank stability. Large inflows of funds from foreign sources can increase a bank's liquidity, profitability, and capital base, which may enhance its stability (Ali & Iness, 2020; Dzapasi, 2020). However, sudden surges or reversals in international inflows can also pose risks. For example, rapid capital inflows can lead to asset price bubbles or excessive credit growth, which may increase the risk of financial instability. Conversely, sudden outflows of funds can

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create liquidity challenges for banks, leading to potential funding gaps and impairments in asset quality (Kanellopoulos, 2023).

This confirms the results of Allen and Gu (2018), who state that even though the credits for the private sector had declined, a severe collapse of the banking industry in emerging sub-Saharan regions did not occur. Under the assumption that western domestic banks represent the parents of the foreign banks within the empirical research, it is noticeable that the number of domestic banks in the 28 selected sub-Saharan countries has, on the other hand, declined by 19% from 2000 to 2020. This illustrates that particularly during the crisis years, in the sub-Saharan region, the number of domestic banks has decreased while the number of foreign banks in the has actually increased. In times of the sovereign debt crisis and economic recession in the sub-Saharan Africa, from 2000 to 2020, the regions have experienced a decline in their quantity of banks and such transactions with foreign banks.

Studies by Agenor, Alper and da Silva (2018), and Qamruzzaman and Jianguo (2020), come to a similar conclusion regarding the internal capital markets of banks within the sub regions. According to their examinations, foreign banks (international operating banks) reduced the credit lines to their subsidiaries in the sub-Saharan regions and, moreover, withdrew liquidity from their affiliates after the outburst of the financial crisis in such years of crisis. Also, de Haas and van Lelyveld (2011) also accuse multinational banks of transferring capital from the periphery to the parent banks during these years. Furthermore, the two authors point

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out that the credit growth of foreign affiliates decreased three times faster than the credit growth of domestic banks.

Likewise, de Haas and van Horen (2011) mention in another study that foreign-controlled credit institutions reduced their credit supply faster and at an earlier point of time. A contrary argumentation is presented by Navaretti, et. al., (2019), who conclude that western multinational banking groups have not funnelled any liquidity out of emerging sub-Saharan regions but, instead, have supported their foreign subsidiaries and branches with the help of internal capital markets. Additionally, the authors claim that the loan-to-deposit ratio of foreign banks has been stable over time and even higher than the respective ratio of domestic credit institutions. The different results between the study of Navaretti et. al., (2019) and the empirical analysis at hand could partly be explained by the use of different time horizons. Whereas the financial sector had undergone the transformation to become a global industry operating on an international scheme, regulators have kept their attention predominantly on the domestic markets (Allen & Gu, 2018; Erol, 2018; Yalman, Marois & Güngen, 2018).

On the positive side, cross-border financial transactions and aggregate international inflows can also provide diversification benefits to banks, as they allow banks to access new markets, customers, and investment opportunities. Diversification can reduce a bank's risk exposure to specific regions or sectors, and enhance its stability by mitigating risks associated with concentration (Naili & Lahrichi, 2022; Al-kayed & Aliani, 2020).

In conclusion, cross-border financial transactions and aggregate international inflows could have both positive and negative effects on bank stability. While they can provide opportunities for growth and diversification, they also expose banks to risks related to foreign markets, liquidity, regulatory compliance, and changes in international capital flows. Proper risk management, including robust liquidity management, compliance with regulatory requirements, and effective monitoring of cross-border exposures, is essential for banks to maintain stability in the face of cross-border financial transactions and international inflows.

To ascertain the validity and consistency of the system GMM estimator, two conditions must be fulfilled; the error term must not be serially correlated and the instruments must be valid. This necessitates the study to perform Arellano-Bond test for serial correlation AR (2), which is a test for second-order serial correlation with null no second-order serial correlation. The second test is the Hansen test for over-identifying restrictions with the null hypothesis, "The instrumented variables are exogenous and not correlated with the error term. Rejecting the null, is an indication of instruments validity. In this model, both AR (2) and Hansen are not significant in any of the models. Hence the model is valid and consistent.

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Research Objective Two: Effect of Macroprudential Regulation on Bank Stability in selected SSA countries

To analyse the relationship between macroprudential regulation and stability of banking institutions, a system GMM was employed to determine whether macroprudential regulation has a significant relationship with bank stability. Macroprudential regulation was measured both by liquid (LADSF) and capital-based instruments (BRKR). The results from Table 4 show that, bank regulatory capital ratio (BRKR), which is the capital-based measurement for macroprudential regulation is not statistically significant. However, liquid assets to deposit ratio (LADSF) which is the liquid-based measurement for macroprudential regulations is negatively statistically significant at 5 percent significance level. This implies that, a percentage change in liquid-based measurement, is associated with a 0.028 decrease in bank stability on the average.

Table 4: Macroprudential regulation and bank stability

VARIABLES	Model	
L.BANKZSCORE	0.825000***	(19.43)
LOGGDPC	0.136000*	(0.99)
RER	0.000141*	(0.01)
COR	-1.786000	(-1.66)
PS	-0.323000	(-0.72)
GEI	2.532000**	(2.86)
LADSF	-0.028200**	(-2.96)
BRKR	-0.005590	(-0.49)
_CONS	0.266000	(0.07)
No. of Obs		406
F Statistic		1652.14
AR (1)		0.001

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AR (2)	0.606
Sargan Test	0.227
Hansen Test	1.000
Groups/Instruments	111/22

t statistics in parentheses

*** p<0.001, ** p<0.01, * p<0.05

Source: Author's computation (2022)

The second research objective sought to examine the effect of macroprudential regulation on bank stability. A unit increase in the previous years' level of stability in the banking sector increases the following year's bank stability by 0.825. This effect is statistically significant at 1 percent level of significance. To the main variable of interest in this objective, the results specifically looked at the effect of Liquid assets to deposits and short-term funds ratio (%) and Bank regulatory capital to risk-weighted assets ratio (%) used as a proxy for macroprudential regulations on the banking sector stability in SSA using the banking sector Z score as a proxy for banking sector stability.

The results showed that an increase in macroprudential regulations proxied by Liquid assets to deposits and short-term funds ratio (%) reduces the bank stability in SSA. Precisely, a unit increase in the Liquid assets to deposits and short-term funds ratio (%) reduces SSA bank stability by 0.028. This is statistically significant at 1 percent level of significance. An increase in Bank regulatory capital to risk-weighted assets ratio (%) which is the second measure of macro-prudential regulations reduces the banking sector stability in SSA. Precisely, even though statistically insignificant, a unit increase in the Liquid assets to deposits and short-term funds ratio (%) reduces SSA banking sector stability by 0.0056.

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The effects of SSA GDP on her banking sector stability are positive. However, the effect is insignificant. Like GDP, even though insignificant, Real exchange rate is also positively related to SSA banking sector stability. On the other hand, political stability and level of corruption is seen to have a negative effect on the level of banking sector stability in SSA even though the effect is not statistically significant. This means that the political process and corrupt activity in SSA by public officials and political appointees over the period under study has reduced the level of stability of the baking sector in SSA. Government effectiveness on the other hand has positively affected the banking sector stability over the period of study. The effect is also seen to be statistically significant at 5 percent.

The results of the study are in line with the findings by Unsal (2011). He analyzed the interaction between monetary policy and macro-prudential regulations with an open economy DSGE model and found that the resurgence of capital flows to emerging market economies since mid-2009 has been accompanied by two main policy challenges. He maintained that traditional monetary policy measures can be used to adequately counteract the risk of financial instability when there are macro-prudential regulations in place, and hence calls for the need to complement monetary policy with macro-prudential measures. His study covered emerging markets in the Americas, Europe and Asia.

This was further confirmed by Bussière (2021), in his study to understand the interaction between monetary and macro-prudential policy. Their study found that, in order to limit the risk of global financial shocks, different macro prudential indicators such as the bank regulatory capital to risk-weighted assets ratio (BRKR)

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and liquid assets to deposits and short-term funds ratio (LADSF) for assessing the health of the financial sector and its vulnerability to shocks. The regulation and supervision of the financial sector used macro prudential tools that are designed to enable efficient control policies, with particular focus on improving the resilience of the financial sector impact of systematic risk. As such, this macro prudential analysis focuses on factors that may threaten the stability of the financial sector and the interrelationship between macroeconomic and financial stability. Macro-prudential application is based on rules or discretion, the entire system or individual financial sector, national or global level.

Furthermore, Ali and Iness (2020) in their study to investigate Capital inflows and bank stability around the financial crisis: the mitigating role of macroprudential policies, by assessing cross-country differences in the financial stability. Their study adopted a disaggregated inflows for 85 developing countries over the period 2000–2014. Their findings emphasize the destructive role financial crises play by preventing developing economies from reaping the financial stability benefits of cross-border flows. Given the recent popularity of macro-prudential policies (bank regulatory capital to risk-weighted assets ratio and liquid assets to deposits and short-term funds ratio) as tools for promoting financial stability. Their study found that the negative impact of capital inflows is indeed mitigated if countries adopt macro-prudential measures, specifically by imposing limits on foreign currency lending.

As it has been justified, macroprudential regulations are designed to strengthen the resilience of banks by imposing prudential requirements, such as

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capital adequacy, liquidity, and leverage ratios, to ensure that banks have a sufficient buffer to absorb losses during adverse economic conditions (Hodula, Komárková & Pfeifer, 2021). Higher capital and liquidity requirements can reduce the risk of bank failures, increase their ability to weather financial shocks, and promote overall stability in the banking system. Macroprudential regulations may require banks to adopt risk mitigation measures, such as stress testing and risk management frameworks, to identify and manage potential risks in their operations. These measures could help banks better understand and mitigate risks, leading to improved stability by reducing the probability of unexpected losses or disruptions in their operations (Raksmey, Lin & Kakinaka, 2022; Rizwan, 2021).

Moreso, macroprudential regulations are designed to address systemic risks that can arise from interconnectedness among banks and other financial sector. For example, regulations may impose limits on exposures to certain sectors or counterparties, or require banks to hold additional capital or liquidity buffers for systemically important institutions (Forbes, 2021). By reducing systemic risks, macroprudential regulations aim to prevent the spread of financial distress from one institution to others, thereby promoting overall stability in the financial sector. Macroprudential regulations can include countercyclical measures, such as loan-to-value (LTV) or debt-to-income (DTI) ratios, which are adjusted based on the economic cycle (Saha & Dutta, 2022; Jeanne & Korinek, 2020). During periods of economic expansion, these measures may be tightened to curb excessive credit growth and reduce the buildup of systemic risks. Conversely, during economic downturns, these measures may be loosened to support credit availability and

promote economic recovery. By moderating credit cycles, countercyclical macroprudential policies can contribute to bank stability by reducing the likelihood of credit booms and busts.

However, it's worth noting that the effectiveness of macroprudential regulations in promoting bank stability is subject to various factors, including the design and implementation of the regulations, the effectiveness of supervision and enforcement, and the dynamic nature of the financial sector. In some cases, unintended consequences or regulatory arbitrage can occur, which may impact the effectiveness of macroprudential regulations in maintaining bank stability (Agénor & Pereira da Silva, 2023; Meuleman & Vander Vennet, 2020). Therefore, ongoing monitoring, evaluation, and adjustment of macroprudential policies are necessary to ensure their effectiveness in promoting bank stability over time.

In conclusion, the findings suggest that macroprudential regulations can have both positive and negative effects on bank stability, however, to attain its' positive effects, it could be achieved through enhancing banks' resilience, mitigating risks, reducing systemic risks, implementing countercyclical policies, and promoting coordination among regulators. However, it's important to consider the specific design, implementation, and effectiveness of macroprudential regulations in different contexts, as well as potential unintended consequences, to ensure their effectiveness in promoting bank stability over time.

For the post estimations, the researcher conducted the Arellano-Bond test for serial correlation AR (2) and Hansen test over-identifying restrictions. The null hypotheses are no second-order serial correlation and the instrumented variables

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are exogenous and not correlated with the error term respectively. Since the coefficient of AR (2) and Hansen over-identification test are 0.606 and 1.000 respectively, the study fails to reject the null, which implies the model does not suffer from second-order serial correlation and over-identification.

Objective Three: Moderating Effect of Macroprudential Regulation on the Relationship between International Financial Integration and Bank Stability

To determine the relationship between international financial integration on bank stability through macroprudential regulation, a system GMM was employed to determine whether international financial integration has significant relationship with bank stability through macroprudential regulation. First, the external loans to deposit ratio, a measure for cross border financial transaction was interacted with both the liquid assets to deposit ratio and bank regulatory capital ratio which are the liquid and capital-based measurements for macroprudential regulation. The results are presented in Table 5.

Table 5: Moderating role of macroprudential regulation between international financial integration and bank stability

VARIABLES	Model
L.BANKZSCORE	0.819000*** (0.047)
LOGGDPC	0.177000* (0.118)
ELD	-0.071300** (0.019)
NFI	-0.064900** (0.070)
BRKR	-0.01200 (0.012)
LADSF	-0.01900** (0.019)
BRKR*ELD	0.00100 (0.002)
LADSF*ELD	0.051100** (0.001)

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RER	0.000576	(0.011)
COR	-0.693000*	(0.757)
PS	-0.572000	(0.496)
GEI	1.633000**	(0.751)
_CONS		-0.08600 (3.716)
No. of Obs		406
F Statistic		463.01
AR (1)		0.003
AR (2)		0.934
Sargan Test		0.595
Hansen Test		1.000
Groups/Instruments		47/22

t statistics in parentheses

*** p<0.001, ** p<0.01, * p<0.05

Source: Author's computation (2022)

External loans to deposit ratio (ELD), a measure for cross border financial transaction was interacted with both liquid assets to deposit ratio and bank regulatory capital ratio. For the post estimations, the researcher conducted the Arellano-Bond test for serial correlation AR (2) and Hansen test over-identifying restrictions. The null hypotheses are no second-order serial correlation and the instrumented variables are exogenous and not correlated with the error term respectively. Since the coefficient of AR (2) and Hansen over-identification test are 0.934 and 1.000 respectively, the study fails to reject the null, which implies the model does not suffer from second-order serial correlation and over-identification.

The interactive effect of cross border financial transactions on Liquid assets to deposits and short-term funds ratio (LADSF) and bank regulatory capital requirement (BRKR) is seen in the marginal effect below.

$$\frac{\Delta \text{BANKZSCORE}_{It}}{\Delta \text{LADSF}_{it}} = \beta_1 + \beta_3 \text{ELD}_{it} \tag{7}$$

$$\frac{\Delta \text{BANKZSCORE}_{It}}{\Delta \text{LADSF}_{it}} = -0.01900 + \beta_3 \text{ELD}_{it} \tag{8}$$

$$\frac{\Delta \text{BANKZSCORE}_{It}}{\Delta \text{LADSF}_{it}} = -0.01900 + 0.051100 \text{ELD}_{it} \tag{9}$$

Substituting the mean value of ELD from the descriptive statistics gives:

$$\frac{\Delta \text{BANKZSCORE}_{It}}{\Delta \text{LADSF}_{it}} = -0.01900 + [(0.015800)(27.563)] \tag{10}$$

$$\frac{\Delta \text{BANKZSCORE}_{It}}{\Delta \text{LADSF}_{it}} = 0.4545 \tag{11}$$

Next, the net foreign capital inflows (NFI), a measure for aggregate international capital inflows is interacted with liquid assets to deposit ratio (LADSF) and bank regulatory capital ratio (BRKR) which are the liquid and capital-based measurements for macroprudential regulation.

Table 6: Moderating role of macroprudential regulation between international financial integration and bank stability

VARIABLES	Model	
L.BANKZSCORE	0.821000***	(0.046)
LOGGDPC	0.101000*	(0.103)
ELD	-0.001000**	(0.019)
NFI	-0.002900**	(0.070)
BRKR	-0.02200*	(0.012)
LADSF	-0.02100*	(0.019)
BRKR*NFI	0.00200	(0.001)

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LADSF*NFI	0.060100**	(0.002)
RER	0.001439	(0.011)
COR	-0.622000	(0.734)
PS	-0.587000	(0.506)
GEI	1.536000*	(0.802)
_CONS		0.933 (3.101)

No. of Obs	406
F Statistic	463.01
AR (1)	0.003
AR (2)	0.934
Sargan Test	0.595
Hansen Test	1.000
Groups/Instruments	47/22

t statistics in parentheses

*** p<0.001, ** p<0.01, * p<0.05

Source: Author's computation (2022)

     The final objective sought to examine an interesting dynamic by looking at the effect of international financial integration (cross border financial transactions and international capital inflows) on banking sector stability taking macroprudential regulation (liquid assets to deposits and short-term funds ratio and bank regulatory capital to risk-weighted assets) into account. Thus, the interactive effect of cross border transactions and macro-prudential regulations on SSA banking sector stability. Consistent with previous results, a unit increase in the previous years' level of stability in the banking sector stability increases the following year's banking sector stability. This effect is statistically significant at 0.1 percent level of significance. The interactive effect of net foreign capital

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inflows, expressed as a share of GDP and Liquid assets to deposits and short-term funds ratio (%) is seen in the marginal effect below.

$$\frac{\Delta \text{BANKZSCORE}_{It}}{\Delta \text{BRKR}_{it}} = \beta_1 + \beta_3 \text{ELD}_{it} \tag{12}$$

$$\frac{\Delta \text{BANKZSCORE}_{It}}{\Delta \text{NFI}_{it}} = -0.02200 + \beta_3 \text{ELD}_{it} \tag{13}$$

$$\frac{\Delta \text{BANKZSCORE}_{It}}{\Delta \text{NFI}_{it}} = -0.02200 + 0.060100 \text{ELD}_{it} \tag{14}$$

Substituting the mean value of ELD from the descriptive statistics gives:

$$\frac{\Delta BANKZSCORE_{It}}{\Delta NFI_{it}} = -0.5300 + [(0.000479)(27.563)] \tag{15}$$

$$\frac{\Delta BANKZSCORE_{It}}{\Delta NFI_{it}} = -0.516797 \tag{16}$$

This effect is statistically significant at 5 percent. This means that an increase in the net foreign capital inflows, expressed as a share of GDP given Liquid assets to deposits and short-term funds ratio decreases the stability of the banking sector in SSA by approximately 0.52. Also, the interactive effect of net foreign capital inflows, expressed as a share of GDP and Bank regulatory capital to risk-weighted assets ratio is seen in the marginal effect. This has a negative marginal effect on the banking sector stability even though it is statistically insignificant. Even though the macroprudential regulations are weak, their interactive effect on the international capital inflows were positive.

The effect of external loans and deposits given the macroprudential regulations are also significant. The effect, given Liquid assets to deposits and short-term funds ratio exhibited a positive coefficient. Generally, the marginal

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effect of macroprudential regulations and International Financial Integration seem to improve the bank stability in SSA and this shows how relevant these macroprudential regulations are. It is also for this macroprudential regulation that is why the effect of net foreign capital inflows, and external loans and deposits is negative at point and insignificant even when its positive after the interaction. The process of financial integration, which involves cross-border flows of capital, goods, and services, has implications for the stability of banks and the overall financial sector. Macroprudential regulation policies and measures aims at mitigating systemic risks and promoting bank stability, plays a crucial role in managing the potential risks associated with international financial integration

Several studies have examined the relationship between international financial integration and bank stability, highlighting the potential risks that may arise from increased cross-border flows. For instance, Avdjiev et al. (2018) found that gross capital flows can impact bank lending, with potential implications for bank stability. Cerutti et al. (2015) also highlighted the importance of global financial cycles in influencing capital flows and their potential impact on bank stability. These studies highlight the need for effective regulatory and supervisory frameworks to manage the risks associated with international financial integration and promote bank stability.

Macroprudential regulation has emerged as an important tool in managing the risks associated with international financial integration. Macroprudential policies are aimed at mitigating systemic risks and promoting financial stability by addressing vulnerabilities at the system-wide level. Several studies have examined

the effectiveness of macroprudential regulation in promoting bank stability in the context of international financial integration. Claessens et al. (2017) found that macroprudential policies can be effective in reducing credit growth and mitigating risks associated with capital flows. Drehmann et al. (2013) also highlighted the importance of countercyclical capital buffers as a tool for managing risks associated with international financial integration.

Furthermore, the interaction between macroprudential regulation and monetary policy has been studied in the context of international financial integration. Claessens et al. (2018) found that the interaction between macroprudential policies and monetary policy can have important implications for bank stability, and the effectiveness of these policies may depend on the specific country context. Demirgüç-Kunt et al. (2014) also examined the relationship between foreign banks and the stability of domestic banks, highlighting the importance of macroprudential policies in mitigating potential risks.

The outcome of the study suggests that macroprudential regulation plays a crucial role in managing the risks associated with international financial integration and promoting bank stability. However, the effectiveness of macroprudential policies may depend on various factors, including the specific country context, the types of risks involved, and the interaction with other policies, such as monetary policy. Further research is needed to better understand the relationship between international financial integration, macroprudential regulation, and bank stability, and to provide insights for policymakers in designing effective regulatory and supervisory frameworks.

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Chapter Summary

At the inception of this section, the study presented the summary statistics of international financial integration (cross border transactions and net foreign capital inflows), financial sector stability and macro-prudential regulations. The study proceeded to examine the effect of aggregate international capital inflows on financial sector stability. Following this, the study sought to find the effect of cross border financial transactions on financial sector stability both in liquidity and solvency. It was observed that the existence of aggregate international capital inflows and cross border financial transactions augmented the stability of the financial sector thus, establishing the relevance of macro-prudential regulations.

The estimation approach involved the use of a system GMM which was applied to a panel of data for the 28 SSA countries obtained from a number of sources. The type of estimation technique adopted for the study depended on a number of diagnostic tests to determine the appropriateness with the use of alternative techniques for the study. The study also covered the period from 2000 to 2020. Particularly to the objectives, the study conducted estimations on the moderating role of macroprudential regulations and international financial integration to bank stability. Upon these analyses, the study revealed the main findings, conclusions and recommendations in the next chapter.

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CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents the summary, conclusions and recommendations. Whereas the summary presents a preamble of the objectives, methodology and findings, the outcomes regarding the findings of the study is recognized in the conclusion. Recommendations in this section also show specific policy actions to be undertaken by policy advisors and specific institutions.

Summary of the Study

The objective of this study was to examine the effect of international financial integration on bank stability in 28 selected SSA countries through the moderating effect of macroprudential regulations. Specifically, the study examined the effect of cross border financial transactions and aggregate international capital inflows on bank stability, to study the effect of macroprudential regulation on bank stability and finally, to determine the moderating effects of macroprudential regulation on the relationship between international financial integration and bank stability in 28 selected SSA countries.

The main variables of interest employed in the study included aggregate international capital inflows, cross border financial transactions, liquid assets to deposits and short-term funds ratio, bank regulatory capital to risk-weighted assets ratio, bankzscore, net foreign capital inflows, external loans and deposits of reporting banks vis-à-vis the banking sector. For the moderating variables of the macro-prudential regulations, the study employed liquid assets to deposits and

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short-term funds ratio (LADSF) and, bank regulatory capital to risk-weighted assets ratio (BRKR). Also, for financial sector stability the study employed bankzscore. Variables used for the study were obtained from WDI, GFD, WGI and IMF.

In examining the objectives of the study, the Generalised Method of Moment was employed to achieve the objectives of the study. Results from objective one showed that an increase in the cross-border financial transactions proxied by external loans and deposits (ELD) and aggregate international capital inflows proxied by net foreign capital inflows (NFI) increases the bank stability in SSA. Also, results from objective two revealed that an increase in the macroprudential regulations proxied by Liquid assets to deposits and short-term funds ratio improves the bank stability in SSA. Also, the final objective revealed that, an interaction effect between international financial integration (cross border financial transactions) and macroprudential regulation (liquid assets to short term deposit funds) improves bank stability.

Conclusions

Based on the first objective, the study concluded that using cross border financial transactions and aggregate international inflows proxied by net foreign inflows and external loans and deposits improves bank stability among sub-Saharan African countries. Therefore, when researchers are analysing, how cross border financial transactions and aggregate international capital inflows affects the stability of banking sector, they should complement the use of utilising external loans and deposits of reporting banks vis-a-vis the banking sector with the traditional measurements of international financial integration. The results indicate

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that lending flows contributed positively to developing country financial stability before the crisis, and that portfolio and lending inflows contributed negatively to bank stability after the crisis.

Secondly, in examining the effect of macroprudential regulations on bank stability, the results indicated that an increase in macroprudential regulations proxied by Liquid assets to deposits and short-term funds ratio and bank regulatory capital requirements improves bank stability in SSA. As such, a unit increase in the macroprudential regulation improves bank stability in SSA. This is statistically significant at 1 percent level of significance. An increase in Bank regulatory capital to risk-weighted assets ratio which is the second measure of macroprudential regulations also improves the stability of banks in SSA.

Finally, in assessing the moderating role of macroprudential regulations on international financial integration and banking sector stability, the result indicates that liquid assets to deposits of reporting banks vis-à-vis the banking sector and bank regulatory capital to risk-weighted assets ratio are effective in playing this moderating role. However, bank regulatory capital to risk-weighted assets ratio appeared to be the driving force among the macroprudential regulation, hence, much attention must be given to these macroprudential regulations coupled with the traditional monetary policies to establish stability within the banking sectors within the SSA region.

Recommendations

With much cognisance of the findings and the conclusion from the study, the recommendations below are proposed. The following policy recommendations are made on the basis of the findings and conclusions:

- The study recommends policy makers and regulators of banking institutions should establish robust monitoring and supervisory frameworks to oversee cross-border financial transactions and aggregate international capital inflows. This includes ensuring that banks adhere to international standards and best practices for risk management, including adequate capital buffers, effective risk assessment and monitoring, and compliance with relevant regulations and reporting requirements. Also, policy makers should conduct thorough risk assessments of cross-border financial transactions and aggregate international capital inflows to identify potential risks to bank stability. This includes assessing the credit risk, market risk, liquidity risk, and operational risk associated with cross-border transactions, and taking appropriate measures to mitigate these risks.

- With regards to the introduction of macroprudential regulations, it is recommended to policy makers to consider implementing macroprudential measures, such as capital controls, reserve requirements, and limits on foreign currency exposures, to manage the impact of cross-border financial transactions and aggregate international capital inflows on bank stability. These measures can help prevent excessive risk-taking and limit the build-up of systemic risks. Also, policy makers should engage in international cooperation and coordination efforts to address challenges associated with cross-border financial transactions and

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aggregate international capital inflows. This includes collaborating with other countries and international organizations to develop common regulatory standards, exchange information, and coordinate policy responses to mitigate potential risks to bank stability.

- Finally, Policy makers should establish and enforce robust legal and regulatory frameworks to govern cross-border financial transactions and aggregate international capital inflows. This includes ensuring that relevant laws and regulations are comprehensive, consistent, and effectively enforced, and that they provide adequate protection to banks, investors, and other stakeholders involved in cross-border transactions. They should also promote data and information sharing among relevant stakeholders, including banks, regulatory authorities, and international organizations, to improve understanding of cross-border financial transactions and aggregate international capital inflows, and to facilitate timely risk assessments and policy responses.

Area for Further Research

The study focused on how international financial integration (cross border financial transactions and net foreign capital inflows) affects bank sector stability and the moderating role of macro-prudential regulations (liquid assets to deposits and short-term funds ratio and bank regulatory capital to risk-weighted assets ratio) on banking sector stability. Future studies could consider in disaggregating the financial sector by considering other forms of the financial sector into various sectors and looking at how these variables affect each sector. Also, future studies could consider using different measurements for financial sector stability to assess

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how international financial integration conditioned with additional institutional variables influence the stability of banking sectors within the SSA region.

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