UNIVERSITY OF MINES AND TECHNOLOGY, TARKWA

FACULTY OF INTEGRATED MANAGEMENT SCIENCE

DEPARTMENT OF MANAGEMENT STUDIES

EFFECTS OF BANKING REGULATION AND SUPERVISION ON FINANCIAL SECTOR STABILITY IN GHANA

BY

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MASTERS OF BUSINESS AND TECHNOLOGY MANAGEMENT

(FINANCE AND INVESTMENT)

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BY

DANIEL ANKRAH

SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF BUSINESS AND TECHNOLOGY MANAGEMENT IN FINANCE AND INVESTMENT

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OCTOBER, 2021

DECLARATION

I declare that this thesis is my own work. It is being submitted for the degree of MASTER OF BUSINESS AND TECHNOLOGY MANAGEMENT (FINANCE AND INVESTMENT) in the University of Mines and Technology (UMaT), Tarkwa. This thesis has not been submitted for any degree or examination in any other University.

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ABSTRACT

The onset of the banking crisis between August 2017 and January 2020 in Ghana, which resulted in the collapse of several local banks, has rekindled policy debate on the role of banking regulation and supervision in enhancing financial stability in Ghana and the world at large. The purpose of this study is to fill this research gap by investigating the drivers of financial stability in Ghana, with a particular focus on bank regulation and supervision. The study utilizes a macro-level annual time series data covering the period 1990-2018 on financial development, bank regulation and supervision and other economic and institutional variables. The autoregressive distributed lags (ARDL) cointegration and estimation method is applied in the study. Having established the presence of cointegration, the study results provide a strong evidence that overall bank regulation and supervision contributes significantly to fostering financial stability in Ghana in the long run. Unbundling the bank regulation and supervision into its sub-components, the study finds that capital regulation and transparency in financial statement practices exert the strongest (positive and statistically significant) impact on financial stability in Ghana in the long run. As hypothesized by the theory of regulatory capture, the study also finds that corruption adversely affects financial stability in Ghana. In the light of these findings, the study provided some important policy implications and recommendations to consolidate and sustain the gains chalked so far in stabilizing the financial sector in Ghana.

DEDICATION

I dedicate my dissertation work to my wife, children, late mum and my siblings. You mean so much for this achievement

A special feeling of gratitude to my late loving mum Mad. Anna Cudjoe for her encouragement when I informed her of my decision to start this program. To my lovely and beautiful wife Mrs. Agnes Ayiem Ankrah for always been by side and encouraging me.

I dedicate this work and give special thanks to God for his continue grace and mercy and to my son Kojo Amankrah Ankrah, daughters Maame Kyekye Ankrah and Nhyira Ekuba Ankrah for being there for Daddy throughout the entire MBTM program. You are have been my best cheerleaders.

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

A well-functioning financial system is vital for a growing and prosperous economy (Beck et al., 2000). The financial sector, which includes among others financial markets and institutions, contributes to economic growth and development by determining the availability and allocation of investible funds to alternative uses. Through its intermediation services of providing savings/deposits, credit/loans, payments/transfers, and risk management (screening and monitoring of investment projects), the financial sector ensures that funds are channelled from individuals and firms who have surplus funds to those who have a shortage.

In particular, financial markets, such as bond and stock markets, lower transaction costs and facilitate efficient allocation of investible funds from people and entities who do not have a productive use for them to those who do (Beck, 2012; Cole and Shaw, 1974; Levine, 2005; Mishkin, 2004). Furthermore, financial institutions and markets also contribute to the growth and development process by pooling risks and ensuring optimal allocation of risk and returns. This is done, for instance, by accepting deposits or collecting savings from several individuals and entities and investing them in a widely diversified spectrum of ventures. This function of financial markets and institutions promotes greater economic efficiency by channelling capital from areas of low productivity to investment projects that yield higher returns (Adu et al., 2013; Beck, 2012). It also enables even small savers to exploit the law of large numbers and obtain an appreciably safe rate of return. Well-functioning financial institutions also limit agency problems by screening and monitoring investors and ensuring that loans offered to

them are used on productive ventures rather than being spent on private consumption and that the ultimate lenders are not defrauded (Aghion et al., 2005).

According to a substantial body of evidence, financial sector developments have a significant impact on economic development through influencing economic growth, business performance, investment, poverty, food security, and other development outcomes. Better developed financial systems, for example, have been demonstrated by Levine (2005) and Adu et al. (2013) to considerably promote company development and overall economic growth by relieving liquidity restrictions. According to Boateng et al. (2017), a well-developed financial sector serves as an essential route for foreign direct investment to influence domestic investment and promote economic growth. Financial development has a direct influence on macroeconomic stability in financially open economies since unanticipated shifts in capital flows can create or aggravate boom-bust cycles in nations with underdeveloped financial sectors (Aghion et al., 2004). Other studies have found that a sound and robust financial system, which promotes loan availability, leads to poverty reduction and increased household welfare in terms of consumption and food security (Shaikh, 2017). (Annim & Frempong, 2018; Schrieder and Heidhues, 1995; Zeller et al., 1997).

In order for the financial sector to fulfil these responsibilities successfully, it is critical that, in addition to depth, access, and efficiency, the financial system remains stable over time, with no crises or system-wide instances of failure. Relative price variations of real or financial assets that affect monetary stability or employment levels are eliminated by a stable financial system, according to Beck et al. (2008) and Cooper and Schinasi (2006). A stable financial

system will self-correct shocks or unexpected events, preventing negative events from damaging the actual economy or other financial systems.

Because the majority of transactions in the actual economy take place through the financial system, financial development's stability is critical for economic growth and development. For the financial sector's stability, strong regulation and oversight of individual banks and institutions are required. As the global financial crisis of 2008-2009 has shown, the lack of such regulatory measures may result in massive defaults and other negative consequences that can seriously destabilise whole economies (Anginer et al., 2019).

1.2 Problem Statement

Following years of concerted reforms and restructuring, Ghana's financial sector has witnessed significant expansion, with several new banks launching their operations in the country over the last ten years (Huq and Tribe, 2018; Quartey and Afful-Mensah, 2014). However, the banking system in Ghana faced a serious crisis between August 2017 and January 2020, resulting in the failure of numerous indigenous institutions. The UT Bank Ltd, Capital Bank Ltd, Unibank Ghana Ltd, The Royal Bank Ltd, Beige Bank Ltd, Sovereign Bank Ltd, and Construction Bank Ltd were among the victims.

These troubled banks' operating licences were withdrawn and consolidated, and several were merged. This action was taken as part of the Bank of Ghana's (BoG) recapitalization and clean-up effort, which intended to restore investor and public trust in the banking and financial sectors in general. The failed banks, on the other hand, were unable to fulfil the

central bank's requirement for a minimum capital reserve of GH400 million by the end of 2018, as mandated by the central bank, Ghana's primary banking regulator (Bank of Ghana, 2018). The removal of these banks' licences was mostly due to their bankruptcy, according to the BoG. According to the BoG, inadequate corporate governance and risk management practises, unethical related party transactions, regulatory non-compliance, and oversight (questionable licencing processes and weak enforcement) all contributed to major banking sector vulnerabilities (Bank of Ghana, 2018; PwC, 2019).

The global financial crisis ushered in a period of aggressive re-regulation of the banking industry, with several nations launching a slew of efforts to remedy the crisis's revealed flaws in market discipline, legislation, and supervision. Reforms have been implemented in many countries around the world to strengthen supervisory and regulatory frameworks, while financial sector policy is aimed at pursuing growth and development while maintaining financial stability, as well as creating inclusive growth to support social stability and equity (Anginer et al., 2019). The emergence of a banking crisis in Ghana over a decade after the global financial crisis of 2007-2009, particularly with regulatory failures as one of the primary drivers, demonstrates Ghana's incapacity to learn from the global crisis and put in place appropriate safeguards to prevent a repeat.

The global and Ghanaian financial crises have reignited significant policy debates regarding the proper mix of regulation and market discipline to maintain banking systems' safety, stability, and efficiency (Anginer et al., 2019). Banking regulation and supervision, according to a number of studies, contribute considerably to enhanced financial sector growth,

particularly in the areas of efficiency and effectiveness (Barth et al., 2004; Beck et al., 2013; Chortareas et al., 2012; Djalilov and Piesse, 2019; Levine, 2001; Ziorklui et al., 2001). Several studies in Ghana have looked at the role of financial sector reforms in improving financial sector development (Quartey and Afful-Mensah, 2014), as well as the effects of financial development on domestic and foreign direct investment (Boateng et al., 2017; Kamasa et al., 2020) and economic growth (Boateng et al., 2017; Kamasa et al., 2020). (Adu et al., 2013). In Ghana, however, little is known about the effects of banking regulation and oversight on the country's overall financial stability. As a result of the country's recent banking crisis, this study attempts to fill a research gap by providing empirical data on the impact of banking regulation and supervision on the strengthening (or worsening) of financial stability in Ghana. This is in response to regulatory failures that contributed to the country's banking crisis.

1.3 Objectives of the Study

The overall objective of this study is to analyze the relationship between banking regulation and supervision and financial development in Ghana. With a focus on financial stability, the study specifically seeks to:

1. Analyze the evolutions in banking regulation and supervision as well as financial sector stability in Ghana.
2. Determine the effects of banking regulation and supervision on financial sector stability in Ghana.
3. Determine the specific aspect(s) of banking regulation and supervision that contributes to financial sector stability in Ghana.

4. Identify the roles of other economic and institutional factors in driving financial stability in Ghana. (Corruption, Government Stability, Education, Trade Policy, Previous Crisis)

1.4 Research Questions

In line with the objectives above, the study aims to address the following research questions:

1. What are the trends in banking regulation and supervision and financial stability in Ghana?
2. Does (stringent) banking regulation and supervision contribute to improved financial stability in Ghana?
3. Which banking regulatory and supervisory measures are most important for achieving financial stability in Ghana?
4. Which economic and institutional factors drive financial stability in Ghana?

1.5 Significance of the Study

It is widely acknowledged that financial instability poses a significant risk to economic growth and development of any economy. The devastating effects of the global financial crisis on the global economy attest to this fact (Anginer et al., 2019; Weeks, 2009). Achieving a stable financial sector that is resilient to unforeseen internal and external shocks is costly. In Ghana, the cost of the financial sector clean-up was estimated to be GH¢20 billion, comprising of allocations to Banks (GH¢11.7 billion), Savings and Loans/Microfinance Institutions (GH¢2.4 billion), Fund Managers (GH¢1.5 billion) and Ghana Amalgamated Trust (GAT) (GH¢0.8 million). In relation to the size of the economic, the total cost of the exercise represents about 5% of Ghana`s overall Gross Domestic Product (GDP). With enormous

resources devoted to developing and stabilizing Ghana's financial sector, it is necessary to examine whether banking regulatory and supervisory measures implemented in the past have been instrumental in enhancing financial stability in the country. This underscores the significance of this thesis. This is the first study, to the best of my knowledge, to address this important research gap in the case of Ghana. Besides contributing to knowledge and the literature on the linkages between banking regulation and supervision and financial stability, the findings of this study will provide policy-relevant evidence to regulatory agencies and government on effectiveness of banking regulatory and supervisory measures in fostering financial stability (and overall financial development) in Ghana. Last but not least, the study will also bring to light the importance of other factors in influencing financial stability in the country.

1.6 Scope and Limitations of the Study

This study employs an annual time series data covering 1990–2018. The study period is primarily determined by the availability of data. Although several monetary policies and financial reforms have been implemented to promote financial development over this period, this study focuses on banking regulation and supervision. Similarly, although financial development is multi-dimensional, this study focuses on financial stability because other aspects – depth, access and efficiency – have been extensively studied.

1.7 Organization of the Study

This project work is in five (5) main chapters. The first chapter is the introduction; The second chapter reviews the relevant literature. The study's methodology is explained in

Chapter 3. Chapter 4 presents data analysis, results presentation, and discussion. Chapter 5 summarises the dissertation's findings, policy recommendations, and research ideas.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

Theoretical and empirical literature on bank regulation, supervision, and financial stability are reviewed in this chapter. It is divided into five pieces. The principles of bank regulation, supervision, and financial stability are discussed in Section 2.1. A survey of regulatory theories is presented in Section 2.2. It also gives a brief overview of bank regulation, and supervision in Ghana. The empirical literature is reviewed in Section 2.3 while Section 2.4 describes the conceptual framework of the study. Section 2.5 concludes the chapter by highlighting the main contributions of the study.

2.1 Conceptual Review

Prior to delving into the relationship between bank regulation and financial stability, it is critical to first define these terms and their many manifestations. According to Moosa (2015), regulation is "an activity in which people or organisations' choice is limited by the imposition of rules." While proponents of the free market despise regulation and any type of government interference, opponents argue that government regulation may be essential or beneficial to protect market players from the full force of the market and to remedy market-related inefficiencies (Moosa, 2015).

Bank regulation is a type of government regulation that imposes certain requirements, restrictions, and procedures on banks and other financial institutions in order to, among other things, create market transparency between these institutions and the individuals and entities with whom they do business. Bank regulation, according to Anginer et al. (2019), is the set of rules that regulate the formation and operation of banks in a given nation, whereas bank supervision is the application of such rules and regulations to maintain market discipline. Banking regulation, according to Djalilov and Piesse (2019), is a combination of supervisory and regulatory measures aimed at protecting the banking industry from excessive risk-taking while also minimising moral hazard. Financial regulation, according to Cohn (2019), is the set of laws, regulations, and enforcement processes that govern the operation of financial institutions and markets.

In general, bank and financial regulations encompass, among others, certain requirements for starting a new bank (or entry into banking), ownership, the definition and holding of capital (minimum capital and reserve requirements), types of licensed activities, accounting, information disclosure, corporate governance, safety net policies and interventions, consumer protection, and bank failure and resolution (Anginer et al., 2019; Barth et al., 2004, 2013). The obligation for banks to maintain a minimum capital ratio, for example, is one of the most important minimum criteria in banking and financial legislation. The capital requirement, often known as the capital adequacy ratio or regulatory capital, is calculated as the equity ratio as a percentage of risk-weighted assets. It defines the amount of capital that banks and other financial institutions must have in place to guarantee that they do not have excessive leverage and risk becoming insolvent, as determined by their regulatory body (Anginer et al.,

2019; Moosa, 2015). Holding too little capital raises the danger of a bank failing, whereas holding too much capital puts unjustified expenses on banks and their customers and may reduce the banking system's efficiency (Chortareas et al., 2012).

These banking and financial rules are established in the Basel Accords on a global scale (I, II, & III). The Basel Accords are a set of three international banking and regulatory meetings that give recommendations on capital needs and risk measures for global banks to guarantee that they have adequate capital to perform their responsibilities while also being able to absorb unforeseen losses (Basel Committee On Banking Supervision, 2011).

As previously said, supervision is a critical aspect of banking regulation. According to Anginer et al. (2019), supervisory or counterparty discipline is desirable to create incentives for regulated parties to follow the regulations. A national regulatory agency oversees the activity of banks and other financial institutions under bank supervision (usually the central bank). Supervisory operations include on-site examinations of the bank's records, activities, and processes, as well as evaluations of the bank's reports, to verify compliance with regulatory guidelines and monitor for any deviations from established regulatory standards. Monitoring the whole banking system, as well as spotting potential concerns outside of the current regulatory limits, is part of supervision. This supervisory monitoring can also help with the regulatory process by providing information that helps market players to keep track of the banks and financial institutions with whom they do business (Anginer et al., 2019; Basel Committee on Banking Supervision, 2010; Moosa, 2015; Stiglitz, 2001).

The major aims of bank regulation and supervision are to guarantee the overall financial system's stability, to safeguard market players (consumers and investors), and to ensure enough competition in the supply of banking services. According to Miskin (2004), the government controls and supervises financial markets and institutions in order to enhance the amount of information available to investors and ensure the financial system's stability. Because the banking industry and the entire financial sector are highly vulnerable to negative externalities and information asymmetries (adverse selection and moral hazards), regulation and supervision are essential to help financial institutions make sound decisions and limit excessive risk-taking, as well as to avoid or mitigate negative externalities that could worsen the financial sector's fragility. As a result, the financial system is considered to be stable if it can promote and increase economic activities, manage risks, and absorb shocks. Cooper and Schinasi (2006), Mayes and Wood (2007), Cooper and Schinasi (2006), Cooper and Schinasi (2006), Cooper and Schinasi (2006), Cooper and Schina

2.2 Theoretical Review

In an imperfect world, characterized by lack of competition, barriers to entry, information asymmetry, and missing markets for certain goods among others, the forces of demand and supply are not self-regulating. Often, they fail to influence market behaviour to keep markets efficient, a situation where scarce resources are put to their highest valued uses. In the face of market failures, a set of theories have been developed to justify government intervention in markets to tackle the inefficiencies or sub-optimal outcomes of the price mechanism.

2.2.1 Public Interest Theory of Regulation

Pigou (1932) established the first economic theory of financial regulation, the public interest theory. Theory highlights the need for regulation to avoid or rectify undesired market outcomes such as imperfect competition, uneven market operations, and missing markets (Moosa, 2015). To create and enforce the rules of the game, limit market power and preserve market competition, address externalities or other market failures resulting from information asymmetry (moral hazard and adverse selection), and protect market participants' interests, the banking industry, like other sectors/industries, requires regulation (especially, consumers, taxpayers, and investors). According to the public interest theory of regulation, economic markets have a propensity to operate inefficiently and in the interests of individuals, while ignoring the relevance of society as a whole. As a result, government involvement in the form of rules is required to guide and supervise economic markets in order for them to function in the public good. When resources are properly distributed and in the best interests of society, banks and other financial organisations are able to serve the social interest. In this case, the hypothesis dictates that the government intervene to regulate markets for the greater good of society rather than for the profit of a single entrenched interest (Adams and Tower, 1994; Hertog, 2010; Huang and Shoenmaker, 2015).

Despite the fact that the public interest theory has become a cornerstone of current public sector economics, it has been criticised. First, the public interest theory is chastised for justifying restrictions in terms of market failure, notwithstanding, the mechanism in the market can frequently compensate for inefficiencies (for example through advertisement and branding to increase the product-related information available to consumers). Second, the idea

is based on the assumption that regulation is both effective and inexpensive to execute. However, it is possible that this is not the case. Last but not least, regulatory bodies frequently lack enough data on cost, demand, quality, and other aspects of the production process. This is especially true in the pharmaceutical industry. In the absence of this knowledge, regulators are not more positioned to advance the public interest by addressing market failure than they would otherwise be (Hertog, 2010; Moosa, 2015; Shleifer, 2005).

2.2.2 Capture Theory of Regulation

Regulators, like other economic actors, may follow activities that are of interest to them, which may or may not be in the public interest. The capture theory's premise is based on this assumption. Regulation of the banking and financial sector, as Manish and O'Reilly (2019) have out, may decrease inequality and increase social welfare if regulators follow public-interest objectives. The economic theory of regulation, on the other hand, predicts that the banking sector would dominate regulatory and supervisory procedures, resulting in policies that promote the industry's interests (Cohn, 2019; Manish and O'Reilly, 2019; Moosa, 2015; Stigler, 1971).

The capture hypothesis (also known as private interest theory) is mostly based on political science research. It predicts that regulation is a politically skewed process that favours politically powerful groups, businesses, or industries, allowing them to capture and control the regulatory process and force regulatory agencies to advance their own special interests, which may be harmful to the public. Regulatory capture is thus a kind of government failure, because government involvement through a captured regulatory body does not effectively

repair market faults and may even result in unexpected negative consequences (Cohn, 2019; Hira et al., 2019). In this scenario, no regulation is better than a government-controlled regulatory agency that exerts power (Moosa, 2015; Stigler, 1971). Regulatory capture theorists, on the other hand, warn that a lack of government supervision allows banks and financial institutions to engage in hazardous activities that might lead to market failure or sub-optimal results.

The capture theory of regulation has been criticised for not being sufficiently different from public interest theory. The argument also fails to explain why a company or other interest groups may capture regulatory agencies but consumer organisations cannot stop them (Hira et al., 2019; Moosa, 2015).

2.2.3 Economic Theory of Regulation

George Stigler's economic theory of regulation is another branch of thought that has been created to explain regulation. Stigler highlighted in his 1971 paper "The Theory of Economic Regulation" that regulation is "acquired by the industry and is planned and managed largely for its advantage," rather than promoting the broader public interest by resolving market failures (Stigler, 1971, p. 3). Stigler contended strongly that regulation is a market good whose availability and distribution are determined by demand and supply (Stigler, 1971).

On the demand side, proponents of economic regulation theory claim that corporate interests tend to triumph in the market because industry organisations have more knowledge than other groups, such as consumers and politicians. On the supply side, the economic regulatory model suggests that politicians would provide regulation as long as demand from politically powerful organisations outweighs

opposition (Adams and Tower, 1994; Hertog, 2010). As a result, contrary the public interest thesis, economic regulation theory claims that government intervention exists to protect the economic interests of politically powerful parties (Adams and Tower, 1994; Stigler, 1971).

2.2.4 Special Interest Groups Theory of Regulation

The special interest groups hypothesis is the final but not least theory of regulation. The capture hypothesis claims that a small number of vested interests may capture and monopolise regulatory agencies, however proponents of this idea disagree. Rather, they believe that many special interest groups are vying for control of an agency's operations. As a result, many powerful organisations compete to use the government's coercive power to produce laws and regulations that benefit their business. Regulation is not seen as fundamentally evil by regulated institutions or companies, as it is in the capture theory—rather, regulated organisations ask for regulation if it is helpful to power protection and profitability increase (Moosa, 2015).

2.2.5 Overview of Bank Regulation, and Supervision in Ghana

The banking sector in Ghana had performed woefully in the past. As characteristic of Ghana's early post-independence period, there was extensive government intervention in every facet of the economy as part of its big push for rapid industrialization. The import-substituting industrialization strategy undergird all policies, including financial policies during this era. The 1970s were characterized by high interest rate controls and credit ceiling which made sure inexpensive credit was available and accessible to manufacturing and other government-dictated priority sectors. Not only were heavy taxes levied on the banking sector at large to

generate revenue for the government, but high reserve requirements were also imposed on banks.

The financial sector was significantly distorted as a result of these repressive policies, with sky-high inflation rates turning real interest rates negative, eroding the capital base of most banks (undercapitalization), restricting long-term lending, and lowering private sector deposits as confidence in banks plummeted. Most Ghanaian banks were in trouble by the mid-1980s, due to extensive defaults on bank loans by both state-owned and private-sector companies, as well as massive non-performing assets. In many ways, the Banking Act of 1970 was out of date, and the Bank of Ghana's regulatory authority was disputed. All capital adequacy and prudential lending requirements were weakened, and there were no clearly defined legal criteria for financial sector activities, and legal sanctions were insufficient to deter reckless financial behaviour (Antwi-Asare and Addison, 2000; Huq and Tribe, 2018; Machiko and Aryeetey, 1998; Quartey and Afful-Mensah, 2014).

The Financial Sector Adjustment Programmes (FINSAP I) were established between 1988 and 1990 to strengthen the banking sector, restructure distressed banks, develop money and capital markets, and ensure the effective functioning of the entire financial sector in response to the negative effects of the restrictive measures (Antwi-Asare and Addison, 2000; Brownbridge and Gockel, 1997; Quartey and Afful-Mensah, 2014). The previous banking legislation, which established capital adequacy and minimum capital requirements, prudential lending rules, and financial reporting processes, was revised in 1989 in this spirit. To boost financial intermediation in the sector, interest rates were liberalised. The new legislation

requires banks to have a minimum capital base of 6% of their net assets and prohibits single borrowers to enhance the supervisory and regulatory environment for banking activities. In 1993, the Non-Bank Financial Institutions Law was also passed.

In 2003, FINSAP II, a revised version of FINSAP I is known as the Financial Sector Strategic Plan (FINSSP), was developed to address the financial sector's lingering issues. The FINSSP/FINSAP II reforms included the implementation of universal banking in 2006, which removed geographical and product limitations on banking activity, as well as the adoption of an open licencing policy and the elimination of excessive reserve requirements. Banks have to be adequately capitalised in order to serve as a "universal bank." In response, the Bank of Ghana increased the minimum capital requirement in 2003, increasing it for Ghanaian banks to $50 billion ($6.7 million) from $25 billion ($3.3 million) and foreign banks to 70 billion ($7.2 million) from 50 billion ($6.67 million) (Huq and Tribe, 2018).

The second phase of the Financial Sector Strategic Plan II (FINSSP II 2011–2015), approved in 2010 and launched in June 2011, aims to expand banking institutions' financing base, improve service quality through increased competition, remove barriers to financing, and introduce innovative financial instruments (Huq and Tribe, 2018; Quartey and Afful-Mensah, 2014).

In order to create a sound, efficient banking system in the interest of depositors and other clients of these institutions, as well as the economy as a whole, the Bank of Ghana has ultimate supervisory and regulatory power in all areas pertaining to banking and non-banking

financial operations. In Ghana, banks, non-bank financial institutions, and currency bureaux operate under the following regulatory and legislative framework: Bank of Ghana Act 2002, Act 612, Bank of Ghana (Amendment) Act, 2016 (Act 918) Banks and Specialised Deposit-Taking Institutions Act, 2016 (Act 930), Non-Bank Financial Institutions Act, 2008 (Act 774), Companies Act, 1963 (Act 179), and Bank of Ghana Notices, Directions, Circulars, and Regulations.

As a consequence, the Bank of Ghana is tasked with maintaining the financial system's stability in order to facilitate wealth creation, economic growth, and development. The following are the duties and responsibilities of the Central Bank as a regulator as defined by Acts 612 and 673: I to regulate, oversee, and control the banking and credit systems in order to guarantee the smooth functioning of a safe and sound banking system; (ii) to select a head of the Banking Supervision Department, who shall be chosen by the Board; and (iii) to study and propose banking legislation changes. As a result, the Central Bank fulfils its responsibilities by ensuring the safety of depositors' funds, bank solvency, excellent quality assets, appropriate liquidity, and profitability, as well as the enforcement of legislative and regulatory requirements and the maintenance of an efficient payment system.

Regulations for licencing, licence revocation, procedures for assessing and monitoring banks, authorities and responsibilities, and supervisory protection are all part of the laws that regulate banking operations. Finally, in order to enhance the legal and regulatory environment, the Bank of Ghana's supervisory responsibilities are designed to be consistent with the Basel Core Principles for Effective Banking Supervision.

2.3 Empirical Review

This research is part of a growing body of work on the influence of financial laws on many elements of financial sector growth. A review of relevant empirical research is given in this section. The seminal work of Barth et al., (2004) on bank regulation and supervision is the most famous research on the subject. Through the use of a newly constructed database on bank regulation and supervision in 107 countries Barth et al. (2004) examined the relationship between key regulatory and supervisory procedures and the banking industry's development, efficiency, and fragility. (i) regulatory restrictions on bank activities and the integration of banking and commerce; (ii) regulations governing domestic and foreign bank entry; (iii) capital adequacy regulations; (iv) deposit insurance system design features; (v) supervisory authority, independence, and resources; (vi) loan classification stringency, provisioning standards, and diversification guidelines; and (vii) regulations promoting information technology. The authors discovered that policies that (1) mandate accurate disclosure of information, (2) empower private-sector corporate management of banks, and (3) create incentives for private agents to exercise corporate control significantly improve bank development, performance, and stability.

Chortareas et al. (2012) looked at the connections between bank supervision, legislation, and several elements of commercial bank efficiency and performance in the European Union (EU). Between 2000 and 2008, they studied 22 EU countries. The net interest margin and cost-to-income ratio were utilised to represent the costs of intermediation and cost effectiveness, respectively, while the data envelopment technique was used to assess efficiency. Estimation techniques included truncated regressions and generalised linear

models. Their findings indicated that tightening financial limits and official supervision capabilities can help ban activities run more smoothly. They also claimed that interventionist supervisory and regulatory policies, such as private sector surveillance and bank activity restrictions, might enhance bank inefficiency. Finally, they discovered that in nations with higher quality institutions, the beneficial impacts of capital limitations and government regulatory authorities on bank efficiency are larger. This thesis varies from Chortareas et al. (2012) in that it focuses on an African nation (Ghana in particular) as well as the banking sector's stability (rather than efficiency).

Klomp and den Hann (2015a) utilised data from 1238 banks in 94 developing and emerging countries to see if the influence of bank legislation and supervision on banking risk (as assessed by bank Z-scores) is affected by bank structure. The results of utilising the system generalised method of moments (system-GMM) showed that tighter regulation and supervision raises the Z-scores of banks (riskiness). Capital requirements and supervisory oversight, in particular, were shown to reduce banking risk. Other aspects of regulation and supervision, on the other hand, are dependent on the organisational structure of banks, as activity restrictions were found to reduce risk in large and foreign-owned banks, whereas liquidity restrictions had the greatest impact on the Z-scores of unlisted and commercial banks.

Klomp and den Hann (2015b) looked at how bank regulation and institution quality impact banking risk in emerging and developing markets. They found that greater regulation and supervision decreases banking risk, using data from 371 banks in emerging and developing nations from 2002 to 2008 using the system-GMM estimator. They discovered that capital requirements and supervisory oversight reduce bank risk considerably. In the context of strong institutional quality, liquidity regulation and activity limits were also shown to reduce banking risk. Finally, they demonstrated that the impact of regulation and oversight is affected by the amount of development. Unlike Klomp and den Hann (2015), who used time series methods to empirically evaluate the connections between bank regulation and supervision and financial stability in Ghana, this research employs time series approaches.

Yang et al. (2019) investigated the link between regulation, supervision, and the state.

For the years 2005 to 2014, ownership in commercial banks in the Asia-Pacific region was at an all-time high. Their regression results revealed the regulation of banks and the supervision have a substantial influence on bank technical effectiveness, but state ownership has no such impact. The authors noted that stricter regulation and oversight are associated with increased efficiency for both small and large banks.

Djalilov and Piesse (2019) used data from 21 transition nations from 2002 to 2014 to evaluate the effects of regulation on bank efficiency. Bank activity limitations, according to Djalilov

and Piesse (2019), are the sole legislation contributing to increased banking efficiency in these nations. The findings suggest that banking rules such as capital requirements, market discipline, and supervisory power are insufficiently successful in improving banking efficiency in transition nations, according to the authors.

Between 2005 and 2011, Bouheni et al. (2014) examined the effect of regulatory and supervisory measures on European banks' profitability and risk-taking. The authors employed the Generalized Method of Moments (GMM) for dynamic panels to investigate the various supervisory effects prior to and following the subprime crisis. According to the report, strengthening legislation and oversight improves the profitability and stability of European financial institutions. Additionally, the study discovered a correlation between bank profitability and capital adequacy, as well as between deposit insurance programmes and capital adequacy. Finally, they discovered that delegating more authority to supervisors reduces risk taking and increases financial stability.

In their study on Turkey, Ozkan et al. (2014) examined the impact of regulation on banking sector performance in an emerging nation scenario. The consequences of three rounds of reformist banking legislation in Turkey during the early 2000s crises are analysed in depth. These include a 2002 banking sector restructuring programme, a 2004 limitation on the complete deposit insurance scheme, and a 2005 corporate governance–related banking law. According to their findings, these policies benefited bank lending, asset quality, and profitability. Additionally, their findings indicated that Turkey's banking reforms were

scheduled and sequenced in such a way as to shield the country from the 2008 global financial crisis.

In Ghana, only a few studies have looked at the impact of banking legislation and supervision on the country's financial industry. Ackah and Asiamah (2014) investigated the potential trade-off between financial regulation and financial stability in Ghana in their research. To identify and assess the key obstacles or gaps in the financial sector for funding inclusive growth, the study employed descriptive and analytical techniques. The research also explains why financial stability is important, particularly in an increasingly globalised world, as well as the problems of preserving financial stability while guaranteeing financial inclusion. Overall, the authors found that the Bank of Ghana's prudential and legislative regulatory changes, as well as increasing the skills and competencies of supervisory personnel, have guaranteed that the Ghanaian banking sector remains sound, liquid, and properly capitalised throughout time. Despite this, there are still considerable counterparty and cross-border risks associated with the growing integration of financial markets in the subregion as a result of regional bank development (Ackah and Asiamah, 2014).

Wumbei et al. (2016) examined the strengths, weaknesses, opportunities, and threats inherent in the banking and financial regulatory framework of the Ghana Banking Act in light of the rapid loss of colossal amounts of money caused by the DKM Diamond Micro-Finance Limited (DKM) financial saga in 2015. The authors analysed the data using self-collected

primary data from fifty (50) bankers using a multi-stage and convenience sample approach, tables, and percentages. According to Wumbei et al. (2016), oversight of the operations of various Micro Finance Companies was not early enough to avoid some of the problems experienced during the DKM crisis.

Using Ghana as a case study, Dadzie and Ferrari (2019) explored whether a country's macroeconomic climate and level of financial development influence the efficacy of financial deregulation measures. The authors utilised the stochastic cost frontier to assess efficiency in the banking industry. The estimate of two distinct models of competition on the loans market, which is the major goal of the reforms, followed. The authors found that only removing entrance barriers improved bank efficiency considerably, and that only private and global foreign banks benefited from the elimination of entry limitations, but not regional banks. They also stated that competition has not improved, and that macroeconomic and institutional deficiencies continue to act as a negative counterbalance.

2.4 Conceptual Framework

The conceptual framework (Figure 2.1) is presented to guide the analysis in this study. The framework illustrates the connections between banking regulation and supervision and financial stability, while taking other economic and non-economic issues into consideration. As previously stated, the Bank of Ghana has overarching regulatory and supervisory responsibility over all banking and non-bank financial transactions in the nation. Its goals include establishing a stable, sound, and efficient system in the best interests of depositors, other clients of these institutions, and the economy as a whole.

The Bank of Ghana regulates, supervises, and directs the banking system and the financial sector as a whole to ensure that the financial system is stable. The central bank's regulatory and supervisory activities include capital regulations, bank activity restrictions, financial statement transparency, and supervisory power (for regulatory supervision and monitoring) to ensure compliance with directives/guidelines and monitor for possible nonconformities with regulatory standards. These banking regulation and supervision initiatives are anticipated to ensure/improve financial stability if they are implemented successfully.

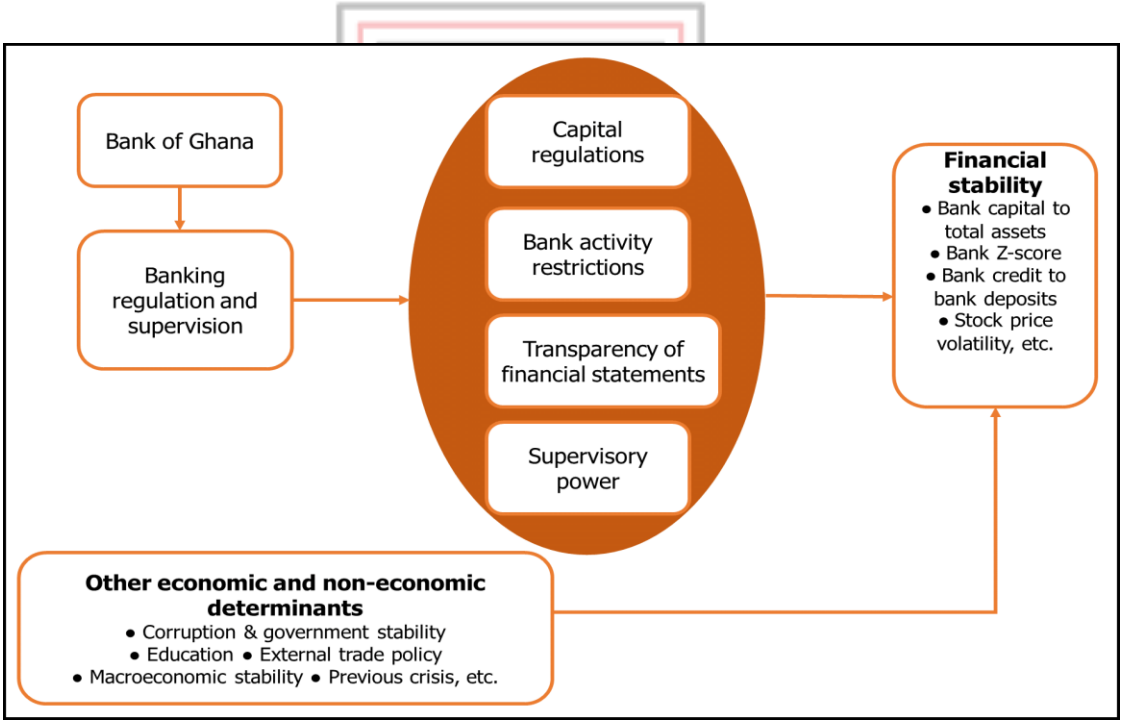

Figure 2. 1: Conceptual framework linking banking regulation and supervision, and financial stability.

The framework also recognizes that, besides regulation and supervision, there are several other factors that may contribute to the stability or otherwise of the financial sector. Drawing from existing literature, these economic and non-economic determinants include institutions

(e.g., level of corruption, government stability), macroeconomic policy and stability (inflation), external trade policy (trade openness), education, and exposure crisis in the past.

2.5 Chapter summary

In this chapter, the concepts of bank/financial regulation, supervision and financial stability are discussed. Theoretically, grounds for regulation are not conclusive. This chapter discussed four theories of regulation namely, the public interest theory, the capture theory, the economic theory of regulation, and the special interest theory. An overview of financial regulations in Ghana has also been presented, highlighting the gradually transition from a highly repressive regime in the pre-reforms era in the 1980s, to the present liberalized regime. The central bank has oversight over the entire financial sector and exercising its regulatory and supervisory authority from time to time to ensure the financial sector is sound, stable and functioning effectively to support inclusive economic growth and development. The empirical literature on the linkages between bank regulations, supervision and different aspects of financial development has also been reviewed. While the studies reviewed documented significant impacts of bank regulation and supervision on bank performance, bank fragility, and bank efficiency, little attention has been paid to their impact on stability dimension of financial development. Hence, the goal of this study is to fill research gap by going beyond bank-level analysis to investigate to what extent bank regulation and supervision contribute to the stability of the entire financial sector. To this end, a conceptual framework that undergirds the study has been proposed and discussed.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

The strategies used to achieve the study's goals are discussed in this chapter. It covers topics such as data sources and how the variables used in the analysis are measured. As illustrated in the conceptual framework, the chapter also provides a theoretical model with financial stability as a function of bank regulation and supervision, as well as a collection of economic and non-economic factors. Most importantly, the chapter also discusses the econometric methods employed to estimate the specified model.

3.1 Data Sources, Description and Measurement of Variables

3.1.1 Data Sources

The research is based on yearly time series data from 1990 to 2018. The information utilised comes from a variety of secondary sources. To begin, the data on financial stability indicator(s) comes from the World Bank's Global Financial Development Dataset. Barth et al. (2004, 2013) collected data on bank regulation and supervision indicators from the World Bank's Regulation and Supervision Surveys (BRSS) and the World Bank (Anginer et al., 2019). The BRSS is a one-of-a-kind collection of globally comparable statistics on how banks are regulated and monitored. BRSS was published in five waves in 1999, 2003, 2007, 2011, and 2019. Because each survey lasted many years and bank regulatory and supervisory metrics change slowly, data from the first wave in 1999 was utilised for the 1990-1999 period. The second wave, issued in 2003, was used for the years 2000-2003; the third wave, released

in 2007, was used for the years 2004-2007; the fourth wave, released in 2011, was used for the years 2008-2011; and the fifth wave, released in 2019, was used for the years 2012-2018.

The research also includes a collection of economic and institutional factors. Inflation, trade openness, and the human capital index are among the economic factors (education). Corruption and government stability are the institutional factors. The World Bank's World Development Indicators include data on inflation and trade openness. The Penn World Tables via the Federal Reserve Bank of St. Louis Economic Database provided data on human capital per person (years of schooling) (FRED). The data on corruption and government stability indices comes from the Political Risk Services (PRS) Group's International Country Risk Guide (ICRG). Finally, data on total crisis (the sum of crises involving the domestic currency, inflation, stock market, sovereign domestic and external debt, and banking) comes from the World Bank's Financial Market Regulation and Financial Crises Dataset and the International Monetary Fund's Financial Market Regulation and Financial Crises Dataset (IMF).

3.1.2 Description and Measurement of Variables

3.1.2.1 Dependent Variable: Financial Stability (FINSTAB)

Financial stability – a characteristic of financial development that refers to the ability of the financial system to support and promote economic processes, manage risks, and resist or absorb shocks – is the dependent or outcome variable in this study. Several measures of financial stability may be found in the Global Financial Development database. However, because it is the only variable with enough observations for the research, this study uses the bank credit to bank deposits (percent) as a measure of financial stability. It calculates how

much money domestic money banks lend to the private sector as a percentage of total deposits. Commercial banks and other financial organisations that take transferable deposits, such as demand deposits, are known as domestic money banks. Demand, time, and savings deposits in deposit money institutions make up total deposits. The greater the bank credit to deposit ratio (or the lower the loan-to-deposit ratio), the more reserves are available to cover foreseeable or unforeseen contingencies, and hence the better the financial stability.

3.1.2.2 The Main Independent Variable: Bank regulation and supervision (BRS)

Bank regulation and supervision are the primary independent variables of interest (BRS). According to Barth et al. (2008, 2013), regulatory and supervisory factors include measures limiting overall banking activity (RESTACTIV), capital requirements (CAPREQ), financial statement transparency (FINTRANSP), and official supervisory authority (SUPOWER). Restriction on banking activities (RESTACTIV) quantifies the extent to which banks can engage in I securities transactions, (ii) insurance transactions, and (iii) real estate transactions. A score of 1 indicates that the activity is unfettered, a score of 2 indicates that it is authorised, a score of 3 indicates that it is limited, and a score of 4 indicates that it is forbidden. The total index of banking activity restriction is calculated by adding the three component scores, with a higher score indicating more restrictive banking activity restrictions.

Capital requirements (CAPREQ) take both overall and initial capital stringency into consideration, determining whether the capital need represents specific risk factors and deducts certain market value losses from capital before determining minimum capital adequacy. The capital index requirement is calculated based on replies to nine questions, with

higher numbers indicating a more stringent capital need. The financial statement transparency (FINTRANSP) index quantifies the financial statement procedures of banks. It is computed by adding one to each 'yes' and zero to each 'no' response to six questions about the openness of banks' financial statements, with higher numbers indicating more regulatory authority. The official supervisory power (SUPOWER) metric assesses supervisory authorities' capacity to conduct specified preventative and corrective actions. It is calculated by adding 1 to each 'yes' and 0 to each 'no' response to questions on supervisory authority, with higher numbers indicating greater supervisory authority.

The BRS index is calculated as a weighted average of the RESTACTIV, CAPREQ, FINTRANSP, and SUPOWER values. The BRS index is computed as follows: BRS=w 1 RESTACTIV+w 2 CAPREQ+w 2 FINSTRAP+w 4 SUPOWER (3.1), where w i are weights such that w 1=w 2=w 3=w 4=14. To eliminate subjective bias in the selection of weight values, equal weights of 14 or 0.25 are applied. Additionally, regardless of the number of questions utilised, it ensures that each sub-index is given equal weight in constructing the overall BRS index. A higher BRS index score suggests tighter banking regulation and oversight.

3.1.2.3 Other Independent (Control) Variables

As mentioned previously, financial stability is affected by other factors apart from regulation and supervision. To account for the influence of these factors, several economic and institutional variables are included in the study. These are inflation, trade openness, education, corruption, government stability and past exposure to financial crisis. Macroeconomic

stability is captured by the inflation rate (*INFLAN*). It is measured as the annual percentage change in the consumer price index. Prudent macroeconomic policies can result in low and stable inflation. Rapidly increasing prices of consumer goods is a signal of instability of consumer prices and can result in large swings in economic activity. Other aspects of the macro-economy, including financial sector, may also be affected as high inflation erodes consumer confidence which may trigger financial panic and a bank run or financial crisis, thereby destabilizing the financial sector.

Trade openness (*TRADEOPEN)* is included to capture the effects of external trade policy. It is measured as total trade (exports plus imports) divided by the gross domestic product (GDP). The higher the share of trade in GDP the more open is economy is to the external sector. Although there is extensive evidence that high trade openness is good for economic growth and development through the inflow of foreign capital, technology, and variety of goods and services, high trade openness also signifies high integration into the global economy, and therefore, increased vulnerability to external shocks. This implies that external market instability, or financial shocks in other economies can quickly spill over or be transmitted to the local economy (and vice versa) through changes in international trade and capital flows, external market competitiveness, and incomes. This will ultimately affect the stability of the financial sector.

The educational level of the general public is strongly related to their financial literacy/knowledge, attitudes, decisions, and behaviour, all of which have implications for financial sector stability. In general, the more financially educated or knowledgeable people

are, the more prudent they are in their financial decisions and behaviours, which contributes positively to financial stability. In addition, more educated the workforce is, the higher banks and financial institutions are likely to comply with bank regulatory and supervisory measures which foster financial stability. In this study, education is captured by the human capital index (*HC*), measured as the average years of formal education per person per year.

Strong institutions or high-quality governance are important for financial stability and development. Two institutional measures are controlled for in the study. These are the corruption (*CORRUPT*) and government stability (*GOVSTAB*). Corruption takes several forms including the capture by powerful companies or individuals to twist the regulatory, policy and legal institutions for their private interest through high-level bribery, lobbying or influence peddling. Corruption and the associated financial crimes such as money laundering, and bribery in international business carried out by bankers and other players in the financial sector have been argued to be a catalyst of the global financial crisis. High levels of corruption weaken regulatory and supervisory power, and thus the enforcement of the rules governing the sector. This in turn increases the risks of financial instability. Government stability (*GOVSTAB*) is also included to account for the effects of political stability in fostering financial stability. It measures government's ability to execute its declared programme(s) and its ability to remain in office throughout its tenure. Persistent conflicts, violence, terrorism, political unrest, or unhealthy tensions between various political parties, or ethnic, religious, and other groups can destabilize government, financial sector, and other aspects of the economic environment. Government stability improves confidence in the business environment, and therefore enhances financial stability.

Lastly, an index of total crisis (*TOTCRISIS*) is included to capture the experience of any financial crises related to the domestic currency, inflation, stock market, sovereign domestic and external debt, and banking sector. Hypothetically, the impact of past financial crisis on financial stability may be positive or negative. On the one hand, it may be positive because it is expected that regulatory and supervisory authorities learn from the experience of past crises in the sector and put measures in place to stabilize the sector and forestall re-occurrence in the future. On the other hand, the onset of financial crises may have lingering negative effects on financial stability and the economy at large, especially if the necessary measures to reverse its impact are lacking.

3.2 Model Specification

Drawing from the existing literature (Chortareas et al., 2012; Dadzie & Ferrari, 2019; Klomp & Haan, 2015a, 2015b), the following is specified to study the effects of bank regulation and supervision on financial stability:

$$lnFINSTAB_t = \gamma_0 + \gamma_1 lnBRS_{t-1} + \gamma_2 lnTRADEOPEN_t + \gamma_3 lnINFLAN_t + \gamma_4 lnHC_t + \gamma_5 lnCORRUPT_t + \gamma_6 lnGOVSTAB_t + \gamma_7 lnTOTCRISIS_t + \varepsilon_t \quad (3.2)$$

Where all variables are as previously defined. *ln* is the natural operator; t refers to time (or year) and ε is the error term. $\gamma_0, \gamma_1, \gamma_3, \ldots, \gamma_7$ are parameters to be estimated and are interpretable as elasticity coefficients. Equation (3.2) states that financial stability (*FINSTAB*)

in year *t* depends on the degree of bank regulation and supervision (BRS_{t-1}) in the past year (or at time $t-1$), and a set of control variables namely trade openness (*TRADEOPEN*), inflation (*INFLAN*), human capital (*HC*), corruption index (*CORRUPT*), government stability (*GOVSTAB*), and total crisis (*TOTCRISIS*) experienced in the country at time *t*.

It is a well-known fact that regulatory and supervisory measures or policies in general do not have impact immediately they are implemented. There is usually a break between when policy implementation and when they actually have impact on the economy. Therefore, *BRS* included in the model in its lagged form (one year lag) to account for this response lag or policy lag (Chortareas et al., 2012).

To determine the effects of the individual components of bank regulation and supervision on financial stability, four variants of Equation (3.2) are specified for each sub-index of BRS as follows:

$$lnFINSTAB_t = \gamma_0 + \gamma_1 lnRESTACTIV_{t-1} + \gamma_2 lnTRADEOPEN_t + \gamma_3 lnINFLAN_t + \gamma_4 lnHC_t + \gamma_5 lnCORRUPT_t + \gamma_6 lnGOVSTAB_t + \gamma_7 lnTOTCRISIS_t + \varepsilon_t \quad (3.3)$$

$$lnFINSTAB_t = \gamma_0 + \gamma_1 lnCAPREQ_{t-1} + \gamma_2 lnTRADEOPEN_t + \gamma_3 lnINFLAN_t + \gamma_4 lnHC_t + \gamma_5 lnCORRUPT_t + \gamma_6 lnGOVSTAB_t + \gamma_7 lnTOTCRISIS_t + \varepsilon_t \quad (3.4)$$

$$lnFINSTAB_t = \gamma_0 + \gamma_1 lnFINTRANSP_{t-1} + \gamma_2 lnTRADEOPEN_t + \gamma_3 lnINFLAN_t + \gamma_4 lnHC_t + \gamma_5 lnCORRUPT_t + \gamma_6 lnGOVSTAB_t + \gamma_7 lnTOTCRISIS_t + \varepsilon_t$$

(3.5)

$$lnFINSTAB_t = \gamma_0 + \gamma_1 lnSUPOWER_{t-1} + \gamma_2 lnTRADEOPEN_t + \gamma_3 lnINFLAN_t + \gamma_4 lnHC_t + \gamma_5 lnCORRUPT_t + \gamma_6 lnGOVSTAB_t + \gamma_7 lnTOTCRISIS_t + \varepsilon_t$$

(3.6)

where *RESTACTIV*, *CAPREQ*, *FINTRANSP*, and *SUPOWER* are sub-indexes for overall restrictions on banking activities; capital requirements; financial statement transparency; and official supervisory power respectively. All other variables remain as previously defined.

The parameter of interest is Equations (3.2) to (3.6) is γ_1, the coefficient of the overall and individual bank regulation and supervision indicators. It measured the effect (elasticity) of bank regulation and supervision variables on financial stability. As a priori, it is expected to be positive and statistically significant as stronger regulation and supervision measures are aimed at stabilizing the financial sector.

3.3 Econometric methodology

A variety of time series approaches are used to estimate the parameters of the operational model described in Equations (3.2) to (3.6). To determine the stationarity qualities of the variables, the Augmented Dickey-Fuller (ADF) test is used first to test for unit root of the variables. Although the estimation procedure used in this study – the Autoregressive Distributive Lag (ARDL) technique – does not require pre-testing of the order of integration

of the variables, a unit root test is necessary to rule out the presence of I(2) series, which would cause the ARDL estimation procedure to fail.

3.3.1 The Augmented Dickey-Fuller (ADF) test for unit root

The ADF test for unit root entails the estimation of the following model, which relates the change in variable *y* to its first lagged level, and lagged changes:

$$\Delta y_t = \mu + \delta y_{t-1} + \alpha_1 \Delta y_{t-1} + \alpha_2 \Delta y_{t-2} + \cdots + \alpha_p \Delta y_{t-p} + \epsilon_t \quad (3.7)$$

where y is a vector of the variables used in the study, Δ is the first difference operator, *p* is the optimal lag length and ϵ is the error term. The choice of the optimal lag length of the differenced variable is based on the Akaike Information Criterion (AIC).

After estimating Equation (3.7), the unit root test is done by testing the null hypothesis that $\hat{\delta}$, the coefficient on y_{t-1}, is equal to unity, against the alternative hypothesis that it is statistically less than one or unity:

$$H_0: \delta = 1$$

$$H_1: \delta < 1$$

Using the *t* test on $\hat{\delta}$, a rejection of the null hypothesis leads to the conclusion that the series has no unit root and that it is stationary. In contrast, failure to reject the null hypothesis is indicative of non-stationarity in the variable being examined. The ARDL approach requires that the variables be stationary at the level or after first differencing, that is, be integrated of order 0 or 1 (i.e., *I*(0) or *I*(0)) or both.

3.3.2 The Autoregressive Distributed Lag (ARDL) Bounds Test for Cointegration

The next stage is to check for cointegration, or if the outcome variable (Y) and the covariates have a long-term connection (X). To do this, Pesaran et al. (2001) introduced the widely used ARDL bounds testing approach. The ARDL framework is used to examine a long-term connection between two variables *Y* and *X* can simply be specified as

$$\Delta Y_t = \alpha_0 + \sum_{i=1}^{p} \beta_i \, \Delta Y_{t-i} + \sum_{i=1}^{p} \theta_k \, \Delta X_{t-i} + \alpha_1 Y_{t-1} + \alpha_k X_{t-1} + \varepsilon_t \qquad (3.8)$$

where Y is the dependent variable, X is the vector of all the explanatory variables included in Equations (3.2) to (3.6). *k* is the number of explanatory variables. Δ is the difference operator and ε is error term. The long-run relationship between the variables of interest can be examined by testing the null hypothesis that the coefficients of the one period lagged level of the variables are simultaneously equal to zero (no cointegration): $H_0: \alpha_1 = \cdots = \alpha_k = 0$ against the alternative hypothesis that $H_1: \alpha_1 \neq \cdots \neq \alpha_k \neq 0$. The computed Wald test or *F*-statistic is the compared with the lower and upper critical values produced by Pesaran et al. (2001). The lower and upper critical values, respectively, assume that all variables are *I*(0) and *I*(1). If the calculated *F*-statistic exceeds the upper critical values, the null hypothesis of no cointegration is rejected, and if it falls below the lower critical values, then we cannot reject the null hypothesis of no cointegration. However, the test result is inconclusive if the computed *F*-statistic lies within the two bounds.

When cointegration is established, the final step is to estimate the long-run and short-run parameters that characterized these relationships. The long-run ARDL (*p*, *q*... *q*) model is expressed as:

$$Y_t = \gamma_0 + \sum_{i=1}^{p} \gamma_{1,i} \, Y_{t-i} + \sum_{i=1}^{q} \gamma_{2,i} \, X_{t-i} + \mu_t \qquad (3.9)$$

The short-run error correction model is specified as:

$$\Delta Y_t = \gamma_0 + \sum_{i=1}^{p} \gamma_{1,i}\, \Delta Y_{t-i} + \sum_{i=1}^{q} \gamma_{2,i}\, \Delta X_{t-i} + \varphi ECT_{t-1} + \mu_t \qquad (3.10)$$

where all variables remain as previous defined, p and q are the maximum lag lengths of the respective explanatory variables, and μ_t is the error term. φ is the coefficient of the error correction term (ECT_{t-1}), measuring the speed of adjustment to the long-run equilibrium after a shock to the system. It is expected to be negative and statistically significant, to confirm the presence of cointegration.

CHAPTER FOUR

ANALYSIS AND DISCUSSION OF RESULTS

4.0 Introduction

The empirical findings from the examination of the impact of bank regulation and supervision on financial stability in Ghana are presented and discussed in this chapter. In Section 4.1, the chapter begins with a descriptive analysis of the variables utilised in the study. Section 4.2 presents and discusses the findings of the study of the data's time series characteristics and cointegration tests, while Section 4.3 discusses the key empirical findings on the long-run impacts of bank regulation and supervision on financial stability. Finally, Section 4.4 wraps up the chapter with a review of the findings from the short-run dynamics study.

4.1 Descriptive Analysis

The evolution of Ghana's bank regulatory and supervision indicators is seen in Figure 4.1 during the research period. Prior to the global financial crisis of 2008/2009, bank regulation and oversight had worsened in most of its aspects. In the years preceding up to the global financial crisis, overall limitations on banking operations (insurance, real estate, and securities) varied. In general, its score fell from 10 in 1990 to 8 in 2008-2011, indicating a decreasing trend (which coincides with the global financial crisis). However, the post-crisis period (2012-2018) registered a remarkable increase in the stringency of restrictions on banking activities. This is also consistent with the adoption of stricter or stronger regulatory reforms across the world following the crisis (Anginer et al., 2019). Throughout the pre-crisis era, the index for official supervisory power remained steady at 10, indicating whether

supervisory authorities had the capacity to take particular steps to avoid and remedy issues. However, it tumbled to 7 during the post-crisis epoch, signifying weakening in the regulatory and supervisory power during this period. Such regulatory and supervisory lapses have been cited as one of the triggers of the recent banking crisis in Ghana, which saw the collapse of several local banks (Bank of Ghana, 2018; Nyalatorgbi, 2019)

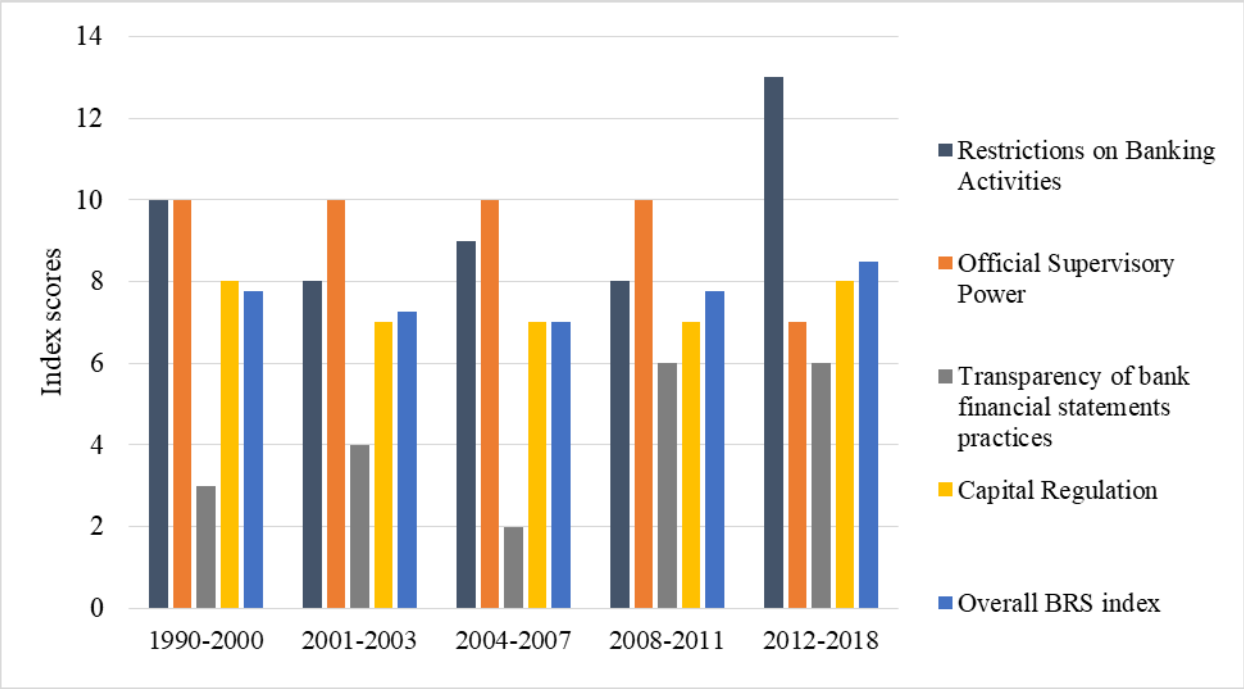

Figure 4. 1: Evolution in bank regulation and supervision in Ghana

Source: Own construction based on the Barth et al (2013) and World Bank's Bank Regulation and Supervision (BRS) Surveys 1, 2, 3, 4 and 5.

Despite improving during 2001-2003, the transparency of practices to bank financial statements declined noticeably during 2004-2007. It however improved during the rest of the period. Capital regulation, which encompasses the stringency of overall and initial capital requirements, deteriorated throughout the pre-crisis period. Capital regulation however

improved during the post crisis era as the Bank of Ghana consistently imposed higher minimum capital requirement (along with other regulatory measures) to protect depositors and promote the efficiency and stability of the financial system. In general, the overall bank regulation and supervision (BRS) index show positive trend over the study period. Although it declined slightly during 2001-2007, regulatory and supervisory responses in Ghana's banking sector have been stronger or stricter since the 2008 global financial crisis.

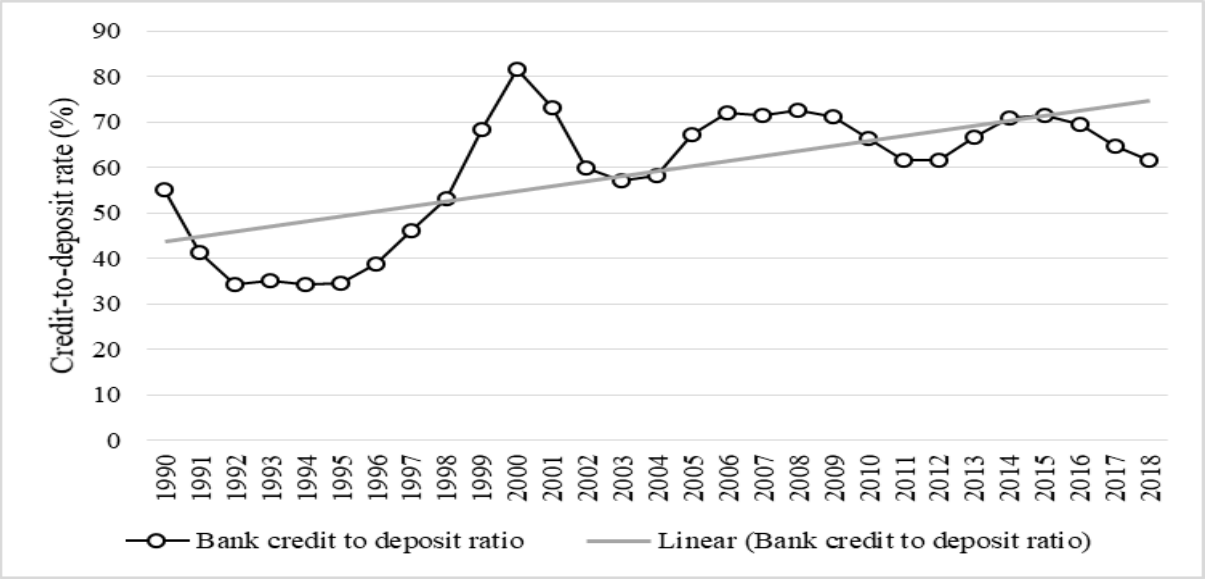

Figure 4. 2: Trend in financial stability: bank credit to deposit ratio (%)

Source: Own construct based on Global Financial Development Indicators

Figure 4.2 shows the development or the trend in bank credit to deposit ratio – the indicator of financial stability used in this study. This ratio shows how much banks lend out of the deposits received or how much of their core funds are used for lending. As a measure of banks financial health, soundness or stability, a very high credit-deposit ratio is considered alarming because it indicates that the loans disbursed are high relative to the deposits, and hints at potential capital or liquidity problems in case unexpected fund requirements (say, a

bank run). Despite showing a general positive trend between 1990 and 2018, Ghana's credit to deposit ratio, expressed in percentages, remained below 100% between 1990 and 2018. This is indicative of a generally stable financial system over the study period. In terms of magnitude, the bank credit to deposit ration averaged 59.318 % during this period, with a minimum of 34.160% in 1994 and 81.702% in 2000 (see Table 4.1).

Table 4. 1: Summary Statistics

Variable	Mean	Std. Dev.	Min	Max
Bank credit to deposit ratio (%)	59.318	13.946	34.160	81.702
Bank regulation & supervision index	6.336	0.355	5.750	7
Restriction on bank activities (3-12)	9.552	1.478	8	13
Transparency of financial statements (0-6)	3.828	1.466	2	6
Capital requirement (0-10)	7.40	0.548	7	8
Supervisory power (0-14)	9.690	0.930	7	10
Corruption index (0-6)	2.584	0.647	1.50	4
Government stability	8.089	1.638	5.333	11
Human capital (years)	2.175	0.166	1.874	2.465
Inflation (%)	19.634	12.058	7.126	59.462
Total crisis	0.724	0.882	0.00	3
Trade openness (%)	75.528	18.891	42.488	116.048

The summary statistics of the other variables employed in the study are reported in Table 4.1. The average corruption index during the period under study is 2.584, which signals that

Ghana is partly corrupt. The index for government stability, another indicator of institutional quality, averaged 8.089. This high value reflects the generally stable political environment that prevails in the country. The average years of education in Ghana, as shown by the human capital index is 2.175 years person. This is relatively low and shows the low level of education for the average Ghanaian. Ranging from 7.126% and 59.462%, the rate of inflation is estimated to be 19.634% on average. The mean value of trade openness is 75.53% over the study period. This high value is indicative of the fact that Ghana's external sector has been highly opened and integrated into the global economy.

4.2 Unit Root Test Results

The results of the ADF unit root tests are reported in Table 4. A variable is said to be stationary (or has not unit root) if the statistical properties of its underlying data generation process do not change over time. Thus, the variable may change over time but the *way* it changes (i.e., its slope or rate of change) does not over time. The stationarity tests were conducted at both the level and first-difference of the variables. The *t*-statistics of the level results show that the null hypothesis of unit root (non-stationarity) is not rejected for all the variables, except for inflation and total crisis index. This implies that only inflation and total crisis index are stationary at the level. However, all the variables achieved stationarity after first differencing, and the null hypothesis that each variable has a unit root is strongly rejected at 1% or 5% significant level. The overall conclusion from these ADF test results is that the variables are mixed integrated (of order 0 and 1), with some being stationary at the level and others after first differencing. Given this finding, the next task is to proceed with the

cointegration test for the presence of a long-term equilibrium relationship between the outcome and explanatory variables.

Table 4. 2: Results of the ADF Unit root test

Variable	Definition (log of ...)	Level	Difference	Conclusion
LNFINSTAB	Financial stability (bank credit to deposit ratio)	-3.162	-4.327**	*I*(1)
LNBRS	Overall index for bank regulation and supervision	-0.7183	-5.245***	*I*(1)
LNACTIVREST	Index for restriction on bank activities	-1.153	-5.243***	*I*(1)
LNFINSTRASP	Index for financial transparency	-2.247	-4.986***	*I*(1)
LNCAPREQ	Index for capital requirement	-1.859	-4.9755***	*I*(1)
LNSUPOWER	Index for official supervisory power	-1.042	-5.563***	*I*(1)
LNCORRUPT	Index for corruption	-1.429	-4.671***	*I*(1)
LNHC	Human capital	-2.563	-4.571***	*I*(1)
LNTRADEOPEN	Trade openness	-2.091	-5.414***	*I*(1)
LNINFLAN	Inflation	-5.412***	-5.559***	*I*(0)
LNGOVSTAB	Government stability	-1.556	-5.926***	*I*(1)
LNTOTCRISIS	Total crisis index	-3.858***	-6.867***	*I*(0)

Notes: The figures are the t-statistics obtained from Augmented-Dickey Fuller unit root test. **, and *** indicate statistical significance at 5% and 1% levels respectively.

4.3 Cointegration Test Results

The bounds test based on the ARDL approach is used to establish the presence of a long-run relationship among the variables. The results of the cointegration test based on the ARDL approach are reported in Table 4.3. The results show a computed F-statistic of 4.42, which exceeds the upper bound critical values at 5% significance level. This result suggests a strong rejection of the null hypothesis of no cointegration or no level relationship financial stability and its determinants. In other words, this provides strong evidence of cointegration and that bank regulation index, corruption, government stability, inflation, human capital, trade openness and total crisis are long-run determinants of financial stability in Ghana. The estimated parameters that characterize this long-run relationship are presented and discussed in the next sub-section.

Table 4. 3: ARDL Bounds Test for cointegration

	Null hypothesis: No cointegration			
Test statistic	value	Significance level	Lower critical bound I(0)	Upper critical bound I(1)
F-statistic	4.42	10%	2.03	3.13
K	7	5%	2.32	3.5
		2.5%	2.6	3.84
		1%	2.96	4.26

4.4 The Long Run Results

The estimated effects of bank regulation and supervision on financial stability in the long run are reported in Table 4.4.

Table 4. 4: The long-run effects of bank regulation and supervision on financial stability

	Dependent variable: LNFINSTAB				
	Overall BRS	Individual components of BRS			
Variable	1	2	3	4	5
LNCORRUPT $_t$	-0.74***	0.20	-0.60***	0.02	0.22
	(0.20)	(0.35)	(0.13)	(0.21)	(0.39)
LNHC $_t$	2.79***	3.43***	1.86***	0.49	3.65*
	(0.70)	(1.13)	(0.71)	(1.34)	(1.69)
LNTRADEOPEN $_t$	0.39**	-0.61	0.45**	-0.12	-0.63
	(0.18)	(0.51)	(0.18)	(0.33)	(0.57)
LNINFLAN $_t$	0.03	0.05	-0.09	-0.13	0.02
	(0.07)	(0.14)	(0.06)	(0.08)	(0.16)
LNGOVSTAB $_t$	0.36	1.96**	0.41	1.63**	2.02*
	(0.31)	(0.86)	(0.28)	(0.58)	(0.96)
LNTOTCRISIS $_t$	-0.14	-0.19	0.08	0.11	-0.17
	(0.12)	(0.19)	(0.08)	(0.09)	(0.21)
LNBRSINDEX $_{t-1}$	2.11**				
	(0.82)				
LNACTIVREST $_{t-1}$		-0.29			
		(0.344)			
LNFINTRANSP $_{t-1}$			0.33***		
			(0.10)		
LNCAPREG $_{t-1}$				0.68**	
				(0.24)	
LNSUPOWER $_{t-1}$					0.24
					(0.65)
Constant	-2.12	-2.49	2.14*	1.18	-3.94
	(1.55)	(2.53)	(1.12)	(1.99)	(4.35)
R-squared	0.97	0.96	0.97	0.98	097
Adjusted R-squared	0.94	0.94	0.95	0.96	0.94
Observations	29	29	29	29	29

The results in model 1 are based on the overall measure of bank regulation and supervision as the main explanatory variable of interest. The remaining results in models 2–5 correspond to each sub-component of bank regulation and supervision.

From model 1, the coefficient of the overall BRS is positive and statistically significant. This suggests that bank regulation and supervision exert positive and significant effect on financial stability in the long run. In other words, regulatory and supervisory measures significantly promote financial stability. The size of the estimated coefficient is 2.11. This implies that a 1% increase in the strictness of bank regulation and supervision leads to a 2.11% increase in financial stability in Ghana (approximated by the bank credit to deposit ratio). This result is consistent with both theoretical expectations as well as available empirical evidence. For instance, Barth et al. (2004) show that bank regulation and supervision, especially capital regulations, enhance bank stability.

Displayed in models 2–5 are the estimated long-run effects of the individual components of bank regulation and supervision on financial stability. As revealed by the results, all the dimensions exert positive effects on financial stability in the long run, except restrictions on bank activities. Though negative, the effect of restrictions on bank activities is not statistically significant. Both the transparency of practices related to bank financial statement and capital regulation are found to be the most significant drivers of financial stability in the long run. In terms of magnitude, the results show that a 1% increase in the financial transparency is estimated to increase financial stability by 0.33%. Relatedly, a 1% increase in the stringency

of capital regulation is found to increase financial stability by 0.68%. The effect of supervisory power, though positive, is not statistically significant.

These results show that bank regulation and supervision play an important role in fostering stability or averting systematic failure in Ghana's financial sector. Thus, the regulatory and supervisory measures or reforms implemented in the past have contributed significantly to been instrumental in stabilizing the financial sector in the long run-in spite of the recent banking crisis. Of these regulatory reforms, capital regulation and transparency in bank financial statements practices are found to be the main drivers behind the stability-enhancing effects of bank regulation and supervision in Ghana. The more stringent the initial and overall capital requirement the more stable the financial sector is in the long run. This is because capital regulation ensures that banks have enough capital (liquidity) in relation to their assets to honour withdrawal requirements, whilst sustaining operation losses. It also prevents banks from engaging in financially irresponsible behaviours that leave them undercapitalized, and the entire financial system vulnerable to unforeseen shocks. Barth et al. (2004) also found similar results in their study on the relationship between specific regulatory and supervisory practices and banking-sector development, efficiency, and fragility in 107 countries across the world. Their results showed that restrictions on bank activities affect negatively bank development, while capital regulations enhance bank stability (Barth et al., 2004). Similarly, Klomp and de Hann (2015a) also found that stricter regulation and supervision, notably capital requirements and supervisory control diminish banking risk.

Similarly, increased transparency in the financial reporting of banks ensures full disclosure of important information regarding the banks' activities, financial position, and financial performance. By reducing information asymmetry and its associated risks, increased transparency strengthens market discipline and enhances financial stability.

Aside the regulation and supervision, the effects of some economic and institutional factors have been accounted for. Focusing on model 1, the main results show that corruption, human capital (education), and trade openness exert significant effects on financial stability in the long run. All other factors being equal, an increase in the corruption index of 1% is expected to reduce financial stability by 0.74 percent. This means that weak institutions, such as corruption, represent a serious danger to Ghana's financial sector's stability. This finding suggests that regulatory capture in the banking and finance industry might have a negative impact on financial stability. This conclusion is also consistent with prior research that shows that corruption has a detrimental impact on bank inefficiencies (Chortareas et al., 2012), as well as bank profitability and stability (Asteriou et al., 2021). On the plus side, Bermpei et al. (2018) found that reducing corruption improves the stability-enhancing effect of activity limitations.

Furthermore, education is also shown to be a robust determinant of financial stability in the long run. From the results in model 1, a 1% increase in human capital (or the years of education) results in a 2.79% increase in financial stability in the long run. In line with findings from elsewhere, this result points to the beneficial of education in enhancing

financial stability by improving people's financial literacy, which encompasses financial knowledge, skills and behaviours (Reddy, 2019; Yates, 2019).

In addition, trade integration is found to be another significant driver of financial stability in the long run. In particular, a 1% in the degree of trade openness is estimated to increase the extent of financial stability by 0.39%. This can be explained by the view that higher trade openness (an indicator of globalization) increases competition and promotes diversified investment opportunities to banks. In a related study, Rahman et al. (2020) showed that trade openness has a beneficial impact on financial sector stability by increasing spread venture facilities and reducing the probability of bank risk-taking.

With respect to the other control variables, while inflation and government stability had positive effects on financial stability, total crisis had a negative effect on financial stability. However, none of them is statistically significant. This implies that, taken individually and given the sample at hand, there is no evidence that variations in inflation, government stability and frequency of crisis significantly affect Ghana's financial stability in the long run.

4.5 The Short Run Results

The results of the short run estimation for model 1 are shown in Table 4.5. The pace of adjustment towards the long-run equilibrium as a result of changes in the variables of financial stability is captured by the coefficient of the error correction term (ECM). The coefficient of ECM (-0.652) is both negative and statistically significant, according to the findings. This means that a 65.2 percent correction is made in the present period for a

divergence from the long run in the preceding period. This also confirms the presence of cointegration or a long-run relationship between financial stability and its determinants. Similar results are obtained for models 2-5, which are reported in appendix for the sake of brevity.

Table 4. 5: Short run results

Variable	Coefficient	Std. Error	t-Statistic
$\Delta LNBRSINDEX_{t-1}$	0.004	0.482	0.009
$\Delta LNCORRUPT_{t}$	-0.242	0.135	-1.791*
$\Delta LNHC_{t}$	10.752	4.225	2.545**
$\Delta LNTRADEOPEN_{t}$	0.256	0.128	1.998*
$\Delta LNINFLAN_{t}$	0.017	0.046	0.365
$\Delta LNGOVSTAB_{t}$	0.236	0.193	1.224
$\Delta LNTOTCRISIS_{t}$	-0.015	0.057	-0.261
ECM_{t-1}	-0.652	0.112	-5.826***

The results show that overall bank regulation and supervision (BRS index) has a positive effect on financial stability in the short run. However, it is not statistically significant. This shows that while the regulatory and supervisory reforms may have positive impact on the stability of the financial sector, such beneficial effects are not realized (or significant) in the short run, possibly because of time lag between the implementation of policy measures and when they actual have the desired impact. The short run effects of corruption, human capital

and trade openness are statistically significant. Corruption negatively affects financial stability, which is also consistent with the long run results. Similarly, improvement in human capital (education) is found to significantly increase financial stability in the short run. Trade openness also exerts a positive and significant effect on financial stability in the short run. These results show that improvements in both education and trade openness have beneficial impacts on financial stability both in the short run as well as long run. The effects of other covariates, namely inflation, government stability and frequency of crisis, remain statistically insignificant. The findings are consistent with the long run findings.

Table 4. 6: Model diagnostic tests

PANEL A: Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.115094	Prob. F(2,19)	0.3484
Obs*R-squared	2.939978	Prob. Chi-Square(2)	0.2299
PANEL B: Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.420680	Prob. F(12,14)	0.9298
Obs*R-squared	7.155559	Prob. Chi-Square(12)	0.8472
Scaled explained SS	0.991636	Prob. Chi-Square(12)	1.0000

PANEL C: Ramsey RESET Test

Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.400806	13	0.6951
F-statistic	0.160645	(1, 13)	0.6951

To assess the validity of the results for policy inference, several diagnostic checks are conducted based on Model 1. The tests result for serial correlation, heteroscedasticity and model specification are provided in Table 4.6. The test results in panels A, B, and C indicate the absence of serial correlation, heteroscedastic residuals/errors, and model misspecification respectively. This conclusion is based on the fact that their probabilities (*p* values) exceed the 5% significance level. This suggests the absence of significant evidence to reject the null hypotheses that the errors are serially correlated (Panel A), homoscedastic (Panel B) and the model is correctly specified and has no missing variables (Panel C).

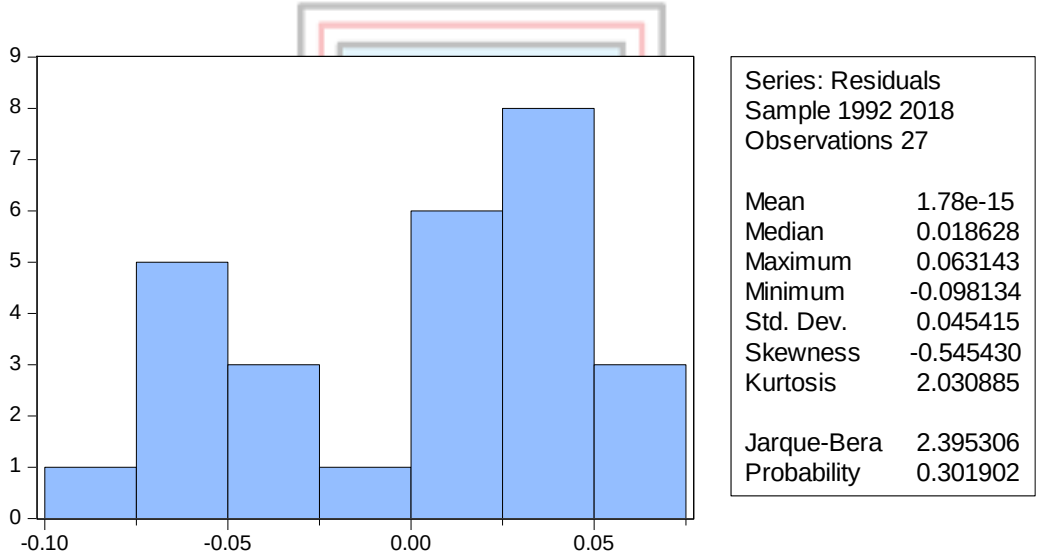

Figure 4. 3: Normality test for the residuals

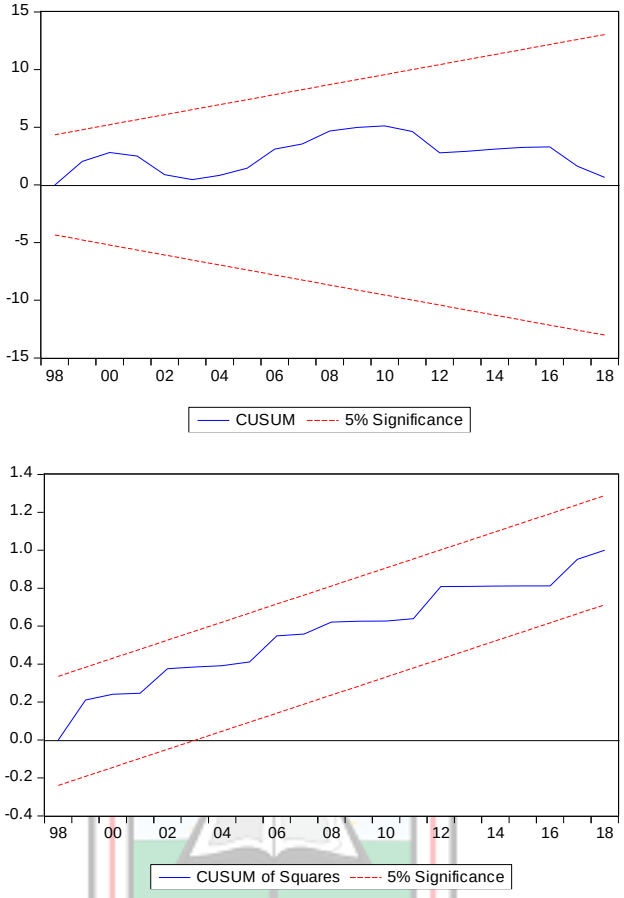

Figure 4. 4: CUSUM and CUSUMSQ tests for stability

Figures 4.3 and 4.4 also assess the normality and stability of the residuals respectively. The p-value of the Jarque-Bera statistic of 2.395 is 0.302, which is larger than the 0.05 significance level, as shown in Figure 4.3. This shows that the null hypothesis that the residuals are normally distributed is not rejected, indicating that the student t statistics may be used to assess the statistical significance of the estimated long and short run models. Lastly, the graphs in Figure 4.4 show that the cumulative sum (CUSUM) and cumulative sum squared (CUMUSQ) of the residuals (from model 1) lie within the 95% confidence bands. This shows that the residuals are stable over time and there is no structural break during the period of study. In conclusion, these results suggest that the estimated model has passed all the diagnostics

tests and that the estimated results are consistent. Hence, they can be used to draw inference for policy decisions.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

The study's major findings and their implications for Ghana's financial stability are summarised in this chapter. Section 5.1 contains a summary of the major results. Section 5.2 discusses the policy implications of these findings and makes some policy suggestions. Section 5.3 discusses the research's shortcomings and makes recommendations for future research.

5.1 Summary of Key Findings

In light of decades of financial sector changes and the country's current banking crisis, this research will conduct an empirical examination of the impact of bank regulation and supervision on the financial system's stability. Using time series data spanning 1990-2018, the study quantifies the overall and stand-alone impacts of regulatory and supervisory initiatives on financial stability in Ghana. A preliminary analysis of the trend in the indicators indicates that overall bank regulation and supervision have become stronger or stricter over time, particularly since the onset of the global financial crisis, as the regulatory and supervisory authority (the Bank of Ghana) works to fulfil its mandate of protecting depositors and ensuring the financial system's soundness and stability. Despite fluctuations over time, trend analysis indicates an overall rising tendency in the bank loan to deposit ratio — a proxy for financial soundness. In other words, the descriptive study demonstrates that the financial sector's stability and general development have improved through time. The study

experimentally assessed the long-run effect of bank regulation and supervision on financial stability using econometric approaches, considering the influence of other economic and institutional factors. Outlined below are a summary of key findings from empirical analysis:

1) The results disclose that there exists a long run relationship between financial stability, bank regulation and supervision and other explanatory variables. In other words, bank regulation and supervision, inflation (macroeconomic stability), corruption and government stability (institutions), trade openness (globalization), human capital (education) and past crisis are jointly significant determinants of financial stability in the long run.
2) It is found, most importantly, that overall bank regulation and supervision exert a positive and statistically significant impact on financial stability in Ghana in the long run. This provides evidence that the financial regulatory and supervisory measures pursued in the past have contributed significantly to improving the stability of Ghana's financial sector during the study period.
3) Furthermore, the results suggest that, of the eclectic financial regulation reforms implemented, capital regulation and transparency in financial reporting are the most significant drivers of financial stability in Ghana.
4) In line with the theory of regulatory capture, the results show that corruption exerts a significantly negative effect on financial stability in both the long run and short run.
5) Both human capital (education) and trade openness (an indicator of trade policy stance) are found to significantly foster financial stability in Ghana.

6) Lastly, the results show evidence that inflation, government stability, and total crisis (frequency of crisis) had any statistically significant impact on financial stability in Ghana over the study period.

5.2 Conclusions

In the aftermath of the global financial crisis, several countries across the world have extensively begun to prioritize financial stability through strong regulation and supervision of the financial sector. Despite being able to successfully weather this storm, largely because of limited integration of the economy in the global market, Ghana's financial sector has suffered a severe banking crisis in recent years. This resulted in the collapse of several local banks and threatened the soundness and stability of the entire financial sector. This necessitated a costly banking cleanup exercise, with the government investing about 20 billion Ghana Cedis ($3.5 billion) to bail-out the distressed banks, protect customer deposits, and stabilize the financial sector. While the exercise yielded the desired results in terms of improving key financial soundness indicators (solvency, liquidity, efficiency, and asset quality), the crisis has re-ignited the debate on the role of banking regulation and supervision in enhancing the stability and soundness of the sector. This is particularly interesting in the Ghanaian context because the Bank of Ghana identified poor banking practices and regulatory and supervisory failure among the causes of the crisis.

Although the legislative and regulatory framework that supports the banking industry in Ghana has been enhanced by the reforms and measures implemented over the years, there is limited evidence on the effects bank regulation and supervision on financial stability in the

country. Previous studies on financial development in Ghana focused on such dimensions as financial deepening, efficiency, and access. The main goal of this study is to fill this knowledge gap by investigating the drivers of financial stability in Ghana, with a particular focus on bank regulation and supervision. The study also aimed to identify the specific aspects of bank regulation and supervision that matter the most for financial stability in Ghana.

To accomplish this, the study utilized a macro-level annual time series data covering the period 1990-2018 on financial development, bank regulation and supervision and other economic and institutional variables, collated from the World Bank and other secondary sources. The quantitative methods used involved the establishment of cointegration and estimation of the associated long run (and short run) relationship between financial stability and its determinants. Specifically, the study applied the ARDL approach to accomplish these estimation tasks.

The study results provide strong evidence that overall bank regulation and supervision contributes significantly to fostering financial stability in Ghana. After disaggregating the composite index, the study finds that capital regulation and transparency in financial statement practices exert the strongest (positive and statistically significant) impact on financial stability in Ghana. Consistent with the theory of regulatory capture, the study finds that corruption adversely affects financial stability in Ghana. Finally, increase in both human capital (education) and trade openness are also found to be instrumental in boosting financial stability in Ghana over the study period. In the light of these findings, the study provided

some important policy implications and recommendations to consolidate and sustain the gains chalked so far in stabilizing the financial sector in Ghana.

5.3 Policy Implications and Recommendations

The findings outlined above hold important implications for policies targeted at achieving financial stability in Ghana. Discussed below are the policy implications and recommendation from the findings of the study.

To begin, this research shows evidence that bank regulation and supervision have a beneficial and considerable impact on Ghana's financial stability. As a result, improving bank regulation and supervision can have a major positive influence on Ghana's financial sector's stability. The findings reveal that policies linked to capital regulation and financial statement transparency have the greatest influence on financial stability in Ghana. Poor banking practises, as well as weak supervision and regulation by the Bank of Ghana, were among the underlying causes of Ghana's recent banking crisis. Based on these findings, it is recommended that the Bank of Ghana take the necessary steps to strengthen supervision and compliance across the industry with its regulatory measures, particularly those related to capital requirements and financial statement transparency, in order to consolidate and sustain the economy.

Secondly, the study results provide evidence that corruption is a significant drag on the central bank and government’s effort to achieving stability in the financial sector. Reversing this calls for anti-corruption regulatory and non-regulatory measures to effectively counter corruption and promote integrity and transparency within the banking industry and financial sector at

large. This can be achieved by instituting and strongly enforcing anti-bribery rules, anti-money laundering rules, and deploying tools that counter banking secrecy. These rule-based methods can be coupled with codes of conduct which offer clear guidelines on ethical dilemmas to employees, provision of incentives for maintaining integrity and careful handling of conflicts of interest, as well as public oaths to foster a culture of integrity in banks and financial institutions. Overall, these anti-corruption measures should be complemented with strong oversight and measures to unlawful financial behaviours are effectively dealt with.

In addition to the above, the results show the education is another significant driver of financial stability in Ghana. While education, especially financial literacy may not be a sufficient condition for financial stability, uninformed or financial illiterate investors (or customers) may take excessive risks, which may threaten the stability of the financial system. In this sense, well-designed educational programmes by the central bank and academic institutions to promote financial literacy or improve financial knowledge will be instrumental in mitigating excessive risk-taking behaviours and fostering financial stability in the long run.

Lastly, based on the finding the trade openness have significant beneficial effect on financial stability, it is recommended that policies that remove or limit restrictions on cross-border trade and financial flows, and thus foster integration into the global economy, be adopted or promoted. This is because increased trade integration (openness) has the potential to increase efficiency in the allocation of capital through diversification of investments across local and international markets, to improve market liquidity due to inflow of external capital, as well as

to improve financial stability by lowering the likelihood of asymmetric shocks and enhancing the capacity of the entire financial system to absorb shocks.

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APPENDIX

PANEL A: RESTRICTION ON BANK ACTIVITIES

Variable	Coefficient	Std. Error	t-Statistic	Prob.
$\Delta(LNACTREST)_{t-1}$	-0.122845	0.137393	-0.894119	0.3854
$\Delta(LNCORRUPT)_{t}$	0.087622	0.140405	0.624066	0.5420
$\Delta(LNHC)_{t}$	1.471662	0.392961	3.745060	0.0020
$\Delta(LNTRADEOPEN)_{t}$	-0.015944	0.144599	-0.110263	0.9137
$\Delta(LNINFLAN)_{t}$	0.054079	0.049979	1.082029	0.2963
$\Delta(LNGOVSTAB)_{t}$	0.378639	0.247010	1.532888	0.1461
$\Delta(LNTOTCRISIS)_{t}$	-0.016918	0.058307	-0.290162	0.7757
ECM_{t-1}	-0.428462	0.100667	-4.256235	0.0007

PANEL B: FINANCIAL TRANSPARENCY

Variable	Coefficient	Std. Error	t-Statistic	Prob.
$\Delta(LNFINTRANSP)_{t-1}$	0.030319	0.065591	0.462244	0.6505
$\Delta(LNCORRUPT)_{t}$	-0.129897	0.111920	-1.160621	0.2639
$\Delta(LNHC)_{t}$	6.315879	3.273720	1.929267	0.0728
$\Delta(LNTRADEOPEN)_{t}$	0.289608	0.130071	2.226535	0.0417
$\Delta(LNINFLAN)_{t}$	-0.057393	0.040737	-1.408855	0.1793
$\Delta(LNGOVSTAB)_{t}$	0.262857	0.165952	1.583940	0.1341
$\Delta(LNTOTCRISIS)_{t}$	0.052517	0.049989	1.050587	0.3101
ECM_{t-1}	-0.637022	0.108574	-5.867144	0.0000

PANEL C: CAPITAL REGULATION

Variable	Coefficient	Std. Error	t-Statistic	Prob.
$\Delta(LNCAPREQ)_{t-1}$	-0.064271	0.066600	-0.965023	0.3521
$\Delta(LNCORRUPT)_{t}$	0.011213	0.105468	0.106320	0.9170
$\Delta(LNHC)_{t}$	-5.914639	4.602406	-1.285119	0.2212
$\Delta(LNTRADEOPEN)_{t}$	0.166794	0.131033	1.272911	0.2253
$\Delta(LNINFLAN)_{t}$	-0.016898	0.038590	-0.437881	0.6687
$\Delta(LNGOVSTAB)_{t}$	0.482689	0.207142	2.330230	0.0365
$\Delta(LNTOTCRISIS)_{t}$	0.054436	0.049798	1.093145	0.2942
ECM_{t-1}	-0.504956	0.093745	-5.386508	0.0001

PANEL D: OFFICIAL SUPERVISORY POWER

Variable	Coefficient	Std. Error	t-Statistic	Prob.
$\Delta(LNSUPOWER)_{t-1}$	-0.178408	0.290031	-0.615134	0.5500
$\Delta(LNCORRUPT)_{t}$	0.027983	0.159942	0.174955	0.8640
$\Delta(LNHC)_{t}$	2.490564	4.614278	0.539752	0.5992
$\Delta(LNTRADEOPEN)_{t}$	-0.007319	0.154705	-0.047311	0.9630
$\Delta(LNINFLAN)_{t}$	0.050007	0.054088	0.924541	0.3734
$\Delta(LNGOVSTAB)_{t}$	0.314534	0.274096	1.147531	0.2735
$\Delta(LNTOTCRISIS)_{t}$	-0.019672	0.061130	-0.321809	0.7531
ECM_{t-1}	-0.433473	0.123375	-3.513463	0.0043

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