

UNIVERSITY OF GHANA

**AN ANALYSIS OF CREDIT RISK ASSOCIATED WITH BANKING
SECTOR DEREGULATION IN WEST AFRICA**

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**THIS LONG ESSAY IS SUBMITTED TO UNIVERSITY OF GHANA,
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DECLARATION

I hereby declare that this submission is my own work towards the MSc. Development Finance degree and that to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any degree of the University, except where due acknowledgement has been made in the text.

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DEDICATION

I dedicate this work to my parents who have been the source of my motivation

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ABSTRACT

The study uses data spanning from the period 1996-2017 with random effect model to investigate the impact of credit risk on banking sector deregulation in West Africa. Two main objectives were addressed. First, the determinants of credit risk. Second the effect of credit risk on banking sector deregulation. The key determinants of the credit risk include return on equity of banks, financial system deposit to GDP ratio and bank assets to GDP ratio. The findings show that return on equity positively and significantly increases credit risk of banks in West Africa. However, we find that financial system deposit and bank assets to GDP negatively and significantly reduce credit risk in West Africa. We did not find any significant impact of macroeconomic indicators such as gross domestic product and inflation in our model. With respect to the impact of credit risk on deregulation, the study finds positive and significant effect of credit risk on deregulation in West Africa. This means that higher credit risk could necessitate deregulation of the financial sector in West Africa. Other bank specific variables we found to relate positively and significantly with deregulation include liquid liabilities to GDP, net interest margin and bank z-score. Similarly, the inclusion of the macroeconomic variables into the model improves on the performance of the model. The liquid liabilities as a percentage of GDP became positive and significant as well. The study makes some useful recommendation for policy and future research direction.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Over the past few decades, many developing countries have focused on reducing or eliminating government control in the financial services sector. The major purpose was to stimulate economic development through removal of controls on interest rates and the allocation of credit and also encourage competition, efficiency and innovation within the sector (Pill & Pradhan, 1997). In another study by Abbas and Malik (2008) they showed that following state-level deregulation of the banking sector in Pakistan, the sector became more competitive with the introduction of innovative products in retail banking mainly to attract customers. In effect banks were able to enhance earnings by lowering their cost of funds generation. Also, Stiroh and Strahan (2003) demonstrated that following the removal of state-level restrictions on branch expansion, the United States' economic boom accelerated. In addition to faster growth, macroeconomic stability improved with interstate deregulation of the banking sector.

However, Isibor, Ojo and Ikpefan (2017) argued that deregulation on its own does not necessarily translate to better performance by the banks, except when it is combined with other regulatory policies focused on promoting financial inclusion and protecting the interests of consumers. In addition, De Grauwe (1987) mentioned that following the economic challenges faced by governments of developing countries in exercising policies in favour of financial repression (the opposite of financial deregulation), there is now a widespread consensus among development economists of the macroeconomic benefits developing countries stand to gain from liberalizing their financial markets given that there are appropriate policies to protect the consumer from the effects of market failures.

The era of unfettered government intervention in the economy led in many situations to economic inefficiency rather than enhancing market performance (Stiglitz, 1998, cited in Adams & Agbemade, 2012), In addition, the socioeconomic environment prevailing in many of the developing countries under a financially repressive regime gave proof to the claim that distortions in interest and foreign exchange costs from government intervention could limit the real size of the financial system and by extension, economic growth (Shaw & McKinnon, 1973, cited in Adams & Agbemade, 2012) In effect financially repressive policies contributed to the retardation of the economic development process in many developing nations as was once evidenced in Ghana for the duration of the 1970s and the 80s (Antwi-Asare & Addison, 2000). According to Adams and Agbemade (2012), it was in response to the inefficiencies and unfavourable economic costs created through a financially repressive regime that the government was compelled to liberalize the financial system. The liberalization programme sought to deepen financial markets and additionally to promote economic growth.

In the early 1980s the wave of government control in the financial sector in most Africa countries began to fall due to the adoption of the Financial Sector Adjustment Programme (FINSAP). The weaknesses in the banking sector such as low competition, weak financials, low profitability, high non-performing loans (NPLs) and mortgages, poor liquidity of banks, low level of technology and low capital base was addressed through the financial sector adjustment program (Nabieu, 2013). According to Ackah and Asiamah (2014), Ghana's financial sector reforms have yielded many gains for the country's financial system. Today the country has a more diversified financial system as a result of the privatization of state-owned banks and the increased competition introduced by the influx of several new banks many of which are foreign-owned banks. In addition, the country's banking industry has evolved to accommodate changes in the global and domestic macroeconomic environments along with technological and financial innovation.

The banks across the West African region have gone through various forms of liberalization with most countries making changes to their laws regarding the entry of foreign-owned banks. This has allowed many banks to expand into other countries within the West African region. Following the consolidation of banks in Nigeria in 2005, which saw the reduction of the banks from 89 banks to nearly 25 banks, the banking sector was strengthened thereby positioning some 14 Nigerian banks to be among the global top 1000 banks. During this period, Nigerian banks that needed offshore licensing required a minimum of \$636 million as capital. This led to most of the Nigeria banks such as Access bank, Zenith bank, United Bank for Africa, GT Bank and others expanding into other West African countries. These banks also made inroads in other parts of Africa and the world as a whole. Seeing the success of this, Ghana followed suit by increasing the minimum capital requirements in 2009 from GHS7 million to GHS60 million. It was again raised to GHS120 million and with the recent re-capitalization of banks in 2018, it was pegged at GHS400 million. These revisions in banking capitalization are meant to make the banks sound and resilient for a successful take off in transforming the economy. Furthermore, in consolidating gains made in creating a robust banking sector, The Bank of Ghana set up a process to develop a framework of risk-based approach to supervision with a sharp focus on solvency and understanding the financial conditions of the individual banks. The aim of this is to ensure that Bank of Ghana better assesses the risks faced by the banks and be proactive in forestalling emerging problems in the banking industry. Apart from Ghana and Nigeria, other countries within the West-African sub-region have made various strides in developing their banking sectors since banks serve as the life blood of the economy. Ahmad & Burki (2016) described financial deregulation as measures focused on allowing interest rates to be determined by market forces, promoting development of financial institutions, extending credit and deposit facilities, developing secondary markets for financial

instruments and encouraging competition among financial institutions. Chigbu, Ubah and Chigbu (2016) described deregulation in the petroleum sector as reducing the role of government as the owner and operator of assets in the sector while maintaining an active role as a policy maker and regulator. In applying this to the financial sector, this means a reduced government presence coupled with its role of protecting public interest within the financial sector. Merriam-Webster's Dictionary defines deregulation as the act or process of removing restrictions and regulations. The Oxford Dictionary defines it as the removal of regulations or restrictions, especially in a particular industry. Izibili and Aiya (2007) cited in Kuye (2012) defined deregulation as doing away with the regulations concerning financial markets and trades. Eme and Onwuka, (2011) explained deregulation in the economic sense as allowing market forces to determine prices. Semaan and Drake (2011) postulated that in theory deregulation has to do with opening up an industry to competition. According to them, this competition should stimulate innovation and the development of products that benefit customers.

For the purpose of this study, deregulation means either the partial or total withdrawal of government controls in the provision of banking and financial services and allowing the private sector to be the driver of banking sector growth. The intent of deregulation is normally to encourage competition. In theory, deregulation opens an industry to competition and this competition should stimulate innovation and the improvement of products that benefit customers. Researchers have examined the modifications in risk that takes place in the deregulation of the airline, trucking, telecommunication, and financial services, among other industries (Semaan & Drake, 2011). This study evaluates the investment risks (with a particular emphasis on credit risk) that arose after the deregulation of the financial sector of West African Countries.

1.2 Statement of the Problem

The financial sector plays an important role in the economy through the facilitation of payments, the mobilization of savings and the allocation of funds to the various economic agents namely governments, firms and investors and households to embark on various economic activities (Abbas & Malik, 2008). In effect, the financial sector is of vital importance for a country's growth and development (Antwi-Asare & Addison, 2000).

According to Balago (2014) regulation of the financial system matters for the rest of the economy since the realization of downside risks like liquidity and insolvency crisis would adversely affect the real sector as was witnessed during the Global Financial Crisis. Indeed, financial industry risk has increased with the expansion of banks into other activities such as securities markets, fund management, insurance, among others, obscuring the distinction between banks and other financial markets (Moyo, Nandwa, Oduor & Simpasa, 2014). According to Moyo et al., (2014), it is projected that through liberalization reforms, banks can potentially be the central source of financial innovation and efficiency or, in a worst-case scenario, as a source of systemic risk to the financial structure through contagion, thus engendering macroeconomic instability and diminished investment and growth. This position is also supported by Korinek and Kreamer (2014) who mentioned that the financial risk-taking activities of banks in their quest to earn higher returns under a liberalized regime could hurt the real economy. According to them, if the financial sector undergoes large losses and finds itself short of capital, it will enforce large negative externalities on the rest of the economy. It will no longer be able to accomplish its role of mobilizing savings into productive investments and spending opportunities, resulting in a credit crunch and a decrease in economic output.

Soedarmono (2011) in his dissertation on *“Bank Risk and Financial Intermediation of Banking Reforms in Emergent Economies”* acknowledged that contemporary financial crisis was mostly triggered by financial sectors within a liberalized regime. According to him, this development cannot also be detached from the collapse of Bretton Woods’s system in 1971 and financial complications of the oil price shocks in 1973 that have made more attractive both international capital markets and less controlled emergent economies. According to Soedarmono, Machrouh and Tarazi, (2011) the 1997 Asian financial crisis cast doubts on the process of uncontrolled financial liberalization and its implications for the economy as a whole. According to Sachs & Woo, 2000, cited in Soedarmono et al., (2011), within the Asian Financial context, financial liberalization had resulted in aggressive bank competition on the credit market creating bubbles notably in the real estate market. In fact, Bentley (2015) had stressed that deregulation was at the core of the 2008 financial crisis.

Existing literature have acknowledged the growing research interest to unravel the complex relationship between deregulation and financial industry development. Yet, research gaps still exist in the area of financial sector deregulation and credit risk especially within Sub-Saharan Africa: most of the studies did not factor the relationship between deregulation and credit risk. On deregulation for instance, Eme and Onwuka (2011) reflected the political economy of deregulation policy in Nigeria. But, their concern was on the deregulation of the downstream oil and gas industry. Isibor et al., (2017) looked at financial sector deregulation in Nigeria, but their focus was on the long-term relationship between financial deregulation, investment growth and economic development. Antwi-Asare and Addison (2000) looked at financial sector reforms and bank performance in Ghana. However, in measuring bank performance, they focused on measures of profitability such as Return on Assets before Tax (ROA), Return on Earning Assets (ROEA) and Return on Shareholders’ Funds (ROSHF). In addition, their

data was from 1981 to 1996. Adams and Agbemade (2012) in their paper on financial liberalization and banking sector performance in Ghana used the size of firms in relation to the industry and their profitability ratios namely ROA and Return on Equity (ROE) as a measure of bank performance. Ackah and Asiamah (2014) looked at Financial Regulation in Ghana with a focus on balancing inclusive growth with financial stability. Among these studies no single study has tried to examine how credit risk affects deregulation. This study therefore adds to the literature by examining the factors that affect credit risk in the West African Sub-region. It also contributes to the literature by examining the effect of credit risk on deregulation of the banking sector in West Africa. This is because the banking sector in African has undergone a lot of reforms which include implementing the various forms of Basel accords. Some countries in West African have implemented Basel I & II respectively and these reforms have yielded some positive results. Since risk is an important component of the Basel accords on Banking Supervision, examining how credit risk affects deregulation in West Africa would be of utmost interest for banks and regulators as well.

1.3 Research Purpose

The main aim of the study is to examine the impact of credit risk on deregulation of banking sector in West Africa.

1.3.1 Research Objectives

In achieving the broader aim of the study, the following objectives would be addressed

- i. To assess the factors that influence credit risk of the banking sector in West Africa.
- ii. To examine the effect of credit risk on deregulation of the banking sector in West Africa.

1.4 Research Question

The following research questions have been formulated to guide the investigation of the specific objectives:

- i. What are the critical factors that affect credit risk in the deregulation of the West African banking sector?
- ii. To what extent can credit risk impact on banking sector deregulation in West Africa?

1.5 Significance of the Study

Kutsienyo (2011) has hypothesized that the existence of banks as well as non-bank financial institutions, coupled with efficient money and capital markets keep the financial system complete. Also, he stipulated that these institutions enrich the overall growth of the economy. According to him, financial institutions play the role of financial intermediation by collecting and mobilizing resources to finance business and development projects that are essential for economic development.

The financial sector of developing economies is dominated by banks. The exposure of these banks to industry risks such as credit risks arising from a deregulated regime poses a threat to the macroeconomic stability of these developing countries. Therefore, it is suitable to embark on this study, to address the research gap in order to provide an understanding of the relationship between credit risk and financial deregulation in West Africa and proffer some solutions as to how to manage these risks. Basically, the study will provide cognizance of the key constituents of risks and also provide stakeholders in the financial sector with an understanding of the critical areas that need their attention. In terms of theory, this research will add to current theories on the subject of credit risks.

Also, this research will add to existing knowledge in academia and industry by serving as a reference for future research into the subject of risks in relation to the financial sector under a liberalized financial regime. The study will also make available to key stakeholders and policymakers, adequate information to regulate the sector to the advantage of all.

1.6 Scope and limitation of the Study

Although, the financial sector comprises commercial banks, rural banks, non-banking financial institutions including finance houses, savings and loans, leasing and mortgage firms, insurance companies, investment banks and the pension schemes, this research will focus on the banking sector deregulation in West Africa. Specifically, data will be taken from 1996 to 2017 among the 16 West African States. The study will seek to investigate the determinants of credit risk in the West African banking sector as well as the effect of the risk on deregulation in West Africa.

1.7 Organization of the Study

The study is organized into five chapters. Chapter one is the general introduction where the background to the study is laid out, statement of the problem, research objectives, research questions and significance of the study are outlined. Chapter two reviews related literature to the study. These include reviews of theoretical and empirical literature related to deregulation, investment risks (including credit risk) and the financial industry. The third chapter is dedicated to the presentation of the methodology used in the study. The fourth chapter presents the analyses and discussion of results while conclusions and recommendations constitute the chapter five of this study.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter focuses on the review of literature related to the subject matter. Specifically, the chapter concentrates on the overview of literature related to the financial sector reforms in Africa including the concepts of credit risk and deregulation. It also reviews the theoretical framework of deregulation and credit risk. Empirical review is provided on the determinants of credit risk as well as the impact of credit risk on financial sector deregulation in West Africa. Conclusion is drawn from the chapter to present the research gap of previous studies.

2.2 Concept of Credit Risk and Deregulation

In this section we provide the conceptual explanation of concepts used in this study. We provide different scholars' definitions of credit risk as well as deregulation. Details of this are discussed below.

2.2.1 Concept of Credit Risk

The concept of risk and risk assessment has a long history (Aven, 2015). Over 2400 years ago, the Athenians demonstrated their capacity for evaluating risks before making decisions (Bernstein, 1996). But risk assessment and risk management as a scientific field is not more than 40 years old. From this period, we see the first scientific journals, papers and conferences covering basic ideas and principles on how to appropriately assess and manage risk (Yilmaz & Flouris, 2017).

These ideas and principles still form the fundamentals of the field today. They are the building blocks for the risk assessment and management practice we have seen since the 1970s and 1980s. But, the field has grown considerably ever since. New and more refined methods of

analysis and techniques have been formed, and risk analytical approaches and methods are now used in most societal sectors (Aven, 2015).

The term “risk” includes any event that will adversely impact an organization’s ability to achieve its key objectives and perform its strategies successfully (Barton, Shenkir, & Walker, 2002). According to Renn (1992), cited in Vasvári, (2015), a condition for the existence of risk is uncertainty, that the future is not predetermined but is reliant on present human activities. Bernstein (1996) contends for the non-existence of absolute certainty, stating that one can never be assured of anything, since the majority of available information is either inaccurate or incomplete. Knight (1964) describes risk as measurable uncertainty and points out that it is something very different from an immeasurable one which he simply describes as “uncertainties of a non-quantitative type”. Expressly, risk is probable uncertainty, and consequently one of its descriptive features is the probability of occurrence (Vasvári, (2015)). The second descriptive feature of risk is a future state of reality i.e. the consequence of risk. The next descriptive feature is the likelihood of occurrence and the method of accumulating the outcomes, the result of which is the magnitude of risk (Renn 1998 cited in Vasvári, 2015). Valsamakis, Vivian and Du Toit (2004) also described risk as a deviation from the expected value. It means presence of uncertainty. There may be doubts as to the occurrence of an event producing a loss, and uncertainty as regards the outcome of the event. The extent of risk is interpreted with reference to the level of variability and not with reference to the probability that it will display a particular result. In this case, the standard deviation becomes a good measure of risk.

Regardless of the fact that most people see risk as avoidable, taking risk is an important part of business activity mostly in the financial sector (Stulz, 2015). This is because there is no reward

without risk. Stulz (2015) associates his assertion on the evidence that entities within the financial sector can only flourish and to an extent increase shareholder value when they participate in projects and activities which come with some level of risk. He concludes therefore that risk management is not merely minimizing risk but also for increasing shareholder value through the execution of effective measures within a set framework.

Risk can also be defined as the probability of occurrence of some uncertain, unpredictable and undesirable events that would impact the success and result of a given investment (Crane, Gantz, Isaacs, Jose & Sharp, 2013). Spikin (2013) points out that in the face of several differences in the definition of risk, a more logical definition which is consistent with the modern perspectives of risk management is “the distribution of possible deviations from expected results and objectives due to events of uncertainty, which may be within or outside the organization”. He argues that risk factors could have both positive or negative implications and thus risk could result in either potential gains or losses: This explains the advances in risk management in modern business and politics.

Aven (2015) suggests that in terms of conceptualization of risk, several attempts had been made to form broadly accepted definitions of key terms related to concepts fundamental for the field of risk. In his view, a scientific field or discipline needs to stand solidly on well-defined and universally understood terms and concepts. Nevertheless, experience has shown that to agree on one unified set of definitions is not realistic. This was the point of departure for a thinking process conducted by an expert committee of the Society for Risk Analysis (SRA), which resulted in a new glossary for SRA (SRA, 2015 cited in Aven, 2015). The glossary is based on the idea that it is still possible to establish authoritative definitions, the key being to allow for

alternative perspectives on fundamental concepts and to make a distinction between overall qualitative definitions and their associated measurements.

The SRA definition of risk (cited in Aven, 2015) is summarized below:

- a) the possibility of an unfortunate occurrence;
- b) the potential for realization of unwanted, negative consequences of an event;
- c) exposure to a proposition (e.g. the occurrence of a loss) of which one is uncertain;
- d) the consequences of the activity and associated uncertainties;
- e) uncertainty about and severity of the consequences of an activity with respect to something that humans value;
- f) the occurrences of some specified consequences of the activity and associated uncertainties;
- g) the deviation from a reference value and associated uncertainties;

These definitions express basically the same idea, adding the uncertainty dimension to events and consequences. The International Organization for Standardization (ISO) defines risk as the effect of uncertainty on objectives (ISO, 2009a, 2009b cited in Aven, 2015). It is possible to interpret this definition in different ways; one as a special case of those considered above, e.g. (d) or (g).

2.2.2 Concept of Deregulation

According to Okarah (2015), deregulation means elimination of regulations concerning financial markets and trades. Also, Ernest and Young, 1988 cited in Baghebo and Beauty (2015) stated that deregulation and privatization are elements of economic reform programmes through which an economy seeks to improve on its overall goal through clearly defined ways. They illustrated this concept by describing a situation where the government through

liberalization reforms is released from the bondage of continuous financing of extensive projects which are better suited for private investment through the sale of public enterprises; the promotion of efficiency and effectiveness in resources utilization; cutting down government borrowing while raising revenue; encouraging healthy market competition in a free market environment; enhancing returns from investment and widening enterprises' share ownership thus engendering capital market development. Deregulation can also be defined as a phenomenon where government policies and rules governing the operations of a system are relaxed so that the system can decide on their own what the optimum level is through the forces of demand and supply (Ajayi and Ekundayo, 2008).

In the opinion of Okarah (2015) deregulation gives enterprises the chance to have the most minimal restriction as possible as a result of overall withdrawal of government controls in the production and sharing of goods and services. Deregulation of a country's economy could be conceptualized as divestiture or privatization of the economy (Baghebo & Beauty, 2015). By this they meant private participation in a country's economic activities. This will boost competition in the economic system and eliminate monopoly so as to allow the forces of demand and supply in price fixing. On the report of Ahmed, 1993 cited in Godwin & Dagogo, 2011, deregulation involves offering greater space to the private sector as the key mover of the economy, which is in contrast to the emphasis on the dominance of the public sector. In order for this objective to be attained, greater roles are given to market factors as against strict regulation by the government. The goal of this is to stabilize and restructure the economy for perpetual growth. This view is also accepted by Ayodele, 1994, who described deregulation as being an important part of price and market reforms and which consists of both unshackling private sector development through the elimination of government restrictions on the private

economic activity and divestiture of the public assets especially the public enterprises (PEs) into private hands.

According to Kupolokun, 2004 cited in Okarah (2014), the major objectives of deregulation policy are to:

- Disassemble the natural monopoly of the state-owned enterprise by privatizing and deregulating price controls.
- Build competition in the sector by encouraging more companies to get involved and ultimately supplying the market at competitive pricing levels.
- Enhance Foreign Direct Investment to the economy.
- Reduce the cost government spends on subsidies
- Permit the free market to set prices. Often prices drop as a result.

Deregulation is a concept that is based on the neoliberal school of thought and the doctrine of competition and profit motive which originated from the free market pricing and least government interference (Saad-Filho & Johnston, 2005). From this theory deregulation could give us advantages of the market system and competition which include; effectiveness, productivity and efficient service delivery. Hence privatization strengthens market forces with some degree of deregulation, economic liberalization, and reduction of wage and price controls (Ugorji, 1995 cited in Udoka & Anyingang, 2012). This is derived from the international capitalist imposition, especially the World Bank/IMF, who specifies economic liberalization as a prerequisite for offering development loans to the less developed countries (LDCs). Deregulation has therefore become an acceptable standard in the political economy of most low-income countries.

2.3 Theoretical Literature Review

The efficient markets hypothesis (EMH) is the fundamental theory of financial economics. Efficient markets hypothesis was first propounded by Eugene F. Fama (1965). According to Timmermann and Granger (2004), EMH in its crudest form effectively says that series we would very much like to forecast, the returns from speculative assets, are unforecastable. According to Malkiel (2003), the efficient market hypothesis is associated with the idea of a “random walk,” which is a term loosely used in the finance literature to characterize a price series where all subsequent price changes represent random departures from previous prices. The logic of the random walk idea is that if the flow of information is unimpeded and information is immediately reflected in stock prices, then tomorrow’s price change will reflect only tomorrow’s news and will be independent of the price changes today. But news is by definition unpredictable and, thus, resulting price changes must be unpredictable and random. As a result, prices fully reflect all known information, and even uninformed investors buying a diversified portfolio at the tableau of prices given by the market will obtain a rate of return as generous as that achieved by the experts. In effect, no investor can manipulate the financial markets.

In extending EMH to the state, the implication here would be that the government would have no interest in controlling financial markets, as the markets distribute capital as efficiently as possible once left to the forces of demand and supply. Advocates held this belief so strongly that in 1978 Michael Jensen famously declared that: “The efficient markets hypothesis is the paramount established fact in all of social sciences (Jenson, cited in De Long, Shleifer, Summers & Waldmann, 1990).

Financial deregulation found its first post-war theoretical support through the EMH. Fama's studies were carried out in the University of Chicago during a period of rebirth in microeconomic theory, with Chicago as the epicenter. In that same era Black, Scholes and Merton formed the eponymous Black Scholes Model (BSM) options pricing theorem (Bonen, 2008). The BSM model made the calculation of prices of options and futures relatively simple. The simplicity and apparent certainty of the BSM provided legitimacy to the whole idea of hedging and efficient pricing (Mackenzie & Millo, 2003). According to Mackenzie and Millo (2003), the Black Scholes Model, once recognized, became the central paradigm in financial economics. Since the BSM Model 'proves' that economic actors can reliably price notional values (i.e. the cost of options and futures), the re-occurrence of the irrational enthusiasm of 1920s need no longer be feared. In effect, modern financial economics had solved the problem of reliably pricing notional assets: capital markets were proven to be Pareto optimal by the EMH, and; securities markets were shown to be safe and rational through the BSM theorem. The only impediment was government (Bonen, 2008).

2.4 Empirical Literature Review

In this section, we discuss the empirical literature in two different forms. These are:

- a) Factors that determine credit risk and;
- b) The effect of credit risk on banking sector deregulation.

2.4.1 Determinants of Credit Risk

Considerable amount of literature exists on the factors influencing credit risk. The determinants of credit risk can be grouped into internal (bank-specific) and external (macroeconomic) factors as already indicated earlier on. For instance, Berger and De Young (1997), by applying generalized methods of moment (GMM) dynamic panel estimators on a panel of Czech banks

from 1994 to 2005, established that lagged risk-weighted asset (RWA) is significantly and positively associated to credit risk, which they measured using NPL to total loans. They justified that a relatively, risky loan portfolio will result in greater NPLs. Lagged Capital measured by equity to total assets exhibited mixed results. For thinly capitalized banks, lagged capital coefficient estimate was significant but showed a negative association to risk. Their findings back the moral hazard hypothesis, and propose that, on an average, thinly capitalized banks take more risky loans, which potentially could lead to higher NPLs. They also provided empirical evidence confirming that deteriorations in cost efficiency precede increases in NPLs. Nonetheless, Berger and De Young (1997) did not acknowledge the fact that NPLs are also affected by macroeconomic factors in their model. Salas and Saurina (2002) modelled problem loan ratios as a function of both macro- and micro-variables. Their results confirmed that lagged credit growth has a positive and significant effect on ex-post credit risk measures for the Spanish banking sector. Credit risk was significantly influenced by individual bank-level variables, after controlling for macroeconomic conditions. Including both macroeconomic and bank-specific variables in the estimation process enriched the model of these authors.

Ahmad and Ahmad (2004) examined the factors affecting credit risk in conventional and Islamic banks in Malaysia. Their findings proved that management efficiency, risk-weighted assets and size of total assets have significant impact on credit risk of Islamic banking, while credit risk of conventional banks are significantly affected by loan exposure to risky sectors, regulatory capital, loan loss provision and risk-weighted assets. Though both categories observed similar effects of funding cost, leverage, and risk-weighted assets on credit risk, Islamic banks experienced dissimilar effects of regulatory capital, management efficiency and loan loss provisions on their credit risk. Although this study did well to compare results of Islamic banks to conventional banks, it fell short by not including macroeconomic variables in

its analysis. Jimenez, Salas and Saurina (2006) found robust empirical support of a positive, although quite lagged, relationship between rapid credit growth and loan losses. A swift increase in loan portfolio is positively related to increases in non-performing loan ratios later on. Besides, loans granted during boom periods have a higher probability of default than those granted during periods of sluggish growth in credit. Again, industry and macroeconomic factors were neglected in this study.

Rinaldi and Sanchis-Arellano (2006) analyzed the household debt sustainability of seven European countries (Belgium, France, Finland, Ireland, Italy, Portugal, and Spain), and provided empirical evidence that monetary conditions, disposable income, and unemployment have a strong effect on banking credit risk. The authors accredited to the fact that, indeed factors internal and external to banks do have implications for credit risk. This added to the richness of the study. Ahmad and Ariff (2007) examined the crucial determinants of credit risk of commercial banks in emerging economies compared to the developed economies. Their findings revealed that regulatory capital is vital for banking systems that offer multiple ranges of products and services. Similarly, management quality is critical in emerging economies for loan-dominant banks. Increase in loan loss provision was also an important determining factor of potential credit risk. The study further emphasized the fact that credit risk of banks in emerging economies is higher than that of developed economies. By comparing emerging nations to developed nations, they provide an insight into the differences that may exist within the two categories of economies. This is a plus for their study although we do not get to appreciate the macroeconomic impacts on bank credit risk.

Berge and Boye (2007) accentuated that the declining share of problem loans at the time of their study was highly attributable to real interest rates and unemployment for the Nordic banking system over the period 1993–2005. Problem loans included non-performing loans and

other particularly doubtful loans. They also documented that problem loans were extremely sensitive to cyclical developments and will typically increase during economic recessions. The authors did well to analyse problem loans in the household sector and that of enterprise. However, they have to be critiqued for centering on macroeconomic drivers, much to the neglect of the equally important bank-specific drivers. In addition, Ali and Daly (2010) investigated macroeconomic variables that are important for two countries, Australia and the US, with the aim of evaluating the banking sectors' vulnerability to bad-loan performance at a macroeconomic level. Additionally, they studied the impact of adverse macroeconomic shocks on default rates in both countries. They recognized that the same set of macroeconomic variables display diverse default rates, although the US economy is much more sensitive to adverse macroeconomic shocks. This study is limited, in that, it does not account for the bank-specific determinants of credit risk. Rather, it only focuses on the macroeconomic influences.

Festic, Kavkler and Repina (2011) considered a panel of five new EU member states (Bulgaria, Romania, Estonia, Latvia, and Lithuania) in analysing the relationship between the NPLs' ratio and macroeconomic variables. Their results indicated that the mix of the growth of credit and available finance, slowdown in economic activity and the lack of supervision cause a deterioration in NPL dynamics. This study recognized the effects of both macro and microeconomic variables and included them in their estimations. However, the results cannot be generalized to cover non-EU members, especially Africa which obviously operates within different circumstances. Boujelbène, and Nabila, 2011 cited in Chaibi and Ftiti, 2015 also looked at both macroeconomic and microeconomic variables that could possibly control for credit risk, which enriches the study. They provided analysis for Tunisia, estimating a panel model that involved ten commercial banks over the period 1995–2008. They concluded that the main determinants of bank credit risk in Tunisia are the prudential regulation of capital,

ownership structure, profitability and bank macroeconomic indicators (inflation, rapid growth of GDP, interest rate and exchange rate). Nonetheless, findings for Tunisia, a North African country cannot be generalized to the rest of Africa, yet alone other continents.

Similarly, Louzis, Vouldis and Metaxas (2012) used dynamic panel data methods over the period 2003–2009 to explore macroeconomic and bank-specific causes of NPLs in the Greek banking sector for consumer loan, business loan, and mortgage loan categories. They found that loan problems in the Greek banking system are explained generally by macroeconomic variables (unemployment rate, real GDP growth rate, interest rates, and public debt). Additionally, performance and efficiency indicators are the bank-specific factors that explain problem loans. Incorporating both macroeconomic and bank-specific elements into their analysis adds to the robustness of their findings. Castro (2013) examined the link between macroeconomic developments and credit risk within European banking systems (Greece, Ireland, Portugal, Spain, and Italy, collectively called PIIGS). Their results showed that credit risk is significantly affected by unemployment rates, GDP growth, interest rates, housing price indices, credit growth, real exchange rates, and the 2008 financial crisis. Solely focusing on macroeconomic dynamics does not provide complete and robust results compared to including factors internal to the banks.

Makri-Tsagkanos and Bellas (2014) also revealed strong correlations between NPL and various macroeconomic factors (unemployment, annual percentage growth rate of gross domestic product and public debt) and bank-specific factors (return on equity, capital adequacy ratio and the rate of nonperforming loans of the preceding year) factors. Podpiera and Weill (2008) continued this line of research by examining the relationship between efficiency and bad loans. They extended the Granger causality model advanced by Berger and De Young (1997) by

applying generalized methods of moment (GMM) dynamic panel estimators on in their research. Their results provided empirical evidence which goes to confirm that deteriorations in cost-efficiency precede increases in NPLs.

Chaibi and Ftiti (2015) used the dynamic panel data method over the period 2005–2011 to examine the determinants of NPLs in the German and French banking systems. They found that all macroeconomic variables, precisely interest rate, GDP growth, exchange rate and unemployment rate, had strong effects on both economies with the exception of inflation rate in France. Both banking systems had only two common bank-specific determining factors of credit risk, specifically size and profitability of banks. Furthermore, NPLs for market and bank-based economies rested on different drivers: NPLs of German banks depended on banks' leverage while French banks' risk was determined by loan loss provisions and inefficiency. They concluded their analysis by highlighting the point that credit risk in a market-based economy is higher than in a bank-based economy, and that this higher risk is formed by a greater number of bank-specific factors in France compared to Germany. Incorporating variables from bank-specific factors and macroeconomic factors yields more robust results.

2.4.2 Impact of Credit Risk on Deregulation

In a survey of the literature and to the best of our knowledge, we have not been able to come across literature that directly reflects the impact of credit risk on bank deregulation. The few works we have come across discussed profitability, stability, deregulation and regulation.

For instance, Klomp and Haan (2015) used a sample of data for 94 developing countries with 1238 banks to investigate the link among banking regulation, supervision, banking risk and the organizational structure of banks. Their finding stated that stricter supervision and regulation

strengthened banking stability. They also found that stability of banks depended on the organizational structure of banks. They found that activity restrictions reduced risk of large and foreign owned banks, while liquidity restrictions had an effect on the z-score of unlisted and commercial banks. Gachunga, Osiemo and Wafula (2013) studied the effect of financial deregulation on performance of banks in Kenya during the period 2000-2011 using 10 listed banks on the Nairobi Stock Exchange (NSE). Their findings indicated that deregulation led to competition which eventually affected performance of banks in Kenya.

Agoraki, Delis and Pasiouras (2011) used data from the Central and Eastern European banking sector over the period 1998-2005 to study the effect of bank regulation on bank credit risk. Their study found that there was a lower probability of default among banks with market power and lower credit risk. They also found that capital requirements reduced risk but this effect was not endemic with banks with market power because the effect was significantly weakened. Their study also found that official supervisory power only had direct impact on bank risk. In a related study, Abbas and Malik (2008) conducted a study on the impact of financial liberalization on deregulation in Pakistani Banking Sector. Their study found that banking sector reforms remained helpful in correcting flaws in the Pakistani banking sector. The study also found that credit risk management and institutional strengthening remained helpful in correcting the prevailing flaws in banks. Finally, Ojwang (2004) highlighted the impact of financial liberalization on bank performance in the Kenya banking industry using data for the period 1973-2002. The study found that financial liberalization impacts positively on the performance of banks in Kenya in the long run.

2.5 Conclusion

In this chapter, we reviewed literature on concept of credit risk, deregulation, determinants of credit risk and deregulation. We find that the literature is vast on the determinants of credit risk. However, the literature on deregulation or financial liberalization is scarce. More specifically, the impact of credit risk on deregulation literature is generally scarce thereby necessitating this current study.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

In this chapter, a detailed description of the data source is provided. The econometric specification of the models is done in line with the objectives of the study. The variable descriptions as well as their implications on the dependent variable are documented. The chapter concludes with the summary of this chapter.

3.2 Data Source

The data in respect of banking sector specific variables for the 16 West African States, and their corresponding macroeconomic variables data as well as the school enrolment data were sourced from the Global Economy Database. The Global Economy Database comprises data for over 200 countries from The World Bank, The United States, the International Monetary Fund, The United Nations, The United Nations Educational, Scientific and Cultural Organization (UNESCO) and the World Economic Forum. The Data is an unbalanced one spanning from the period 1996-2017. This source of data is public and is deemed fit for this study.

Econometric Model

Panel regression models were employed in this study. Regression models are appropriate when we want to relate an explained variable to several explanatory variables. As per the nature of the data collected, it was reasonable to employ a panel data methodology. Panel regression analysis entails analysis with “a spatial and temporal dimension” and also improves upon the identification of effects that could otherwise have not been detected in pure cross-sectional or pure time-series studies (Bokpin, 2011). He argued, in using panel data analysis, degrees of

freedom is increased, therefore reducing any collinearity among the independent variables while increasing the efficiency of financial and economic estimates.

Generally, the panel regression is written in the form below:

$$Y_{it} = \alpha_0 + \beta X_{it} + \varepsilon_{it} \quad i = 1, \dots, N; t = 1, \dots, T. \quad (1)$$

Where, i stands for individual banks, t indicates the time period, Y_{it} shows the independent variable, α is a scalar and β is the coefficient, X_{it} shows a vector of independent variables used in the study and ε_{it} represent the error term of the regression model. We use a multivariate regression model by employing random effect regression model after conducting Hausman Specification Test.

3.2.1 Empirical Strategy

The study contains two key objectives. The first objective is to determine the factors that affect credit risk. The second objective is to determine the effect of credit risk on deregulation of the financial sector in West Africa.

In particular, to examine the determinants of credit risk we specified the following model.

$$\begin{aligned} CREDITRISK_{it} &= \beta_1 ROE_{it} + \beta_2 SPREAD_{it} + \beta_3 FINDEPOT_{it} + \beta_4 BAGDP_{it} + \beta_5 GDP_{it} \\ &+ \beta_6 Inflation_{it} + \gamma_t + \mu_i + \varepsilon_{it} \end{aligned} \quad (2)$$

CREDITRISK is measured using the loans to total deposit, ROE is returns on equity, SPREAD is used to measure the difference between interest charged on loans and interest to depositors. FINDEPOT measures the financial system deposit as a percentage of GDP, BAGDP is the measures of bank assets to GDP ratio, GDP is the gross domestic product and Inflation is the measure of the consumer price index. $\beta_1 - \beta_6$ are the coefficients, γ_t is the time effect, μ_i is the measure of country specific effect and ε_{it} is the error term.

In order to address the second objective, the model specified below is used.

$$DEREG_{it} = \alpha_1 LDR_{it} + \alpha_2 ZSCORE_{it} + \alpha_3 NIM_{it} + \alpha_4 LLGDP_{it} + \alpha_5 DCPS_{it} + \alpha_6 GDP_{it} + \alpha_7 Inflation_{it} + \alpha_8 School_{it} + \delta_t + \eta_i + \zeta_{it} \quad (3)$$

DEREG is measure of deregulation using financial freedom, LDR is loans to deposit ratio as a measure of credit risk, Z-SCORE is the measure of banking system stability. NIM is the measure of net interest margin of the banks which shows the financial intermediation cost. LLGDP is a measure of liquid liabilities as a percentage of GDP. Also, DCPS is the measure of domestic credit to the private sector. GDP is the gross domestic product and Inflation is the measure of the consumer price index and schooling is the number of primary school enrolment. $\alpha_1 - \alpha_8$ are the coefficients, δ_t is the time effect, η_i is the measure of country specific effect and ζ_{it} is the error term.

3.3 Dependent Variables

There are two key dependent variables, credit risk and deregulation. These are discussed below:

3.3.1 Credit Risk

In this study, we measured credit risk as the ratio of loan advances to total deposit. We used this measure because it comes closer with existing measures of credit risk such as non-performing loans to total loans advances and loan loss provision to total assets. This variable serves as both dependent and independent variables. It serves as a dependent variable in model 1 and serves as independent variable in model 2 where we determine the impact of credit risk on deregulation. Due to this, we expect a positive relationship between credit risk and deregulation. This is because as credit risk increases central banks will find alternative ways to formulate policies that will help reduce risk.

3.3.1.1 Return on Equity

Return on equity is measured as the net profit of a bank divided by the total shareholders' funds. This measure is used as a key factor in determining a bank's credit risk. We argue that highly profitable banks can reduce the credit risk faced by banks since those banks are able to claim their loans which help them reduce their non-performing loans portfolio. We expect a negative relationship between return on equity and credit risk of banks.

3.3.1.2 SPREAD

The SPREAD of a bank is measured as the difference between interest income earned on loans and interest expense on deposits. This helps financial institutions reduce their risk and make it sound. Banks with high spread are more likely to reduce credit risk all other things being equal. So, we expect a negative relationship between spread and credit risk.

3.3.1.3 Financial System Deposit

Financial system deposit is the aggregate of the demand, time and savings deposits in deposit money banks and other financial institutions as a share of GDP. When countries record high financial system deposit the tendency of those countries to have a solid banking system is high. This will help to reduce the rate of credit risk of banks since banks are able to mobilize deposits from several sources at a cheaper cost. We therefore, expect a negative relationship between financial system deposit and credit risk of banks.

3.3.1.4 Bank Assets

Bank assets form part of the total size of the banking system relative to the GDP of a country. This means that countries with significant banking penetration are able to reduce the credit risk of the banking system all other things being equal. This means that those big banks will support the too-big-to-fail theory. They will have the financial muscle to give out loans and monitor

the loans very well so that they do not go bad. We therefore, expect a negative relationship between credit risk and bank assets to GDP ratio.

3.3.1.5 Control Variables

The main control variables used are inflation and gross domestic product (GDP). We argue that an increase in GDP will lead to excessive demand for loans for business expansion. This will increase cost of loanable funds hence leading to default if loans are not properly utilized. This will increase the credit risk of banks all other things being equal. We expect a positive relationship between increase in GDP growth rates and credit risk of countries. Similarly, a rise in inflation will increase the cost of borrowing leading to high default rates if borrowers are not able to honour their loan obligations.

3.3.2 Deregulation

Financial sector deregulation is the liberalization of the banking system. Deregulation is measured as the ability of countries to have financial freedom for banks to use demand and supply forces to determine their interest rates, foreign exchange transactions, and cross-border banking activities with or without government minimal control.

3.3.2.1 Bank Stability

Bank stability is measured using the z-score. The z-score is computed as the ratio of capital adequacy ratio plus return on assets divided by the standard deviation of return on assets. Higher z-score signifies stable banks. Hence countries with stable banks enhance deregulation all other things being equal since this can limit government controls and allow the forces of demand and supply to determine loan prices and other essential services on banking. We expect a positive relationship between deregulation and banking stability.

3.3.2.2 Net Interest Margin

Net interest margin (NIM) is the difference between the interest income and interest expense scaled over the total revenue of the banks. The interest income is what is earned from the loans given out. The interest expense is the credit interest given to depositors for keeping their money in their bank accounts. We expect that countries with higher average net interest margins are those countries which might have had a liberalized banking sector. We expect a positive relationship between NIM and deregulation.

3.3.2.3 Liquid Liabilities

Liquid liabilities are debt obligations a firm has to pay off within a year. It is measured as the total value of a bank's liquid liabilities to gross domestic product of a country in a given year. Countries that have banks paying off their liquid liabilities will be less constrained and those countries can have deregulated or liberalized banking sector. We expect either a positive or negative relation.

3.3.2.4 Domestic Credit to Private sector

This is also known as credit to the private sector. It is measured as the total credit provided to the private sector by both bank and non-bank financial institutions in the entire economy. The expectation is that higher domestic credit to the private sector will expand businesses which will lead to banking sector liberalization. Similarly, higher credit provision may also lead to higher default risk which might lead to tighter government controls, hence a negative relationship.

3.3.2.5 Control Variables

We employed three control variables in this model: a) gross domestic product, b) inflation and c) education. Our argument is that countries with impressive macroeconomic variables will lessen deregulation. Therefore, there will be a negative relationship between GDP growth rates and deregulation. Similarly, with greater inflation, deregulation will decrease because government control will increase. Also, when education intensifies citizens will demand less government control or may demand that government should act in the market especially when there is exploitation from private individuals who control the sector. So, the relationship may be negative or positive.

3.4 Conclusion

The chapter discusses the methodology used for the study. It talks about the panel regression model and the specific econometric specifications used to address the objectives of the study. The chapter also presents the definitions of the variables used in the study, its measurements and implications of those variables on the dependent variables used.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION OF RESULTS

4.1 Introduction

In line with the key objective of the study which seeks to determine the impact of credit risk on deregulation of banking sector in West Africa, this chapter provides the detailed analysis and discussion of the findings. The chapter provides the summary of the descriptive statistics and correlation matrix of the study. The chapter also provides the analysis of the determinants of credit risk as well as the effect of credit risk on deregulation in West Africa.

4.2 Summary of descriptive statistics

In this section, we present the detail descriptive statistics of the study in Table 1

Table 1 Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
ROE	290	26.525	22.785	-48.43	131.62
LDRSPREAD	208	8.324	5.397	0.44	48.25
FINDEPOSIT	318	32.704	76.455	3.3	763.78
BAGDP	318	34.538	80.502	1.14	840.09
ZSCORE	302	12.042	7.182	-1.31	42.90
Credit risk	318	73.488	25.432	20.66	134.96
NIM	292	6.8346	3.435	0.33	18.63
DCPS	319	15.340	11.746	0.41	65.74
LLGDP	317	45.865	106.088	6.02	981.91
FINFREEDOM	317	41.420	14.171	10	70.00
GDP	336	5.032	7.658	-30.15	106.28
Inflation	310	6.007	7.572	-5.4	50.7
Schooling	275	85.490	21.881	28.01	132.47

ROE is Return on Asset, LDRSPREAD is Liquid Rate Spread, FINDEPOSIT is Financial System Deposit, BAGDP is Bank Asset to gross domestic product ratio, ZSCORE, Bank Z-Score, LDR (credit risk) is loans to deposit ratio, NIM is Net Interest Margin, DCPS is Domestic Credit to the private sector, FINFREEDOM is Financial Freedom, GDP is Gross Domestic Product.

In Table 1 the study records an average return on equity of 26.53%. This means that most banks in the sub region over the sample period have been able to translate shareholders' equity into profit. Thus, any shareholder who held their investment till maturity has the probability of

making a return of 26.53% for the same period. However, the minimum ROE on equity recorded was -48.43% whilst the maximum was 131.62%. Similarly, on average the spread recorded was 8.324% implying that banks can obtain a minimal interest of 8% for holding deposit for the period with the minimum average of 0.44% but a maximum of 48.25%. The study also finds that on average financial system deposit is 32.704%. Bank assets also recorded an average rate of 34.54% implying that West African banks are not really deep in penetration. With regard to z-score, the study records an average Z-score of 12.04% implying that the banks are fragile. Higher z-score means stable banks. The study records a liquid liability to deposit ratio of 45.87% meaning that most of the banks hold enough cash to pay off debt on yearly basis. On average the loans to deposit ratio (LDR) which measures credit risk shows 73.49% implying that at least over the study period banks in West Africa gave out more than 70% of their deposits as bank loans. This increase in bank loans margin has the probability of fostering default if the higher loans to deposit ratio is not properly managed.

The study also finds that net interest margin recorded a mean score of 6.8% over the sample period. This means that financial institutions have relatively low cost of financial intermediation in West Africa. This means that some of the banks are not really relying on interest income for their profitability. Thus, they also diversify into other sources of non-interest income. Domestic credit to the private sector recorded an average rate of 15.34% implying that credit to the private sector is low. Deregulation measured by financial freedom index recorded an average financial freedom index of 41.42% over the sample period implying that most countries in the West Africa banking system are still operating under government control. It recorded a minimum of 10% and a maximum of 70%. The average GDP growth rate over the sample period is 5.032% which is impressive for the developing countries. Inflation recorded an average score of 6%, with a minimum of -5.4% and a maximum of 50.7% over the

sample period. Finally, with primary school enrolment rate, over 85% of the pupils are in primary education over the period with a minimum of 28% and a maximum of 132%. This impressive school attainment will contribute massively to understanding of complex financial issues as the pupils advance in education. This will make them demand a better deregulated financial sector.

4.3 Correlation Matrix

Table 2 below shows the correlation matrix for determinants of credit risk. The variables used for this correlation matrix include; return on equity (ROE), SPREAD, Financial system deposit (FINDEPOSIT), bank assets to GDP (BAGDP), gross domestic product (GDP) and inflation.

Table 2 Correlation Matrix

No.	Variable	1	2	3	4	5	6
1	ROE	1					
2	LDRSPREAD	0.305	1				
3	FINDEPOSIT	-0.004	0.159	1			
4	BAGDP	-0.008	0.137	0.691	1		
5	GDP	-0.054	0.067	0.095	0.025	1	
6	Inflation	0.363	0.527	0.021	0.047	0.086	1

Table 2 shows the correlation matrix for model 1 of this study. Thus, the determinants of credit risk. We can see clearly that all the independent variables are not strongly correlated with each other. With the exception of bank assets to GDP and financial system deposit which shows a correlation of 0.691 and inflation and SPREAD which shows a correlation of 0.527, the rest of the correlation matrix shows below 0.5. The argument is therefore, that the variables can be put into the same model since there is no element of multicollinearity.

Table 3 below shows the correlation matrix for the effect of credit risk on deregulation in West Africa. The main variables used are loans to deposit ratio (LDR), Z-score (ZSCORE), net interest margin (NIM), liquid liabilities to gross domestic product (LLGDP), domestic credit to private sector (DCPS), gross domestic product (GDP), inflation and schooling.

Table 3 Correlation Matrix

Variable	1	2	3	4	5	6	7	8
1. Credit risk	1							
2. ZSCORE	0.460	1						
3. NIM	-0.420	-0.243	1					
4. LLGDP	-0.152	-0.114	-0.152	1				
5. DCPS	0.324	0.383	-0.365	-0.018	1			
6. GDP	-0.076	-0.088	0.056	0.140	-0.042	1		
7. Inflation	-0.245	-0.172	0.521	0.100	-0.195	0.086	1	
8. Schooling	-0.207	-0.085	-0.065	0.149	0.419	0.100	0.002	1

Table 3 shows the correlation matrix for the independent variables in the model 2 for the effect of bank credit risk on deregulation. The finding is that all the variables are not strongly correlated with each other. This is because their correlation coefficients are less than 0.5. This means that all the independent variables can be put into the same model. For instance, Z-Score and domestic credit to the private sector shows positive relation with loans to total deposit. Similarly, net interest margin, liquid liability to gross domestic product, inflation, education and gross domestic product shows a negative relationship.

4.4 Determinants of Credit Risk in West Africa

Table 4 shows the determinants of credit risk in West Africa. Some of the variables used as determinants include return on equity (ROE), SPREAD, financial system deposit (FINDEPOSIT), bank assets to gross domestic product (BAGDP) gross domestic product (GDP) and inflation.

Table 4 Determinants of Credit Risk

VARIABLES	Model 1	Model 2
ROE	-0.00729 (0.0649)	0.0807* (0.0441)

LDRSPREAD	-0.575 (0.499)	-0.463 (0.544)
FINDEPOSIT	-0.00432 (0.00391)	-0.00627* (0.00371)
BAGDP	-0.00949*** (0.00303)	-0.0136*** (0.00227)
GDP		-0.0457 (0.187)
Inflation		0.146 (0.153)
Constant	83.07*** 3.739	80.89*** 4.464
R-Square	0.3225	0.082
Observations	167	153
No. of Countries	15	14

Table 4 contains two models. Model 1 shows the determinants of bank specific factors while model 2 includes the macroeconomic indicators. The ***,** and * are the levels of significance level for 1%, 5% and 10% respectively. The robust standard errors are clustered in parenthesis.

In Table 4 above, the determinants of credit risk are estimated. Two models are estimated. Model 1 involves country level bank characteristics. All the four variables discussed show a negative relationship with bank credit risk. The implication is that an increase in any of these variables leads to reduction in level of bank credit risk for each country. They include return on equity, bank spread, financial system deposit and bank assets to GDP. It is only the level of bank asset to GDP that shows significant relationship with bank credit risk. The implication is that bank assets as a percentage of GDP keenly reduces credit risk of banks in West Africa. This means that as banks assets increase by one unit, credit risk also reduces by 0.0095 units all other things being equal. This means that as banks strive to increase their size, bank managers in those countries are not efficiently managing the large assets resulting in credit risk. Additionally, as bank assets enlarge there tends to be bureaucratic procedures that reduce the efforts to monitor bank loans leading to most of them going bad and this affects the banks negatively. This finding is consistent with Salas and Saurina (2002) who noted that growth in assets of banks reduce credit risk of banks in Spain. It is also consistent with (Makri-Tsagkanos & Bellas, 2014; Chaibi & Ftiti, 2015).

Even though return on equity shows the expected sign, it does indicate that it does not really matter much in reducing credit risk among West African banks. Similarly, higher spread promotes the profitability of banks which is likely to reduce risk but at the same time, it has the tendency to increase risk if more loans are defaulted. So, it not being significant is not really surprising at all. Finally, increase in deposit may have the tendency to make the bank more liquid so they can afford to give out more loans. So, once banks are giving out more loans, they device the appropriate measures to protect their depositors' funds hence credit risk can be reduced.

Finally, in model 2 we considered both macroeconomic variables and bank specific factors, since each country's macroeconomic indicators can have a serious influence on credit risk. Also, most West African states have weak fundamentals, so the extent to which these weak fundamentals can expose them to credit risk is high. We find that the ROE sign had changed from negative to positive and significant indicating that when macroeconomic variables are added to the model, ROE can lead to credit risk. Thus, a unit increase in return on equity leads to an increase in risk by 0.0807 units all other things being equal. Financial system deposit negatively and significantly reduces credit risk. This means that as deposit ratio of banks in West Africa increases, funds to the private sector will be less costly which reduces interest rate thereby lowering the rate of default all other things being equal. Thus, a unit increase in financial system deposit will lead to 0.0063 units decrease in credit risk. The improvement in the significance level of the bank specific factors as macro-economic variables are introduced supports the existing literature. For instance, Salas and Saurina (2002) argue that credit risk was significantly influenced by individual bank-level variables after controlling for

macroeconomic conditions. Similar results were established in Tunisia (Boujelbène & Nabila, 2011 cited in Chaibi & Ftiti, 2015), and the European banking system (Castro 2013).

However, our sign for the rest of the bank specific factors remain the same, but with slight improvement in the level of significance at 10% for financial system deposit. For the macroeconomic variables we included GDP and inflation. We find that GDP has a negative effect on credit risk while inflation has positive effects. These signs are expected since an increase in GDP implies economic expansion which can help borrowers to service their loans faster than in a period of recession. Conversely, an increase in inflation may lead to high bank interest rates which can lead to a rise in bank loans default rates. The findings from the macroeconomic variables are consistent with Berge & Boye's (2007); Salas & Saurina's (2002); and Ali and Daly's (2010) works. They all established that macroeconomic variables such as gross domestic product and inflation matter in impacting credit risk.

4.5 Impact of Credit risk on Deregulation in West Africa

This section discusses the effect of credit risk on banking sector deregulation in West Africa. Some of the key variables employed in the study include; loans to total deposit ratio, Z-score, net interest margin (NIM), liquid liabilities to GDP, domestic credit to private sector, gross domestic product, inflation and schooling.

Table 5 Effect of Credit Risk on Deregulation

VARIABLES	Model 1	Model 2
Credit risk	0.107* (0.0604)	0.109* (0.0594)
ZSCORE	0.705*** (0.257)	0.617** (0.247)

NIM	0.588** (0.268)	0.771*** (0.278)
LLGDP	0.206 (0.138)	0.310*** (0.109)
DCPS	-0.0941 (0.188)	-0.121 (0.189)
GDP		-0.0421 (0.108)
Inflation		0.0822 (0.103)
Schooling		-0.0245 (0.0901)
Constant	17.49*** (4.248)	16.56* (8.563)
R-Square	0.2123	0.2259
Observations	266	221
No. of Countries	16	16

Table 4 contains two models. Model 1 shows the effect of credit risk of bank specific factors while model 2 included the macroeconomic indicators. The ***,** and * are the level of significance level for 1%, 5% and 10% respectively. The robust standard errors are clustered in parenthesis.

In Table 5 we show the effect of credit risk on bank deregulation in West Africa. Our measure of bank deregulation is financial freedom and credit risk is the ratio of bank loans to deposit. We control for both bank specific factors and macroeconomic indicators. We estimated the model 1 first with bank specific factors. We find that bank credit risk makes West African countries to deregulate. Thus, the regulators of the financial system in West Africa, make policies for banks when they find that credit risk among banks are increasing. They make the financial system open in the bid to reduce the risk. The study does find that a unit increase in credit risk increases deregulation by 0.107 units all other things being equal in model 1. In model 2 the results remain the same as credit risk shows significance effect at 10% significance level. However, an increase credit risk increases deregulation by 0.109 units. Thus, inclusion of macroeconomic variable only increases deregulation by 0.02 units above the model 1 without the macroeconomic variables.

We control for bank stability by using Z-score. We find a positive and significant relationship between bank stability and deregulation implying that stable banks foster financial freedom in West Africa. In model 1 the study shows that a unit increase in z-score leads to an increase in deregulation by 0.705 units all other things being equal. Similarly, in model 2, an increase in z-score by a unit increases deregulation by 0.617 units all other things being equal. Then again, an increase in net interest margin increases financial freedom. Thus, as bank interest margin increases by 1-unit, financial freedom will increase by 0.558 units in model 1 and 0.771 units in model 2 all other things being equal. Thus, as banks' net interest margin rises they find innovative ways of making more profit thereby making the regulators pass laws that will make their operations better. With respect of liquid liabilities to GDP there is no significant relationship in model 1 but the inclusion of the macroeconomic variables and education makes it significant at 1% significance level. Thus, any increase in payment of short term debt will lead to an increase in financial freedom. Finally, we did not find any significant relationship in our model with the inclusion of GDP growth, inflation and education in model 2.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This is the final chapter of the study. In this chapter, a summary of the study is presented detailing the rationale behind the study. The key findings are noted in this chapter as well as the conclusion. The chapter also draws conclusions and provides the needed recommendations to support the key findings. The limitation of the study and future research direction are presented in this chapter.

5.2 Summary of Study

The financial system is an important channel through which funds flow from surplus units to deficit units in any economy. Therefore, there is the need for the financial system to be open in order to ensure proper financial intermediation process. The West African sub-region has undergone a lot of financial sector reforms notably, the Financial Sector Adjustment Programme (FINSAP) that greeted most countries during the early 1980s. This made most State-owned financial institutions in West Africa undergo deregulation to free them from strict government control. The aim of this study was therefore to investigate the impact of credit risk on deregulation of the banking sector in West Africa. Specifically, the study addressed two objectives. First, the determinants of credit risk in West Africa. Second the impact of credit risk on banking sector deregulation in West Africa.

The study uses data spanning from the period 1996-2017 with random effect model to investigate these objectives stated above. The key determinants of the credit risk include return on equity of banks, financial system deposit to GDP ratio and bank assets to GDP ratio. We find that return on equity positively and significantly increases credit risk of banks in West Africa. However, we also find that financial system deposit and bank assets to GDP negatively and significantly reduce credit risk in West Africa. Moreover, we did not find any significant impact of macroeconomic indicators such as gross domestic product and inflation in our model.

With respect to the impact of credit risk on deregulation, the study finds positive and significant effect of credit risk on deregulation in West Africa. This means that higher credit risk could necessitate deregulation of the financial sector in West Africa. Other bank specific variables we found to relate positively and significantly with deregulation include liquid liabilities to GDP, net interest margin and bank z-score. Similarly, the inclusion of the macroeconomic variables into the model improves on the performance of the model. The liquid liabilities as a percentage of GDP became positive and significant as well.

5.3 Conclusion

Literature is scarce on the role of credit risk in impacting banking sector deregulation in general. Also, the West African sub-region has undergone tremendous reforms in the financial sector, from the FINSAP, to changes in laws to allow cross-border banking, banking sector consolidation and all other forms of deregulation. This study therefore highlights the important role that credit risk may play in the deregulation efforts of most West African countries.

Specifically, the study noted that without including macroeconomic variables in the model to ascertain the determinants of credit risk, bank assets as a percentage of GDP is the only negative and significant determinant of credit risk. This means that as banks assets increase credit risk of banks in West Africa reduces. Similarly, the inclusion of macroeconomic variables into the model improves on the performance of the model. Thus, return on equity tends to be positive and significant meaning that increases in return on equity increase the risk of the banking sector which goes contrary to our expectation. Also, financial system deposit tends to be negative and significant which means that increase in deposit mobilization reduces credit risk which supports our expectation.

In our final model we estimated the effect of credit risk on deregulation. We find that credit risk positively and significantly affects deregulation. This implies that as credit risk of banks in West Africa increases, central banks find ways to deregulate the banking sector so that they could be a means of diversification in order to reduce the risk. Finally, we find that the inclusion of macroeconomic variables changes the performance of the model as more of the bank specific variables became significant. We find specifically that, z-score, net interest margin, banks assets to GDP, liquid liabilities to GDP all were positive and significant.

5.4 Recommendations

On the basis of the contributions made, the study recommends the following. First, the study finds that banks assets as a percentage of GDP shows negative and significant relationship with credit risk. We therefore recommend that bank managers in West Africa should work hard to strengthen their assets base so that they can maintain the stability of their banks. Similarly, the study finds that return on equity increases credit risk of banking sector in West Africa. This means that profit made by shareholders should not unnecessarily be distributed to them in the form of dividend payment, portion of it should be reserved to mitigate against credit risk, this will help to reduce credit risk of banks. With regards to financial system deposit as a percentage of GDP, the study recommends that banks should strengthen their deposit mobilization muscle so that they can further decrease the credit risk of the banks in West Africa.

In our final objective, we find credit risk to enhance deregulation of banks. This means that the central banks of West Africa, should put in proper macroprudential regulatory measures to safeguard the security of the banks so that the risk banks take do not always put them under stringent conditions to undertake deregulatory policies in order to safeguard the interest of the banks. Additionally, the stability of banks matter in ensuring deregulation. If central banks have to deregulate because banks are stable and are therefore finding better regulatory

conditions to expand then banks in West African should strive to be stable. Finally, banks within West Africa should maintain good net interest margin since that helps central banks to undertake good deregulatory measures. Banks should also continue to pay off their short-term debt on time especially those to be paid within a year. This will help the central banks to formulate proper deregulatory measures to withstand the test of time.

5.5 Limitation and Future Research

The key limitation of our study is the measure of deregulation used, which is the financial freedom given by a country. It would have been good if we had found a common deregulatory measure such as recapitalization, reforms to allow private sector participation etc. for all countries. However, financial freedom was the only measure that comes closer. Another limitation is that we could not check reverse causality whether deregulation causes the credit risk of banks to go up. These are possible research areas we can take up in the future. First, looking for an alternative deregulatory measure aside what we used in this study. Second, checking for reverse causality.

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