

**GLOBAL REGULATORY STANDARDS AND FINANCIAL INCLUSION
IN AFRICA**

A THESIS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON

BY

SCHENINEDA ANKOMAH KWAKU

(10550478)

**IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE
AWARD OF THE MASTER OF PHILOSOPHY (MPHIL) DEGREE IN
ECONOMICS**

JULY, 2017

DECLARATION

This is to certify that this thesis is the result of research undertaken by Schenineda Ankomah Kwaku towards the award of a Master of Philosophy (M.Phil.) degree in Economics at the Department of Economics, University of Ghana.



.....

SCHENINEDA ANKOMAH KWAKU

(10550478)

.....

PROF. PETER QUARTEY

(SUPERVISOR)

.....

DR. MICHAEL DANQUAH

(CO-SUPERVISOR)

.....

DATE

.....

DATE

ABSTRACT

Inclusive finance that takes into consideration lower-income households is an important policy goal. Despite the above claim, greater regulation of the financial system is the way to mitigate the risk running from policies geared toward greater financial inclusion to the integrity and stability of the financial system. This study recognizes the causality running from regulatory requirement to financial inclusion efforts since this direction of causality has received no much empirical evidence in the literature. The study, therefore, seeks to examine global regulatory standards and financial inclusion in Africa. A cross-sectional data set of twenty-seven (27) countries in Africa is analyzed. The study employs linear regression models and OLS estimation technique for the empirical investigation.

The baseline model shows no significant relationship between regulatory variables and financial inclusion except Government owned banks regulatory variable, which had a negative relationship with financial inclusion. All the variables entered the second econometric model and tested significantly except the entry into banking regulatory variable after the study introduced country specific macroeconomic controls. The results of the empirical estimation established that global regulatory standards only have significant effect on financial inclusion when the macroeconomic framework of individual countries is taken into consideration. Moreover, the study established that these country-specific macroeconomic indicators have an effect on financial inclusion. The variables were found to be statistically significant in influencing financial inclusion.

Based on the empirical results, the study recommends that in order for the Standard Setting Bodies to deliver on their mandate of successfully incorporating financial inclusion into their

work, there is the need to strengthen information disclosure by banks. Moreover, some of the standards should be revised to incorporate the specific macroeconomic characteristics and peculiarities of developing countries.



DEDICATION

This thesis is dedicated to the Almighty God, my family, especially Mr. Apraku Kyeremeh and my friends.



ACKNOWLEDGEMENTS

My greatest thanks go to God for seeing me through this thesis and successful completion of my Masters studies.

I am particularly indebted to my supervisors, Prof. Peter Quartey and Dr. Michael Danquah, lecturers at the Department of Economics, University of Ghana, who painstakingly nurtured and guided me to plumb the depths of this thesis.

I am also thankful to my family, especially my dad, Mr. Apraku Kyeremeh, my mom, Mrs. Juliana Kyeremaa and my siblings who supported me in diverse ways.

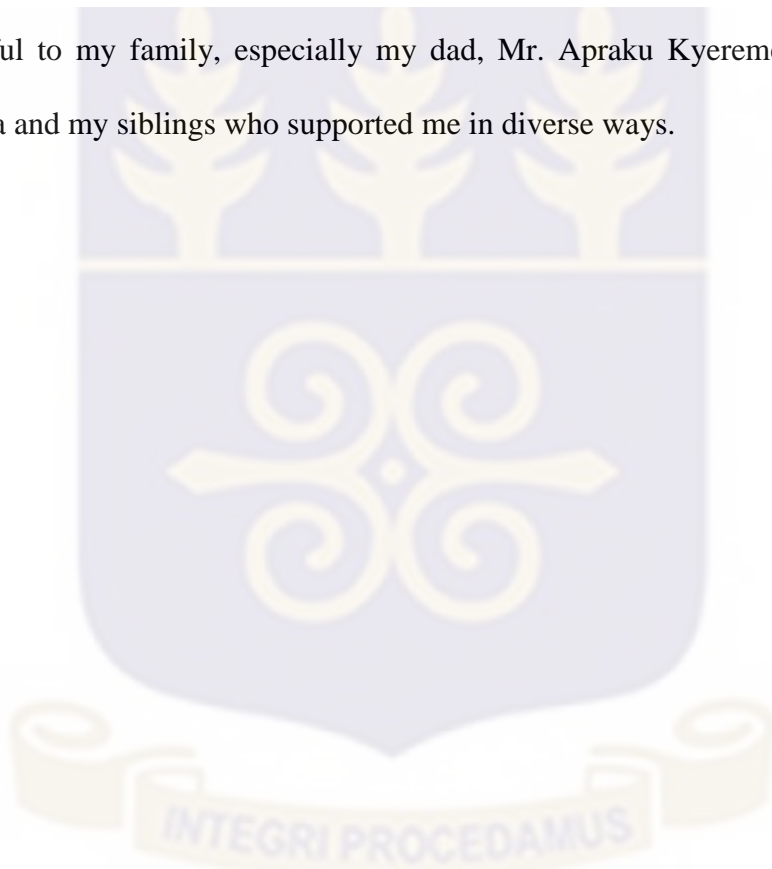


TABLE OF CONTENTS

CONTENTS	PAGES
DECLARATION	i
ABSTRACT.....	ii
DEDICATION.....	iv
ACKNOWLEDGEMENTS.....	v
TABLE OF CONTENTS.....	vi
LIST OF FIGURES	xii
LIST OF TABLES	xiii
LIST OF ABBREVIATIONS	xiv
CHAPTER ONE	
INTRODUCTION	
1.1 Background of the Study	1
1.2 Statement of the Problem.....	6
1.3 Research Objectives	9
1.4 Research Questions.....	10
1.5 Justification.....	10
1.6 Organization of the Study.....	11

CHAPTER TWO

OVERVIEW OF GLOBAL REGULATORY STANDARDS AND FINANCIAL INCLUSION IN AFRICA

2.1	Introduction.....	12
2.2	The Banking System and Financial Inclusion in Africa	12
2.2.1	Financial Depth.....	12
2.2.2	Account Penetration.....	13
2.2.3	Innovative Financial Inclusion.....	15
2.3	Overview of Bank Regulation in Africa	17
2.3.1	Bank regulation: The Role of Capital Requirement	18
2.3.2	Bank Regulation: The Role of Competition Policy	19
2.3.3	Bank Regulation: The Role of Deposit Insurance	20
2.3.4	Bank Regulation: The Role of Government Ownership.....	20
2.4	The State of Basel Implementation in Africa	21

CHAPTER THREE

LITERATURE REVIEW

3.1	Introduction.....	25
-----	-------------------	----

3.2 Financial Inclusion and Exclusion: The Concepts, Definitions, and Dimensions.....	25
3.2.1 Dimensions of Financial Inclusion	28
3.3 Global Finance Regulation	30
3.3.1 The Basel Committee, Basel I&2	31
3.3.2 The Basel Committee.....	31
3.3.3 Basel I	32
3.3.4 Basel II.....	33
3.4 Positive Economic theories of Regulation	35
3.5 Theoretical Arguments on Regulation and Financial Inclusion	39
3.5.1 Regulations on Internal and Overseas Bank Entry	39
3.5.2 Regulation on Capital requirement	40
3.5.3 Deposit Insurance Design	41
3.5.4 Government Ownership of Banks.....	41
3.5.5 Bank Concentration	42
3.6 Related Empirical Literature on Regulation and Financial Inclusion and Determinants of Financial Inclusion.....	42
3.6.1 Regulation and Financial Inclusion	42

CHAPTER FOUR

METHODOLOGY

4.1 Introduction.....	47
-----------------------	----

4.2 Banking Regulation Conceptual Framework.....	47
4.3 Framework for Estimating Financial Inclusion	50
4.4 Measurement of Global Regulatory Standards.....	53
4.5 Model for Empirical Estimation	55
4.6: Diagnostic Tests.....	59
4.6.1 Test for Heteroskedasticity	59
4.6.2 Test for Multicollinearity.....	59
4.6.3 Test for Model Specification	59
4.6.4 Test for Normality of Residuals.....	60
4.7: Estimation Technique	60
4.8 Data Sources	61

CHAPTER FIVE

ESTIMATION OF RESULTS AND DISCUSSIONS

5.1 Introduction.....	63
5.2 Results of the Principal Component Analysis	63
5.2.1 Multivariate Analysis.....	63
5.2.2 Weighting and Aggregation.....	66
5.3 Empirical Estimation	69
5.3.1 Heteroskedasticity Test.....	70
5.3.2 Normality Test.....	70

5.3.3 Multicollinearity Test.....	71
5.3.5 Model Specification Test.....	72
5.4 Regression Output for the Empirical Estimation.....	73
5.5 Conclusion.....	78

CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction.....	80
6.2 Summary.....	80
6.3 Conclusion.....	82
6.4 Recommendations.....	83
6.5 Recommendation for Future Studies.....	84
6.6 Limitations of the Study.....	85
References.....	86
Appendices.....	97
Appendix (A): Summary Statistics for the Independent Variables.....	97
Appendix (B): Correlations Among Macroeconomic Variables.....	97
Appendix C: Breusch-Pagan / Cook-Weisberg Test for Heteroskedasticity.....	98
Appendix D: Test for Model Specification.....	98
Appendix E: Correlation between Financial Inclusion Variables.....	99

Appendix F: KMO and Bartlett's Test 99

Appendix G: Financial Inclusion Index and Country Rank..... 100



LIST OF FIGURES

Figure 2.1: Sub-Saharan Africa: Dimension of Financial Depth.....	13
Figure 2.2A: Account Penetration within Africa.....	14
Figure 2.2B: Account Penetration in Africa	14
Figure 2.3A: Innovative Financial Inclusion within Africa Region	16
Figure 2.3B: Innovative Financial Inclusion Africa Region and Rest of the World	17
Figure 2.4 Capital Requirement.....	18
Figure 2.5 Limitation on Foreign Bank Entry	19
Figure 2.6: Government Ownership of Banks in Africa.....	21
Figure 4.1 Banking Regulations Conceptual Flow Diagram.....	48
Figure 5.1A: Financial Inclusion Index, Africa	68
Figure 5.1B: Financial Depth of Top Three Countries against Bottom Three Countries.....	68
Figure 5.2: Kernel Density Estimate for Normality.....	71

LIST OF TABLES

Table 2.1: A Classification of Countries from Early-comprehensive Adopters to Late-Partial Adopters.....	22
Table 3.1 Macro versus micro prudential viewpoints.....	38
Table 4.1: Proxies for Global Regulatory Standards and their Coding Schemes	54
Table 5.1: Evaluating Communalities.....	65
Table 5.2: Rotated Component Matrix	66
Table 5.3: Total Variance Explained	67
Table 5.4: Correlation between independent variables of the model.....	70
Table 5.5: Test Results for Multicollinearity	72
Table 5.6: Financial Inclusion, Regulatory Standards and Macroeconomic Variables Estimation Output	74



LIST OF ABBREVIATIONS

AFI	Alliance for Financial Inclusion
ATM	Automated Teller Machine
AMA	Advanced Measurement Approach
BCBS	Basel Committee on Banking Supervision
BCG	Basel Consultative Group
BIA	Basic Indicator Approach
BIS	Bank for International Settlement
DEA	Data Envelopment Analysis
EIU	Economic Intelligence Unit
FIDWG	Financial Inclusion Data Working Group
FSAP	Financial Sector Assessment Program
FSI	Financial Stability Institute
G10	Group of Ten
G20	Group of Twenty
GDP	Gross Domestic Product
GFDR	Global Financial Development Report



GPII	Global Partnership for Financial Inclusion
HDI	Human Development Indicator
IADI	International Association of Deposit Insurers
ICAP	Internal Capital Adequacy Process
IMF	International Monetary Fund
IRB	Internal Ratings Based
KMO	Kaiser-Meyer-Olkin
KYC	Know Your Customer
OECD	Organization for Economic Co-operation and Development
OLS	Ordinary Least Square
PCA	Principal Component Analysis
SA	Standardized Approach
SSBs	Standard Setting Bodies
UNDP	United Nations Development Programme
VIF	Variance Inflation Factors
WDI	World Development Indicators

CHAPTER ONE

INTRODUCTION

This chapter presents the background of the write-up, the problem statement, and the research question. This section also presents the justifications as well as the organization of the study.

1.1 Background of the Study

Inclusive finance that takes into consideration low-income households and other disadvantaged groups has become an important public policy goal over the years. Many developing economies have welcomed the introduction of a variety of services and branchless banking instruments ranging from automated teller machines (ATM) to the use of mobile phone to reach those whom traditional, branched-based systems had sidelined. After the 2008 financial crisis, the leaders of the Group of Twenty (G20) recognized the need to promote these initiatives for sustainable economic growth and reduction in income inequality through a vibrant, healthy and stable financial system Sousa (2015).

Financial inclusion is undoubtedly comfortable if it is considered as an independent and stand-alone objective. However, when assessed to include other financial objectives such as stability, consumer protection and integrity of the financial system, policy interventions geared towards greater financial inclusion may have an inherent risk which can pose a significant risk on growth and equality-enhancing benefits of financial empowerment (Sousa, 2015). This has informed efforts to regulate the activities of banks and other non-bank financial institutions, to nick in the bud any recurrence of the global financial crisis. It is in this context that global actors such as G20's Global Partnership for Financial Inclusion (GPMI) and Basel Committee on Banking

Supervision (BCBS) have been engaged through the establishment of a work stream on financial inclusion under the supervision of its outreach arm, the Basel Consultative Group. The duty of the Basel Consultative group was to help the BCBS gain an understanding of individual country context, constraints, and market features associated with inclusive finance GPMI (2015). Among the thematic areas to create responsible financial inclusion was to speed progress on financial inclusion and to ensure that the regulatory environment supports national policy makers' efforts to promote innovative financial inclusion reforms. Incorporating financial inclusion into all types of financial sector assessment; creating a meaningful and extensive dataset of financial inclusion and evaluating the country's framework for financial literacy and consumer protection.

Global regulatory standards connote set of rules and principles guiding the conduct of an institution. In the context of this thesis, the global regulatory standard is broken down to bank regulatory standards and refers to the set of rules or standards set by global financial Standard-Setting Bodies (SSBs) to regulate the activities of banks and other financial institutions. These set of regulations are set to guide the information disclosure requirement of banks, rules concerning the entry into the banking sector, regulations on deposit insurance design, and bank capital regulation, banking activities etc. Particularly, the BCBS established a detailed set of restructuring procedures upon the request of the Group of Twenty to reinforce the international regulatory principles for the capital structure of banks and macro-prudential guideline. The set of principles known as the Basel II was at the center of the Group of Twenty's schema on international financial reform and was considered a major leap forward to bring some level of resilience to world financial system (Hannoun, 2010). The Basel II Capital accords are built on a set of pillars: the pillar one emphasizes enhanced "minimum bank capital" requirement, the pillar two lays emphasis on improved practices of supervision and the third pillar focuses on "greater

market discipline” via information disclosure by banks. During the Group of Twenty (G20) Summit in 2010, the leaders sanctioned the new bank capital structure developed by the Basel Committee. The leaders signed on to take actions at global and domestic level “to raise standards and ensure that national authorities implement global standards developed to date, consistently, in a way that ensure a level playing field, a race to the top and avoid fragmentation of the markets, protectionism, and regulatory arbitrage” (G20, 2010, p. 2).

Basel II builds upon Basel I and consists of a set of best practices. Unlike other standards like those on International trade, it is not obligatory on countries to adhere (details of which would be reviewed somewhere in literature). Although negotiations on Basel framework were tedious and the settlement represents a milestone in itself, the application of Basel framework to banking and financial systems around the globe presents a challenge and yet vital step forward.

A survey by the Financial Stability Institute (FSI) in 2015 reveals the level of adaptation and implementation of various aspects of the Basel I, II, and III in some African countries. Countries like Ghana, Botswana, Liberia, Angola, Nigeria, etc. have adopted various aspects of the Basel II pending full adaptation and implementation. Ghana plans to look at Basel II/III together, and implement various aspects relevant to the goals of the banking system in 2017 (FSI, 2015)

A report by Economic Intelligence Unit (EIU) in 2015 shows that advances in financial inclusion policy environment are not readily obvious in Sub-Saharan Africa on the aggregate level. This comes from a combination of low scores in certain areas of application of regulatory policies and high scores in other areas. Notably, in terms of government support for regulatory capacity for financial inclusion and financial inclusion agenda, the region ranks high. On the low, lack of deposit insurance is a widespread issue and the region lags behind other regions in terms of

supervision and regulation of deposit-taking activities. Similarly, the region is ranked last among her peers when it comes to Requirements for Non-Regulated Lenders indicator.

The Alliance for Financial Inclusion (AFI) published a document in 2014, highlighting the main global trends and recommendations from previous financial inclusion experiences (Newnham, 2014). In one of those recommendations, policymakers needed to pursue a proportionate application of the regulatory standards. However, these global regulatory standards set by these bodies can pose a threat to developing countries' ability to create and adopt new services and innovations for greater financial inclusion.

Financial inclusion, which is the variable of interest in the work, is often defined as the proportion of firms and individuals that have access to or use financial services (World Bank, 2014). However, for the purposes of this thesis, a more restrictive definition of financial inclusion would be adopted: the use of financial services through traditional instruments (example, bank accounts or debit card) or innovative instruments such as mobile phones. On the other hand, financial exclusion is defined as the situation whereby an organization, a group, or a person lacks or denied access to appropriate, fair and affordable financial products and services, with the outcome that their ability to take part in economic and social activities is curtailed, poverty is exacerbated and financial hardships is increased (Burkett & Sheehan, 2009). Financial inclusion is therefore not limited to only access to financial services but usage and quality of the service are of the essence. Some particular group of individuals may have access to financial service at an affordable price but may opt not to use it for individual reasons such as culture and religion. Factors as age, gender, and income are usually cited (Demirguc-Kunt et al., 2015). Others may also lack access due to cost constraints and unavailability of the services due to regulatory barriers.

Financial inclusion is globally seen as basic to development as it leads to healthier households and small business sector. Financial inclusion leads to micro stability through the entry, growth, and capitalization of new non-financial firms. Evidence shows that financial development through stronger inclusion is linked with the efficient allocation of capital at the firm level (Wurgler, 2000). Financial development is positively linked to the growth of firms and the rate of entry of new firms (Klapper et al., 2006), and the implication of relieving financial constraints are especially strong for small firm's growth rates (Beck et al., 2005). Thus, greater financial inclusion associated with access to credit might coincide with greater stability at the level of providers of financial services. There is also strong country-level evidence that financial inclusion can lead to greater efficiency in the financial intermediation process (Prasad, 2010). Due to the above implications, global policy makers are beginning to cast themes around financial inclusion by introducing measures to increase access, usage, and quality of financial services.

Globally, recent studies have shown that 2 billion adults remain unbanked with more than half of the unbanked coming from the Pacific, East Asia and the South Asia (Demirgüç-Kunt, Klapper, Singer, & Van Oudheusden, 2015). This position however improved between 2011 and 2014, as 700 million adults worldwide became account holders according to Global Findex Database. This represents 20% decrease in the percentage of the unbanked to the current 2billion (Demirgüç-Kunt et al., 2015).

The African financial system in general lags behind that of other developing economies and developed economies. However, significant improvements have been made over the past decades and can be attributed to the role of mobile payment technology that is gaining waves in the region.

In recent years, an initiative to increase financial inclusion in Africa and globally has focused mostly on the use of technology with Africa making significant headway. The enormous adaptation of mobile phones brought with it the opportunity to be used as a channel to reach previously unbanked customers (Pickens et al., 2009). The cash-in cash-out services provided informal mobile banking agents has created an avenue for service providers to reach a wide range of customers while keeping the cost at the minimum (Chatain et al., 2008).

From the foregoing discussions this thesis, therefore, seeks to investigate which aspects of the regulations have an impact on financial inclusion and assess whether these regulatory standards have been applied proportionately. This will be answered through the negative or positive impacts it has on financial inclusion or lack thereof.

1.2 Statement of the Problem

The concept of financial inclusion has gained prominence since the early 2000s when a direct correlation between financial inclusion and poverty reduction was established (Chibba, 2009; Manji, 2010). Today, inclusive finance is gaining a lot of attention in the literature of economic development and even G20 has recognized its relevance (G20 leaders' declaration, 2012).

In Africa, only 23% of adults in the region have an account with a formal financial institution compared to 33%, for South Asia and 39% for the Caribbean and Latin America (Demirgüç-Kunt & Klapper, 2012). This clearly shows that Africa clearly lags behind its peers and one of the surest ways to inclusive development is through broad financial inclusion. The literature on financial inclusion has mainly focused on indices of financial inclusion (Sarma, 2008; Arora, 2010; Gupte et al., 2012; Chakravarty & Pal, 2012). All these authors have constructed broad indices of financial inclusion to benchmark in-country performance and cross-country

performance in terms of financial inclusion. They have done so without placing much emphasis on the role of innovation such as the role of mobile phones (mobile money) in driving inclusion. In Africa, the drive towards robust financial inclusion is significantly through the use of mobile money which has since become a widespread phenomenon. Having taken into consideration the indefatigable role of financial innovation such as mobile money, literature needs to provide an update on how the landscape of financial inclusion has evolved and how African countries have improved on their financial inclusion standing. This, therefore, provides an avenue for further research to use measures that are more appropriate in order to investigate the current financial inclusion rankings of African countries.

Aside from the use of access and broad index of financial inclusion, another issue that has commanded a lot of consideration in the financial inclusion literature is the use of the 2011 Global Financial Inclusion index (Findex) dataset. The data set is used to explore the socio-economic determinants and barriers to financial inclusion (Allen et al., 2012; Demirguc-Kunt & Klapper, 2012; Klapper & Singer, 2013; Camara & Tuesta, 2014; Efobi et al., 2014). Most of these scholars provide only the descriptive statistics of the measurement of financial inclusion without testing for any statistical significance. Others have also focused on the financial inclusion-stability nexus while others have focused on the link between regulation and bank governance, bank profitability and/or financial development see (Demirguc-Kunt et al., 2003; Barth et al., 2004; Pasiouras et al., 2009). Through a thorough literature search, no literature has focused on the link between financial inclusion and global regulatory standards and therefore, there is the need to investigate how compliance with regulatory standards can cause financial inclusion to increase or decrease. By so doing the thesis can inform policy on which areas of the regulatory standards need revision to ensure sustainable inclusive finance. This thesis will

thereby fill the gap on the linkages/relationship between financial inclusion and global regulatory standards.

Moreover, global regulatory standards were originally developed to provide a best-practice benchmark for developed countries to follow to avoid the recurrence of the financial crisis. Following these standards, the standard setting bodies (SSBs) provided guidance on the regulation of present institutions and their characteristically non-poor clienteles, without paying too much attention to the possible unplanned effects of these standards. This has therefore brought the argument on whether compliance with global regulatory standards has an unequivocally positive impact on inclusion. The Governor of the Central Bank of the Philippines affirmed that global regulatory standards were not originally established with financial inclusion as a consideration and this might lead countries to adopt approaches that can limit innovation (Newnham, 2014).

Recently, considerable attention is being given to inclusion as all five standard-setting bodies (SSBs) have embraced the goal of financial inclusion, albeit at different paces, incorporating these new policy objectives into global recommendation. However, there is a paucity of literature systematically testing empirically if countries that have adopted or complied with these policies have achieved greater improvement in the number of poor households included in the financial system. Moreover, there is no empirical testing of how individual country macroeconomic characteristics contribute to these effects. Especially, in Africa where the macroeconomic environment is highly volatile there is the possibility that these effects may be exacerbated. The thesis intends to fill this gap in the literature by testing empirically how overall global regulatory standards has impacted financial inclusion using a current dataset from the World Bank survey on Bank Regulation. By so doing, the work will also provide some empirical evidence the

individual pillars accompanying the Basel II capital framework and test to see if the standards have been applied proportionately in Africa. A proportionate application of the regulatory standards should reflect the positive effect it has on financial inclusion.

Again, there are contradictory forecasts surrounding the impact of bank regulation and supervisory practice in economic theory. Some argue in favor of restricting bank activities. They argue that neither official nor private bodies can successfully oversee such complex banks because of information asymmetries. In addition, competition is hindered and policies are undesirably influenced through both political and market authority enjoyed by complex banks. Others debate the contrary that such restrictions are not necessary since possible unwanted trickle-down effect to the whole economy is not plenty. In addition, banks are able to exploit economies of scope, scale when restrictions are fewer, and hence deliver services efficiently.

A look at nations with varying levels of regulation of bank activities can help bring resolution to this problem specifically on policies regarding financial inclusion.

1.3 Research Objectives

Consequently, the research objectives of the study would be:

- i. To benchmark African countries' performance in terms of financial inclusion.
- ii. To show empirically, the effect of various aspects of global regulatory standards on financial inclusion in Africa.
- iii. Assess how country-specific macroeconomic characteristics determine the effect of global regulatory standards on financial inclusion in Africa.

1.4 Research Questions

The research questions that emanate from the research problem are as follows:

- i. Are African countries well placed in terms of financial inclusion?
- ii. What effect do various aspects of the global regulatory standard have on financial inclusion in Africa?
- iii. How do country-specific macroeconomic characteristics determine the effect of global regulatory standards on financial inclusion in Africa?

1.5 Justification

The idea of financial inclusion has been discussed variedly in most parts of the world and for different reasons (Sarma, 2008; Chibba, 2009; Arora, 2010; Manji, 2010; Chakravarty & Pal, 2012; Gupte et al., 2012). So is the idea of regulatory standards and its influence financial stability. In Africa, about 77% are excluded from the official financial system. An attempt to regulate the financial system with the so-called international regulatory standards may improve or worsen the state of financial inclusion in the region. No empirical work has tested or provided a link or quantitative assessment of the implication of global regulatory standards for financial inclusion in the sub-region. The global regulatory standards were originally developed to provide best practice benchmark for developed countries to follow and so the impact on a phenomenon peculiar to developing countries' situations is yet unknown. It would be necessary to find out what implication these regulatory standards would have on financial inclusion. This study would provide a reference point for future research.

1.6 Organization of the Study

The study is organized into six chapters, with chapter one as the introductory chapter. This chapter contains the background, the research problem, research objectives, the research questions, justification, and organization of the study. Chapter 2 provides the overview of financial inclusion in Africa. Chapter 3 contains the literature review, where both empirical and theoretical studies have been reviewed. Chapter 4 is dedicated to the empirical methodology for the study. Chapter 5 is where the results of the study are discussed while chapter six provides summary, conclusions, and recommendations for policy.



CHAPTER TWO

OVERVIEW OF GLOBAL REGULATORY STANDARDS AND FINANCIAL INCLUSION IN AFRICA

2.1 Introduction

In order to put into perspective, the state of financial Inclusion and global regulatory standards in the region, this chapter presents the overview of financial inclusion in Africa and global regulatory indicators in Africa.

2.2 The Banking System and Financial Inclusion in Africa

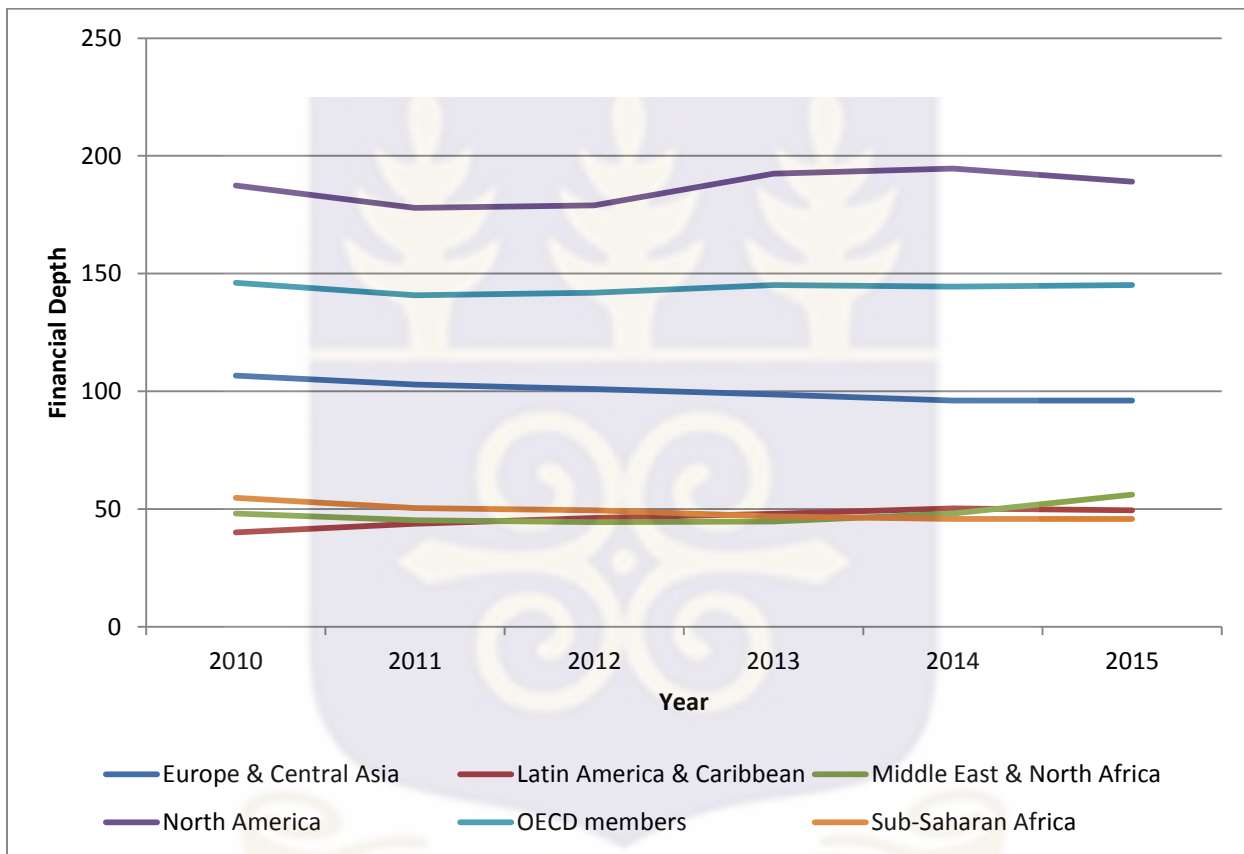
This part gives a broad overview of the banking systems in Africa comparative to the rest of the world. This part discusses the depth, ownership structure, and access to finance and presents some revolutionary initiatives employed to promote inclusion and efficiency in the banking industry.

2.2.1 Financial Depth

Economic growth has a strong link with the depth of financial development. A common proxy for financial depth is the amount of credit the private sector receives from the domestic economy, which is expressed as a percentage of GDP. It captures banks' claim on the private sector relative to economic activities and therefore reflects the role of banks in channeling deposits to the private sector investors. According to King and Levine (1993), higher domestic credit to the private sector shows the financial sector role in enhancing productivity. Using financial depth as a measure of access to finance by the private sector, Africa generally lags behind those in other

regions between the period of 2010 and 2015. For example, the ratio of credit the private sector received from the domestic economy, which is expressed as a percentage of GDP, averaged 45.8% for Sub-Saharan Africa, which is the lowest, compared to the other regions. The trend of financial depth is presented in figure (2.1).

Figure 2.1: Sub-Saharan Africa: Dimension of Financial Depth.



Source: Author's computation from WDI.

2.2.2 Account Penetration

Aside from financial depth, financial penetration remains low in Africa. As shown in figure 2.2B, overall, less than a quarter of African Population has access to a formal bank account with 23% having a formal bank account. Compared to other regions, the Latin America & Caribbean

has an account ownership of 39%, whereas, in the OECD countries, the share of account ownership averages an impressive 90%. As depicted in figure (2.2B), within the sub-region, huge difference in account ownership exists, though this ranges from 51% in South Africa to 20% in North Africa. Sub-Saharan Africa records and account ownership of 24%.

Figure 2.2A: Account Penetration within Africa

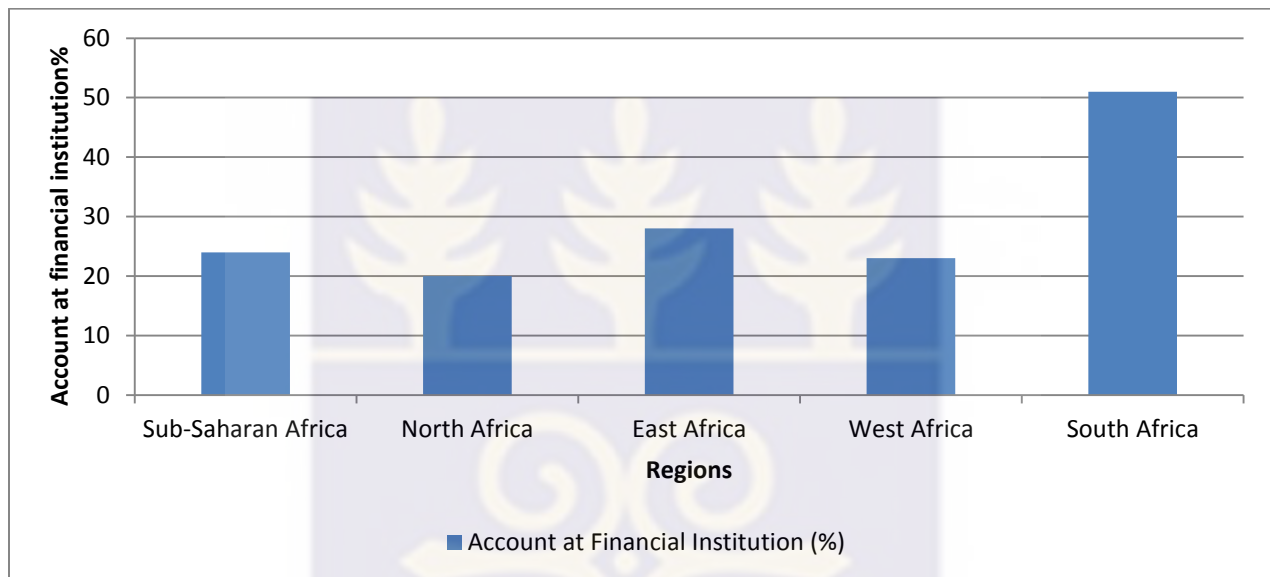
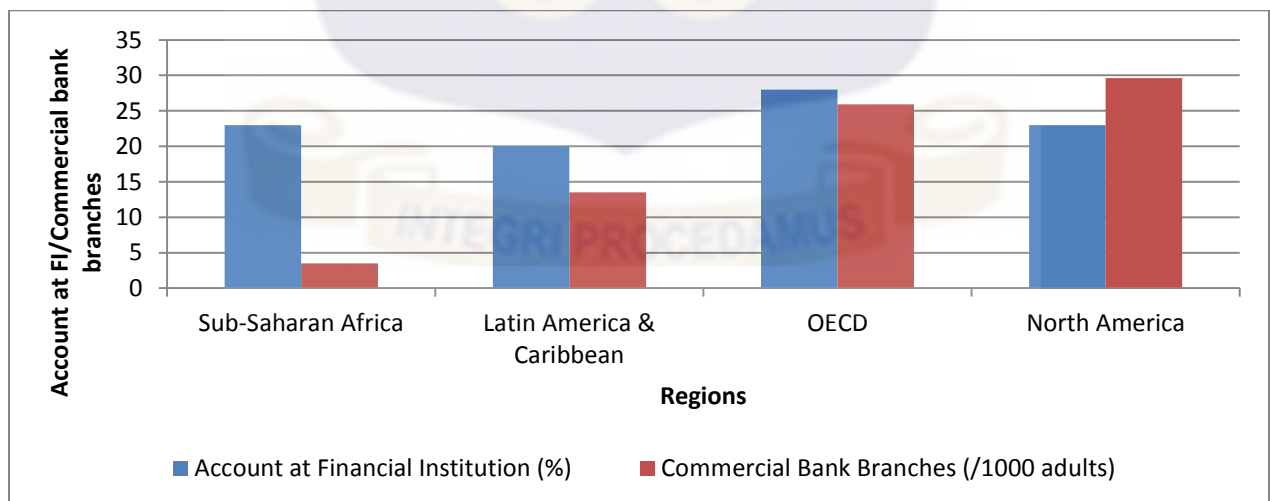


Figure 2.2B: Account Penetration in Africa



Source: calculation based on global findex, 2011

Another measure of penetration or access, which is commercial bank branches per 1000 adults, shown in figure (2.2B) also shows that Africa lags behind other regions. For instance, the commercial bank branches per 1000 adults in Sub-Saharan Africa is 3.5, compared to 13.5 in the Latin America& Caribbean, 26 in OECD countries and 30 in North America.

The low access to finance in Africa as depicted in the figure above can allude to regulatory complexities and the tedious processes and requirements in opening a bank account. Due to the Know Your Customer (KYC) conditions, opening an account in some countries and even some top banks may require that the customer has an identification card, access to a formal address, a constant stream of income with minimum required deposits and proof of formal employment. While these requirements may be necessary, many people in low-income nations may not be able to meet even one of these requirements.

2.2.3 Innovative Financial Inclusion

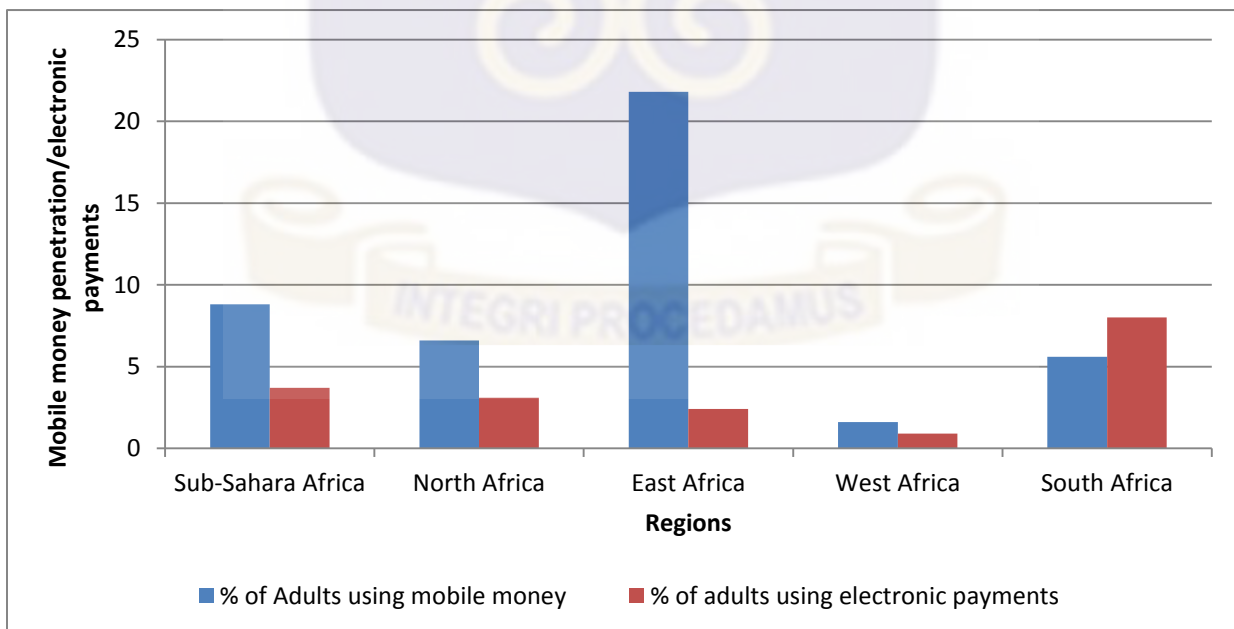
Over the years, the landscape of financial access is changing with Africa making significant headway. This can be attributed to changes in approaches to banking and innovation in the banking sector.

Expansion of mobile phones and mobile communication networks to rural communities has come with it an opportunity to be used as a tool to reach the previously unbanked population. This technology challenges the conventional ATM and electronic payment systems. In Africa, financial institutions are now working with telecommunication providers to develop mobile banking systems that make banking accessible to clients. This has led to a reduction in the “shoe-leather” cost associated with the operation of ATMs and traditional bank branches.

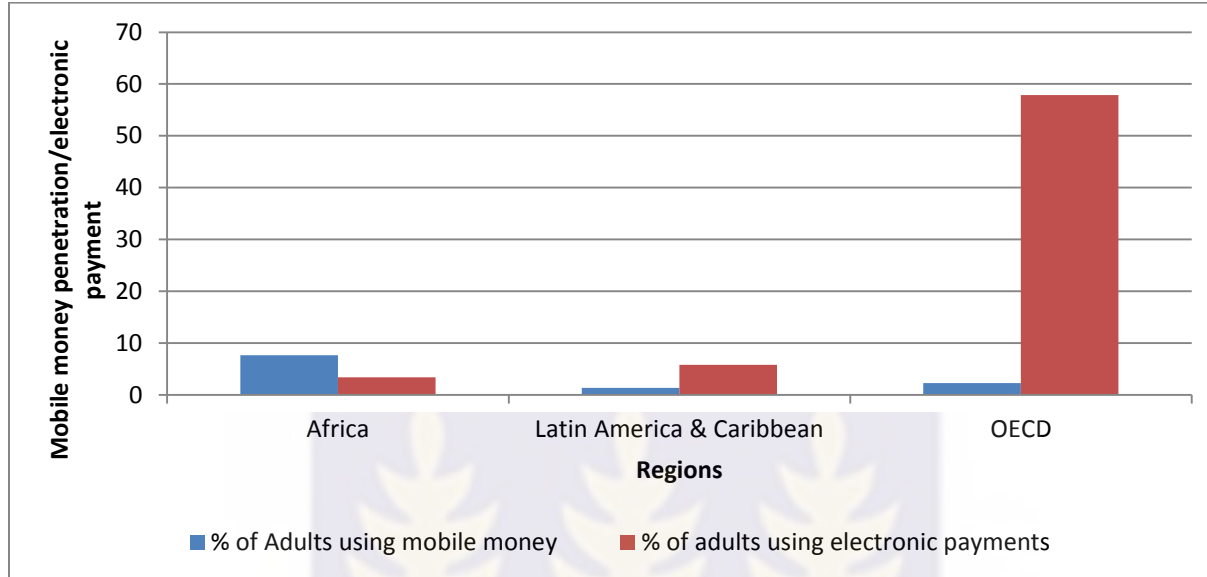
The success of mobile banking in including the previously unbanked population is more pronounced in East Africa than elsewhere. Notably, Safaricom developed MPESA mobile money transfer and payment system in Kenya. The system currently serves over 17million clients with over 40,000 agents across the country. Similar slides are being replicated in West African countries with the emergence of MTN mobile money, Vodafone cash, and Tigo cash in Nigeria, Ghana, Ivory Coast.

From figure (2.3A), East Africa has the highest percentage of adults (22%) using mobile phones to receive or send cash. The percentages are 2%, 6%, and 7% respectively for West, Southern, and North Africa respectively. From figure (2.3B), in OECD countries, only 3% of the population relies on mobile money banking compared to 8.8% of African adult population using mobile money. This emphasizes the role of mobile money in promoting financial inclusion in Africa.

Figure 2.3A: Innovative Financial Inclusion within Africa Region



Source: calculations based on global finindex, 2011

Figure 2.3B: Innovative Financial Inclusion Africa Region and Rest of the World

Source: calculations based on global findex 2011

Other innovations such as the use of electronic payments are lesser in Africa relative to other regions. As shown in Figure (2.3B), only 3.4% of the African adult population reportedly uses an electronic form of payment. This is very low, especially when compared to 58% of adults using electronic payment mechanisms in OECD countries and 6% in Latin America & Caribbean. In the sub-regions of Africa, as shown in figure (2.3A), Southern Africa with the highest financial sector development unsurprisingly reports the highest percentage (8%) of adults using electronic payments. In general, Africa lags behind other regions in terms of the use of electronic payments and this is unsurprising.

2.3 Overview of Bank Regulation in Africa

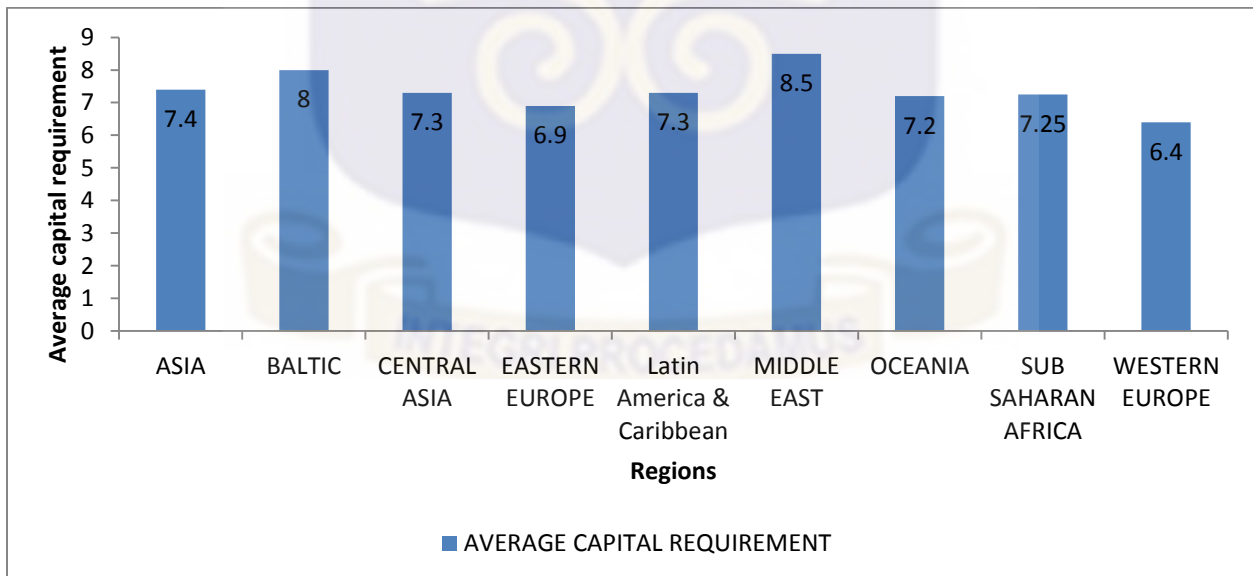
To measure the state of regulation of the banking systems in Africa, we use data from the survey of Barth et al. (2012). The survey, which was conducted in 2011 and released in 2012, contains

information on banking regulation in 125 countries around the world. For the purpose of this study, the focus is on banking regulation in Africa comparative to the rest of the world.

2.3.1 Bank Regulation: The Role of Capital Requirement

Authorities use the role of capital requirement as a tool to regulate the banking system. Three indices are used to assess capital regulation. The first index is the overall capital requirement. The second index is the “initial capital stringency” and it measures whether certain funds are used to primarily capitalize banks. The third index, which is the regulatory index is the aggregation of the two indices previously mentioned. The index ranges between 0 and 10. The higher the index, the more stringent capital requirement. A look at figure 2.4 shows that Sub-Saharan Africa has an average ratio of 7.25. This shows that the regulation of capital is relatively stringent in Africa than the Western Europe, Oceania, North America and Eastern Europe.

Figure 2.4 Capital Requirement

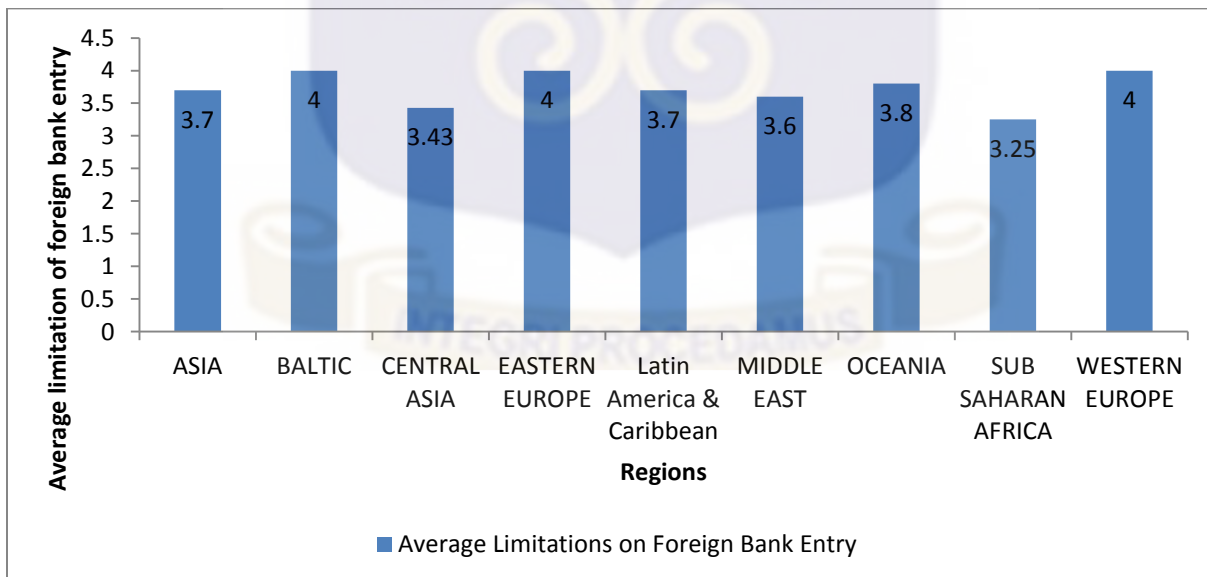


Source: based on Basel committee on banking supervision 2011 and authors' calculation

2.3.2 Bank Regulation: The Role of Competition Policy

The debate on the role of competition is ongoing. Some argue that when there is more competition in the banking system, capacity for funding projects would increase. However, excessive bank regulation can trigger greater risk-taking behavior by banks. In the survey data, five indices are used to measure the extent of bank competition in Africa but for the sake of this thesis, the index of foreign entry and ownership is used to proxy the level of bank competition. The index of limitation on foreign entry measures whether foreign banks are restricted from entering the banking system. The index ranges from zero to four with lower values indicating greater stringency or limitation on competition. Sub-Saharan Africa has the greatest limitation on foreign entry into domestic banking system relative to other regions. Although the limitation on competition is highest (3.2) relative to the other regions, the banking system is fairly opened to foreign invasion as shown in Figure 2.5.

Figure 2.5 Limitation on Foreign Bank Entry



Source: based on Basel committee on banking supervision 2011 and authors' calculation

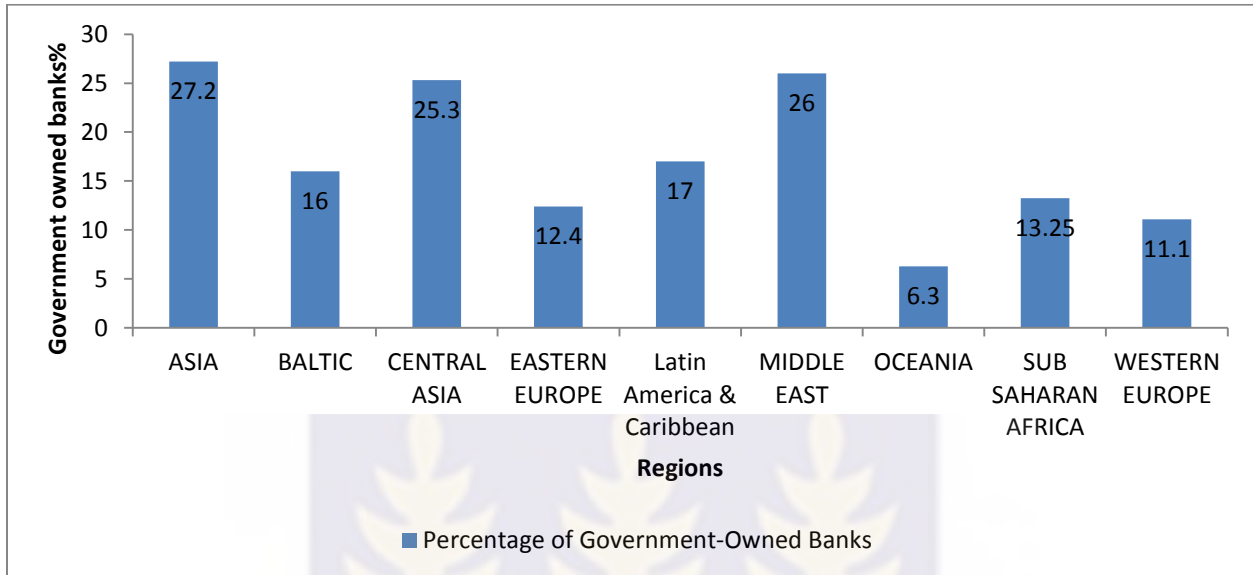
2.3.3 Bank Regulation: The Role of Deposit Insurance

Few countries across Africa have some sort of deposit insurance protection schemes that follow the essential values for effective deposit insurance issued by the Basel Committee for Banking Supervision. Only twelve (12) countries in Africa have some sort of deposit insurance according to the International Association of Deposit Insurers (IADI). Four other African countries are also preparing to establish deposit insurance schemes to protect depositors' funds.

2.3.4 Bank Regulation: The Role of Government Ownership

The number of banks owned by the government determines the market structure of the country. State-owned banks account for 10% of banking system assets in developed countries and the share of state-owned banks in developing economies is twice that of the developed economies according to Global Financial Development Report (2013). Government ownership of banks, which is quite prevalent in developing economies, has declined considerably over time (see Figure 2.6). The retrenchment of government ownership of bank assets has been dramatic in Asia and the Middle East. The massive privatization of banks in transition economies in the early 1990s has significantly reduced the stake of government in banking system across Africa to an average of 13% in 2011. Asia followed by the Middle East has the highest government stake in bank assets recording 27% and 26% of government-owned banks respectively. The detailed statistics are shown in Figure 2.6.

Figure 2.6: Government Ownership of Banks in Africa



Source: based on Basel committee on banking supervision 2011 and authors' calculation

2.4 The State of Basel Implementation in Africa

The global landscape of regulatory convergence is highly uneven and limited. According to Barth, Caprio Jr, and Levine (2008), one hundred and forty nations were assumed to have applied Basel I with about 100 countries declaring their intention to implement various aspects of Basel II. Whilst only one African country has completely applied Basel II in accordance with the stipulated time given to Basel adherents, a chunk of African countries have not implemented Basel II. Between the two levels of adherence are other African countries that have made a significant stride in complying with Basel II standards. This ranges between late-partial adopters and early-comprehensive adopters who have gradually made selective implementation of Basel II. However, most banking systems in Africa are being guided by Basel I.

To paint a clearer picture of the overall state of implementation of Basel II across Africa, countries are grouped into four (4) stylized categories. Based on pace and scope of

implementation, the categories are: early-complete adopters (nations that have applied basic and advanced methods of pillar 1, 2 & 3 according to Basel timetable for members); late- complete adopters (nations that deferred application of Basel II but however has arranged to apply elementary and progressive methods of pillar 1, 2 & 3); early-partial adopters (nations that have applied only the elementary methods at a consistent timetable); and late partial adopters (nations that are behind in the application of Basel II and also have partially applied portions of the Basel framework).

Table 2.1: A Classification of Countries from “Early-complete Adopters” to “Late-Partial Adopters”

Early -Complete	Late- complete	Early partial	Late partial
South Africa	Morocco Mauritius	Malawi Central Africa Republic Egypt Nigeria Namibia	Ghana Lebanon Botswana Gambia Mozambique Tanzania Uganda Congo Seychelles Tunisia Zimbabwe Other WAMU

Of the nations surveyed in Africa, a lot of financial sector leaders emphatically announce arrangements to apply Basel II. However, the level of convergence is essentially not impressive. Although most of the countries are one way or the other abiding by Basel I core principles and some parts of Basel II, only two countries have implemented substantive portions of Basel II. South Africa, the only African country that is a member of the Basel Committee applied all

principles of Basel II framework in the year 2008 and Morocco and Mauritius adopted a late-comprehensive approach by applying the elementary principles of Basel II in the year 2007. Only Malawi, Central African Republic, Nigeria, and Namibia are early-partial adopters. The rest of the African countries are late partial adopters. Significant instances of deferred application exist across African countries, and this highlights the application hurdles the region faces. For instance, according to Reserve Bank of Malawi (2006), the Reserve Bank of Malawi was poised to implement Basel II in 2005 only to abandon this ambition to place emphasis on compliance with Basel core principles rather. The Commission of Central African Banking postponed its arrangement to apply Basel II in countries within its jurisdiction to 2015 following the advice of the International Monetary Fund and the World Bank (COBAC, 2009). In similar fashion, the Bank of Uganda played patient tactic to the application of Basel standards pending a resolve by the Monetary Affairs Committee for East African Nations to enable them to study Basel II further awaiting complete adoption in the area (Bank of Uganda, 2005). Botswana adopted a gradual approach to Basel II implementation commencing with “parallel-run” of Basel I and Basel II. Full implementation of simple approaches is slated for 2015. In addition, Gambia, considering the financial burden on banks is currently focusing on implantation of qualitative aspects of Basel II (FSI, 2015). Ghana has implemented risk-based supervision in banks upon a recommendation in FSAP report in 2010 to embed risk culture in banks before embarking on Basel II. The Central Bank of Ghana, however, seeks to look at Basel II and Basel III together and implement portions necessary for banking systems in the country (FSI, 2015).

In conclusion, the banking system of Africa is not fully developed compared to the banking system of the rest of the world. In general, the banking system is characterized by low financial depth and low account penetration. However, with the mass adaptation of mobile money on the

continent especially by low-income households, Africa is making significant headway in terms of the number of people who are included in the formal financial system. Generally, the adaptation of global regulatory standards is quite bleak on the continent. However, due to sophistication and current developments in the global financial sector, most African countries are adopting sections of global regulatory standards to strengthen the resilience of their banking system.



CHAPTER THREE

LITERATURE REVIEW

3.1 Introduction

This chapter is organized into five parts. First, review of definitions, dimensions of financial inclusion and exclusion are presented. This is followed by an overview of Bank regulation, Basel Committee, Basel I and Basel II to provide a contextual framework to the international financial regulatory structure for bank capital and throw light on the difference between Basel I framework and Basel II framework. The next section talks about the theoretical approaches to regulation. The study continues with a review of some theoretical and empirical works on the Basel regulatory framework (global regulatory standards) and financial inclusion, which is the main broad area of study that this study intends to contribute towards. The literature on determinants of financial inclusion and theoretical and empirical literature is done to capture which aspects of the global regulatory reforms could have a substantial influence on financial inclusion and finally to comprehend the studies that have been addressed in relation to global regulatory standards and financial inclusion.

3.2 Financial Inclusion and Exclusion: The Concepts, Definitions, and Dimensions.

In order to identify the underlying factors that constitute and affect financial inclusion, the definition of financial inclusion is a crucial next step. Financial inclusion has no generally accepted definition in literature. Depending on the geographies, priorities of social concern and the level of financial development of a place, the definitional focus of financial inclusion varies. Financial inclusion can be broadly conceptualized as access to finance and financial service for

all in a transparent and nondiscriminatory manner at a reasonable cost (Thingalaya et al., 2010). The term financial inclusion was devised in the British lexicon as they found out that nearly 7.5 million persons did not have an account at banks. In the Indian context, the concept emerged prominently in the post-liberalization period with rising exclusion in the country. Hence, to define financial inclusion, it is necessary to understand the concept of financial exclusion.

Leyshon and Thrift (1995) provided one of the early definitions of financial exclusion. They describe the term as the practice that serves to thwart certain individuals and groups from getting access to the official banking system. Sinclair (2001) defines financial exclusion as the inability to have essential financial services in the required manner because of problems concerning conditions, marketing, access, and prices in response to undesirable experience. According to Carbo et al. (2005), financial exclusion is broadly the failure of some social groups to have access to the formal financial system. To Mohan (2006), it signifies the inability of certain segments of the society to have significant participation in the financial system.

Contrast to financial exclusion, financial inclusion broadly means accessing an extensive variety of financial services at a reasonable price (Rajan, 2009). In a more concise manner, it can also mean the provision of basic banking services at an inexpensive price to all units of the society, especially the low-income units who tend to be excluded (Leeladhar, 2006). In a similar fashion, Chakravarty (2006) also defined the term as extending the benefits of financial services to the “have-nots”. When put simply, it means that banks will offer a basic account to anyone who wants to have one.

In addition, financial inclusion implies a coordinated effort in order to design financial services among a large number of customers. It aims at providing safe and fair instruments or financial

service and products like bank accounts, affordable credit, assets, savings, insurance, payments and remittances facilities as well as money advice from mainstream providers to all (Mohan, 2006). Thorat (2007) expressed similar views when he defined the term financial inclusion as delivering low-priced financial services to those who were previously excluded.

By introducing a different element to the understanding financial inclusion term, Bernanke (2006) asserts that it requires great effort in comprehending the wants of the client, financial literacy, counseling, monitoring, and screening. Dev (2006) in his definition of financial inclusion broadens the scope by placing substantial emphasis on the role of new institutions and players in the financial system.

World Bank (2008) approaches the financial inclusion concept in a broad manner. It defines the term as taking away all the barriers that prevent the usage of financial services. It, however, does not imply that firms and all households should be able to transmit funds across the world or borrow unlimited amounts without some fee. The creditworthiness of the customer is the essence if financial service is extended to the individual. The report by the World Bank emphasized the difference between the use of financial services and access to financial services as it has implication for policy makers. Access fundamentally refers to the supply of the services, whereas use is determined by both supply and demand conditions. The report further calls for differentiating between involuntary and voluntary exclusion among people who do not use financial services. “Voluntary exclusion” refers to people who claim that they do not want financial services, even if the institutions do not disallow them. Whereas “involuntary exclusion” refers to all those who would like to avail themselves to the use of financial services but are unable to do so because of some barriers in the system. The challenge of financial inclusion is

the “involuntarily excluded” as they form the group of people demanding financial services but cannot have access to them (Bhavani & Bhanumurthy, 2012)

The World Bank’s 2014 Global Financial Report defines financial inclusion as a section of firms and individuals that have access to or use financial services. The report notes that lack of use does not mean lack of access. Some may not use certain financial services despite the accessibility due to cost, legal barriers and market failures (World Bank, 2014).

Considering the foregoing discussions, the definition of the term financial inclusion in the framework of this study has been restricted to the use of financial services through traditional instruments (example, bank accounts or debit card) or innovative instruments such as mobile phones.

3.2.1 Dimensions of Financial Inclusion

Accessibility, availability, affordability, and quality are the important dimensions of financial inclusion as evident from the above definitions of financial inclusion and exclusion. However, an inclusive financial system does not only imply accessibility and availability. The usage dimension should also be taken into consideration. Sarma (2008) emphasized these three dimensions of financial inclusion. According to her, inclusion is a process that guarantees the simplicity of usage, availability, and access to the official financial system. To the Alliance for Financial Inclusion (2012), financial inclusion is multidimensional and so individuals and enterprises are classified as included or not. The Financial Inclusion Data Working Group (FIDWG) agrees on three main dimensions of financial inclusion and that provides the basis for data collection. These are access, usage, and quality of financial services.

The various dimensions of financial inclusion (Access, Usage, and Quality) are thus broad categories into which indicators of financial inclusion can be grouped, without being limiting. These dimensions simply provide a comprehensive outline to direct policy makers in the quest to develop a robust measurement strategy to reflect the multi-dimensional nature of financial inclusion. The detail discussion of the access and usage dimensions is given below:

Access: this dimension refers to the ability to use the products and services offered by official financial institutions. Assessing the levels of access may require finding and examining potential barriers to opening and using a bank account, such as physical proximity or cost of bank service points (ATMs, branches, etc.). Information on access can be obtained from both demand-side and supply-side data.

Usage: it refers to product use and the extent or depth of usage of products and depth of financial services. Defining usage requires gathering details about the regularity, duration, and frequency of use over time. In order to use financial services, households or firms must first have access. This, however, does not imply that having access means that everybody uses financial services.

Other dimensions such as quality, availability, etc. are adopted in several kinds of literature for obvious reasons. According to Allen, Demirgüç-Kunt, Klapper, and Martinez Peria (2012), access is more closely related to factors that affect the supply of financial services, whereas use is determined by supply as well as demand influences. In this context, the study is restricted to the usage dimension as a proxy for financial inclusion as it captures both demand and supply influences.

3.3 Global Finance Regulation

The banking sector is among the profoundly regulated industry around the World. Bank regulation generally means the general guidelines that oversee the conduct of banking institutions. Regulation of the banking industry is a controversial and sensitive issue as regulation of banks could lead to moral hazard. In addition to the issue of moral hazard, distortions can arise between unregulated banks and regulated banks (Barth et al., 2004).

However, the crucial function of banks necessitates some form of regulation to ensure system stability. Regulation is also needed to ensure efficiency of the banking system. To this regard, whenever a bank is subjected to regulation with the objective of limiting the bank's activities, the bank's routine activities and efficacy with which it operates is affected. This can induce banks to operate in more risky ways to circumvent regulation and this could eventually affect economic growth (Jalilian et al., 2007).

The financial crisis of 2008 has resurrected the long-standing argument between groups who support tighter regulations and groups who associate the crisis to regulatory failures. In the midst of the wide adoption of Basel II framework, there is still unending argument about the benefit and costs of the framework (Herring, 2005). It is, therefore, important to evaluate the effect of the Basel I & II types of regulation on financial sector outcomes. The chief economist of IMF, Raghuram Rajan, highlighted the need to study the effects of Basel regulations when he challenged the current practices of regulation.

3.3.1 The Basel Committee, Basel I & II

3.3.2 The Basel Committee

The failure of Bankhaus Herstatt in West Germany led to a severe disturbance in the international currency and banking markets and this called for the establishment of the Basel Committee in 1974 by Group of Ten (G10) central bank governors. The Basel Committee provided the platform for regular cooperation between member countries on bank supervisory matters. The Basel Committee since inception has sought to advance supervisory indulgence and the quality of banking systems around the globe.

Aside from the standards on supervision formulated by the committee, it is well acknowledged for the regulations with regard capital adequacy conditions. The 1998 Accord also known as Basel I put the BCBS in the scope for policy makers and banks (Goodhart, 2011). In the 1990s, the Accord rose to become the worldwide standard, with a lot over hundred (100) countries adopting the standard to their financial system (BCBS, 2001). According to Barth et al. (2008), one hundred and forty (140) nations were assumed to have applied Basel I when Basel II was agreed. The Basel I framework was revised in 1998 and Basel II framework was available in 2004. At the time many nations were transitioning to Basel II, the Basel Committee was yet again at the center of another revision at the request of the Group of Twenty (G20), after crisis to the financial system in 2008.

The Basel Committee lack formal national supervisory authority over its member and non-members, however, the nonbinding requirements have had substantial effect shaping the regulatory regimes of countries around the globe. To be specific, the Basel Capital Accords have

had a deep root in international banking practices and supervision in developing and developed countries.

3.3.3 Basel I

The Bank for International Settlements (BIS) in 1988 assigned the first framework for banks' capital adequacy. The primary purpose of the Basel I framework was to ensure an adequate capital level for banks around the globe and to ensure a "level playing field" with regards to competition so that financial institutions could not conduct huge business activities deprived of strong capital support (BCBS, 2004). This accord focused on lending and so the focus of the regulation was on credit risk (Eun & Resnick, 2008). Members of the committee were much concerned about the deteriorating capital standards and took steps to halt the further deterioration by ensuring deeper consensus in the capital adequacy measurement. This brought about a convergence on a subjective strategy for measuring off and on balance sheet risks. After consultations and remarks on the December 1987 consultative paper, Basel I framework was accepted and released for use by financial institutions.

Basel I framework was basically a governing capital calculation system that made it mandatory for banks that abide to hold an 8% ratio of capital to risk-weighted assets by 1992. Whilst Tier 2 consisted of supplementary internal and external resources, Tier 1 of Basel capital comprised shareholders' equity and retained earnings. Four buckets, 0%, 20%, 50% and 100% of assets were classified to measure risk-weighted assets. The classifications into each bucket were based on the basis riskiness of the kind of asset, which in the case of Basel I was differentiated according to the characteristics of the debtor. For instance, capital was not required on government treasury bills and bonds whilst dues on banks called for a 20% weight. Claims on

non-private sector attracted the standard weight of 8%. Due to changing market conditions Basel I was updated frequently. Basel I was generally a success and touted to have succeeded brilliantly in moving towards a level playing ground and raising capital levels (Goodhart, 2011).

3.3.4 Basel II

Because of the fast paced changes in the financial system, the basic capital requirement under Basel I quickly became outdated. The capital requirement calculation under Basel I led to regulatory arbitrage, as banks were moving from the balance sheet, first-rate assets. Therefore, the rationale of the Basel II was to make the regulatory capital requirement more responsive to risk and to cut back regulatory arbitrage. In 2004, the Basel II was finally agreed and it operated around three pillars conforming to the basic regulatory capital requirement in the first pillar, supervisory review process in pillar two and greater market discipline in pillar three.

The leading pillar outlines how the minimum capital for market risk, operational risk, and credit risk are calculated. The credit risk alone has been subdivided into three approaches to finding the risk. According to the BCBS (2004), there are three approaches to finding credit risk. The approaches are outlined below.

The Standardized Approach (SA) in an attempt to improve the risk sensitivity of capital requirements distinguishes between the riskiness of a particular exposure and type of exposure. Each asset type and level of exposure are assigned fixed risk weights. Banks may also use peripheral credit valuations by rating agencies to investigate the credit quality of the borrowers. In an instance when an external rating is not applied, a risk weighting of 100%, corresponding to 8% capital requirement is mandated by the standardized approach. Furthermore, special

treatment is given to retail exposures such as residential mortgage and loan to small scale enterprises.

The Internal Rating Based approach (IRB) gives banks the right to use their own internal systems to classify the individual risk- weights given exposure to risk. In order to do this, banks need supervisory approval from BCBS.

The securitization approach or framework under credit risk posits that a transaction should be backed by capital; the banks have to hold a portfolio of capital that backs all their securitizations (BCBS, 2004).

Operational risk under pillar 1 may result from banks' own internal operations. Examples of operational risk include fraud and loss of data. Operational risk can be calculated using the Basic Indicator Approach (BIA), Advanced Measurement Approach (AMA) and Standardized approach. Under the BIA, it is mandatory for banks to hold capital base equal to fixed 15% of average annual positive gross earnings over the previous three years. Under the SA, the activities of the bank are subdivided into eight business lines. In order to get each business line's capital charge, each line's gross income is multiplied by 12%-18%. The pillar 2, which consists of the supervisory review process, necessitates financial institutions to have an Internal Capital Adequacy Assessment Process (ICCAP) and specify capital objectives to guarantee that financial institutions have satisfactory capital cushion beyond the core minimum capital requirements.

The third pillar emphasizes greater market discipline and requires banks to incorporate greater discipline into their activities. This they do by publishing information about their risk assessments and how they adhere to the core principles of Basel II. This according to (Balthazar,

2006; Casu & Girardone, 2006) makes it easier for stakeholders to judge banks' soundness and performance.

Although Basel II framework remains a “non-legally binding” structure for members and voluntary principles for the rest of the world, the Financial Stability Institute (2004) believes it would become the “global standard” for regulatory exercise. The next section examines two theoretical approaches to regulation.

3.4 Positive Economic Theories of Regulation

Positive Economics studies causality of behavioral relationships of variables in an economic context. Positive Economics theories give an explanation to economic situations by making inquiry into the functions, nature, and reasons for its being (Mohammed Ahmed, 2016). Positive economics answers questions such as how banking regulations are designed, and why banks are regulated in the current form. Thus, in discussing banking regulation as an economic phenomenon, a positive economist tends to address the above questions. In this section of the study, subsets of positive economics are discussed in addition to two approaches to regulation.

Public Interest Theory: Public interest theory of regulation designs regulation by considering public interest only. The interest of the public receives much priority as opposed to the self-interest of investors, political parties' interest of lobbies, etc. According to Baldwin and Cave (2012), the theory of public interest views regulation as a benevolent hand that helps the general public as oppose to the self-interest groups. In the view of the public interest theory, economic regulation is supplied in response to public demand to protect their interest from market imperfections (Freixas and Rochet, 1999). It is motivated by the behavior of market players to pursue personal interests that have negative consequences to public interest (Moran, 1986). The

government or a regulatory body, therefore, intervenes as a neutral hand through structured regulations to ensure a level-playing field. Thus, from the theory, economic regulation should be designed and supplied to hedge public interest against market imperfections such as financial exclusion. In relation to banking sector regulation, the regulation is supplied to protect depositors' money against bank runs. Loss of depositors' money is thus an important negative externality that bank regulators seek to minimize because of the intensity of the aftermath effect (Santos, 2000).

Administrative theory: Administrative theory deals with regulation from the realm of the regulator's control over economic activities and the behavior of firms. Regulators are supposed to have various classes of administrative tools at their disposal that are individually designed to deal with each economic phenomenon or problem. Not applying the appropriate tool to an economic phenomenon is likely to lead to regulatory failure. For instance, take a government faced with money problem in its country. The government would seek to use "price control" tool by considering solid empirical backing to the suitability of the "price control" tool to deal with the monopoly problem. Breyer (1982) and Hood (1984) attributed the failure of economic regulation to administrative failure to select the right tool for an economic situation. In the context of bank capital adequacy, a Basel capital accord is the administrative tool adopted to regulate bank capital. The suitability of this tool is can be tested by studying the implication it has for bank capital and other bank sector outcomes.

Microprudential Approach: Microprudential approach to bank regulation focuses on the individual banks and this is explained using deposit insurance (Hanson et al., 2011). Deposit insurance, for instance, may provide an incentive for bank managers to take on additional risk. To deal with these risks, governments give deposit insurance. By providing deposit insurance

cover for depositors' funds, they may feel safer and may not rush to retrieve their deposits in case there is trouble in the particular bank. Despite the positive effects of deposit insurance, it can lead to a moral hazard problem as managers may not be vigilant in their dealings (Hanson et al., 2011). Capital regulation gives banks an internal cushion to absorb losses should they occur. This deals with the moral hazard problem by protecting deposit insurance funds. Microprudential regulation in the presence of moral hazard problem works best if the probability of using deposit insurance is reduced to the barest minimum.

If banks do not have an adequate capital base, it is forced to draw down on deposits in case of difficulties and so the goal of capital regulation is to force banks to have enough capital so that deposits may not be used. It is always implicitly assumed that even if the capital base has been used to cover up losses, the capital base will always return to the required minimum capital. This is done by either drawing down on the bank's assets or retrieving new capital from the market. This approach to revamping capital base according to Hanson et al. (2011) would not have been a problem if it concerns only a bank. However, if all banks are shrinking their assets by not lending to borrowers, there may be serious economic ramifications.

Zhou (2009) asserts that what constitutes a major flaw of the microprudential approach to regulation is the focus on individual banks.

Macroprudential Approach: Concerning policy decisions, the financial crisis of 2007/2008 has underscored the necessity to see beyond the acclaimed micro-based method to financial supervision and regulation. There is a rising agreement in the literature on the superiority of macroprudential approach to regulation:

“[...] we need a new set of macro-prudential policy tools which enable the authorities to more directly influence the supply of credit[...]” (Chairman of the UK Financial Services Authority, Adair Turner, 2010)

Due to the above, standard- setting bodies have been called on to develop macroprudential tools:

“The implementation of Basel III will considerably increase the quality of banks’ capital and significantly raise the required level of their capital. In addition, it will provide a “macroprudential overlay” to better deal with systematic risk” (Caruana, 2010).

The mention of macroprudential technique became popular only in the middle of 1980. Bank for International Settlements (BIS) in 1986 mentioned it as a policy targeted at providing support to “the safety and soundness of the financial system as a whole as well as payment mechanisms” BIS (1986, p. 3). The first chairman of the BCBS, George Blunden, stressed on how a systematic opinion could mean limiting the bank practices that may appear prudent from the lens of the individual banks (Blunden, 2007).

Drawing a distinction between macroprudential approaches to regulation and microprudential approaches, Table 3.1 provides the stylized perspectives:

Table 3.1 Macro versus micro prudential viewpoints

	Macro prudential	Micro prudential
Immediate objective	Limit financial system- wide distress	Limit distress of individual institutions
Ultimate objective	Avoid macroeconomic costs linked to financial instability	Consumer protection (investor/depositor)
Characterization of risk	“endogenous” (dependent on collective behavior	“exogenous” (independent of individual agents’ behavior

Source: Borio (2003)

The Basel Accords was mainly built on microprudential theory but the Basel III mainly incorporates the macroprudential theories to regulation. Overall, the macroprudential approach emphasizes on risks pertaining to the entire banking system and makes effort to minimize those risks whilst microprudential regulation emphasizes on reinforcing the individual banks at the bank level (BIS, 2012). This thesis is centered mainly on Basel I&II and hence will adopt more of the Microprudential approach to regulation.

3.5 Theoretical Arguments on Regulation and Financial Inclusion

There is no exact theory that explains global regulatory standards and financial inclusion nexus in literature. However, studies by Keeley (1990); Shleifer (1998); Dewatripont and Tirole (1994); Santos (2001); Barth et al. (2001); Demirgüç-Kunt and Detragiache (2002); La Porta et al. (2002); Gorton and Winton (2003) etc. have all stressed on the link between regulation and various aspects of financial sector development.

3.5.1 Regulations on Internal and Overseas Bank Entry

Economic theory presents contradictory ideas on the need for and consequence of regulations on overseas banks and local financial institutions entry into banking. One school argues that active scrutiny of banks' entry can stimulate overall stability. Others also emphasize that banks holding greater uncompetitive power have a greater franchise worth, which leads to judicious risk-taking conduct (Keeley, 1990). Others are also in favor of competition and opposing restrictions on entry due to beneficial effects and harmful effects of competition and restrictions respectively (Shleifer, 1998).

Among those in favor of competition through foreign entry are Demirgüç-Kunt and Detragiache (1997); Denizer (2000); and Habber et al., (2012). They find a positive effect of the presence of foreign banks on financial efficiency. Emphasizing on the positive effect of foreign banks' entry is Denizer (2000). In his work, he finds evidence that the penetration of foreign banks increased the use of technology in the financial sector and attracted a more qualified workforce. Bhattacharya and Thakor (1993) noted in his work that various fees in the banking system reduced significantly after foreign bank entry into Turkey.

3.5.2 Regulation on Capital requirement

The capital of banks provides a cushion against losses the banks may incur and hence mitigating banking failure. Therefore, according to Dewatripont and Tirole (1994), traditional approaches to regulation of banks' capital lay emphasis on the positive features of capital adequacy requirement. The theory gives contradictory results on whether the application of the capital obligation will have a positive effect (Santos, 2001). Koehn and Santomero (1980) argue that capital requirement may upsurge the risk-taking behavior of banks. According to Gorton and Winton (2003), in general equilibrium context, raising capital requirements forces banks to supply fewer deposits, which goes on to reduce the liquidity-providing roles of banks.

Given the conflicting theoretical results, the controversy over the new risk-based capital requirements in the Basel II&III, it appears timely and imperative to study the relationship and consequently the effect of this capital requirement on banking sector outcome such as banks' ability to extend financial services to the excluded across countries. This thesis specifically addresses the relationship and effect of capital requirement on financial inclusion.

3.5.3 Deposit Insurance Design

Deposit insurance schemes are widely applied to avert excessive bank runs. If circumstances should trigger excessive withdrawal of depositors' funds all at a go, illiquid but solvent banks may be pushed into insolvency. To shield the financial system from scary bank runs, scholars argue in favor of deposit insurance schemes. Deposit insurance has the tendency to increase the risk-taking behavior of banks and hence reduce its stabilization effect if any. Yet, many contend that appropriate regulation can help resolve the moral hazard associated with it. Deposit insurance, however, comes with a cost. Demirgüç-Kunt and Detragiache (2002) argues that the probability of banking crisis is high when the coverage of the deposit insurance scheme is large. However, according to Angkinand (2009), deposit insurance schemes are linked to lower output cost of the financial crisis. Byström (2004) finds a positive relationship between explicit deposit insurance scheme and banking sector outcome when he finds evidence that deposit insurance is associated with a lower probability of banking failure. In this thesis, we try to contribute to the argument by analyzing the effect of deposit insurance on banking sector outcome such as financial inclusion.

3.5.4 Government Ownership of Banks

Economists are of varied opinions when it comes to the impact of government owning a high percentage of banks. According to Gerschenkron (1962), governments assist in circumventing capital market catastrophes, exploit externalities and invest in purposefully vital ventures that yield positive results. This view argues that governments have enough incentive and information to promote socially required investments. In contrast, Shleifer (1998) argue that governments do not have the incentive to stimulate socially essential investments. Government owning banks according to them politicizes resources distribution and impedes economic efficacy.

In an important study, La Porta et al. (2002) discover that nations with a high level of government owned banks happen to experience less financial development. In a similar study, Barth, Caprio Jr, and Levine (2001) find that government owning a greater percentage of banks is associated with less developed financial systems.

3.5.5 Bank Concentration

The theory on bank concentration and financial sector outcome provide mixed views. The mixed views are evident on the concentration-stability nexus. Beck et al. (2006) find a positive effect of concentration on the stability of the banking system. Boyd et al. (2006) have a divergent view as their study show that systems that are more concentrated are more likely to incur banking failures. Demirguc-Kunt et al. (2003) find that the more inefficient banks are those found in concentrated banking systems. Peria and Mody (2004) find that higher concentration raises bank spreads and administrative cost. However, in developing countries, Detragiache et al. (2005) find confirmation to the contrary.

3.6 Related Empirical Literature on Regulation, Financial Inclusion and Determinants of Financial Inclusion

This section is categorized into two parts. The first part is focused on the financial regulation and financial inclusion nexus. The second part considers determinants of financial inclusion and it is mainly based on financial regulatory determinants.

3.6.1 Regulation and Financial Inclusion

Not much empirical studies have been done on the direct link between regulation of banks and financial inclusion in developing and developed countries alike. The few studies in the literature

are based on the linkages between regulation and financial efficiency, regulation and the performance of banks, regulation and financial depth/efficiency and regulation and financial development.

For instance, Barth et al. (2004) is among the earlier studies to provide some sort of empirical confirmation on the three pillars stipulated in the Basel II. The authors examined the connection between bank development and bank regulation cum performance and bank stability. Their study was based on a World Bank sponsored survey on the regulatory environment of 107 countries. Their study finds no statistically significant link between capital adequacy and bank stability and bank performance. Barth et al. (2004) provided numerous reasons against and for restriction of bank activities. They concluded that restricting bank activities might upsurge the probability of a banking crisis and reduce efficiency. The study by Barth et al. (2014) did not explore the nexus between bank regulatory variables and financial inclusion.

Using the time span between 1995 and 1999, Fernández and González (2005) provide strong confirmation to show that in countries where there are low accounting requirements, granting power to supervisory authorities may decrease risk-taking behavior from managers' standpoints.

Using cross-country analysis, Pasiouras (2008) investigated the impact of regulations on banks' efficiency for 715 commercial banks across 95 countries in 2003. The study used nonparametric analysis to estimate technical efficiency and Tobit regressions. The results provide confirmation that market discipline, powerful supervision, and strict capital adequacy promote technical efficiency. Using a parametric frontier analysis this time, Pasiouras et al. (2009) examine the relationship between bank regulation and profit and cost efficiency of banks. The study relied on a sample of 615 publicly quoted commercial banks from 74 countries covering the period of

2000-2004. The outcomes on the capital requirement and restriction of bank activities are mixed. Although this study provided evidence on the impact of bank regulation on bank efficiency, it did not emphasise bank efficiency in terms of how inclusive the banking systems are.

In another study by Chortareas et al. (2012), the study investigates the link between key regulatory policies and commercial bank performance and efficiency for a sample of 22 EU countries over 2000-2008 using Data Envelopment Analysis to calculate bank efficiency. The results of the truncated regressions and generalized linear models show that strengthening capital restrictions can improve efficient operation of banks. They further stipulated that the beneficial effects of capital restriction are more pronounced in countries with higher quality institutions. The study only provided evidence on the banking system of European countries and made no mention of the banking system of Africa.

One study that provides a direct link between regulation of banks and financial inclusion is that of de Sousa (2015). In her seminal paper, she investigated the link between global regulatory standards and financial inclusion in developing countries using principal component analysis to construct broad indices of financial inclusion and data from World Bank Survey on financial regulation. After estimating two cross-country linear regression models, the author finds that there is no unequivocal impact (positive or negative) of global standards on financial inclusion. However, as a baseline study, the author failed to include pertinent variables of regulation that are likely to have a significant impact on inclusion. Including a wide array of regulatory variables will provide a broad point of reference for future studies.

Beck et al. (2004) studied the influence of the market structure of banks on firms' access to bank finance using a unique dataset for 74 countries and for firms of different sizes. They discovered

that bank concentration upsurges hindrances to obtaining finance, but this they further stated, happens only in economies with low levels of institutional and economic development. The authors further find that the effect of concentration on obtaining finance is reduced when a larger percentage of bank assets are owned by foreigners. The effect is reported to exacerbate through more restrictive banking sector activities and larger share of government-owned banks.

By employing Ordered Probit model, Beck et al. (2006) used standard maximum likelihood estimation with heteroskedasticity-robust standard errors to investigate which supervisory commercial bank regulation and supervisory policies ease or deepen the extent to which bank corruption is an impediment to firms soliciting external finance. They find that traditional approach to bank supervision does not advance the integrity of bank lending but rather strategies that force banks to adhere to full information disclosure to the public happens to lower the extent to which corruption of bank officials is a hindrance to firms soliciting external finance.

Using data from 123 countries over 124000 households, Allen et al. (2012) investigate the foundations of financial inclusion. The authors find that greater use and ownership of bank account is connected with coverage of deposit insurance schemes.

Brown et al. (2009) use a firm-level panel data set covering transition economies to investigate whether information sharing among banks has affected credit market performance. They document positive and significant effects of information sharing on access to finance but stress that this effect is more pronounced for countries with weak legal environment than those with strong legal environment.

La Porta et al. (2002) studied government ownership of banks. Their study finds that countries with a higher government stake in banking sector provide restrictive access to finance.

In examining the impact of foreign banks penetration in poor countries, Detragiache et al. (2005) test a theoretical model that shows that when domestic banks are better than foreign banks at monitoring soft information customers, foreign banks entry may hurt these customers and worsen welfare. Their test using a sample of lower income countries finds a strong support for the theoretical model.

Conclusion

Generally, although there seems to be some evidence on the effect of regulation on some financial sector development outcomes, existing literature on regulation and financial sector development outcome such as financial inclusion is not copious. Besides, there appears to be a lack of literature concentrating specifically on African countries. Moreover, no much work has used a methodological framework that allows including a wide spectrum of regulatory variables. This study would add to literature the empirical evidence on the link between global regulatory standards and financial inclusion. Also, several studies that have been reviewed did not investigate the link between global regulatory standards and financial inclusion. In an era where most African countries want to step up the inclusion agenda to stimulate financial sector expansion, it is critical to understand how the adoption of regulatory standards would stifle or aid the inclusion agenda. This thesis would therefore provide empirical evidence on the relationship between financial inclusion and global regulatory standards which there is lack of in existing literature.

CHAPTER FOUR

METHODOLOGY

4.1 Introduction

This chapter deals with the conceptual framework of the study, the framework for measuring financial inclusion and global regulatory standards. The chapter also presents the model for empirical estimation, estimation techniques, data sources and definition of variables and a priori expectations.

4.2 Banking Regulation Conceptual Framework

The following flow chart depicts the concept that was developed from intuitive experience in the light of the theories reviewed in chapter three. The chart illustrates the application of the theories discussed in the review.

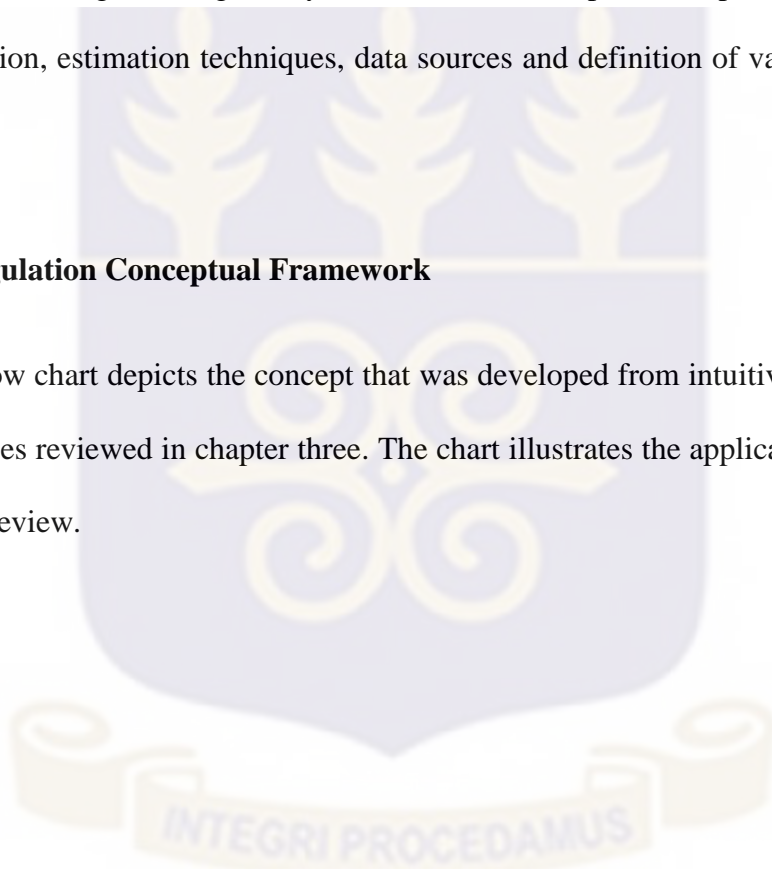
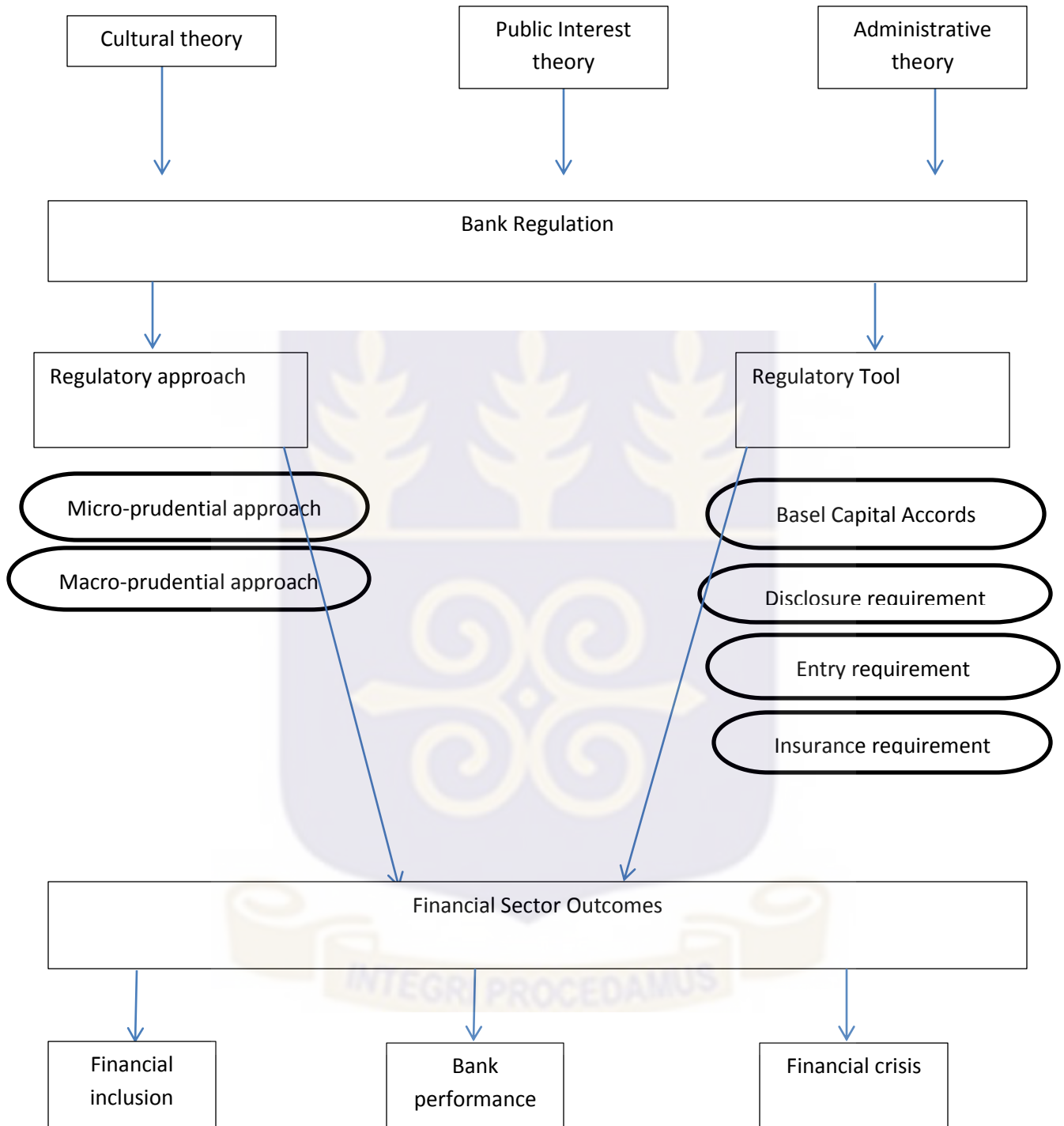


Figure 4.1 Banking Regulations Conceptual Flow Diagram



Source: Author's own construct.

Explanation of banking regulation cannot be completely exhausted by one theory. The public interest theory, administrative theory, and cultural theory collectively give some explanation to the existing banking regulation. Banking regulation manifests itself in two ways: the regulatory tool and the regulatory approach.

Regulatory/supervisory approach: The regulatory approach to bank regulation can be put into two economic scopes: macro-prudential and micro-prudential approach. A regulator may choose to apply these two approaches in parallel or apply both approaches at the same time. However, the emphasis of this thesis is not much on the supervisory/regulatory approach adopted.

Regulatory tools: Anti-money laundering, corporate governance, Basel capital accords, regulation of bank entry, regulation of information disclosure requirement, etc. form part of the regulatory tools employed to regulate bank activities. Regulatory tools in this study are limited to Basel capital accords (capital regulation), bank entry regulation, information disclosure requirement and deposit insurance regulation. The Basel capital accords, for instance, is a tool used by countries to mitigate the risk to bank capital (Mohammed Ahmed, 2016).

The regulatory /supervisory approach and the regulatory tools adopted by regulators intuitively have collective consequences for financial/banking sector outcomes such as financial inclusion bank performance, financial crisis, etc. The impact of bank regulatory tools or standards on bank performance indicators and financial crisis has received considerable attention in literature as discussed earlier. However, the impact on financial inclusion has not received any attention in the literature and hence has become the focal point of inquiry in this study. Subsequent model of inquiry would be based on the conceptual framework above.

4.3 Framework for Estimating Financial Inclusion

In order to benchmark the position of African countries in terms of their financial inclusion efforts, it is imperative to construct a comprehensive index. It helps to compare issues across several countries and establish ranks by using the scores as the source of comparison (Gupte, Venkataramani, & Gupta, 2012). The index is used for further estimation in this work. In this chapter, we begin by showing how the indices are constructed. The steps and formulas outlined below follow OECD's handbook for the construction of composite indicators.

- *Imputing Missing Data:* To explore a comprehensive dataset, we consider imputing the missing variables. The “single imputation method”- regression imputation – as used in OECD (2008) handbook is applied to calculate the missing values.
- *Multivariate Analysis:* the study makes use of multivariate analysis to examine the organization of the data and determine the appropriate methodological approach for weighting and aggregation. This study employs Principal Component Analysis technique introduced by Pearson (1901). The purpose here is to transform the variables into a set of uncorrelated variables. This parametric method of estimation is specifically chosen as an alternative to nonparametric methods used in several kinds of literature, for instance, Sarma (2008) used the nonparametric approach to discuss the differences between two indices and compare the statistical importance of the indicators. The parametric method is appealing because it assigns the largest weights to the indicators that have the largest variations across countries, independent of prior intuition on their relative importance. Principal Component Analysis prefers the indicators to be put on the same scale: sample size must be greater than 50 and the amount of correlation of the indicators must contain two or more amounts of 0.3 or greater.

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy should be 0.5 or higher; the Bartlett test of sphericity must be statistically significant, determining the importance of the indicators, and evaluating communalities, which means variables less than 0.5 must be removed. KMO is used to compare the degrees of estimated correlation coefficients and the partial correlation coefficients, where the partial correlations are not expected to be too large (Hutcheson & Sofroniou, 1999). The Bartlett test of sphericity is used in testing the null hypothesis that the individual variables are not correlated (Nardo et al., 2005).

- *Normalization:* Financial inclusion indicators are usually not expressed in the same scale. In order to put the variables on the same scale of measurement and deal with extremely skewed variables, we normalize the data to make the variables comparable. The normalization process allows us to put all the variables in an equal range between zero and one. Thus, the Min-Max method is employed to normalize the indicators. The formula for the normalization process is:

$$I_{pc}^t = (X_{pc}^t - \min_c X_p^t) / (\max_c X_p^t - \min_c X_p^t)$$

In the above formula, X_{pc}^t is the real value of p at time t for country c . the minimum value for indicator p for country c at time t is $\min_c X_p^t$ and the maximum value of indicator p at time t for country c is represented by $\max_c X_p^t$.

- *Weight construction:* The Human Development Index (UNDPs HDI) constructs weights by giving equal weight to all variables. This supposes that all the variables are of equal importance. However, the method employed in this study may imply unequal weighting

among the dimensions. Thus, the method measurements of the weighting processes are outlined below:

- ❖ Checking the correlation structure: It is required to check correlation to deal with the issue of multicollinear variables in the index construction.
- ❖ Choice of dormant factors: the following points must be fulfilled before the choice of those factors.
 - Factors must have an overall variance of more than 10%.
 - Factors must have corresponding eigenvalues greater than one.
- ❖ Factors rotation: variables with higher loading on the same factor are minimized after they have been rotated.
- ❖ Weight assignment: following the method used by Nicoletti et al. (1999), intermediate composite indicators are derived from variables with the highest square factor loadings.
- *Aggregation*: the study uses the modernized form of the UNDP's Human Development Index to construct the indices. After assigning the weights, which is made possible through factor analysis, the formula below is used to build the intermediate index:

$$D_i = \sum l_1 w_i$$

D_i denotes the dimension i , and l_1 represents indicator one while w_i denotes the equivalent weights of indicator i .

Finally, the aggregation formula for the indices is given by:

$$FI_i = \omega_1 D_i^u + \omega_2 D_i^b + \omega_3 D_i^a + e_i$$

Where subscript i denotes the country, (D_i^u, D_i^b, D_i^a) capture the respective dimensions and ω represents the respective weights.

4.4 Measurement of Global Regulatory Standards

In constructing the index of regulatory standards for bank practice, we extract from the survey by Barth et al. (2012) on bank regulation and supervision. Following Barth et al. (2012), two methods are used to construct the indices incorporating several responses from the survey with specific questions and details of the survey listed in the appendix of this paper. Since most of the questions elicit simple yes or no answers, the first method sums the individual one/zero answers. This methodology assigns equal weights to individual questions in the construction of the index. The next technique employs principal component analysis on the underlying questions. In constructing this component, the factor analysis process creates a principal component with a standard deviation of one and mean of zero. A benefit of this approach is that equal weights to the underlying components are not specified. However, this method is less revealing on how an alteration in response to a question changes the index. The details and interpretation of the index in this thesis is outlined in Table 4.1.

Table 4.1: Proxies for Global Regulatory Standards and their Coding Schemes

Variables of capital regulation	Overall Capital Strictness	“Whether the capital requirement echoes certain risk elements and deducts certain market value losses from capital before minimum capital adequacy is determined”	0—7 (Higher values indicate greater stringency)
	Preliminary Capital Strictness	“Whether certain funds may be used to initially capitalize a bank and whether they are done officially”	0—3 (Higher values indicate greater stringency)
	Capital Regulatory Index	Overall Capital Stringency + Initial Capital Stringency	0—10 (Higher values indicate greater stringency)
Competition/Entry Regulatory variables	“Limitations on Foreign Bank Entry/Ownership”	“Whether foreign banks may own domestic banks and whether foreign banks may enter a country's banking industry”	0—4 (Lower values indicate greater stringency)
Private monitoring regulatory variables(explicit deposit insurance)	No Explicit Deposit Insurance Scheme	“Whether there is an explicit deposit insurance scheme and whether depositors were fully compensated the last time a bank failed”	0—1 (Higher values indicate more private supervision)
Market structure Variables	Bank Concentration (Asset)	“The degree of concentration of assets in the 5 largest banks”	Pure number (Percentage)
	Foreign-Owned Banks	“The extent to which the banking system's assets are foreign owned”	Pure number (Percentage)
	“Government-Owned Banks”	“The extent to which the banking system's assets are government owned”	Pure number (Percentage)
Information disclosure regulatory variables	Public disclosure	It answers whether banks do disclose information to the public	0—8 (Higher values indicate better transparency)

Source: Barth et al. (2013)

4.5 Model for Empirical Estimation

Following from the conceptual framework, the model that would be employed is the augmented form of the model specification devised by Chortareas, Girardone, and Ventouri (2012). Specifically, we estimate the following baseline regression model.

$$FI_i^T = \alpha + \beta_1 S_i + \varepsilon_i \dots \dots \dots (1)$$

Where i indexes country i , S_i is a vector of regulatory indicators in country i , and ε_i is the error term. The dependent variable FI_i in equation (1) is the measure for financial inclusion.

To provide evidence on the Basel I&II's pillars on bank supervision and regulation, the variables in the vector S_i of equation 1 are used. As mentioned earlier, data for regulatory variables are obtained from Barth et al. (2012) World Bank database. The vector is defined below.

$$S_i = (\text{depins}_i, \text{capt}_i, \text{entry}_i, \text{info}_i \text{ gov}_i)$$

Where depins_i is regulation regarding the existence of explicit deposit insurance schemes. The deposit insurance variable is treated as a dummy variable and so it is calculated by adding 1 for “yes” and 0 for each “no” to the question related to the existence of explicit deposit insurance to cover depositors’ funds. The existence of explicit deposit insurance may boost confidence in the banking system. On the other hand, the absence of deposit insurance might affect customers’ participation in the financial system. A priori, the study expects a positive link between deposit insurance and financial inclusion. However, the bulk of empirical and theoretical evidence offers varied outcomes.

Capital regulatory variable, $capt_i$, is an index of the capital requirement that combines both “overall” and “initial capital stringency”. Overall capital stringency gives information on “whether the capital requirement reflects certain risk elements and subtracts certain market value losses from capital before minimum capital adequacy is determined”. “Initial capital stringency” also shows “whether certain funds are used to initially capitalize a bank or whether they are verified officially”. Higher values of the capital regulatory index indicate greater stringency and vice versa. The theory, however, provides conflicting results on whether the imposition of the capital requirement will have a positive effect (Santos, 2001). A priori, we expect a negative relationship between the capital regulatory index and financial inclusion.

The third variable used to proxy regulatory standards is the regulation on foreign entry into domestic banking space, $entry_i$. This variable characterizes banking competition and it ranges from 0-4, with lower values signifying more stringency and vice versa. More recently, Habber et al. (2012) find a positive effect of the presence of foreign banks on financial efficiency. Despite the great convergence of the positive effect on efficiency, its effect on financial access is not pronounced.

In addition, we identify government ownership of banks, $govn_i$, which represents the percentage of government-owned banks. It is calculated as a pure percentage of the banking system assets owned by the government. La Porta et al. (2002) study on government ownership of banks reveals that countries with higher government stake in the banking sector provide restrictive access to finance. Therefore, we expect a negative connection between the financial inclusion variable and government ownership of banks.

Finally, information disclosure regulation, $info_i$, is an indicator signifying the extent to which banks disclose information to officials and the public. The indicator of information disclosure ranges from 0-8. A Higher value indicates better disclosure. High disclosure of information to the public and officials may boost confidence in the financial system and hence boost participation. The study, therefore, expects a positive connection between information disclosure and financial inclusion.

Banking regulation should not be studied independently from the macroeconomic as well as the banking environment of the individual countries (Mohammed Ahmed, 2016). The study would therefore not confine banking regulations to a set of rules and their relationships to an objective.

The regression model presented in equations 1 is augmented to account for country-specific C_i control variables. Specifically, the model in Equation 2 is estimated.

$$FI_i^T = \alpha + \beta_1 S_i + \beta_2 C_i + \varepsilon_i \dots \dots \dots (2)$$

Vector $C_i = (\ln int_i, realint_i, gdppc_i, inf_i)$ and vector S_i retains its meaning explained in equation 1.

The vector of country-specific macroeconomic variables are drawn from Beck et al. (2004) and they include the natural log of GDP per capita, $gdppc_i$, is used to control for the conditions of the local economy. A higher level of GDP per capita captures the cyclical conditions of the macro economy. It is anticipated to capture the consequences for financial inclusion emanating from operating in diverse economic conditions, as demand for financial products are contingent on the level of economic activities. Experience has shown that countries with high level of development tend to have increased number of people forming part of the formal financial system and making use of financial products through traditional instruments of banking. As a result, the expectation is to find a positive correlation between financial inclusion and GDP per capita.

Also included in C_i is inflation, inf_i . The relationship between inflation and inclusion is not direct. Intuitively, it is probable that the increased circulation of money and the creation of additional demand will lead people to use financial services most often. Irrespective of the direction of causality, we expect inflation to have a positive relationship with financial inclusion.

Another measure of the country-specific economic condition is real interest rate ($realint_i$). It is measured as interest rate adjusted for inflation as measured by the GDP deflator. Higher rates hurt financial inclusion. The reasoning attached to this is simple and straightforward. When banks and other financial institutions charge a higher fee for their services, consumers, especially low-income consumers cannot afford and will shy away from using financial products. The study, therefore, expects a negative connection between financial inclusion and real interest rate.

Finally, the study also investigates the effect of lending interest rate (lnt_i) on financial inclusion. Intuitively, a higher lending interest rate increases the profit margin of Lending institutions and hence their increased willingness to give out loans to borrowers who can afford the going lending rate. If this is the case in Africa, then the study expects a positive link between financial inclusion and lending interest rate. However, it is also a correct reasoning to assume that a higher lending rate may discourage low-income households from borrowing from banks. In this scenario, a negative or positive association is expected between financial inclusion and lending rate.

4.6: Diagnostic Tests

4.6.1 Test for Heteroskedasticity

The usual assumption underlying the use of OLS is the equal variances of the error term. The variance of the error term is assumed constant. Failure of the homoscedasticity assumption supposes that the error term would have non-uniform variances and hence render the estimates inconsistent and inefficient. We, therefore, employ the Breausch-Pagan Test to check for heteroskedasticity.

4.6.2 Test for Multicollinearity

The study assumes that there is no issue of multicollinearity among the independent variables. There is the issue of multicollinearity if there is a linear relationship between the regressors in the model. Multicollinearity renders OLS estimator biased and inefficient as the estimates tend to be inflated. A small change in data leads to a sporadic change in the coefficients of the multiple regressions. Pairwise correlation test is used to detect the case of multicollinearity. The presence of which will lead to dropping the variables causing the problem.

4.6.3 Test for Model Specification

A model specification error mostly occurs when the pertinent variable(s) are excluded from the model or when unrelated variables are added to the model. Errors with model specification can significantly affect the estimates of regression coefficients. We, therefore, do specification test to check if the model is not flawed by the addition of irrelevant variables or exclusion of relevant variables. We use the Ramsey RESET test and the linktest command in STATA to perform the test of model specification. The linktest follows that the predicted variable (\hat{y}) should be

significant and the squared variable (\hat{y}) should not be significant because the correct specification of the model will render the squared variable insignificant.

4.6.4 Test for Normality of Residuals

Normality is not required to obtain unbiased estimates of the regression coefficients. OLS regression merely requires that the residuals be identical and independently distributed. However, we perform a test of normality of residuals to ensure valid hypothesis testing. The assumption of normality ensures that the p-values for the t-tests and F-tests are valid.

4.7: Estimation Technique

To estimate the effect of global regulatory variables and macroeconomic variables on financial inclusion, the study makes use of the following regression models as already stated in the previous section:

$$FI_t^T = \alpha + \beta_1 S_t + \varepsilon_t \dots \dots \dots (1)$$

$$FI_t^T = \alpha + \beta_1 S_t + \beta_2 C_t + \varepsilon_t \dots \dots \dots (2)$$

Given that there is no reason to suspect endogeneity problem in the models stated, the study estimates the parameters using OLS. An OLS estimate provides biased and inconsistent results of the parameters in the presence of endogeneity. A host of factors including simultaneous causality and omitted variables causes endogeneity problem. In the models stated, there is no established reason to suspect causality running from financial inclusion to the regulatory variables mostly because the variables were computed from separate survey responses. Thus, change in the number of people included in the financial system intuitively would not cause changes in the regulatory variables. With this being said, OLS provides consistent estimates to the models.

To assess whether country specific macroeconomic variables affect financial inclusion, the study estimates equation 2, where macroeconomic variables have been included in the baseline model. In the alternative specification, the study excludes countries that are highly compliant with Basel capital framework from the sample and investigate whether the results remain robust.

4.8 Data Sources

This section of the work gives information on the different sources of data used for the construction of our financial inclusion index and the empirical analysis.

The construction of financial inclusion index uses data from the Global Findex Survey, a survey conducted by Gallup Inc. as part of its Gallup World Poll among more than 150,000 adults in 2011. It is the data set that systematically covers indicators of financial inclusion across several countries (Demirguc-Kunt and Klapper, 2012). In order to rank African countries in terms of financial inclusion, data is extracted for 51 out of the 56 African countries. Data on the indicators of regulatory standards is extracted from World Bank Database on Bank Regulation and Supervision (2012). The survey assesses the regulatory environment for banking practices across 14 indicators and 180 developed and developing countries. The data for this study is extracted for the 27 African countries that took part in the survey and also have corresponding financial inclusion data used in the empirical estimation. We get data for the control variables; gross domestic product per capita, inflation, and bank concentration from the World Development Indicators database and lending interest rate and government owned banks from the dataset of Bank Regulation and Supervision.

The sample used in this study includes African countries that took part in the recent round of Bank Regulation and Supervision Survey and has data on financial inclusion. Out of the 56

African countries, only 27 countries took part in the recent World Bank survey on Bank Regulation and has corresponding financial inclusion index. Thus, our study comprises a sample of 27 African countries.



CHAPTER FIVE

ESTIMATION RESULTS AND DISCUSSION

5.1 Introduction

This chapter presents the results of this study followed by discussions in line with the objectives of the study. It presents results of the descriptive statistics and correlations among the variables.

This chapter also presents the detail results of the financial inclusion index. We also present the results of the OLS model, which estimates the effect of global regulatory standards and macroeconomic factors on financial inclusion index.

5.2 Results of the Principal Component Analysis

In this section, we present the results of the financial inclusion index for fifty- one (51) African countries constructed by using PCA for the year 2011. However, not all the 51 countries presented here are selected for the subsequent empirical estimation.

The descriptive statistics of the variables used to measure financial inclusion and their correlation matrix is presented in Appendix (A) and Appendix E respectively.

5.2.1 Multivariate Analysis

The study employs Principal Component Analysis as the tool for the multivariate analysis. As a requirement for PCA, the sample size must be adequate. The study checks the Bartlett test of sphericity, the Kaiser-Meyer-Olkin, communalities and the percentage of variance explained.

Finally, explanation is given to the cumulative percentage of variance (Hair, Anderson, Babin, & Black, 2010).

The requirement that the sample size should be appropriately greater than zero has been fulfilled. The correlation matrix between the indicators is presented in Appendix E. As can be seen from the Appendix E, more indicators have high correlation matrix, which meets the next requirement. Most of the variables have a high and positive correlation between them. The highest correlation is found between debit card and account at a financial institution with a correlation of 0.93. Suci and Holden (2008) argue that because variables used for measuring financial development have a high correlation between them, they are prone to redundancy. However, the use of PCA to measure a comprehensive index helps to overcome this problem.

In order to satisfy the requirement for the next stage, the Bartlett test and the Kaiser-Meyer-Olkin test is performed. As a requirement, the Bartlett test of sphericity must be statistically significant and the Kaiser-Meyer-Olkin test for sampling adequacy must be greater than 0.5. This step is considered important because it tells whether the sample size is adequate for the analysis. The results of the test are presented in Appendix F.

From Appendix F, the Kaiser-Meyer-Olkin test of sampling adequacy of 0.75 is greater than the minimum requirement of 0.5. Therefore, that requirement is satisfied. The next is the Bartlett test of sphericity. As can be seen on the table in appendix F, the probability associated with Bartlett's test is $p < 0.00$, which satisfies the condition for the construction of the index.

Another requirement is the evaluation of communalities, which stipulates that variables with values less than 0.5 must be removed from the analysis and PCA re-calculated Hair et al. (2010). As seen in Table 5.1, all the indicators have communalities above 0.5 and hence all variables were maintained for the analysis.

Table 5.1: Evaluating Communalities

Variables	Initial	Extraction
ACCFI	1.0	.925
ACCBUS	1.0	.683
GPAY	1.0	.735
REMAC	1.0	.702
ACCWAGE	1.0	.930
ATMS	1.0	.848
BANKAC	1.0	.841
BANKBRANCH	1.0	.841
DCARD	1.0	.916
DCREDIT	1.0	.777
ELECTPAY	1.0	.620
MOBISEND	1.0	.686
SAVEFI	1.0	.755

Source: Author's construct using SPSS.

In order to ascertain the importance of the remaining variables after the above requirements have been satisfied, the coefficient scores of the rotated factor loadings of the index are checked. The indicators with the highest scores on component one are considered the most important and so forth. As shown in Table 5.2, account at a financial institution (ACCFI), account for business purposes (ACCBUS), government payment through account (GPAY), remittances received through an account (REMAC), account used to receive wages (ACCWAGE), debit card (DCARD), electronic payments (ELECTPAY) and saved at a financial institution (SAVEFI) are the primary indicators for the computation of the index. Bank account per 1000 adults

(BANKAC) has high loading on the second extracted component (0.84) likewise ATMs, bank branches, and domestic credit to the private sector (DCREDIT). Together, they form the secondary indicators for the index. Mobile phone used to send money, a representation for inclusion through innovative channel has high loading on the third principal component.

Table 5.2: Rotated Component Matrix

Variables	Component		
	1	2	3
ACCFI	.908	.316	.026
ACCBUS	.631	.315	.431
GPAY	.818	.161	-.199
REMAC	.700	.065	.456
ACCWAGE	.929	.233	.108
ATMS	.407	.814	-.142
BANKAC	.029	.864	.306
BANKBRANCH	.148	.905	-.001
DCARD	.914	.284	.031
DCREDIT	.515	.636	-.327
ELECTPAY	.745	.017	.254
MOBISEND	.134	-.019	.817
SAVEFI	.816	.201	.220

Source: Author's computation with data from Global Findex (2012)

5.2.2 Weighting and Aggregation

We normalized the data based on the formula already stated in the previous chapter and weights for the components were assigned. Weights are assigned based on the statistical importance of the indicators in the index construction. As shown in Table 5.3, the study first identifies latent components with eigenvalue that is greater than one. Afterward, the Varimax Method rotates the components to minimize indicators with large values on the same component. Finally, the matrix

of factor loadings after the indicators have been rotated is used to construct the weights, following the approach of Nicoletti, Scarpetta, and Boylaud (1999).

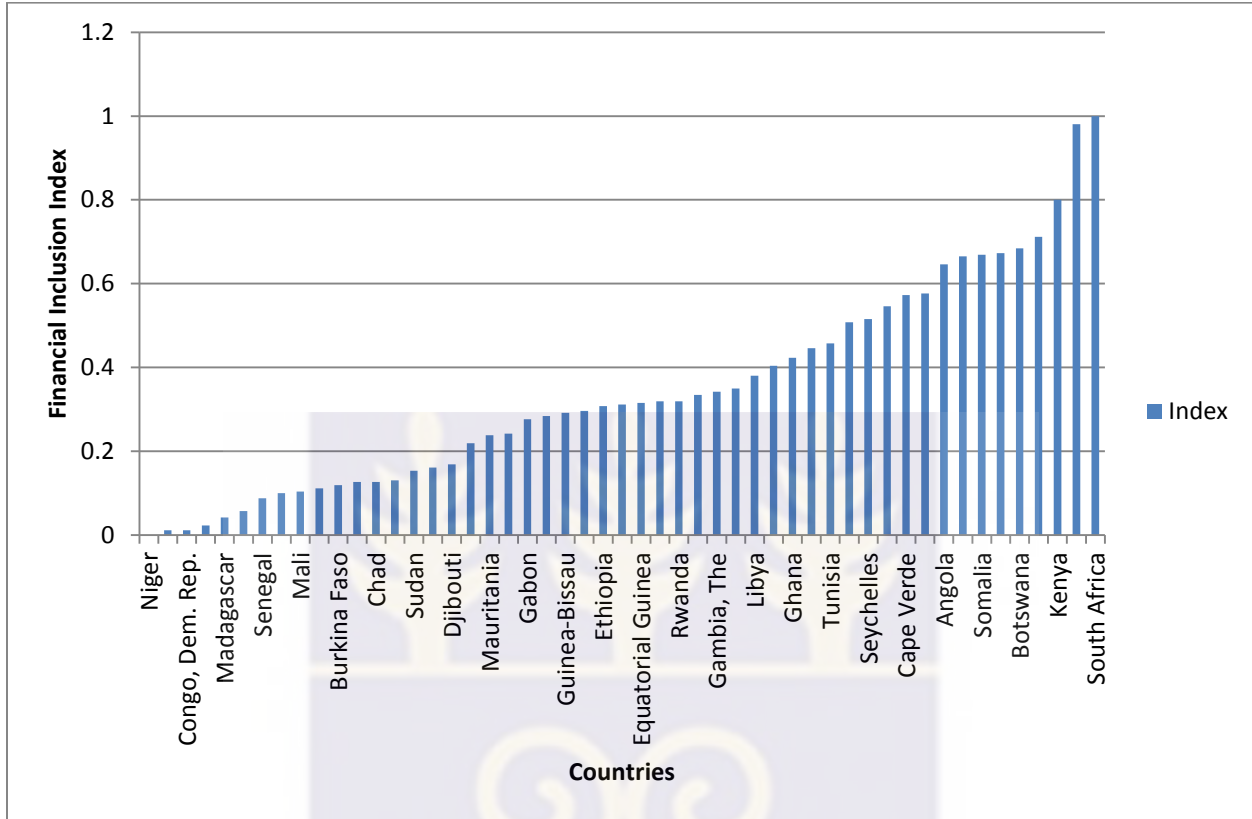
Table 5.3: Total Variance Explained

Component	Preliminary Eigenvalue			Sums of Squared Loading			Rotated Sum of Squared Loading		
	Totals	Percentage of Variance	Cumulative percentage	Totals	percentage of Variance	Cumulative percentage	Totals	percentage of Variance	Cumulative percentage
1.0	7.055	54.266	54.266	7.055	54.266	54.266	5.773	44.405	44.405
2.0	1.986	15.276	69.542	1.986	15.276	69.542	3.039	23.378	67.783
3.0	1.219	9.377	78.919	1.219	9.377	78.919	1.448	11.137	78.919
4.0	.672	5.172	84.091						
5.0	.587	4.517	88.608						
6.0	.419	3.221	91.829						
7.0	.362	2.783	94.612						
8.0	.263	2.025	96.637						
9.0	.215	1.654	98.291						
10.0	.090	.693	98.984						
11.0	.075	.575	99.560						
12.0	.036	.280	99.840						
13.0	.021	.160	100.000						

Source: Author's computation with data from Global Findex (2012)

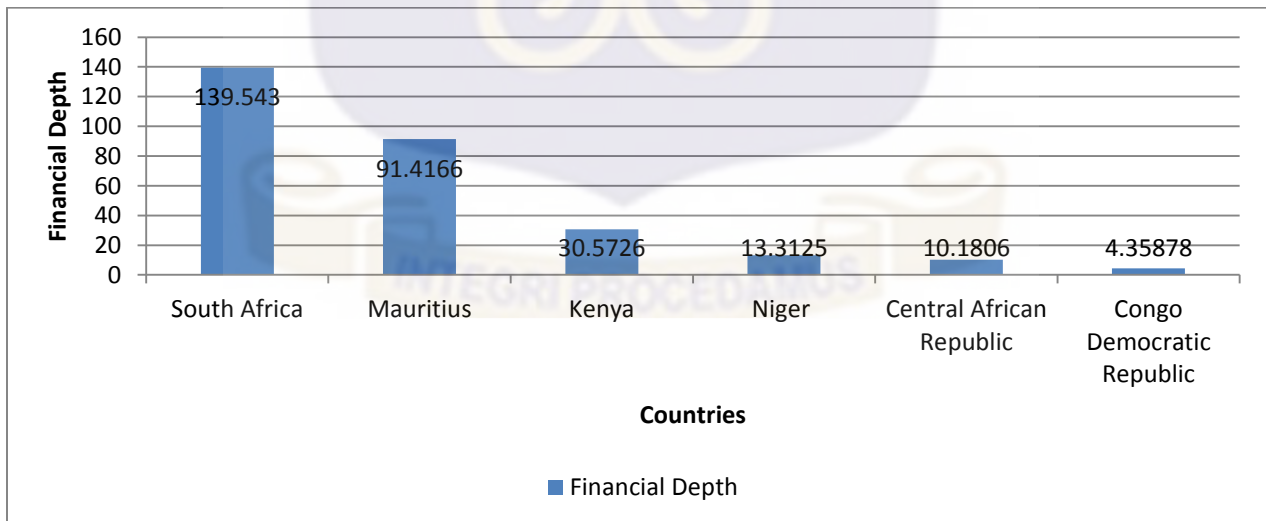
The final index is constructed using the formula stated in the methodology section of this study and the index for each country and country rankings are presented in Figure 5.1 A.

Figure 5.1A: Financial Inclusion Index, Africa



Source: Author's Computation from Global Findex (2011)

Figure 5.1B: Financial Depth of Top Three Countries against Bottom Three Countries



Source: Author's Computation from WDI (2011)

From the inclusion results in Figure 5.1A, South Africa ranks first in terms of financial inclusion followed by Mauritius and Kenya in second and third position respectively. The results are consistent with the financial development in the respective countries. In figure 5.1B, South Africa has the deepest financial system followed by Mauritius. Although Kenya does not have a deep financial system as compared to the top two countries, Kenya ranks third in terms of financial inclusion. The success of Kenya's financial inclusion exploits can allude to the large penetration of mobile money services in the country. In the year 2011, 60% of the Kenyan population used mobile money to transfer cash compared to only 5% using mobile money to transfer cash in South Africa. Through mobile money services, a large proportion of the people has been included in the financial system in Kenya. The bottom three countries in terms of financial inclusion index comprise the Congo Democratic Republic, Central African Republic, and Niger in last place. Their respective positions as shown in figure 5.1A can be attributed to the depth of their respective financial system as shown in Figure 5.1B. Another key explanation that can be given to the performance of the bottom three countries in terms of inclusion index is the political unrest in those countries. The political instability in those countries in some way has affected their financial system leading to low level of financial inclusion.

5.3 Empirical Estimation

The correlation between the explanatory variables in the model suggests that multicollinearity would not be a problem to contend with in the model. The highest correlation is found between the dummy variable deposit insurance and the natural logarithm of Inflation. Information disclosure is negatively correlated with all the other explanatory variables except the logarithm of gross domestic product per capita.

Table 5.4: Correlation between Independent Variables of the Model

	DEPINS	LNGDPPC	LNINT	LNINF	LNGOV	ENTRY	INFODIS	REALINT	CAPTREG
DEPINS	1								
LNGDPPC	0.3845	1							
LNINT	0.3122	-0.4253	1						
LNINF	0.5909	-0.1865	0.5078	1					
LNGOV	0.353	-0.0138	0.0604	0.4364	1				
ENTRY	0.4	0.3092	0.193	0.2657	0.151	1			
INFODIS	-0.3091	0.0326	-0.3732	-0.4277	-0.3572	-0.4905	1		
REALINT	0.1455	-0.3176	0.7149	0.2246	-0.1842	0.2593	-0.2742	1	
CAPTREG	0.1857	0.0981	0.1199	0.2876	0.2817	-0.1377	0.0274	-0.2246	1

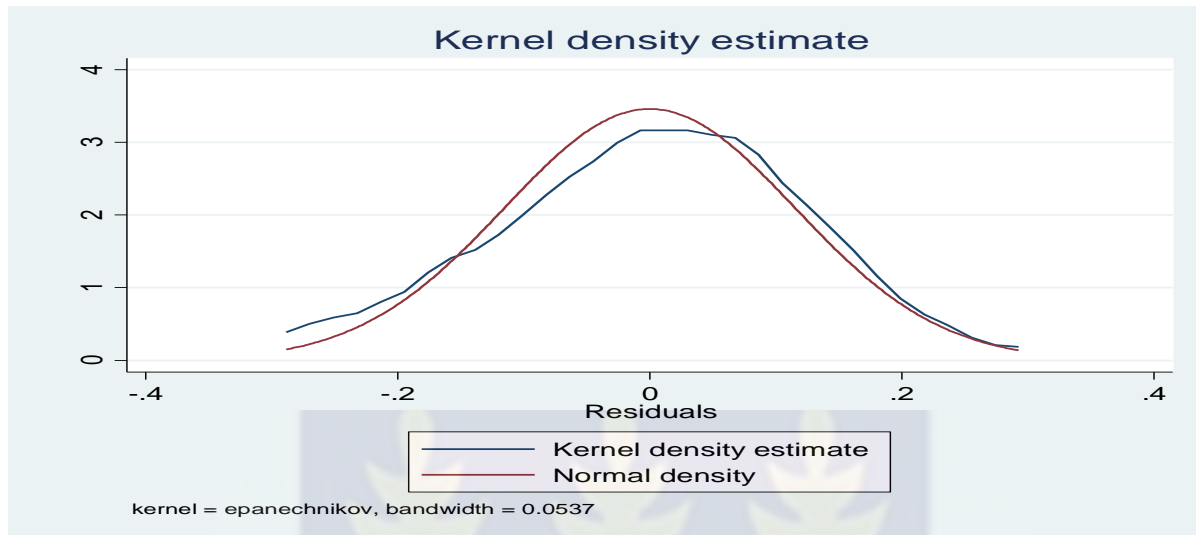
Source: Author's Computation from Bank Regulation and Survey (2012) and WDI (2011)

5.3.1 Heteroskedasticity Test

The Breusch-Pagan / Cook-Weisberg test for heteroscedasticity was employed in this study. The test statistics rejects the null hypothesis of constant variance in favor of heteroskedasticity at 5% significance level. The implication of heteroskedasticity if not corrected is inconsistency and inefficiency of our estimates. Therefore, we estimate robust errors to correct the heteroskedasticity present in the empirical estimation.

5.3.2 Normality Test

As discussed earlier we perform a normality test to ensure valid hypothesis testing. It is very important that the error term is drawn from a normal distribution. As a standard procedure, we observe the kernel density plot to detect normality of the residuals. The results of the kdensity plot is shown in Figure 5.2

Figure 5.2: Kernel Density Estimate for Normality

Source: Author's own computation using STATA

As can be seen from Figure 5.2, there is only a minor deviation from normal at the upper tail. Nevertheless, there seems to be a trivial deviation from normality, which is most likely due to the standardization of some of the variables. We can, therefore, accept that the residuals are near to a distribution that is considered normal.

5.3.3 Multicollinearity Test

The estimated correlation between explanatory variables in Appendix B shows that multicollinearity might not be a problem in this study. Nevertheless, the study did not give room for chance. Thus, the existence of multicollinearity was examined using the variance inflation factors (VIF). Any variable with a VIF value that is greater than 10 merits further investigation. The VIF of the variables in this study does not exceed 10. Further, all the variables have tolerance value ($1/VIF$) greater than 0.1. This supposes that the variables are not a linear

combination of other independent variables. Hence, multicollinearity is not a problem in the study. The estimates are presented in Table 5.5.

Table 5.5: Test Results for Multicollinearity

Variable	VIF	1/VIF
LNINT	3.83	0.260814
DEPINS	3.16	0.316077
LNGDPPC	3.05	0.328191
REALINT	2.81	0.356128
LNINF	2.8	0.357289
ENTRY	1.81	0.551103
INFODIS	1.74	0.574349
LNGOV	1.66	0.601284
CAPTREG	1.55	0.644571
Mean VIF	2.49	

Source: Author's own computation using STATA

5.3.5 Model Specification Test

In order to avoid model specification errors in the form of omission of relevant variables and inclusion of irrelevant variables, model specification test was conducted on the model. We used the `linktest` command in STATA to perform the test. The test follows the notion that once the model is correctly specified, one would not find any extra explanatory variable that would be significant except by chance. The predicted variable of the model for empirical estimation is significant at 10% while the `_hatsq` is not significant. We, therefore, draw a conclusion that the model for empirical estimation is properly specified. The estimates are presented in Appendix D

5.4 Regression Output for the Empirical Estimation

The necessary model for examining the objectives of the study stipulated in chapter one was estimated and presented in Table 5.6. As indicated earlier, the various diagnostic checks have been catered for and robust estimates are presented.



Table 5.6: Financial Inclusion, Regulatory Standards, and Macroeconomic Variables Estimation Output

VARIABLES	(1) Baseline Model	(2) Control for Macroeconomic factors	(3) Control for Basel II compliant countries
DEPINS	0.152 (0.115)	-0.268** (0.103)	-0.356*** (0.0811)
CAPT	-0.0414 (0.191)	-0.388** (0.161)	-0.207 (0.123)
ENTRY	0.829 (0.486)	0.236 (0.345)	0.546* (0.261)
INFO	0.200 (0.169)	0.212** (0.0866)	0.174* (0.0835)
GOV	-0.127* (0.0667)	-0.109*** (0.0303)	-0.0657 (0.0497)
GDPPC		0.264*** (0.0451)	0.222*** (0.0342)
LNINT		0.330*** (0.0907)	0.371*** (0.0820)
INF		0.235*** (0.0573)	0.186*** (0.0590)
REALINT		-0.0109** (0.00438)	-0.0115** (0.00448)
Constant	-0.263 (0.524)	-3.426*** (0.530)	-3.371*** (0.442)
Observations	27	27	25
R-squared	0.341	0.831	0.837

The dependent variable is financial inclusion. Heteroskedastic standard errors clustered for countries. Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Results in column three exclude South Africa and Mauritius.

Source: Author's computation from Bank Supervision Survey (2012) and WDI (2011)

Columns (1) to (3) in Table 5.6 summarizes the results for regression of financial inclusion on bank regulatory scores and macroeconomic indicators. Given that the study wants to estimate the effect of regulatory standards on financial inclusion, we run two separate models. The baseline model in column (1) does not include macroeconomic indicators of the respective countries. The effect of regulation on financial inclusion after controlling for macroeconomic indicators of the individual countries is presented in column (2) of Table 5.6.

Results reported in column (1) of Table 5.6 suggests that the regulatory variables conform to the expected signs but are not statistically significant in influencing financial inclusion in Africa. An explanation to this could be the low level of adoption of Basel core principles and regulatory inconsistencies in the region. Another explanation could be that the study initially did not include the economic conditions of the countries to which the regulations apply. Except for government owned banks, which has a significant relationship with financial inclusion. The findings on government owned a bank suggests that government participation in the banking system leads to restrictive access to finance. This observation is consistent with La Porta et al. (2002) study on government ownership of banks that reveals that countries with higher government stake in the banking sector provide restrictive access to finance.

Since the findings for the regulatory variables are not statistically significant, the study provides a further investigation into whether the regulatory variables are driven by country specific macroeconomic conditions. In column (2), we rerun the baseline model (1) while adding some macroeconomic indicators.

Results from column (2) in Table 5.6 suggest that the existence of deposit insurance design, which was treated as a dummy in this study, leads to a fall in financial inclusion. This means

countries with deposit insurance systems are more likely to experience a decline in the number of poor households included in the financial system. Although the sign was positive in the baseline regression, controlling for macroeconomic factors changes the sign of the deposit insurance variable. This result is counter intuitive since the existence of deposit insurance can boost confidence in the financial system and hence lead to higher inclusion. Despite the counter intuitiveness of the results, it may also be that the existence of deposit insurance may lead to high transaction cost. When this cost is pushed to customers, it becomes a disincentive to participate in the financial system, especially to the low-income households. Nevertheless, this is an observation that requires further inquiry. Still on the results from column 2, after controlling for country specific characteristics, capital adequacy requirement becomes significant and maintains the expected negative relationship with financial inclusion. This means that for any risk included in the measurement of minimum capital requirement, financial inclusion would decrease. Therefore, a country that adheres to the capital regulatory requirement is likely to experience a decrease in the number of people included in the financial system. Put in a different way, adhering to strict capital requirements decreases banks' ability to invest in projects that will lead to higher financial participation. After controlling for macroeconomic factors, information disclosure requirement maintained its expected positive sign but this time becomes statistically significant in determining financial inclusion. The higher the level of compliance with information disclosure requirement by a country, the more likely it is that the financial system would be more inclusive. The result makes intuitive sense since greater information disclosure by banks to the public would lead to greater transparency into the activities of banks and hence boost public confidence in the financial system. Again, government ownership of banks maintains its effect in model 2 in column 2. Entry into banking variable is not statistically

significant in model 2 in column 2 although the result suggests that regulations relaxing entry requirements needed to enter into a country's banking system would boost financial inclusion.

The results following from model 1 & 2 reveal an interesting pattern in the effect of global regulatory standards on financial inclusion in Africa. The regulatory variables tend to have no significant impact on financial inclusion in Africa when they are assessed in isolation. However, global regulatory standards could only have an impact on financial inclusion depending on the regulatory environment. Thus, the effect of global regulatory standards on inclusion can only be assessed when we include the macroeconomic framework of individual countries.

Ultimately, it is worth noting that the macroeconomic variables behaved as expected except lending rate. Similar to what previous literature has established, inclusive finance is larger in more rich countries. As could be seen from column 2 of Table 5.6, gross domestic product per capita, which is a measure of a country's affluence, is statistically significant at all levels in improving inclusive finance. More specifically, a unit increase in gross domestic per capita would lead to 0.26 unit increase in inclusive financing. Similarly, as expected, inflation is statistically significant at all levels and it is positively correlated with the financial inclusion index. Intuitively, increase circulation of money and creation of additional demand lead people to use financial service. This is confirmed by this study that a unit increase in inflation would lead to a 0.23 unit increase in financial inclusion. Moreover, the coefficient of real interest rate has the expected sign. Higher rates hurt financial inclusion and the reasoning behind this assumption is simple. When financial institutions charge more for their products and services, consumers within the low- income bracket will avoid such services. Therefore, as confirmed by this study, a one-percentage point increase in the interest rate will reduce financial inclusion by 0.01%. Another example of control variable, which a priori presented inconclusive sign, is

lending interest rate. From Table 5.6 column 2, the lending interest rate is highly significant and positively associated with financial inclusion in Africa. This probably follows the reasoning that higher lending rate increases profit margins and boosts banks willingness to give out financial credit to customers. This reasoning, however, demands further inquiry.

After examining the estimated regression output, the study turns to the test of the research hypotheses. These are presented in the subsection below.

In column 3 of Table 5.6, specification 2 is re-estimated by excluding from the sample countries that are actively adhering to Basel II capital framework. This estimation allows us to test whether well-established African banking systems in South Africa and Mauritius does not influence the results in column (2). The conclusions pertaining to the results in column 2 does not change after excluding these two countries from the results in column (3) with the exception of the capital regulatory variable (which loses its significance) and entry into banking variable (which becomes significant). The results in column (3) show that the effect of bank regulatory capital on financial inclusion is driven by greater adherence to Basel II capital framework.

5.5 Conclusion

Following the observations from the empirical estimations, it is clear that African countries are well placed in terms of financial inclusion due to the wide adoption of mobile money as a channel to participate in the formal financial system. However, few countries that have not widely adopted mobile money showed minimal improvement in their financial inclusion ranking

Also from the estimations it is unequivocal that global regulatory standards do not significantly affect financial inclusion in Africa. However, since global regulatory standards are not applied in

a vacuum, when the macroeconomic framework of individual countries is included in the analysis there are implications (positive and negative) for adhering to Basel Core Principles in the region. In a similar fashion, the effect of adhering to Basel regulatory capital on financial inclusion is amplified by the presence of countries like South Africa and Mauritius who have strongly adhered to the Basel II framework. Other macroeconomic indicators such as inflation, gross domestic product per capita, real interest rate, and the lending rate have an effect on financial inclusion. As such, summary, conclusions, and recommendations would be outlined in the final chapter of this study.



CHAPTER SIX

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

6.1 Introduction

This final chapter discusses and highlights the main conclusions and recommendations of this work. The study set out to investigate the implications of global regulatory standards specifically bank regulatory standards for financial inclusion in Africa. The study methodology began with the development of a comprehensive index of financial inclusion which was used as the dependent variable for the empirical estimation. An augmented form of the linear model by Chortareas et al. (2012) was used to estimate the linear relationship between global regulatory variables and financial inclusion. The OLS estimation technique is employed for the cross-sectional analysis of twenty-seven (27) African countries.

6.2 Summary

The continent has experienced a significant improvement in financial inclusion efforts especially with the introduction of mobile money and the emergence of micro credit and micro finance institutions. Inclusive finance that takes into consideration lower- income households is undoubtedly comfortable when it is considered an end in itself. However, when assessed in light of other financial sector objectives such as financial stability, integrity, and consumer protection,

policies geared towards greater inclusion may pose a significant risk to the financial system and hence the need to regulate activities of financial institutions. Global Standard Setting Bodies more specifically the Basel Committee on Banking Supervision has developed a detailed set of reforms to regulate bank capital and activities of banks. Part of the mandate of BCBS was to incorporate financial inclusion into all aspects of their work. Regulation is likely to hurt financial inclusion efforts in the region especially when the issue of proportionality is not adequately taken into consideration. Despite the financial inclusion concern by the Global Standard Setting Bodies, not much empirical attention has been given to the link between regulation of banks and financial inclusion in Africa.

Therefore, the objectives of the study were to first, investigate the position of African countries in terms of their financial inclusion efforts by constructing a composite indicator of inclusion. Secondly, the study set out to investigate the effect of various aspects of global regulatory standards on financial inclusion and finally assess how country-specific macroeconomic characteristics amplify the effect of regulation on financial inclusion. In light of these, various literature, empirical and theoretical were reviewed on bank regulatory variables and financial inclusion.

The study used Principal Component Analysis for the financial inclusion index construction and employed OLS estimation technique for empirical estimation after it had passed all model specification and diagnostic tests. The study employed secondary cross-sectional data extracted for the year 2011. The data for the study were mainly extracted from the Global Findex Survey and the World Bank Database on Bank Regulation and Supervision (2012). The statistical software SPSS was mainly used for the index construction and STATA used for the main empirical estimation.

The result of the financial inclusion index constructed using principal component analysis shows that South Africa, Mauritius and Kenya place in the top three in terms of their financial inclusion effort. Democratic Republic of Congo, Central African Republic and Niger place in the bottom three according to the index of financial inclusion. Overall, financial inclusion in the region is poor considering the low scores on the financial inclusion index.

An estimation of bank regulatory variables and country-specific macroeconomic characteristics on financial inclusion was conducted. Initial regression without country specific macroeconomic indicators showed that all regulatory variables but Government owned banks were not statistically significant though they had their expected signs. In the second model, the study interacted global regulatory standards with some macroeconomic controls. This was to investigate how the effect of the regulatory variables would be amplified by the presence of these macroeconomic variables. Interestingly, all the variables of interest became statistically significant at 1%, and 5% significance level except for the entry regulatory variable, which was not significant at the accepted levels of this work. As a means of Robustness check, the study eliminated countries that are highly compliant with Basel II capital framework and interestingly, capital regulatory variable loses its explanatory power. All the macroeconomic indicators entered significantly into the model.

6.3 Conclusion

In light of these findings, three main conclusions could be drawn: First, African countries perform poorly in terms of financial inclusion except few countries that have well developed financial systems. Again, innovative ways of approaching financial exclusion can boost financial inclusion as evident from the position of Kenya in the financial inclusion effort. Lastly, global

regulatory standards do not affect financial inclusion in Africa when its effect is assessed without taking into consideration the macroeconomic characteristics of the countries involved. However, when assessed to include country specific macroeconomic factors such as inflation, gross domestic product per capita, lending interest rate, and real interest rate, individual regulatory variables affects the level of financial inclusion in Africa in varied ways.

These imply that there is more to be done by the Global Standard Setting Bodies if they are going to deliver on their mandate of incorporating financial inclusion into their work. It is also worthy to mention that as African countries develop, the effort to ensure greater participation in the financial system would be enhanced.

6.4 Recommendations

Efforts to push greater financial inclusion vary significantly due to differences in countries' economic, social, legal, political, and technological advancement. As such, the implementation of global regulatory standards, which were originally developed as a best practice for banks in developed countries could prove to be counterproductive and worse kill financial inclusion initiatives by developing countries. About the estimation results and conclusions of the study stated above, in order for the Standard Setting Bodies to effectively promote financial inclusion and strengthen proportionality as part of their mandate, we recommend the following:

- In assessing the effect of the regulatory framework for financial inclusion, the macroeconomic features of less developed countries need to be taken into consideration. By doing so, the negative consequences of the regulatory framework would not fall on the blind side of the Standard Setting Bodies (SSBs). Countries need to take into

consideration their unique macroeconomic environment before adopting aspects of regulatory requirements.

- Regulations pertaining to information disclosure have a strong positive effect on financial inclusion and hence information disclosure requirements need to be strengthened by individual country regulators.
- Another way is to revise some of the standards to take into consideration different economic characteristics and peculiarities of developing economies such as those in Africa and leave room for simplification and adjustments based on the country's specific risk profiles.
- Per the results, the government owning a higher percentage of bank assets does not boost financial inclusion. Therefore, a way out is to allow a more private participation in the banking sector to boost the financial inclusion agenda.
- A major drive to ensure more inclusion is through technology adoption and innovative approaches to inclusion such as mobile money. Moving forward, interoperability efforts in mobile money transactions should be encouraged so that more people can be included in the financial system.

6.5 Recommendation for Future Studies

No single research work is exhaustive to capture all the issues pertaining to an area of work. This work is no exception and as such, there is more room for improvement in this area of work. Consequently, as a pioneering work, the thesis was not able to provide all the answers to the effect of global regulatory standards on financial inclusion. Future researchers would want to look into the issue again as current data on regulation becomes available. As alternative data or

more data becomes available, future researchers can also apply other estimation techniques such as a panel to verify or improve upon the results of this work.

6.6 Limitations of the Study

The obvious limitation of this study is data availability especially the regulatory variables. Data on the regulatory variables are available for only a point in time, which limits the work to only cross-sectional studies. Another limitation has to do with the small sample size and small data points due to data unavailability. Finally, there is the issue self-selection bias because countries that do not have relevant data on the regulatory variables were excluded. Since the exclusion criterion is non-random, it will affect the generalizability of the study findings. However, these do not diminish the basic findings of this thesis that global regulatory standards and macroeconomic indicators when interacted have a significant impact on financial inclusion in Africa.



References

- Allen, F., Demirgüç-Kunt, A., Klapper, L. F., & Martinez Peria, M. S. (2012). The foundations of financial inclusion: Understanding ownership and use of formal accounts.
- Angkinand, A. P. (2009). Banking regulation and the output cost of banking crises. *Journal of International Financial Markets, Institutions and Money*, 19(2), 240-257.
- Arora, R. U. (2010). Measuring financial access. *Griffith University, Discussion Paper in Economics*,(7), 1-21.
- Balthazar, L. (2006). From Basel 1 to Basel 3 *From Basel 1 to Basel 3: The Integration of State-of-the-Art Risk Modeling in Banking Regulation* (pp. 209-213): Springer.
- Bank of Uganda (2008) "Annual Supervision Report 2008" Bank of Uganda, December 2008, Uganda.
- Bank Regulation and Supervision database (2012). The World Bank.
- Barth, J. R., Caprio, G., & Levine, R. (2004). Bank regulation and supervision: what works best? *Journal of Financial Intermediation*, 13(2), 205-248.
- Barth, J. R., Caprio Jr, G., & Levine, R. (2001). Banking systems around the globe: do regulation and ownership affect performance and stability? *Prudential supervision: What works and what doesn't* (pp. 31-96): University of Chicago Press.
- Barth, J. R., Caprio Jr, G., & Levine, R. (2008). Bank regulations are changing: for better or worse? *Comparative Economic Studies*, 50(4), 537-563.

- Barth, J. R., Caprio Jr, G., & Levine, R. (2013). Bank Regulation and Supervision in 180 Countries from 1999 to 2011. *Journal of Financial Economic Policy*, 5(2), 111-219.
- BCBS. (2001). *The New Basel Capital Accord: an explanatory note*. Retrieved from Basel Committee on Banking Supervision, Bank for International Settlement
- BCBS. (2004). International Convergence of Capital Measurement and Capital Standards: A Revised Framework *Basel Committee on Banking Supervision, Bank for International Settlement*.
- BCBS (2011) "Progress report on Basel III implementation" October 2011, Basel Committee on Banking Supervision, Bank for International Settlements.
- Beck, T., Demirgüç-Kunt, A., & Levine, R. (2006). Bank supervision and corruption in lending. *Journal of Monetary Economics*, 53(8), 2131-2163.
- Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2004). Bank competition and access to finance: International evidence. *Journal of Money, Credit and Banking*, 627-648.
- Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2005). Financial and legal constraints to growth: Does firm size matter? *The journal of finance*, 60(1), 137-177.
- Bernanke, B. S. (2006). *Global economic integration: what's new and what's not?* Retrieved from <http://www.federalreserve.gov/boarddocs/speeches/2006/20060825/default.htm>
- Bhattacharya, S., & Thakor, A. V. (1993). Contemporary banking theory. *Journal of Financial intermediation*, 3(1), 2-50.
- Bhavani, T., & Bhanumurthy, N. (2012). Financial access in post-reform India. *OUP Catalogue*.
- BIS (1986). "Recent Innovations in International Banking" April, 1986, Bank for International Settlement.

- BIS (2012). “Guidelines to the international consolidated banking statistics” Monetary and Economic Department, June 2012, Bank for International Settlements.
- Blunden, G. (2007). Supervision and central banking. *Bank of England Quarterly Bulletin*, August.
- Borio, C. (2003). Towards a macroprudential framework for financial supervision and regulation? *CESifo Economic Studies*, 49(2), 181-215.
- Boyd, J. H., De Nicolò, G., & Jalal, A. M. (2006). Bank risk-taking and competition revisited: New theory and new evidence.
- Brown, M., T. Jappelli, and M. Pagano. (2009). “Information Sharing and Credit: Firm- Level Evidence from Transition Countries.” *Journal of Financial Intermediation* 18 (2): 151–72.
- Burkett, I., & Sheehan, G. (2009). From the margins to the mainstream: The challenges for microfinance in Australia.
- Byström, H. N. (2004). The market’s view on the probability of banking sector failure: cross-country comparisons. *Journal of International Financial Markets, Institutions and Money*, 14(5), 419-438.
- Cámara, N., & Tuesta, D. (2014). Measuring Financial Inclusion: A Multidimensional Index.
- Carbo, S., Gardener, E. P., & Molyneux, P. (2005). Financial exclusion in Europe *Financial Exclusion* (pp. 98-111): Springer.
- Caruana, J. (2010). *Why Basel III matters for Latin American and Caribbean financial markets*. Paper presented at the Speech given at the ASBA–FSI “High-Level Meeting,” Antigua, Guatemala. November.
- Casu, B., & Girardone, C. (2006). Bank competition, concentration and efficiency in the single European market. *The Manchester School*, 74(4), 441-468.

- Chakravarty, S. (2006). Regional variation in banking services and social exclusion. *Regional Studies*, 40(4), 415-428.
- Chakravarty, S. R., & Pal, R. (2012). Measuring financial inclusion: an axiomatic approach. IGIDR, WP 2010(3).
- Chatain, P.-L., Hernández-Coss, R., Borowik, K., & Zerzan, A. (2008). *Integrity in mobile phone financial services: measures for mitigating risks from money laundering and terrorist financing* (Vol. 146): World Bank Publications.
- Chibba, M. (2009). Financial inclusion, poverty reduction and the millennium development goals. *The European Journal of Development Research*, 21(2), 213-230.
- Cho, Y. B. (2013). Why do countries implement Basel II? An analysis of the global diffusion of Basel II implementation (Unpublished doctoral dissertation). London School of Economics and Political Science.
- Chortareas, G. E., Girardone, C., & Ventouri, A. (2012). Bank supervision, regulation, and efficiency: Evidence from the European Union. *Journal of Financial Stability*, 8(4), 292-302.
- Cull, R., Demirgüç-Kunt, A., & Morduch, J. (2011). Does regulatory supervision curtail microfinance profitability and outreach? *World development*, 39(6), 949-965.
- COBAC (2009) “La Commission Bancaire de l’Afrique Centrale Rapport Annuel 2008” La Commission Bancaire de l’Afrique Centrale.
- Danquah, M., Barimah, A., & Ohemeng, W. (2013). Efficiency measurement using a “true” random effects and random parameter stochastic frontier models: an application to rural and community banks in Ghana. *Modern Economy*, 4(12), 864.

- Danquah, M., Quartey, P., & Iddrisu, M., (2017). Access to financial services via Rural and Community Banks and poverty reduction in rural households in Ghana. *Journal of African Development*. (in press)
- Demirgüç-Kunt, A., & Detragiache, E. (1997). *The determinants of banking crises-evidence from developing and developed countries* (Vol. 106): World Bank Publications.
- Demirgüç-Kunt, A., & Detragiache, E. (2002). Does deposit insurance increase banking system stability? An empirical investigation. *Journal of Monetary Economics*, 49(7), 1373-1406.
- Demirgüç-Kunt, A., & Klapper, L. F. (2012). Financial inclusion in Africa: an overview.
- Demirgüç-Kunt, A., Klapper, L. F., Singer, D., & Van Oudheusden, P. (2015). The global index database 2014: Measuring financial inclusion around the world.
- Demirguc-Kunt, A., Laeven, L., & Levine, R. (2003). *Regulations, market structure, institutions, and the cost of financial intermediation*. *Journal of Money, Credit, and Banking* 36, 593-622.
- Denizer, C. 2000. "Foreign Entry in Turkey's Banking Sector, 1980-97." Policy Research Working Paper Series 2462, World Bank, Washington, DC.
- Detragiache, E., Gupta, P., & Tressel, T. (2005). Finance in lower-income countries: An empirical exploration. International Monetary Fund Working Paper, WP/05/167.
- Dev, S. M. (2006). Financial Inclusion: Issues and Challenges. *Economic and Political Weekly*, 41(41), 4310-4313.
- Dewatripont, M., & Tirole, J. (1994). *The prudential regulation of banks*. MIT Press, Cambridge.
- Efobi, U., Beecroft, I., & Osabuohien, E. (2014). Access to and use of bank services in Nigeria: Micro-econometric evidence. *Review of Development Finance*, 4(2), 104-114.

- EIU. (2015). *Global Microscope 2015: The enabling environment for financial inclusion*. Retrieved from New York, NY.
- Eun, C. S., & Resnick, B. G. (2008). *International Financial Management* MC Graw-Hill. *Boston pg, 146*.
- Fernández, A. I., & González, F. (2005). How accounting and auditing systems can counteract risk-shifting of safety-nets in banking: Some international evidence. *Journal of Financial Stability, 1*(4), 466-500.
- FSI. (2015). *Basel II, 2.5 and III Implementation (Vol. Occasional Paper No. 4): Financial Stability Institute, Bank for International Settlements*.
- FSI (2004) "Implementation of the new capital adequacy framework in non-Basel Committee member countries" Occasional Paper No. 4, Financial Stability Institute, Bank for International Settlements.
- G20 (2010) "The Seoul Summit Document: Framework for Strong, Sustainable and Balanced Growth" Seoul Summit, November 2010, G20.
- G20 Leaders Declaration. (2012). G20 Summit, Los Cabos, Mexico. www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/131069.pdf.
- Gerschenkron, A. (1962). *Economic backwardness in historical perspective: a book of essays*: Belknap Press of Harvard University Press Cambridge, MA.
- Global Financial Inclusion database, 2011. The World Bank.
- Goodhart, C. (2011). *The Basel Committee on Banking Supervision: a history of the early years 1974–1997*: Cambridge University Press.

- Gorton, G., & Winton, A. (2003). Financial intermediation. *Handbook of the Economics of Finance, 1*, 431-552.
- Gupte, R., Venkataramani, B., & Gupta, D. (2012). Computation of financial inclusion index for India. *Procedia-Social and Behavioral Sciences, 37*, 133-149.
- Haber, S., Musacchio, A., & Rojas-Suarez, L. (2012). Foreign Entry and the Mexican Banking System, 1997-2007 [with Comments]. *Economía, 13*(1), 13-37.
- Hair, J. F., Anderson, R. E., Babin, B. J., & Black, W. C. (2010). *Multivariate data analysis: A global perspective* (Vol. 7): Pearson Upper Saddle River, NJ.
- Hannoun, H. (2010). The Basel III capital framework: a decisive breakthrough. *BIS, Hong Kong*.
- Hanson, S. G., Kashyap, A. K., & Stein, J. C. (2011). A macroprudential approach to financial regulation. *The Journal of Economic Perspectives, 25*(1), 3-28.
- Herring, R. (2005). Implementing Basel II: Is the game worth the candle? *Financial Markets, Institutions & Instruments, 14*(5), 267-287.
- Hutcheson, G. D., & Sofroniou, N. (1999). *The multivariate social scientist: Introductory statistics using generalized linear models*: Sage.
- Jalilian, H., Kirkpatrick, C., & Parker, D. (2007). The impact of regulation on economic growth in developing countries: A cross-country analysis. *World development, 35*(1), 87-103.
- Keeley, M. C. (1990). Deposit insurance, risk, and market power in banking. *The American Economic Review, 1183-1200*.
- King, R. G., & Levine, R. (1993). Finance and growth: Schumpeter might be right. *The quarterly journal of economics, 108*(3), 717-737.
- Klapper, L., Laeven, L., & Rajan, R. (2006). Entry regulation as a barrier to entrepreneurship. *Journal of financial economics, 82*(3), 591-629.

- Klapper, L., & Singer, D. (2013). Financial Inclusion in Africa: The Role of Informality. *World Bank*.
- Koehn, M., & Santomero, A. M. (1980). Regulation of bank capital and portfolio risk. *The journal of finance*, 35(5), 1235-1244.
- La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2002). Government ownership of banks. *The journal of finance*, 57(1), 265-301.
- Leeladhar, V. (2006). Taking banking services to the common man-financial inclusion. *Reserve Bank of India Bulletin*, 60(1), 73-77.
- Leyshon, A., & Thrift, N. (1995). Geographies of financial exclusion: financial abandonment in Britain and the United States. *Transactions of the Institute of British Geographers*, 312-341.
- Manji, A. (2010). Eliminating poverty? 'Financial inclusion', access to land, and gender equality in international development. *The Modern Law Review*, 73(6), 985-1004.
- Mehrotra, N., Puhazhendhi, V., Nair, G. G., & Sahoo, B. (2009). *Financial inclusion: An overview*: National Bank for Agricultural and Rural Development.
- Mohammed Ahmed, J. (2016). A conceptual framework for the Basel accords-based regulation. *Journal of Financial Regulation and Compliance*, 24(1), 90-103.
- Mohan, R. (2006). Economic growth, financial deepening, and financial inclusion: Atlantic Publishers & Distributors New Delhi.
- Nardo, M., Saisana, M., Saltelli, A., Tarantola, S., Hoffman, A., & Giovannini, E. (2005). Handbook on constructing composite indicators.
- Newnham, R. (2014). "Financial Inclusion Strategies: Global Trends and Lessons Learnt from the AFI Network" Presentation given at AFI conference, Bogota, Colombia, April 28-29.

- Nicoletti, G., Scarpetta, S., & Boylaud, O. (1999). Summary indicators of product market regulation with an extension to employment protection legislation.
- OECD/JRC (2008). Handbook on constructing composite indicators. Methodology and user guide. OECD Publisher, Paris.
- Pasiouras, F. (2008). International evidence on the impact of regulations and supervision on banks' technical efficiency: an application of two-stage data envelopment analysis. *Review of Quantitative Finance and Accounting*, 30(2), 187-223.
- Pasiouras, F., Tanna, S., & Zopounidis, C. (2009). The impact of banking regulations on banks' cost and profit efficiency: Cross-country evidence. *International Review of Financial Analysis*, 18(5), 294-302.
- Pearson, K. (1901). Principal components analysis. *The London, Edinburgh and Dublin Philosophical Magazine and Journal*, 6(2), 566.
- Peria, M. S. M., & Mody, A. (2004). How foreign participation and market concentration impact bank spreads: evidence from Latin America. *Journal of Money, Credit and Banking*, 511-537.
- Pickens, M., Porteous, D., & Rotman, S. (2009). Scenarios for Branchless Banking in 2020. *Washington, DC: CGAP*.
- Prasad, E. S. (2010). *Financial sector regulation and reforms in emerging markets: An overview*. NBER Working Paper Series 16428, National Bureau of Economic Research, Cambridge.
- Rajan, R. (2009). *A Hundred Small Steps: Report of the Committee on Financial Sector Reforms*
- Reserve Bank of Malawi (2006) "Bank Supervision Department Annual Report 2006" Reserve Bank of Malawi.

- Saci, K., & Holden, K. (2008). Evidence on growth and financial development using principal components. *Applied Financial Economics*, 18(19), 1549-1560.
- Santos, J. A. (2001). Bank capital regulation in contemporary banking theory: A review of the literature. *Financial Markets, Institutions & Instruments*, 10(2), 41-84.
- Sarma, M. (2008). *Index of financial inclusion*: Indian Council for Research on International Economics Relations New Delhi.
- Shleifer, A. (1998). *State versus private ownership* (No. w6665). Retrieved from National bureau of economic research.
- Sinclair, S. P. (2001). *Financial exclusion: An introductory survey*: CRSIS, Edinburgh College of Art/Heriot Watt University.
- Sousa, M. M. d. (2015). *Financial Inclusion and Global Regulatory Standards: An Empirical Study across Developing Economies*. Paper presented at the New Thinking and the New G20 Series. www.cigionline.org
- Thingalaya, N., Moodithaya, M., & Shetty, N. (2010). *Financial inclusion and beyond: Issues and challenges*: Academic Foundation.
- Thorat, U. (2007). *Taking Banking Services to the Common Man—Financial Inclusion*. Paper presented at the Deputy Governor, Reserve Bank of India at the HMT-DFID Financial Inclusion Conference.
- Tuesta, D., Sorensen, G., Haring, A., & Camara, N. (2015). *Financial inclusion and its determinants: the case of Argentina*. Retrieved from
- Turner, A. (2012). Regulatory reform and deleveraging risks, Speech by A. Turner, Chairman, FSA at Bretton Woods Committee 2012, International Council Meeting, Tokyo, 13 October 2012.

World Bank. (2012). *Global Financial Development Report 2013: Rethinking the Role of the State in Finance*. Retrieved from

<https://openknowledge.worldbank.org/handle/10986/11848>

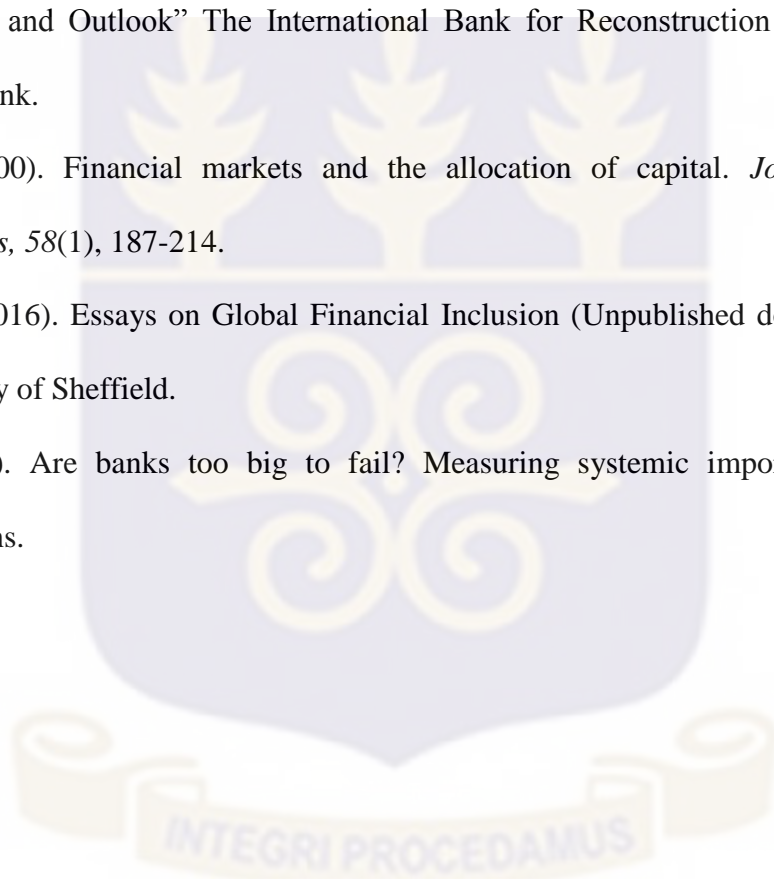
World Bank. (2014). World Development Indicators. Dataset. <http://data.worldbank.org/data-catalog/world-development-indicators>.

World Bank (2008) “Global Development Finance: The Role of International Banking: Review, Analysis, and Outlook” The International Bank for Reconstruction and Development, World Bank.

Wurgler, J. (2000). Financial markets and the allocation of capital. *Journal of financial economics*, 58(1), 187-214.

Yorulmaz, R. (2016). Essays on Global Financial Inclusion (Unpublished doctoral thesis). The University of Sheffield.

Zhou, C. (2009). Are banks too big to fail? Measuring systemic importance of financial institutions.



Appendices

Appendix A: Summary Statistics for the Independent Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
DEPINS	32	0.4375	0.504016	0	1
CAPT	32	0.4875	0.282557	0	1
INFODIS	32	0.723214	0.360925	0	1
ENTRY	32	0.835938	0.196844	0	1
GOV	32	2.309187	0.876117	0	4.198705
INF	32	5.513499	0.828787	4.585233	7.750322
LNINT	32	2.661849	0.49892	1.894617	4.094345
GDPPC	32	7.213748	1.113544	5.40727	9.409778
REALINT	32	5.49406	9.309791	-4.65131	40.90373

Source: Author's own compilation from Bank Regulation Survey (2012) and WDI (2011)

Appendix B: Correlations among Macroeconomic Variables

	INF	LNINT	GDPPC	REALINT
INF	1			
LNINT	0.5078	1		
GDPPC	-0.1865	-0.4253	1	
REALINT	0.2246	0.7149	-0.3176	1

Source: Author's own compilation from WDI (2011)

Appendix C: Breusch-Pagan / Cook-Weisberg Test for Heteroskedasticity

Ho: Constant variance

Variables: fitted values of FI

chi2(1) = 4.59

Prob > chi2 = 0.0321

Source: Authors own computation using STATA

Appendix D: Test for Model Specification

Source	SS	df	MS	Number of obs	27
Model	1.717407	2	.858703663	F(2, 24)	61.77
Residual	0.333659	24	.013902472	Prob > F	0
				R-squared	0.8373
				Adj R-squared	0.8238
Total	2.051067	26	.078887179	Root MSE	0.11791

FI	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
_hat	0.670132	.3631523	1.85	0.077	-0.0793772	1.419642
_hatsq	0.390581	.416488	0.94	0.358	-0.4690081	1.25017
_cons	0.043675	.0613734	0.71	0.484	-0.082994	0.1703431

Source: Author's own computation using STATA

APPENDIX E: CORRELATION BETWEEN FINANCIAL INCLUSION VARIABLES

	AC	ACBU	GPAY	REM	ACW	ATMS	BAC	BBRAN	CON	DC	DCRE	EPAY	MM	SAVE
AC	1													
ACBU	.881**	1												
GPAY	.691**	.454**	1											
REM	.712**	.641**	.455**	1										
ACWA	.897**	.801**	.597**	.748**	1									
ATMS	.682**	.570**	0.298	.445**	.621**	1								
BAC	.745**	.768**	0.295	.584**	.561**	.817**	1							
BBRAN	.607**	.593**	0.177	0.206	.544**	.880**	.771**	1						
CON	-.512**	-.545**	-0.14	-0.26	-.366*	-0.28	-.469**	-.377*	1					
DC	.931**	.811**	.600**	.749**	.890**	.692**	.733**	.579**	-.414*	1				
DCRE	.415*	.482**	-0.01	0.036	0.274	.725**	.731**	.887**	-.331*	.409*	1			
EPAY	.668**	.396*	.531**	.495**	.784**	.438**	0.203	0.293	-0.21	.748**	0.048	1		
MM	.499**	.514**	0.297	.435*	.417*	0.1	0.262	-0.028	-0.2	.517**	-0.12	.347*	1	
SAVE	.776**	.778**	.350*	.859**	.828**	.487**	.559**	.340*	-.453**	.724**	0.115	.528**	.468**	1

** . Correlation is significant at the 0.01 level (1-tailed).
 * . Correlation is significant at the 0.05 level (1-tailed).

Source: Computed by Author from Global Findex (2011)

Appendix F: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.745
Bartlett's Test of Sphericity	Approx. Chi-Square
	403.421
	Df
	78
	Sig.
	.000

Appendix G: Financial Inclusion Index and Country Rank

Country Name	Index	Rank
Algeria	0.403846	18
Angola	0.646154	9
Benin	0.126923	40
Botswana	0.507692	14
Burkina Faso	0.119231	41
Burundi	0.057692	46
Cameroon	0.130769	38
Cape Verde	0.573077	11
The Central African Republic	0.011538	49
Chad	0.126923	39
Congo, Dem. Rep.	0.011538	50
Congo, Rep.	0.161538	36
Cote d'Ivoire	0.319231	24
Djibouti	0.169231	35
Egypt, Arab Rep.	0.1	44
Equatorial Guinea	0.315385	25
Ethiopia	0.307692	27
Gabon	0.276923	31
Gambia, The	0.342308	21
Ghana	0.423077	17
Guinea	0.023077	48
Guinea-Bissau	0.292308	29
Kenya	0.8	3
Lebanon	0.684615	5
Lesotho	0.311538	26
Liberia	0.284615	30
Libya	0.380769	19
Madagascar	0.042308	47
Malawi	0.219231	34
Mali	0.103846	43
Mauritania	0.238462	33
Mauritius	0.980769	2
Morocco	0.711538	4
Mozambique	0.673077	6
Namibia	0.446154	16
Niger	0	51
Nigeria	0.546154	12
Rwanda	0.319231	23
Senegal	0.088462	45
Seychelles	0.515385	13
Sierra Leone	0.242308	32
Somalia	0.669231	7
South Africa	1	1
Sudan	0.153846	37
Swaziland	0.576923	10
Tanzania	0.296154	28
Togo	0.111538	42
Tunisia	0.457692	15
Uganda	0.35	20
Zambia	0.334615	22
Zimbabwe	0.665385	8