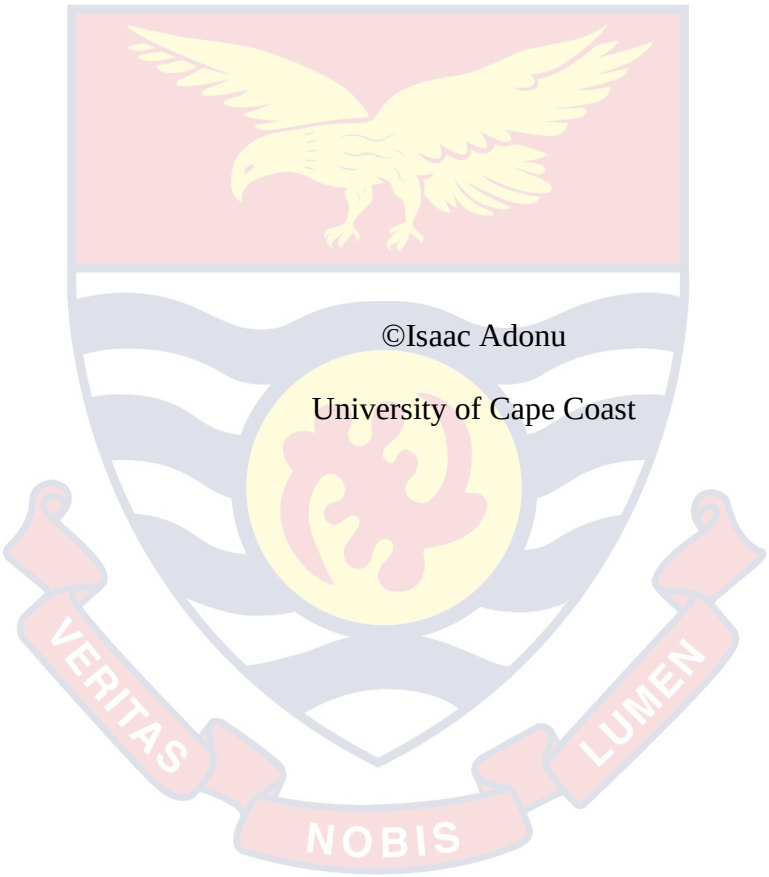
UNIVERSITY OF CAPE COAST

DISTRIBUTION OF BANK AND NON-BANK FINANCIAL INSTITUTIONS AND FINANCIAL INCLUSION IN GHANA

ISAAC ADONU

2020



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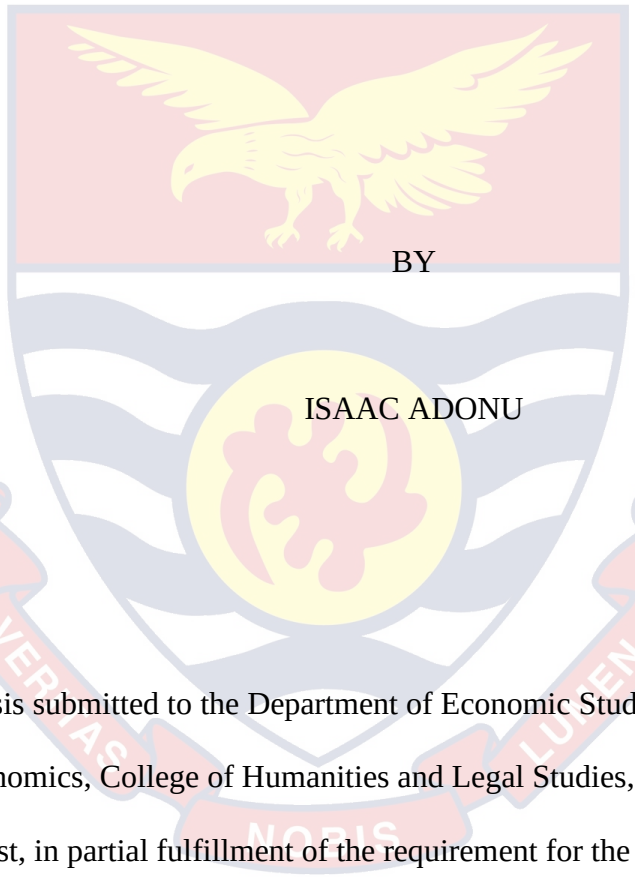

BY

ISAAC ADONU

Thesis submitted to the Department of Economic Studies of the School of Economics, College of Humanities and Legal Studies, University of Cape Coast, in partial fulfillment of the requirement for the award of Master of Philosophy Degree in Economics

DECEMBER, 2020

DECLARATION

Candidate's Declaration

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

Candidate's Signature …… Date……

Name ……

Supervisors' Declaration

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

Principal Supervisor's Signature …… Date……

Name ……...

Co-Supervisor's Signature …… Date……

Name ……...

ABSTRACT

This study sought to examine the effects of the distribution of Banks and Non-bank financial institutions on Financial Inclusion in Ghana. Data from the seventh round of the Ghana Living Standard Survey (GLSS 7) sourced from Ghana Statistical Service (GSS) and another secondary data on types and location of financial institutions were collected from Bank of Ghana and other official online sources and used for the study. The final sample size analyzed for the research work is 2530. The main objectives of the study were to analyze the effects of number of bank and non-bank financial institutions in a community on financial inclusion and also the effects of increase in number of financial institutions in rural areas on financial inclusion. The study found that as the number of banks in a community increases, financial inclusion improves. Again, financial inclusion increases in rural areas as the presence of bank and non-bank financial institutions in the rural areas increases. The dominance analysis conducted also show that formal education plays a major role in the fight against financial exclusion in Ghana. This study makes a recommendation that the government through the Ministry of Finance and Economic Planning, and the Communication Ministry should make available the needed infrastructure that will support the opening of new branches of bank and non-bank financial institutions in all parts of Ghana. Moreover, it is recommended that the government of Ghana through the Bank of Ghana should encourage existing bank and non-bank financial institutions to extend their operations to underserved areas either through enactment of policies or provision of incentives.

KEY WORDS

Distribution

Financial Inclusion

Financial Institutions

Non-bank Financial Institutions

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Finally, I would like to thank all my colleagues and lecturers, especially, Richard Kwabena Nkrumah and Michael Coffie Hills who supported me in diverse ways to make this dream a reality.

DEDICATION

To my wife, Esther Amoakoa Essel

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LIST OF ABBREVIATIONS

ARB	Association of Rural Banks
ATM	Automated Teller Machine
BoG	Bank of Ghana
ERP	Economic Reform Programme
FI	Financial Inclusion
FINSAP	Financial Sector Adjustment Programme
GCB	Ghana Commercial Bank
GDP	Gross Domestic Product
GLSS	Ghana Living Standard Survey
GMM	Generalized Method of Moment
GNI	Gross National Income
GSS	Ghana Statistical Service
IMF	International Monetary Fund
MFI	Micro Finance Institution
MLE	Maximum Likelihood Estimation
NBFI	Non-Bank Financial Institutions
OLS	Ordinary Least Squares
PCA	Principal Component Analysis
SDG	Sustainable Development Goals
SME	Small and Medium Enterprises
SSA	Sub Saharan Africa
TPB	Theory of Planned Behaviour
UFA	Universal Financial Access
VIF	Variance Inflation Factor

WDI	World Development Indicators
WGI	World Governance Indicators

CHAPTER ONE

INTRODUCTION

Background to the Study

Policy makers and development practitioners across the globe are bent on ensuring that no one is left behind in terms of access to credit and usage of financial products and services. The eighth goal of the Sustainable Development Goals (SDGs) aims at strengthening financial institutions to achieve universal access to financial services and credit by 2030. Achieving financial inclusion worldwide has also been on the agenda of the World Bank. There are several programs outlined by World Bank to get everyone to participate in the financial space across the globe. Consequently, the adult populations worldwide who own transaction accounts have increased from 51% to 69% since 2011. Several positive strides have also been made in Africa, especially, in East Africa, through the introduction of Mobile Money (Demriguc-Kunt et al, 2018).

In Ghana, there was an appreciable increase in financial inclusion from 41% in 2014 to 58% in 2017 as per the recent Global Findex Database report released by the World Bank (Demriguc-Kunt et al, 2018). However, increase in bank account ownership was not significant and this has attracted criticism from the World Bank. The inaccessibility to bank accounts and other usage of financial services such as savings, credit and payment may be due to unavailability of bank and non-bank financial institutions in most of the rural areas in Ghana. Demriguc-Kunt et al, (2012) argue that longer distances traveled by rural folks to access financial services impacts negatively on financial inclusion. Improving on bank account ownership in Ghana to help

achieve broader financial inclusion will therefore require getting access points closer to the people, especially, the rural dwellers, hence; the need for policy makers to know the distribution of banks in Ghana, and the effects of the distribution on financial inclusion. This study seeks to analyze the distribution of Bank and Non-bank financial institutions in Ghana and how the distribution affects financial inclusion.

World leaders and development practitioners have identified financial inclusion as a very potent strategy to reduce poverty and make life prosperous for all. The World Bank Global Findex report for 2017 establishes a direct link between financial inclusion and seven (7) out of the seventeen (17) Sustainable Development Goals SDGs) identified by the United Nations. Financial inclusion is achieved when individuals and firms gain access to useful formal financial products and services at affordable prices where these products and services take care of all financial needs such as transactions, payments, savings, credit, and insurance, and are delivered in a responsible and sustainable manner (Demriguc-Kunt et al, 2018).

There has been significant progress in ensuring financial inclusion worldwide since the launching of the Universal Financial Access 2020 initiative by the World Bank in 2011. About 1.2 billion adults across the globe have gotten access to account since 2011, increasing the percentage of adults with transaction account from 51% to 69%. Countries such as Kenya, India, China, and Thailand have 80% of the adult population owning account as at 2017 (Demriguc-Kunt et al, 2018). The financial inclusion agenda in Africa has chalked some successes through the introduction of mobile money, especially, in East Africa (Demiriguc et al, 2012). The Global Findex Reports released in

both 2014 and 2017 confirms that over 10 percent share of adults in Africa own mobile money accounts. In Ghana and other Sub-Saharan Africa countries, about 40% of farmers have been found to receive payments through mobile money accounts which are very positive as far as financial inclusion is concerned.

Despite the success story of financial inclusion in Africa and the rest of the world as can be inferred from the Global Findex Reports released so far, there are also some negatives that needs to be rectified. The recent Global Findex report shows about 1.7 billion adults worldwide have no transaction account which is a worrying situation for policy makers. This means over 30 percent of the world's adult population do not participate in the financial space. Number of bank account ownership did not also increase as expected. Though majority of adults who own account across the globe have accounts with Bank and Non-bank financial institutions, progress made in terms of bank account ownership is not impressive (Demriguc-Kunt et al, 2018).

Championing a successful financial inclusion campaign requires not only mobile money usage but also the physical presence of financial institutions. The presence of bank and non-bank financial institutions in communities may provide opportunities for individuals and firms to own accounts, thereby encouraging individuals and firms' participation in the financial space (Olaniyi & Adeoye, 2016). Gaining access to transaction account allows individuals and firms to save and send money, and receive payments, which according to Demriguc-Kunt et al, (2018) is the first step towards achieving broader financial inclusion.

One desirable attribute of bank and non-bank financial institutions that has the potential to improve financial inclusion is its accessibility (Boateng, 2019). Achieving universal access to financial services and credit as enshrined in the Sustainable Development Goals (SDGs) will require accessible financial institutions, hence, the need to put systems in place to strengthen the financial sector as a whole and extend coverage to the hard-to-reach and underserved areas. Currently, much focus dwells on how to make financial services accessible to individuals and businesses and encourage usage to promote economic activities (Demriguc-Kunt et al, 2018). The need to extend financial services and credit to the hard-to-reach, and expand coverage in under-served areas have made lots of waves lately in the finance literature (Cull, Demeriguc-Kunt, & Morduch, 2009; Hermes, Lensink, & Meesters, 2009). The World Bank and other Development Agencies are also contributing greatly to this course but researchers have not intensively discussed the effects of making banking facilities available in underserved areas on financial inclusion.

The launching of the Universal Financial Access 2020 initiative by the World Bank and the recent introduction of Mobile Money Interoperability by Bank of Ghana and also in other countries are all geared towards achieving broader financial inclusion, however, we must ensure all other necessary factors are employed.

Statement of the Problem

Nearly a decade ago, financial inclusion attracted a lot of attention from policy makers but almost all the studies conducted on financial inclusion (Olaniyi & Adeoye, 2016; Zins & Weill, 2016; Oji, 2015; and Demiriguc-

Kunt & Klapper, 2012) did not give the needed attention to the distribution of financial institutions. Studies that discussed the distribution of banks (Demirguc-Kent & Klapper, 2012; Olaniyi & Adeoye, 2016) only did it passively. Recent studies that analyzed the distribution of financial institutions (Khan & Rabbani, 2015; Denes & Repetto, 2015) restricted their studies to either banks only or microfinance institutions only in specific territories. Though researchers and policy makers are pushing for extension of banks and non-bank financial institutions to rural areas and other underserved areas, the effects of the presence of a bank or a non-bank financial institution in the rural areas have not been fully considered. This research work intends to study the effects of increase in the number of bank and non-bank financial institutions in a community on financial inclusion in Ghana.

Specifically, the first objective of this study will seek to examine the effects of number of bank and non-bank financial institutions on financial inclusion in Ghana. Earlier studies have passively mentioned the importance of bank presence on access to credit and bank account ownership but the impact of number of banks on financial inclusion or any of the financial inclusion indicators is yet to gain the needed attention in the financial inclusion literature. Olaniyi and Adeoye (2016) found Islamic bank presence in Nigeria as a significant contributor to financial inclusion but did not consider how increase in the number of banks will affect financial inclusion.

Ansong D., Chowa, G., & Adjabeng, B.K. (2015) found out that most of the bank and non-bank financial institutions in Ghana are located in the urban centers and that deprives the rural communities a fair participation in the financial space. Other studies have also confirmed the gap between the rural

residents and the urban residents (Desalegn & Yematawy, 2017; Demirguc-Kunt & Klapper, 2012; Demirguc-Kunt, Klapper, Singer, & Van Oudheusden, 2015) and have recommended that banking infrastructure be extended to the rural areas. However, the effects of these banking infrastructures on financial inclusion have not been intensively discussed in the literature. This study intends to fill this gap by examining the effects of number of bank and non-bank financial institutions in rural areas on the rural/urban financial inclusion gap in Ghana.

Almost all the available literature on financial inclusion rarely discussed the relative importance of the variables included in their respective models despite the importance of dominance analysis to policy makers. Dominance analysis helps to know the relative importance or contribution of each predictor variable in the model (Johnson & LeBreton, 2004). This research work will go a step further to analyze the relative importance of number of banks and density of banks in the financial inclusion equation in Ghana. General dominance, conditional, and complete dominance analysis will be conducted to know which variable really dominates the other.

Objectives of the study

The general objective of the study is to examine the effects of the distribution of Bank and Non-bank financial institutions on financial inclusion in Ghana. Specifically, the study seeks to:

1. Examine the effects of increase in number of banks on financial inclusion in Ghana.
2. Analyze the effects of increase in number of banks in rural areas on the rural-urban gap in financial inclusion in Ghana.

3. Determine the likelihood that financial inclusion will increase if number of banks increases in Ghana.

Hypotheses

Based on the above-mentioned objectives and knowledge gap identified the following hypotheses will be tested:

1. H_0: There is no relationship between increase in number of banks and financial inclusion in Ghana.

   H_A: Increase in number of banks leads to increase in financial inclusion in Ghana.

2. H_0: Number of banks has no effect on the financial inclusion gap between rural and urban locations in Ghana.

   H_A: Increase in number of banks in rural areas leads to increase in financial inclusion in rural locations in Ghana.

3. H_0: Financial inclusion is not likely to change if number of banks increases in Ghana.

   H_A: Financial inclusion is more likely to increase if the number of banks increases in Ghana.

Contribution to Knowledge

The need to have bank and non-bank financial institutions in a country and their benefits to the global economy and society as a whole have been discussed in available literature on finance and development, however, how these financial institutions are distributed is yet to gain the needed attention.

The few distribution analysis conducted restricted their studies to either banks only or non-bank financial institutions only. Khan and Rabbani (2015) analyzed the spatial accessibility of Microfinance in the northern part

of Bangladesh. Denes and Repetto (2015) also considered only urban centers in analyzing the financial system of Bueno Aires. This research work will add to the few available research works worldwide by exploring how bank and non-bank financial institutions in Ghana are distributed and how the pattern of distribution affects financial inclusion in Ghana. Unlike previous studies that concentrated on urban centers and microfinance institutions, this study will cover bank and non-bank financial institutions in urban and rural Ghana.

Moreover, this study will serve as a guide to policy makers and development practitioners in their quest to achieve universal access to quality financial services and credit by 2030 as spelt out in the Sustainable Development Goals (SDGs). Knowledge on how bank and non-bank financial institutions are distributed geographically is a necessary condition as far as the goal to extend financial services and credit to the hard-to-reach and also expand coverage to underserved areas is concerned. The study points out the gap between the rural and urban centers in Ghana as far as financial inclusion is concerned and how opening additional branches of bank and non-bank financial institutions in the rural areas can lead to a reduction in the gap. It is therefore believed that this research work will help reduce the gap between the urban and rural areas in terms of financial inclusion if not close the gap completely.

Limitations of the Study

The first limitation has to do with the number of bank and non-bank financial institutions used for the study. The target was to include all bank and non-bank financial institutions at all levels but unfortunately information on institutions in tier 4 was not accessible. Most of the lending activities in tier 4

are handled by individuals who operate from their homes. As a result addresses of such businesses are very difficult to obtain. Moreover, not all branches of tier 1, 2, and 3 were surveyed though all registered and licensed institutions in tier 1, 2, and 3 were included.

Organization of the study

This study has five chapters with each chapter capturing an important aspect of the study. The first chapter discusses the background to the entire study, the knowledge gap to be filled by the study, objectives of the study, hypotheses to be tested, and contributions of the study to knowledge, limitations of the study, and finally, how the study has been organized.

Chapter two takes care of review of relevant and related literature. This chapter reviewed relevant theories on the distribution of bank and non-bank financial institutions. This chapter also contains a review and critique of related empirical works by other researchers and how gaps identified will be filled.

The third chapter of this study elaborates on the methodology employed for the study. Research design, data sources and preparation, definition and generation of variables, model specification, and estimation techniques used for the study are all explained in this chapter.

Chapter four covers presentation of results and discussion of findings whiles chapter five gives a summary of the entire research work and draw conclusions based on findings resulting from the study. Policy recommendations are also given and directed to the appropriate institutions responsible for implementing these policies in chapter five.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter covers review of relevant concepts, theories, and related empirical literature. The literature review begins with an overview of bank and non-bank financial institutions in Ghana, followed by a review of the concept of financial inclusion. Theory of Planned Behaviour, Location theory, Cluster Theory, and Accessibility were also reviewed because of their bearing on the study. Empirical literature on financial inclusion and other related concepts were also reviewed.

Overview of Bank and Non-bank Financial Institutions in Ghana

Formal Banking in Ghana dates back to the colonial era (Fuller, 2009). In 1896 the then British Bank of West Africa opened a branch in Gold Coast, now Ghana to provide banking services. Bank of Gold Coast was established in 1953 by the Bank of England but it was later split into two; Bank of Ghana acting as the bank of issue and Ghana Commercial Bank handling the retail aspect of banking (Adusei, 2016). Other state-owned banks such as Ghana Investment Bank, Agricultural Development Bank, Merchant Bank and Social Security Bank were established by legislation after independence to support the economy. All these banks were placed under the supervision of the Central bank of Ghana (Aryeetey, E. Baah-Nuakoh, A., Duggleby, T., Hettige, H., & Steel, W. F., 1996; Adusei, 2016).

The banking industry has gone through a lot of reforms (Aryeetey et al., 1996). According to the authors, the Economic Recovery Programme (ERP) introduced in 1983 by International Monetary Fund (IMF) helped to

make the banking industry competitive. The Economic Recovery Programme led to the abolishment of several trade restrictions which allowed private sector participation in the banking sector of Ghana.

Adusei (2016) reveals that new Banking laws were enacted to allow full operation of banks, non-bank financial institutions, securities, etc. Shortly after the enactment of the new law, banks such as CAL Merchant Bank, Meridian Trust Bank, Allied Bank, and ECOBANK entered the banking industry. The licensing of non-bank financial institutions was provided for by the Financial Institutions (Non-bank) Law 1993 under PNDC Law 328. The Financial Sector Adjustment Programme (FINSAP) introduced in the 1990's helped to strengthen the financial sector of Ghana by restructuring banks in distressed situations and ensuring that banks at the time kept quality loan portfolios.

The architecture of Ghana's financial system has evolved into a more sophisticated one as a result of the springing up of banks and financial institutions in the country, including foreign banks. Ghana has since 2003 moved away from the three-pillar banking model, that is, development, merchant, and commercial banking, to universal banking (Mawutor, J.K.M., & Obeng, I., (2015). This has necessitated the amendment of old laws regarding the financial industry and also the passage of new laws to regulate the financial sector. Between 1998 and 2016 several laws were passed to guide and direct the activities of all financial institutions that operate within the boundaries of Ghana (Ackah & Asiamah, 2016). The said Acts are enshrined in the 1992 constitution of Ghana and these Acts define the regulatory framework of the financial system of Ghana. The Bank of Ghana which

regulates and supervises activities of bank and non-bank financial institutions is empowered by these Acts and therefore has powers to sanction any institution; either foreign or indigenous that does not conform to the provisions of the Acts.

The total number of registered and licensed bank and non-bank financial institutions in Ghana as at January, 2019 was 770 (Bank of Ghana, 2019). This comprises 23 fully recapitalized Universal Banks, 37 Savings & Loans Companies, 144 Rural Banks, 484 Microfinance Companies, 70 Micro-Credit Institutions, and 12 Financial Non-Governmental Organizations. Savings & Loans Companies, Rural Banks, Microfinance Companies, Micro-Credit Institutions, and Financial Non-Governmental Organizations fall under non-bank financial institutions category.

The universal banks that survived the recapitalization and restructuring exercise conducted by Bank of Ghana are expected to be liquid and solvent. According to Ghana Banking Survey (2018), all universal banks had three main options to increase their minimum capital requirement from GH¢120 million to GH¢400 million by the end of December, 2018. These options include: (i) injection of fresh capital into the business; (ii) recapitalization from reserves; and (iii) consolidation. The 23 fully recapitalized universal banks consist of fourteen (14) foreign-controlled banks and nine (9) domestically-controlled banks. The banking sector report released in January, 2019 by Bank of Ghana attributes the increase in total banking assets from 13.3 percent to 14.7 percent as at December, 2018 to the recapitalization exercise.

GCB held the largest share of the industry's total operating assets. GCB held 11.4 percent followed by Ecobank Ghana (11.3%), and Barclays Bank Ghana (7.9) in third position. In terms of the banking industry's total share of deposits, Ecobank Ghana was leading with 12.6 percent followed by GCB with 12.3 percent. Interestingly, the profitability and efficiency (Profit before tax margin) analysis conducted in the survey put Bank of Baroda on top of the chart (Ghana Banking Survey, 2018). The survey also revealed over 1500 branches of universal banks across Ghana.

Another important component of the financial sector is the Non-bank financial institutions. Bank of Ghana categorizes these institutions into four (4) tiers. Tier one (1) comprises Savings & Loans companies, Rural and Community banks, and other Finance Houses. Tier 1 institutions are regulated under the Banking Act, 2004 (Act 673), ARB Apex Bank Regulations, 2006 (LI 1825), and the Non-bank Financial Institutions Act, 2008 (Act 774). Tier two (2) covers microfinance institutions and is regulated under the Non-bank Financial Institutions Act, 2008 (Act 774). Financial Non-Governmental Organizations and Micro-Credit Institutions are in tier three (3) whereas individual susu collectors and money lenders are in tier four (4) (Bank of Ghana, 2019.

The Bank of Ghana after revoking licenses of some major universal banks in the country turned its attention to the non-bank financial institutions. The main aim of the Central Bank of Ghana is to strengthen the financial sector, especially, the banking sector. It is believed that by the end of the clean-up exercise, Ghana will have a strong and resilient banking industry that

will promote economic activities, thereby leading to economic growth and development (Ackah & Asiamah, 2016).

The Concept of Financial Inclusion

According World Bank report in 2018, financial inclusion starts from owning a transaction account. About 1.2 billion adults got access to transaction account between 2011 and 2017. The most current global Findex database report reveals that about 1.7 billion adults are still without transaction account (Demirguc-Kunt et al.., 2018). Financial inclusion is a concept that has attracted attention all over the world, especially, in the developing countries because of its potential to eliminate poverty in all its forms. World leaders have been advised to include financial inclusion in their development plans because of the strong links between financial inclusion and development (Klapper, El-Zoghbi, & Hess, 2016). Though financial inclusion is now a widely used concept, there appears to be no consensus on its definition and measurement (Koomson & Ibrahim, 2018). Demirguc-Kunt et al.., 2018 reveals that financial inclusion has strong connections with seven out of the seventeen Sustainable Development Goals (SDGs). Schmidt-Traub and Sachs (2015) also revealed that financial inclusion impacts positively on SDGs; 1, 2, 3, 4, 6, 7, 8, 9, and 10. Though there has been improvement in financial inclusion in other parts of the world and Africa, the financial system is still less developed in Africa and that poses a great challenge to the campaign against financial exclusion in Africa (Demirguc-Kunt & Klapper, 2012).

Definition of Financial Inclusion

Several attempts have been made by countries, practitioners, and development agencies to define financial inclusion. According to AFI

Financial Inclusion Strategy Peer Learning Group guidelines on the definition of financial Inclusion published in 2017, The Central Bank of Tanzania, Bank of Tanzania, has come out with a definition of financial inclusion as: "*the regular use of financial services, through payment infrastructure to manage cash flows and mitigate shocks, which are delivered by formal providers through a range of appropriate services with dignity and fairness*." This definition by Bank of Tanzania considered the following elements in the context of Tanzania; frequency of use, type of financial services, target group, and providers of financial services (TOOLKIT, 2016).

According to Olaniyi and Adeoye (2016), there is financial inclusion when a greater percentage of the country's population is able to access financial services. A very comprehensive definition of financial inclusion that will serve as a guide for this study is the definition provided by the World Bank: "*Financial inclusion means that individuals and businesses have access to useful and affordable financial products and services that meet their needs- transactions, payments, savings, credit and insurance- delivered in a responsible and sustainable way*" (Demirguc-Kunt et al.., 2018).

Measurement of Financial Inclusion

Another issue that has generated much discussion in the literature is how financial inclusion is measured. Sanderson et al.., (2018) used the Fin Scope Consumer Survey 2014 conducted in Zimbabwe to find the determinants of financial inclusion, and financial inclusion was measured as adults who have or use financial products and services. Previously, adults who owned just transaction account with formal financial institutions were considered as financially included adults (Demirguc-Kunt & Klapper, 2012)

but currently there is a gradual shift from just access to usage of financial services and products including mobile money accounts (Demirguc-Kunt et al., 2015; Demirguc-Kunt et al.., 2018). Studies conducted recently used more comprehensive measures that include variables ranging from ownership of account, usage of financial services and products, savings, access to credit, insurance, remittances and transfers (Demirguc-Kunt et al, 2015).

Bakari, Idi, and Ibrahim (2018) constructed a financial inclusion index from variables such as account ownership, savings, and credit to the private sector as a percentage of GDP using Principal Component Analysis. However, the Principal Component Analysis may not be feasible in cases where required conditions are not met and that may lead to loss of some characteristics of indicators used in creating the index (Koomson & Ibrahim, 2018).

A more comprehensive measure was adopted by Koomson and Ibrahim (2018) to create an index for financial inclusion. Koomson and Ibrahim (2018) created an index for financial inclusion with the additive index approach, using fourteen (14) indicators grouped under; ownership of financial products, usage of financial products, access to credit, and receipt of remittances. This study will follow the work of Koomson and Ibrahim (2018) to generate an index for financial inclusion since the GLSS 7 data is similar to the GLSS 6 data in terms of sampling techniques and methodology.

Gendered Analysis of Financial Inclusion

Furthermore, there exist gaps in financial inclusion in terms of gender and urban/rural communities across the globe. These gaps have been confirmed by Wokabi and Fatoki (2019); Lotto (2018); Gashaw and Gebe (2017); Botric and Broz (2017); Zins & Weill (2016); Demirguc-Kunt,

Klapper and Singer (2013) and other literature on financial inclusion. The gender gap runs through almost all the indicators of financial inclusion identified by available literature on financial inclusion. As at 2015, only 58% of women across the globe owned formal account as compared to 65% of men owning formal account. In Sub Saharan Africa, it was 39% for men and 30% for women (Demirguc-Kunt et al.., 2015). The 2017 global Findex database report shows an increase to 72% for men and 65% for women across the globe and 67% for men in developing countries and 59% for women. Generally, women across the globe are less likely to save, make payments through formal transaction account, and also gain access to credit (Demirguc-Kunt et al.., 2015). The gender difference in account ownership worldwide and for developing economies has not significantly changed (Demirguc-kunt et al.., 2017).

Rural & Urban Analysis of Financial Inclusion

Financial inclusion also differs among urban dwellers and rural dwellers globally and this happens even in high income economies. Majority of the rural residents do not own formal transaction accounts. Whiles it was 89% and 88% for urban and rural residents in advanced economies as at 2011, the difference between urban centers and rural areas in terms of account ownership was about 17% in Sub Saharan Africa (Demirguc-Kunt & Klapper, 2012). Despite the improvement in financial inclusion over the years, there still exist a gap in financial inclusion between urban residents and rural folks across the globe (Demirguc-Kunt et al.., 2017; Lotto, 2018; Desalegn & Yemataw, 2017; Zins & Weill, 2016). Recent study conducted by Wokabi and Fatoki (2019) in East Africa has also confirmed that there is low financial

inclusion among people living in rural areas. The study revealed that a country with more rural population is likely not to achieve its financial inclusion targets.

Theoretical Literature Review

The Theory of Planned Behaviour

Studying and trying to understand why human beings behave the way they do or take certain actions is a very difficult task if not the most difficult task to perform (Sherman & Fazio, 1983; Ajzen 1998). Several theories have been propounded to help explain human behaviour and one of such theories is the Theory of Planned Behaviour attributed to Ajzen (1991). This theory has been very useful in predicting and explaining why people behave in peculiar ways as admitted by Saidin and Isa (2013).

The Theory of Planned Behaviour is an extension of the Theory of Reasoned Action. The difference between the Theory of Planned Behaviour and the Theory of Reasoned Action is that the former uses perceived behaviour of an individual to predict how the individual intends to behave. According to Ajzen (1991), three factors inform one's intended behaviour; attitude of the person, others opinion towards the intended behaviour, and perceived behavioural control. Perceived behavioural control is linked to how the individual perceives the difficulty attached to engaging in a particular behaviour. Perceived behavioural control increases when engaging in certain behaviour is perceived to be less difficult and decreases when it is more difficult to engage in that same behaviour.

Individual characteristics such as gender, age, location, and educational background do contribute to shaping an individual's behaviour (Giluk &

Postlethwaite, 2015). It is believed that the Theory of Planned Behaviour may have a direct bearing on financial inclusion since all the variables mentioned above; age, gender, location, and educational background, have been found to affect financial inclusion all over the world (Zins & Weill, 2016; Demirguc-Kunt & Klapper, 2012; Demirguc-Kunt et al.., 2017; Desalegn & Yemataw, 2017; Lotto, 2018). Moreover, individuals who find it difficult to participate in the financial space because of distance get discouraged and exclude themselves financially as explained by the Theory of Planned Behaviour.

Location Theory

Location theory dates back to the work of Johann Heinrich Von Thunen in 1826 and has since played relevant roles in both economic geography and spatial economics. Theories on location try to identify the locations of economic activities in an area and also find out why these economic activities are found in the said areas (Haining, 2003). Von Thunen's location theory relied on the assumption that economic agents are rational and would always choose locations that maximize their profit. According to Von Thunen (1826), Cost of transporting goods reduces economic rents hence; agents always factor in transportation cost in making decisions regarding their locations.

Although Von Thunen is regarded by some scholars in the field as the father of location theory, the foundation of modern location theory is credited to the work of Alfred Weber in 1909 (Haining, 2003). Weber's theory of location assumes a perfect competitive market where there are more firms and consumers. Natural resource such as water is assumed to be common and can be found everywhere whereas other production inputs such as fuel, labour, and

minerals are mostly available at specific locations. Fearon (2006) identified three key factors that may determine location of industries: (i) transportation cost; (ii) labour cost; and (iii) agglomeration economies. When firms are faced with location decisions, they first consider transportation cost, and then later adjust to include labour cost and agglomeration of economies (Rodrigue, 2012). According to Weber (1909) cited in Fearon (2006), firms that make use of more raw materials are likely to locate close to the source of raw materials to avoid high transportation cost. Weber developed an index called Material Index to help predict the locations of industries, that is, whether a firm will locate close to the market or close to the source of raw materials. Weber's Material Index is expressed mathematically as:

Material Index (MI) = Weight of Inputs (WI) / Weight of Output (WO).

The theory of Weber (1909) cited in Fearon (2006) explains that firms with MI greater than 1 are more likely to locate close to the source of raw materials while firms with MI less than one are more likely to locate close to market centers.

The location theory is very applicable to the financial sector since bank and non-bank financial institutions make decisions concerning location of branches and more especially, head offices. Ansong et al.., (2015) found out that most banks in Ghana operate within the urban centers and are mostly located close to market centers leading to clustering of banks. Similar patterns have been confirmed in London and other cities worldwide (Kuah, 2002).

Cluster Theory

Issues relating to cluster are mostly discussed in the field of geography, however, the emergence of economic geography and spatial economics has

directed a lot of attention to the term cluster (Kuah, 2002). Defining the term "cluster" is very challenging because of the differences in characteristics, functions, geographical scale, and sustainability. Porter (1998) defines cluster as *"the geographical concentrations of interconnected companies, specialist suppliers, service providers, firms in related industries and associated institutions."* Cluster theory has been in existence for more than a century and it is usually traced to Alfred Marshall's work on districts. According Newlands (2003), a firm is said to be in a cluster when it operates with at least 10 other firms in the same sector in the same location within a space of 100meters.

Several theories of cluster have been propounded thereafter, especially, in the last two decades but the cluster theory gained much popularity after the works of Porter (1990) and has since remained relevant because clusters are common across the globe (Kuah, 2002).

Firms prefer to locate in clusters because clusters are mostly found in cities and being in a city has a lot of benefits. Newlands (2003) identified the following as benefits enjoyed by firms in clusters found in London:

1. The prestige and credibility that comes with having a city address as a company.
2. Proximity to professional bodies and access to skilled labour.
3. Being located close to competitors ensures access to knowledge.
4. Cultural diversity and life styles in the city of London.

Huggings (2000) found out that financial institutions are likely to cluster in capital cities because of access to skilled labour and support services, proximity to markets, and external economies of scale. Moreover,

financial institutions grow faster when they locate in clusters (Pandit et al.., 2001). Regardless of the numerous benefits derived by financial institutions that locate in clusters, clustering may not promote people's participation in the financial space because of the poor transportation systems in our cities and the cost of traveling.

Accessibility Theory

Accessibility theory is one of the social psychology theories as contained in the work of Van Lange, P. A., Kruglanski, A. W., & Higgins, E. T. (2011). Under accessibility theory, human beings are more likely to verify and choose what they can see and experience when presented with options. In effect, accessibility has been found to influence preference (Kusev, P., van Schaik, P., & Aldrovandi, S., 2012). As cited in Kusev et al, (2012), Gilad and Kliger, (2008) discussed how humans associate events in their memories before making financial decisions.

Linking this theory to the study, individuals are more likely to get enough information on financial institutions that are closer to them and that help them to process information and make decisions. It is therefore more likely that as number of banks increases and financial services and products are brought closer to people, individuals are more likely to participate in the financial space. Based on this theory, three hypotheses were formulated as shown in chapter two of this study.

Empirical Literature Review

This section of the study will review empirical studies conducted on distribution of banks and financial inclusion that may have influence on this work. Focus of the empirical literature review will be on methodology

employed, especially, how variables were selected and measured, and also findings that in one way or the other relate or impact on this study.

In estimating the accessibility of healthcare, Luo and Wang (2003) analyzed spatially the locations of hospitals and clinics and the effect it has on users of these facilities. Similar works have been done by McLafferty, and Grady (2004) and Goldman and Schmalz (2000). Binita (2010) through spatial analysis found out that locating educational institutions far away from users affects its usage. Spatial analysis has also been an indispensable tool for law enforcement agencies in tracking criminal activities (McLafferty, & Williamson, 1999). One branch of economics that has not really utilized spatial analysis is finance (Khan & Rabbani, 2015). This work reviewed prior studies of spatial accessibility in relation to financial services.

Khan and Rabbani (2015) used Kernel Density Estimation (KDE) to measure spatial accessibility of microfinance institutions in Kurigram and Lalmonirhat districts in Northern Bangladesh. The study used GIS tools to analyze and map branches of microfinance institutions in the two districts. Distance from roads, rivers, and distance from district headquarters and other administrative centers of microfinance institutions were identified as significant factors determining spatial accessibility of microfinance institutions in Kurigram and Lalmonirhat districts in northern Bangladesh. A GIS map of branches of microfinance institutions in the two districts were produced by the authors to show the pattern of distribution of MFIs in the selected districts. The map shows a variation in access to MFIs in both districts. The study revealed a significant positive relationship between spatial accessibility and participation in MFI programs. Attributes of specific

locations were considered in the analysis which is good but using results from only two districts to generalize for an entire country may not be right.

Another study that has recently analyzed the geographical locations of financial institutions is Denes and Repetto (2015). This study conducted a spatial analysis of the financial system in urban cities in Argentina, specifically, Bueno Aires. The researchers employed OLS, Probit, and Heckman Selection Model to identify factors that determine the geographical location of bank branches in Argentina. Population density as measured as population per square kilometers, education of household head, percentage of economically active household heads, number of firms per square kilometers, distance to the nearest station/ market, and meters of banking avenue per square kilometers were identified as determinants of spatial distribution of bank branches in Bueno Aires. Suitability analysis was also conducted to find out the most suitable locations to cite branches in order to promote access to financial services. The authors analyzed only factors pertaining to urban centers and also did not show how the spatial distribution of banks will affect access to credit and financial services. Again, the researchers concentrated solely on banks.

Beck et al, (2007) in their cross-country analysis of access to credit tried to find out how the geographic distribution of banking services impacts on access to credit. The Authors measured distribution of financial services as the number of branches of financial institutions or ATMs located within each 1000 square kilometers. The study concentrated on only formal financial institutions and found a positive correlation between distribution of banking services and population density of an area. Beck et al.., (2007) therefore found

that banking services are predominant in large economies because of the high number of people visiting transacting businesses in these economics.

Pedrosa and Do (2011) investigated the impact of distance on access to credit in Niger. Distance is a very fundamental concept in economic geography and appears in almost all spatial analysis. The study considered the distance one needs to travel in order to access credit with emphasis on transportation cost. It was revealed the more distant a borrower's residence from the location of financial services, the more vulnerable the individual becomes in terms of access to credit. The study also found out that distant borrowers paid extra interest and incurred other expenses as a result of high transportation cost and monitoring expenses incurred by financial institutions that lend to this category of borrowers. The extra expenses may be partly due to the likely moral hazards in transacting business from a distance.

In Ghana, Annim, Awusabo-Asare, and Asare-Mintah, (2008) selected 1628 clients households from 17 microfinance institutions and 1104 non-client households in the three ecological regions to analyze the socio-economic background of these clients and outreach of the 17 MFIs. The study revealed a spatial variation in the outreach of MFIs in the selected regions as well as socio-demographic variations.

Ansong et al, (2015) analyzed the pattern of distribution of branches foreign and domestic banks, and rural and community banks in Ghana. The researchers employed spatial tools and geographically weighted poison regression to analyze the distribution and inequality in branches available at the district and regional levels. The study revealed that bank branches are more accessible in the urban south. The study also finds that bank branch

presence is determined by population size, percentage of urban residents, the size of workforce, and literacy level.

Financial inclusion has been described by the World Bank as "a key enabler to reducing poverty and boosting prosperity" (World Bank, 2018). A strong connection has been found between financial inclusion and nine of the seventeen SDGs (Schmidt-Traub, & Sachs, 2015) and as a result, a lot has been written on financial inclusion in the economics literature. El-Zoghbi and Hess (2016) has advised policy makers to do their best to improve upon access to credit and financial products because there exist, a strong connection between financial inclusion and development.

One of the most recent studies conducted in Ghana has shown that financial inclusion impacts positively on revenues of non-farm enterprise. Koomson and Ibrahim (2018) employed data from the sixth round of the Ghana Living Standard Survey to examine the effect of financial inclusion on growth of non-farm enterprises in Ghana. Out of 16,772 households enumerated, there were a total of 7,060 non-farm enterprise households. However, after managing and cleaning the data, the sample reduced to 1,508. Growth of non-farm enterprises was measured as sales revenue from non-farm enterprises by following Delmar, Davidson, and Gartner, (2003). This approach was chosen by the authors after considering other approaches such as profit/income, assets, and market shares used by Ardishvili, Cardozo, Harmon, and Vadakath, (1998); Davidson (1991); Delmar, (2006); Weinzimmer, Nystrom, and Freeman, (1998), as cited in Koomson and Ibrahim (2018). The study also used a multi-dimensional approach to create an index for financial inclusion. Fourteen (14) indicators were used to create an

additive index for financial inclusion. Instrumental variable method was used for the estimation and the findings revealed that financial inclusion has the potential to increases revenue of non-farm enterprises by 43%.

Focusing on Africa, Wokabi and Fatoki (2019) analyzed the determinants of financial inclusion in five East African countries, namely; Kenya, Uganda, Tanzania, Rwanda, and Burundi. The study used data from the World Bank's World Development Indicators database (WDI) spanning from 2000 to 2016. Using the Fixed Effects model, the study included variables such as interest rates, rural population, unemployment rate, and income levels in the model. Among the variables, the study found that income and rural population significantly affect financial inclusion in East Africa. One interesting finding is that rural population negatively influences financial inclusion in East Africa.

Another recent study on financial inclusion was conducted by Agyeman-Badu et al.., (2018). The study investigated the nexus between financial inclusion, poverty, and income inequality in Africa. Panel data on 48 countries in Africa from 2004-2015 was extracted from the World Bank Development Indicators (WDI) on variables such as education, Gross National Income per capita, poverty rate, top 10% income earning group, bottom 20%- and 40%-income earning group, population, and private credit. The variable rule of law was extracted from Mo Ibrahim Governance data from 2004-2015. Palma ratio measured as top 10% income earning group divided by bottom 40% income earning group was used to measure income inequality. By following Park and Mercado (2015), the study created an index for financial inclusion. Gross National Income per capita, population, and level of

education were found to influence financial inclusion positively. The study revealed that improvement in financial inclusion and economic growth lead to reduction in poverty at all conventional levels of significance.

Asuming et al.., (2019) employed data from World Bank's global Findex database to conduct a comprehensive analysis of financial inclusion in Sub Saharan Africa (SSA). The study selected 31 SSA countries for the analysis and found variations in the level of improvement and also the rate of improvement in the selected countries. Variables such as age, wealth, gender, education, growth rate of GDP, presence of financial institutions, and business freedom were found to be significantly influencing financial inclusion in Sub Saharan Africa. The study revealed that females and young people were less likely to be financially included, hence, recommended that financial inclusion policies in Sub Saharan Africa should target women and young people.

Bakari et al, (2018) tried to find the innovation determinants of financial inclusion in Africa, using data from the top ten African countries; Angola, Algeria, Egypt, Kenya, Libya, Nigeria, Morocco, South Africa, Sudan and Tunisia. The study used data from World Development Indicators (WDI) and Worldwide Governance Indicators (WGI) between 2000 and 2015. Financial inclusion index was created with indicators such as account ownership, savings, and credit to private sector as a percentage of GDP following the Principal Composition Analysis (PCA) approach. Employing a System GMM approach which corrects for omission bias, endogeneity, and autocorrelation; the study found out a positive significant impact of mobile banking, bank branches, political stability, interest rate, inflation on financial inclusion in the selected top ten African countries. However, the study reports

a negative relationship between financial inclusion, and access to ATMs and government expenditure.

Lotto (2018) examined the determinants of financial inclusion in Tanzania using household survey data collected by TWAWEZA in Tanzania. The data contain information on 1800 respondents in Tanzania. Probit regression was employed in the analysis. Findings of the study show a significant relationship between gender, education, age, and income. These factors influenced both usage of mobile banking and traditional banking in Tanzania.

In Ethiopia, Gashaw and Gebe (2017) used World Bank's 2016 Socioeconomic Survey (ESS) data to analyze the status, level, and determinants of financial inclusion in Ethiopia. Factors that hinder financial inclusion were also identified in the study. The study considered three key indicators of financial inclusion as used by Demirguc-Kunt and Klapper (2013); account ownership, using account to save, and usage of financial products and services. Gashaw and Gebe (2017) employed probit model in estimating the determinants of financial inclusion. Using a dataset that had information on about 11,810 adults, the study identified age, gender, residence (urban/rural), education level, marital status, religion, financial literacy, region, and financial capability and preference as determinants of financial inclusion.

Moreover, Botric and Broz (2017) analyzed the differences that exist among males and females in terms of financial inclusion with data from Central and South Eastern Europe. The study did the analysis with data from the World Bank's Global Financial Inclusion Database released in 2014. Total

of 19 countries in Central and South Eastern Europe were used for the analysis. Despite mentioning three indicators of financial inclusion the study only focused on account ownership. Applying Fairlie decomposition, the authors categorize the financial inclusion gaps that exist among males and females into young group, working group, and older group. The variables included in the probit model are level of education, employment status, income, agriculture, government support, and country as a dummy variable. The findings reveal that employment status contributes largely and positively to the gaps existing among females and males in terms of financial inclusion. High education level was also found to contribute to a reduction in the financial inclusion gaps among males and females.

Furthermore, Tita and Aziakpono (2017) investigated the relationship between financial inclusion and income inequality in Sub-Saharan Africa. The study used data from the Global Findex Dataset released in 2014. Seven indicators were used to measure financial inclusion, namely; account ownership, account use for business, electronic payment, loans from formal financial institutions, formal loans to pay school fees, health insurance, and formal savings. The study used Gini co-efficient to measure income inequality. Cross section regression analysis was used to examine the relationship between all the seven indicators of financial inclusion and income inequality in Sub-Saharan Africa. Out of the seven indicators of financial inclusion employed, account for business, electronic payment, and formal savings had a positive relationship with income inequality which according to the authors is a deviation from the expected results. Health insurance, loans from formal financial institutions had a negative relationship with income

inequality but the variables were not significant, hence; could not have any influence on policy making.

Wale and Makina (2017) studied factors that affect financial inclusion in 18 Sub Saharan African countries. The study employed account ownership and usage of accounts to save as indicators for financial inclusion. Both indicators were binary indicating whether an individual owns account or not, or whether an individual uses the account owned or not. Wale and Makina (2017) used the probit model to estimate the effects of variables such as age, income, education, and sex on financial inclusion. Both the descriptive analysis and the results from the probit model estimation show that males are more likely to own bank account than females. The study also revealed that individuals become more financially included as they move from primary education to the tertiary level. The variable age was also found to be positively affecting financial inclusion in SSA but the relationship becomes negative as an individual age.

Again, Chikalipah (2017) also studied the factors that are likely to influence an individual's participation in the financial space. The author used the SSA region as the study area and employed data from World Bank on twenty (20) SSA countries. Ownership of bank account was used as the only indicator for financial inclusion in SSA. Variables such as literacy, GDP growth, GNI per capita, population density, and infrastructure index were included in the model. Using Ordinary Least Squares estimation technique, the study found literacy, GDP growth, and GNI per capita as the main drivers of financial inclusion in SSA.

In an attempt to identify and examine the determinants of financial inclusion in 37 African countries, Zins and Weill (2016) extracted data from the 2014 edition of the World Bank's Global Financial Inclusion Indicators (Global Findex). The study employed probit model estimation because the dependent variable was a binary variable. After the estimation, the study revealed that gender, wealth, education level, and age were the key variables influencing financial inclusion in the selected African countries. The study mentioned lack of trust, documentation, religious beliefs, lack of money, and market failure as some of the reasons why women are often excluded from the financial space.

Applying a Dynamic Panel Data approach, Olaniyi and Adeoye (2016) explored the determinants of financial inclusion in Africa between 2005 and 2014. Data was extracted from World Development Indicators (WDI) on variables such as number of depositors with commercial banks, GDP per capita, deposit interest rate, inflation, and money supply as a percentage of GDP, population, and credit to private sector as a percentage of GDP, number of internet users, secure internet servers, and adult literacy. Number of depositors with commercial bank served as a proxy for financial inclusion. With the Dynamic Panel Data approach, the study revealed significant relationships between financial inclusion, and GDP per capita, broad money supply as a percentage of GDP, adult literacy, internet access, and Islamic bank presence and activity.

Dabla-Norris et al.., (2015) analyzed financial inclusion in Latin American countries. The paper sought to find the current status of financial inclusion, identify financial inclusion gaps, and also analyze the impact of

financial inclusion on economic growth, inequality, and financial stability. The authors constructed a multi-dimensional index for financial inclusion consisting of usage of financial services by households, usage of financial services by SMEs, and access to financial institutions. Deviations from factors such as income per capita, education, size of the shadow economy, rule of law, the share of foreign-owned firms, and fuel exports, were used to compute gaps in financial inclusion. Results show that Latin American countries have made progress in terms of access to financial institutions. It was also revealed that firms were more financially included but households lacked behind in terms of account ownership and savings.

Demirguc-Kent et al.., (2015) analyzed progress made so far by African countries in financial inclusion with data from Global Findex dataset released in 2014 by the World Bank. Findings from the paper shows there were some progress made in terms of financial inclusion in Africa between 2011 and 2014. The study also attributes the gains in financial inclusion partly to the introduction and high patronage of mobile money in Africa, especially, in East Africa. The introduction of mobile money led to a reduction in the proportion of adults who had no formal transaction accounts. The paper also revealed that the percentage of adult population with accounts increased to 62% in 2014.

Similarly, Demirguc-Kunt and Klapper (2012) summarize financial inclusion across the African continent after the release of the World Bank's Global Financial Inclusion Indicators (Global Findex) dataset in 2011.The paper reports that several individuals were not having access to financial services in Africa despite some improvements in the financial sector of Africa.

The study found out that about 50% of adults worldwide did not have transaction account with any formal financial institution. The authors cited cost, distance, and documentation requirements as the main factors hindering financial inclusion in Africa. The study also revealed that Democratic Republic of Congo and Central African Republic were worst performing countries in terms of financial inclusion since more than 95% of adults were not having bank accounts.

Chapter Summary

Chapter two of this research work highlights on review of relevant theories and concepts on financial inclusion and the architecture of Ghana's financial services sector. Prior empirical works on financial inclusion and all variables of interest were also reviewed in this chapter. The review was done by focusing on methodologies employed in previous empirical works, and most importantly focusing on their findings and how these finding relate to this research work.

Bank and non-bank financial institutions in Ghana as well as laws governing these institutions were analyzed and reviewed. The study reviewed 770 bank and non-bank financial institutions as at January, 2019, comprising 23 fully capitalized universal banks, 37 savings & loans institutions, 144 rural and community banks, 484 microfinance institutions, 70 micro-credit institutions, and 12 Financial non-governmental organizations.

` In reviewing the concept of financial inclusion it was revealed that about 1.2 billion adults obtained transaction account between 2011 and 2017, however, about 1.7 billion adults are still without transaction accounts (World Bank, 2018). As a result of the strong connection between financial inclusion

and development (Klapper, El-Zoghbi, & Hess, 2015), and the impacts of financial inclusion on 9 out of the SDGs (Schmidt-Traub & Sachs, 2015), world leaders and development practitioners are making efforts to get everybody to participate in the financial space. Working definitions by the World Bank, Bank of Tanzania, and Olaniyi and Adeoye (2016) were also reviewed. Another aspect of the concept of financial inclusion reviewed in this study is how financial inclusion has been measured over the years. It starts with adults with transaction accounts (Demirguc-Kunt & Klapper, 2012) through ownership, access and usage of transaction accounts (Demirguc-kunt et al.., 2015; World Bank, 2018) to construction of indexes for financial inclusion by including variables such as savings, access to credit, insurance, transfers, and remittances (Bakari, Idi & Ibrahim, 2018; Koomson & Ibrahim, 2018). This study followed the multidimensional approach adopted by Koomson and Ibrahim (2018)

Theoretical literature review was also conducted. Theories reviewed include Location Theory, Cluster Theory, and the Theory of Planned Behaviour. Location theory is attributed to the works of Von Thunnen (1826) and Weber (1909). Location theories try to find out the locations of economic activities and why specific locations are chosen (Hanning, 2003; Hanning, 2010). Cluster theory was reviewed because financial institutions are likely to concentrate in cities and urban centers (Ansong et al.., 2018). According to Pandit et al.., (2001), financial inclusion grows faster when they locate in clusters, hence; financial institutions prefer to locate in urban centers to rural communities.

The third relevant theory, the Theory of Planned Behaviour by Ajzen (1991) helps to explain why people behave the way they do and what factors influence the behaviour exhibited. The Theory of Planned Behaviour is therefore required to explain why people participate in the financial space or otherwise. Another Social Psychology Theory that was considered in this study is accessibility because accessibility has been found to influence preferences (Kusev et al, 2012).

Empirical literatures reviewed were studies conducted in Europe, Africa, Ghana, and other parts of the world. Works by Bayer and Gavriletea (2018), Agyeman-Badu et al.., (2018), Bakari et al.., (2018), Lotto (2018), Demirguc-Kent and Klapper (2012) and many others across the globe were reviewed by the authors of this study. The studies mentioned showed that financial inclusion is determined by macroeconomic variables, institutional factors and individual characteristics.

Macroeconomic variables such as Gross National Income per capita, poverty rate, Gross Domestic Product, interest rate, inflation, etc., were found to be influencing financial inclusion by Agyeman-Badu et al.., (2018) and Bakari et al.., (2018). Olaniyi and Adeoye (2016) found that bank presence in a community and macroeconomic variables affect financial inclusion in Africa. Individual characteristics such as gender, age, education level, and residential locations were also found to be influencing financial inclusion (Demirguc-Kunt & Klapper, 2012; Lotto, 2018; Zins & Weill, 2016; Desalegn & Yemataw, 2017; Dabla-Norris et al.., 2015).

Inferring from literatures reviewed, the following gaps have been identified:

1. Prior studies did not examine the effects of number of financial institutions in a community on financial inclusion though researchers are advocating for extension of financial services to underserved areas.
2. Earlier research works did not intensively consider the effect of increasing number of banks in a community on the rural/urban gap in terms of financial inclusion.

CHAPTER THREE

RESEARCH METHODS

Introduction

This chapter of the study gives details of the research design, method, and techniques employed to analyze issues pertaining to the study to achieve the set objectives. Details of the research design and how variables were generated are shown in this chapter. Chapter three is organized into the following sections: research design, data sources, and definition of variables, data management and generation of variables, empirical model specification, and estimation techniques.

Research Design

Research design of a study refers to how various components of the study are arranged and integrated logically, beginning with the collection, through measurement to analysis of data. According to Kerlinger (1986) research design starts from hypotheses through operational implications to the final analysis of data. Research design may serve two main purposes: (i) it details the procedures and strategies needed for the study; and (ii) it gives clarity on the causal relationships that exist between the outcome variable and the right hand-side variables in the model (Kumar, 2005).

This study follows the quantitative approach. The quantitative paradigm involves testing hypotheses with quantitative data (Creswell & Creswell, 2017). Kumar (2005) identified three main perspectives of designs commonly used in quantitative studies: (1) the period between which the study is done; (2) the nature of the study or investigation; (3) the number of times you engage the study population. According to Kumar (2005) studies may

further be classified as retrospective, prospective, and retrospective prospective based on the reference point, and also as experimental, non-experimental, and quasi experimental based on the nature of the investigation. Kumar (2005) further classifies quantitative studies into before-and-after studies, longitudinal studies, and cross-sectional studies based on the number of times a researcher engages the study population.

Discussing the classification in detail, retrospective studies focus on past phenomena, situations or occurrences (de Vaus & de Vaus, 2001) while prospective studies dwell on how prevalent an outcome or phenomena may be in future (Creswell & Creswell, 2017; Kumar, 2005). Retrospective prospective studies as the name suggests considers past, present and the future. It involves collecting data on past events, introducing an intervention and following up on the study population into the future to know the outcome (Bordens & Abbott, 2002).

The major difference between experimental research and non-experimental research is that the former interrogate the relationship between variables starting from the cause to ascertain the effect whereas the latter establishes relationships between variables beginning from the effect to the cause (Kerlinger, 1986). Quasi or semi-experimental studies draw characteristics from both experimental and non-experimental studies.

After-and-before studies consider two cross sectional data collected at different points on the same study population to ascertain changes in prevalence of outcomes. This type of study is used mainly in conducting impact analysis (Kumar, 2005; Bordens &Abbott, 2002). With longitudinal or panel studies, the study population is followed several times for over a long

period at regular intervals (Miller & Salkind, 2002; Kumar, 2005). Cross section studies is the most commonly used study in the field of social sciences. It is also called one-shot or status studies. Unlike longitudinal and after-and-before studies, in cross section studies, researchers engage a cross section of the study population at just a point to gather relevant information for analysis (Kumar, 2005; Bordens & Abbott, 2002). This study will make use of cross section studies techniques to analyze the effects of the distribution of financial institutions on financial inclusion in Ghana.

Data

This study employs a secondary data from the seventh round of the Ghana Living Standard Survey (GLSS 7) obtained from Ghana Statistical Service and data on branches of banks and non-bank financial institutions from the official websites of the respective banks. Information on registered bank and non-bank financial institutions was obtained from Bank of Ghana.

The Ghana Living Standard Survey (GLSS) is an initiative by the World Bank but the survey is conducted and supervised by Ghana Statistical Service (Ghana Statistical Service, 2017). The survey is conducted every four to five years to compile information on the standard of living of the citizenry. The survey targets information on the demographic characteristics of households and individuals, education, health, employment and time use, migration and tourism, housing and housing conditions, household income and expenditure, agricultural activities undertaking by households, household financial services, ownership of assets, and other relevant information on welfare of Ghanaians. Seven surveys have been conducted so far in Ghana beginning in 1987. The subsequent rounds were conducted in 1988, 1991/92,

1998/99, 2005/06, 2012/13, and 2016/17 respectively (Ghana Statistical Service, 2017). The seventh and latest round of the GLSS sampled 15,000 households from 1,000 enumeration areas across the country. The selected enumeration areas include 561 rural areas and 439 urban settlements. The survey successfully captured 14,009 households made up of 59,864 individuals in the 1,000 enumeration areas selected for the survey.

Data on registered banks and non-bank financial institutions in Ghana as at January, 2019 was obtained from the Central Bank of Ghana. As of January, 2019, there were 770 registered bank and non-bank financial institutions in Ghana (Bank of Ghana, 2019). This comprised 23 universal banks, 37 savings and loans companies, 144 rural and community banks, 484 microfinance companies, 70 micro-credit institutions, and 12 financial non-governmental organizations. Subsequently, information on branches of these institutions and their physical addresses were gathered from the official websites of the institutions and other online sources in all the 216 districts in Ghana. In all information on 2,929 branches of bank and non-bank financial institutions were collected and used for the analysis. Moreover, the branches were sorted out according to districts whereas information on the total land area of each district was obtained from the district analytical reports compiled by the Ghana Statistical Service.

Data Management and Generation of Variables

Data management and analysis was conducted using version 14 of the Stata Statistical Software. Data collected on bank and non-bank financial institutions across Ghana was merged with datasets from the seventh round of the Ghana Living Standard Survey (GLSS 7). Datasets including g7sec1,

g7sec12a, g7sec11_12screening, g7comSEC0, and povgh_2017 were used in the analysis. The dataset g7sec1 contains information on individuals' age, location (urban/rural), sex, educational level, and the remaining individual datasets g7sec12a and g7sec11_12screening contain information on individuals' ownership of financial products, usage of financial products, remittances, and access to credit. The last two datasets has information on regions in Ghana, clusters, districts and their codes, and other economic information.

The above-mentioned datasets were selected from GLSS 7 datasets and merged with data collected on bank and non-bank financial institutions across Ghana. Information on these bank and non-bank financial institutions includes district and region where these institutions are located. The GLSS 7 has information on district codes and cluster numbers so it was easier to merge the selected datasets with the data collected on bank and non-bank financial institutions which also contains information on districts and regions in Ghana. After successfully merging the excel data containing information on bank and non-bank financial institutions with the selected GLSS 7 datasets, the number of observations finally dropped to 2530 which means 2530 individuals were used for the analysis.

The unit of analysis is the individual. The study looks at how these 2530 individuals living in areas where branches of bank and non-bank financial institutions are located respond to increase in number of branches of banks in their catchment areas.

Regarding the generation of variables, the variable sex was originally coded in the GLSS 7 dataset as: 1 = Male and 2 = Female but was recoded as 0

= Male and 1= Female. The variable marital status was also recoded as: 0 = Married/Living together, 1 = Separated/Divorced, 3= Widowed and 4= Never Married. Also, the variable residence was recoded as: 0 = Urban and 1 = Rural.

Theoretical Models

Ordinary Least Squares (OLS)

The study employs Ordinary Least Squares Model in the estimation of objectives 1 and 2.

OLS model is generally of the form:

$$Y = X\beta + \varepsilon \quad (1)$$

Where Y is Nx1 vector of the values of the outcome variable, X is N by K matrix of the independent variables, β is K by 1 vector of unknown parameters, and ε is N by 1 vector of errors for the observations used for the analysis.

The OLS equation above can be written in matrix form as:

$$Y = \begin{pmatrix} y1 \\ yn \end{pmatrix}, \quad X = \begin{bmatrix} x11 & \cdots & x1k \\ \vdots & \ddots & \vdots \\ xn1 & \cdots & xnk \end{bmatrix}, \quad \beta = \begin{pmatrix} \beta 1 \\ \beta k \end{pmatrix} \quad (2)$$

The above matrices can be written in equation form as:

$$Yi = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} \ldots\ldots\ldots\ldots \beta_k X_{nk} + \varepsilon_i \quad (3)$$

The aim is to estimate $\beta = (X'X)X'Y$

Logit Regression Model

Determinants of financial inclusion have been modeled using Discrete Choice Models (Abel et al.., 2018; Potrich et al.., 2015). Discrete Choice Models depict the probability that an individual will choose an alternative. Financial inclusion is considered a binary outcome variable, hence; may be

modeled using a Probit or Logit model (Potrich et al.., 2015). The estimated coefficients of Probit and Logit models cannot be compared though there are some similarities in terms of direction (Gujarati, 2006). This study intends to apply the Logit Model to determine the likelihood that financial inclusion will increase given that number of financial institutions has increased in a community.

Given that

$$Yi = \beta Xi + Ui \quad (4)$$

Where $Y = \begin{cases} 1, & if\ financially\ included \\ 0, & if\ not\ financially\ included \end{cases}$

Xi is a set of independent variables such as age, sex, educational level, marital status, poverty status, and number of financial institutions in a community.

Ui is the disturbance term.

The probability that an individual is financially included is expressed mathematically as:

$$P(Yi = 1) = F(\beta' Xi) \quad (5)$$

and the probability that an individual is excluded is given as:

$$P(Yi = 0) = 1 - F(\beta' Xi) \quad (6)$$

Logit models have Cumulative Distributive Function and as a result equations (2) and (3) can be represented as:

$$P(Y = 1) = \frac{e\beta'^{x}}{1 + e\beta'^{x}} \quad (7)$$

$$P(Y = 0) = 1 - \frac{e\beta'^{x}}{1 + e\beta'^{x}} = \frac{1}{1 + e\beta'^{x}} \quad (8)$$

Solving for the conditional expectation of Y given X yields:

$$E(Y/X) = (F(\beta' Xi) + 0\big(1 - F(\beta' Xi)\big) = F(\beta' Xi) \quad (9)$$

Differentiating equation (6) with respect to Xij gives:

$$\delta Pi \Big/ \delta Xij = F(\beta' Xi)\big(1 - F(\beta' Xi)\big)\beta \qquad (10)$$

Equation (10) will be estimated with a Maximum Likelihood estimation technique.

Empirical Models for OLS Estimation

The first three objectives will be estimated using Ordinary Least Squares (OLS). The empirical models for objectives 1 and 2 have been specified below:

Objective 1

$$Finc = \beta_0 + \beta_1 Numofinst + \beta_2 age + \beta_3 agesq + \beta_4 sex + \beta_5 Marstat + \beta_6 Edu + \beta_7 Pstatus + \beta_8 Residence + \varepsilon_i \qquad (11)$$

Objective 2

The regression equation above will be modified slightly to include the interaction term for objective 2:

$$Finc = \beta_0 + Numofinst + \beta_2 age + \beta_3 agesq + \beta_4 sex + \beta_5 Marstat + \beta_6 Edu + \beta_7 Pstatus + \beta_8 Residence * Numofins + \beta_9 Residence + \varepsilon_i \qquad (12)$$

OLS Estimation Technique

Objectives (1) and (2) were analyzed using Ordinary Least Squares (OLS). OLS estimation technique is the best linear unbiased estimator (Wooldridge, 2006). However, one needs to satisfy all assumptions underlying OLS. According to Cameron and Trivedi (2005) and Wooldridge (2006), OLS estimation technique works properly under the following assumptions: (i) The relationship between the dependent variables and parameters in the model must be linear; (ii) expected value of the error term (ε) must be zero for all

observations; (iii) the matrix of independent variables must have a full rank; (iv) variance of the error term must be constant in all observations and over time; (v) sample size must be large enough; and (vi) there must be no perfect collinearity among independent variables in the model.

To ensure that the OLS estimation technique is fit and proper for the analysis, series of tests were conducted on the model. Internal validity tests such as Variance Inflation Factor (VIF), and Link test were used to check the presence of multicollinearity, and strength of the models. To solve the issue of heteroskedasticity robust standard errors were employed.

The study runs separate regressions for all the objectives. The two regression equations used to analyze the first and second objectives have been specified above as equations (11) and (12). Variables in the two models include: financial inclusion (FI) which is an additive index of 14 indicators of ownership and use of financial products and services; number of banks measured as the number of bank and non-bank financial institutions in a community; sex (Male/Female) is the gender of individual household member; age of the household member; square of age; marital status of individual respondent; educational level of individual respondent; and residence (Urban/Rural) indicating whether the individual resides in a rural area or in an urban center.

Empirical Model for Logit Regression

Objective 4

Empirically, the Logit regression model has been specified as:

$$P(Finc = 1) = \beta_0 + \beta_1 Numofinst + \beta_2 age + \beta_3 agesq + \beta_4 sex + \beta_5 Marstat + \beta_6 Edu + \beta_7 Pstatus + \beta_8 Residence + \varepsilon_i \quad (14)$$

As can be viewed from the empirical model for the Logit regression, the variables are not different from those included in the OLS models. The main aim for running a Logit regression is to confirm the results obtained using the OLS regression.

Dominance Analysis

The Dominance analysis technique is credited to the work of Budescu (1993) but it was later perfected by Azen and Budescu, (2003). Following Nathan et al.., (2012), Dominance Analysis estimation technique is employed to determine the relative importance of all the variables in the financial inclusion equation.

There are three types of dominance analysis; general dominance, conditional dominance, and complete dominance (Azen & Budescu, 2003) and this study employed all the three types. According Azen and Budescu (2003) the general dominance shows on average the unique variance added by each predictor variable to subset equations. Again, the general dominance is able to decompose the R-squared of the model and as a result it is able to rank predictor variables according to their variance contributions to subset models (Nathans et al.., 2012). The conditional dominance shows how an independent variable conditionally dominates another independent variable across subset

models by comparing their unique variance contributions. The third type of dominance is the complete dominance. This is when an independent variable completely dominates another independent variable in across all sub-models any time the dominant variable is entered into a model containing all variables. This study relies on the General Dominance because it is able to rank variables according to their respective contributions in the model.

Measurement and description of Variables

Financial Inclusion

Financial inclusion has been measured differently by different authors. Demirguc-Kunt and Klapper (2012) measured financial inclusion as adults owning transaction accounts with formal financial institutions. Considering the definition of financial inclusion by the World Bank which encompasses ownership and usage of all kinds of financial services and products, the measurement of financial inclusion has been extended to include mobile money, insurance and remittances (Demirguc-Kunt et al..,2015; Fanta & Mutsonziwa, 2016).

Recent study by Koomson and Ibrahim (2018) created an index for financial inclusion using data from the sixth round of the Ghana Living Standard Survey. The authors used 14 indicators to create the financial inclusion index. The indicators were grouped under ownership of financial products and use of financial products. According to Koomson and Ibrahim (2018) creating an index using the additive index approach does not lead to loss of characteristics of indicators; hence, their preferred approach. This study measured financial inclusion by following the approach used by Koomson and

Ibrahim (2018) since the sixth and seventh rounds of the Ghana Living Standard Survey (GLSS 6 & 7) have similar characteristics.

This study used 14 indicators to create an index for financial inclusion. These indicators were grouped under Ownership of Financial Accounts: Mobile Money account, Current/Cheque account, Investment account, Savings account, Susu account, Fixed Deposit account, E-Zwich account; and Use of Financial Products such as Cheque book, E-Zwich card, ATM, E-banking, Other, Access to credit, and Remittances. Because all indicators are binary, that is, a minimum value of 0 and a maximum value of 14. Zero (0) means financial inclusion is low whiles a value of 14 depicts high financial inclusion. As mentioned earlier, the additive approach has been used by researchers to generate employment security index and financial inclusion index (Peprah, Afoakwah, & Koomson, 2015; Koomson & Ibrahim, 2018).

Table 1: Indicators used to generate the financial inclusion index

Variable	Mean	SD
Momo	1.286	0.499
Current/Cheque	2.932	0.857
Investment Account	4.111	1.451
Savings Account	2.875	1.010
Susu Account	4.563	1.209
Fixed Deposit	7.167	3.312
E-Zwich Account	2.867	1.356
Cheque book	2.383	0.538
ATM card	3.111	0.913
E-zwich	4.600	1.350
E-banking	5.420	1.785
Other	2.494	0.633
Access to Credit	3.058	1.538
Remittance	2.000	1.291

Source: Generated from GLSS (7)

Number of Financial Institutions

Number of financial institutions has been measured as the number of bank and non-bank financial institutions in a community. It is a continuous variable and based on reviewed literature (Demirguc-Kunt & Klapper, 2012; Olaniyi & Adeoye, 2017) as the number of financial institutions increases in a community, it is expected to impact positively on financial inclusion.

Age

The variable age is the age of the individual household member. Age has appeared in many literatures on financial inclusion and its indicators. It is expected to have a positive sign indicating a positive impact on financial inclusion as reported in the literature (Lotto, 2018; Desalegn & Yemataw, 2017, Zins & Weill, 2016). The variable agesq is the square of age and its sign is indeterminate.

Gender

Another variable shown which was also included in the model is sex. Sex is a categorical variable showing whether the individual is a male or female. Male takes the value 1 while female takes 0. Sex as a variable was selected based on the works of Demirguc-Kunt and Klapper, (2012); Demirguc-Kunt and Klapper, (2015); Gashaw and Gebe, (2017); and Zins and Weill, (2016). The sign for the variable sex may be negative if male is used as the base and positive if female is used as the base. The variable sex is represented in the regression equation as isFemale because male is used as the base.

Marital Status

Marital status has four categories, namely; Married/Living together, Separated/Divorced, Widowed, and Never Married. Married/Living together is recoded as 0, Separated/Divorced is 1, Widowed takes 2, and the last category, Never Married takes 3. Just like other categorical variables the sign is indeterminate. Desalegn & Yemataw (2017) also included marital status in their study.

Educational Attainment

Educational level is measured as the highest educational level attained by the individual household member. The highest educational level of an individual in the sample is tertiary. It is a categorical variable with six categories. The categories start with No Education= 0, BECE= 1, SSS/Secondary= 2, MSLC= 3, Voc/Tech/Teacher= 4, and Tertiary= 5. Education is another key variable that has been found to have impacted positively on financial inclusion in Africa and the rest of the world (Desalegn & Yemataw, 2017; Zins & Weill, 2016). It is therefore expected that individual members with no education may not be able to participate fully in the financial space as compared to individuals with BECE and above.

Poverty Status

Poverty status is also included in the study as a categorical variable. It has three categories; Very poor= 0, Poor= 1, and Non-poor= 2. The sign is indeterminate since the sign depends on which of the categories is used as the base.

Residence

The variable residence is also included in the models. The variable residence is categorized into two; urban and rural residence. The expected sign depends on which category becomes the reference point. The sign is expected to be negative if urban becomes the base category and positive if rural is used as the base category. The reason is that individuals living in urban areas are more likely to be financially included than individuals residing in rural areas, indicating a gap between the rural communities and the urban communities in terms of financial inclusion (Desalegn & Yemataw, 2017; Demirguc-Kunt & Klapper, 2012; Zins & Weill, 2016). The variable residence was therefore chosen after careful consideration of the available literature.

Chapter Summary

Chapter three of this study focuses on methodology employed for the research. This study uses quantitative data to test hypotheses, hence; it follows the quantitative approach (Creswell & Creswell, 2017). The chapter begins with a thorough discussion of various research designs. The study adopted the cross-sectional research design because cross-sectional design is good at finding the prevalence of an issue or problem at a point in time.

Secondary data from the seventh round of the Ghana Living Standard Survey (GLSS7) was obtained from the Ghana Statistical Service. The data was released in 2017 and it contains information on 14,009 households made up of 59,864 individuals in 1000 enumeration areas. Secondary data on registered and licensed banks and non-bank financial institutions in Ghana as at January, 2019 was also obtained from the Central Bank of Ghana. In all information on location and physical addresses of 770 registered and licensed

bank and non-bank financial institutions are included in the data. These bank and non-bank financial institutions include universal banks, savings & loans, rural & community banks, microfinance companies, micro-credit institutions, and financial non-governmental organizations. The analysis was done at the individual level with the version 14 of Stata Statistical Software. The total number of observations reduced to 2530 observations after successfully merging the GLSS datasets with the information on all 770 licensed bank and non-bank financial institutions.

In chapter three, both the theoretical and empirical models for the study have been specified, following Wooldridge (2006); Potrich et al.., (2015); and Abel et al.., (2018). Objective 1 and 2 are estimated with OLS estimation techniques while objective 3 is estimated with a Logit regression model. Dominance Analysis estimation technique is then used to ascertain the relative importance of all the variables in the model. The study relied on the General Dominance Statistics because of its ability to rank the predictor variables according to their variance contributions.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter focuses on discussion of all statistical results and analysis aimed at achieving the main objectives of the study. Descriptive and regression results have been displayed in Tables, charts, and figures for readers to appreciate the existing relationship among variables included in the models employed, as well as the direction of the relationships. Chapter four begins with discussion of relevant descriptive statistics, followed by discussion of the regression results and comparison with results of other related studies.

Descriptive Statistics

This section of the study discusses descriptive statistics of variables included in the model. Averages and distribution of variables in the sample are discussed and compared with the population of the study.

Distribution of Bank and Non-bank Financial Institutions in Ghana

This study analyzes how the presence of a bank or non-bank financial institution in a community influences financial inclusion in Ghana. It is, therefore, important to show how branches of bank and non-bank financial institutions are distributed across the country. As a result, the descriptive analysis starts with the distribution of bank and non-bank financial institutions in Ghana by region. Figure 1, 2, 3 & 4 shows how universal banks, tier 1, tier 2, and tier 3 financial institutions sampled for the study are distributed across Ghana. Analysis of all the maps shows the distribution of banks and non-bank financial institutions is not even. As shown in figure 1, banks have clustered

in the southern part of Ghana with only few branches in the northern part of the country. This observation is no different from what has been observed from figure 2, 3 & 4. This pattern of distribution has also been confirmed by Ansong et al.., (2018).

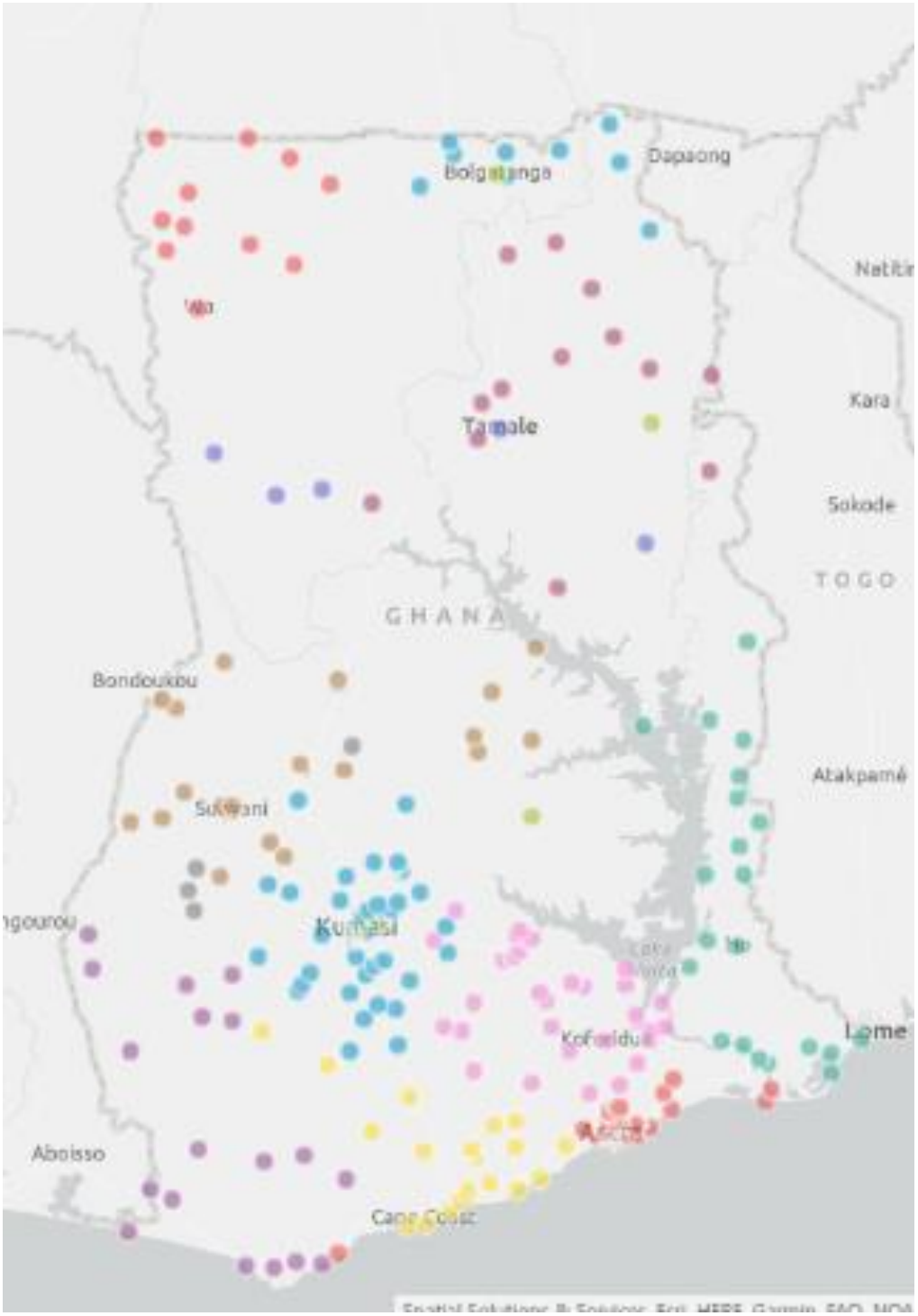

Figure 1: Distribution of Universal Banks in Ghana
Source: Field Survey (2019)

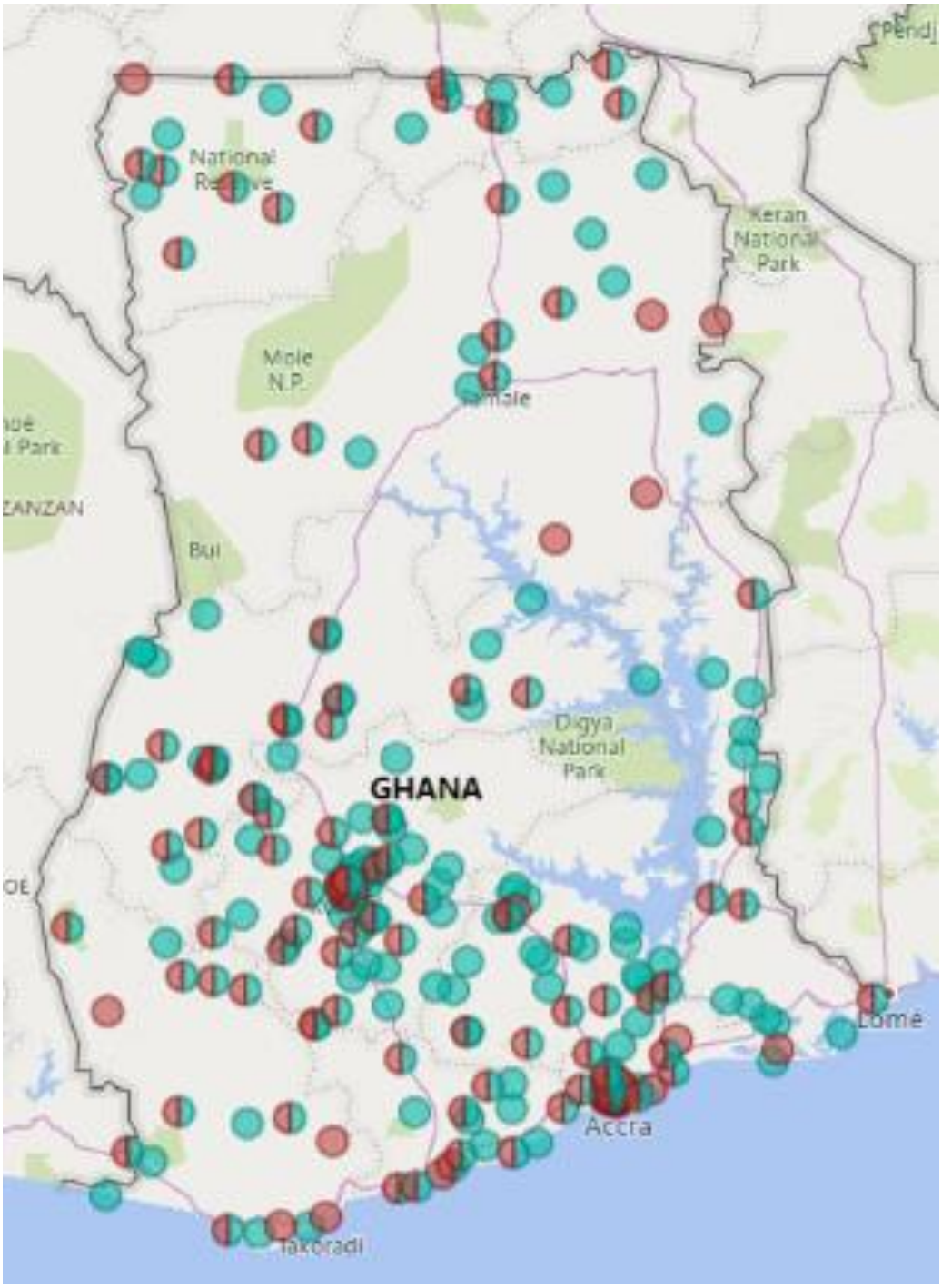

Figure 2: Distribution Savings & Loans and Rural banks in Ghana
Source: Field Survey (2019)

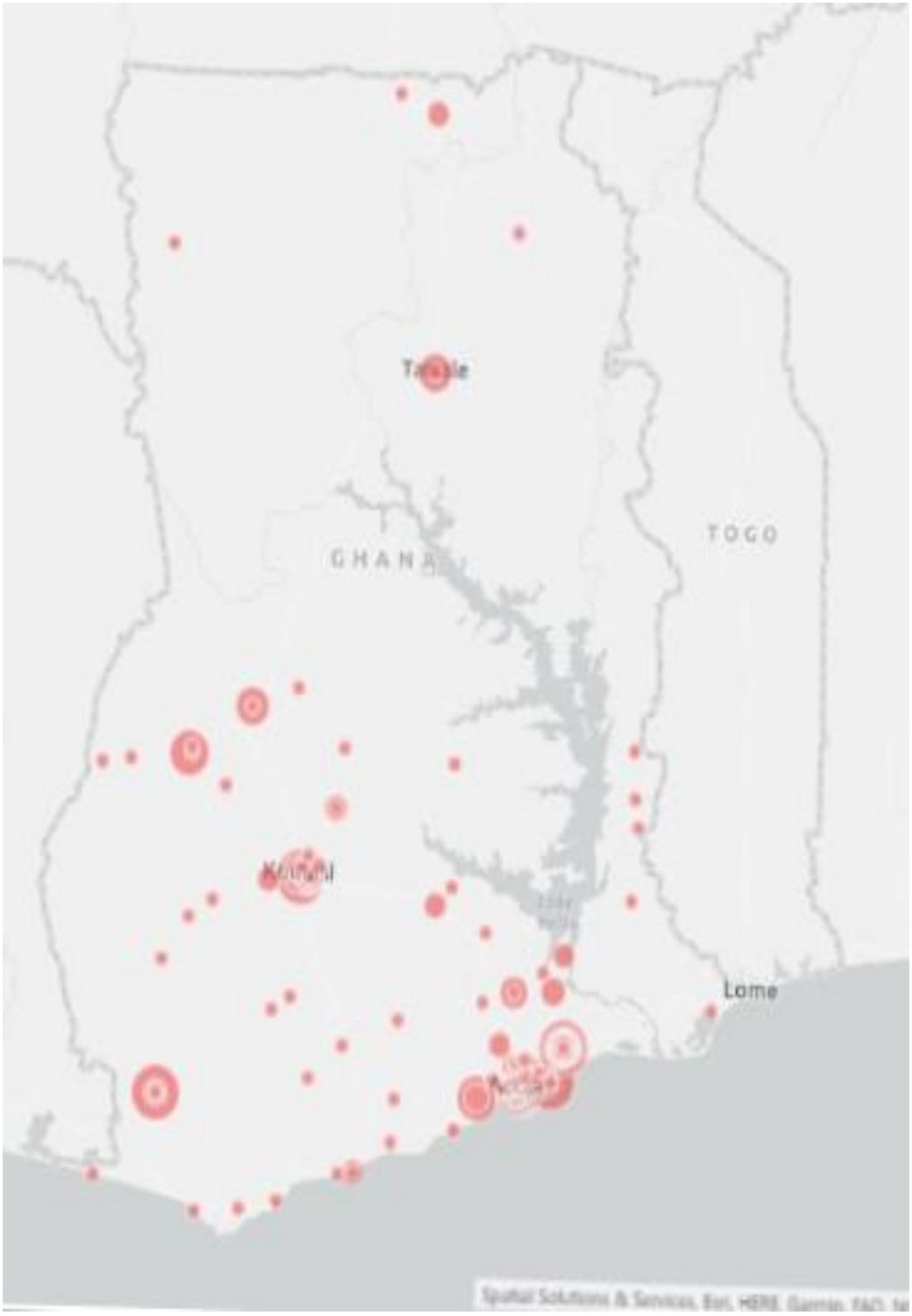

Figure 3: Distribution of Microfinance Institutions in Ghana
Source: Field Survey (2019)

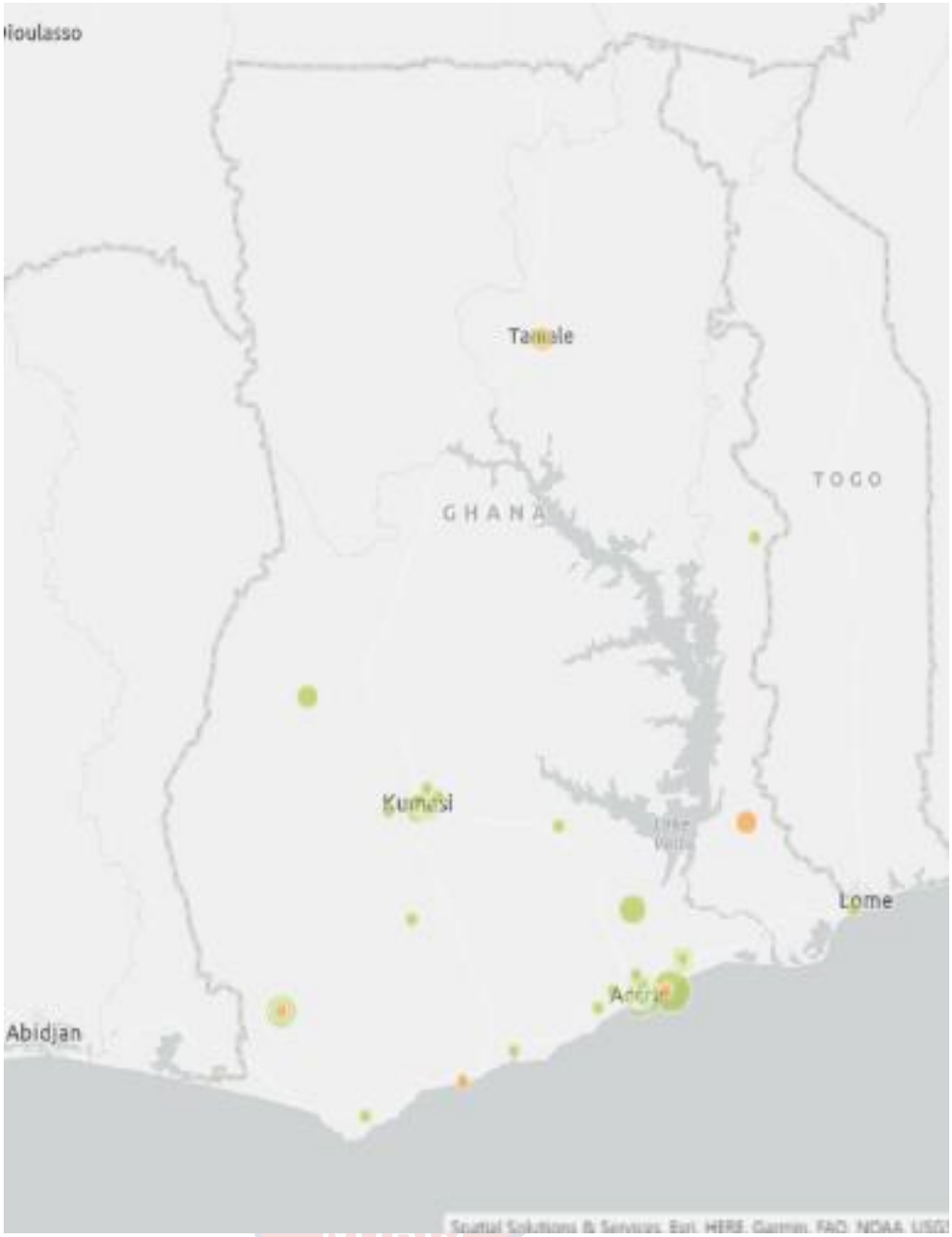

Figure 4: Distribution of Micro-credit Institutions in Ghana by Region
Source: Field Survey (2019)

Descriptive Statistics of Variables

Table 2 shows summary statistics of all categorical variables included in the model. It is evident from Table 2 below that the successful sample size was 2530. The Table in question shows that males recorded average financial inclusion index score of 2.84 as against 2.57 for females in the sample,

depicting a dominance of males over females in terms of financial inclusion. It can also be inferred from Table 2 that individuals who are married recorded a financial inclusion score of 2.75 which is higher than the scores recorded by individuals who are divorced/separated, and widowed. Educational level is another variable that was included in the model and Table 2 clearly shows how important education proves to be in the financial inclusion campaign. The financial inclusion index scores increases as one move higher on the education ladder. The average financial inclusion index for Educational level is 2.33 for no education and 3.99 for individuals with tertiary education. Another observation made from Table 2 is that individuals who are rich are more financially included than individuals in the poor and non-poor categories. Also, individuals who live in urban centers have an average financial inclusion index score of 2.94 whiles the score for the rural folk is 2.38 which again shows there is a gap in financial inclusion between the urban center and the rural communities.

Table 2: Descriptive statistics of variables

Variable	Financial Inclusion	
	Mean	N
Sex		
Male	2.84	1711
Female	2.57	819
Total	2.75	2530
Marital Status		
Married/living together	2.75	1531
Separated/Divorced	2.51	286
Widowed	2.48	292
Never Married	3.10	421
Total	2.75	2530
Educational level		
None	2.33	988
BECE	2.64	408
MSLC	2.71	396
SSS/Secondary	3.13	332
Voc/Tech/Teacher	3.31	233
Tertiary	3.99	173
Total	2.75	2530
Poverty Status		
Very poor	2.07	85
Poor	2.13	197
Non poor	2.83	2248
Total	2.75	2530
Residence		
Urban	2.94	1685
Rural	2.38	845
Total	2.75	2530

Source: Generated from GLSS (7)

In Tables 3 and 4 below are the descriptive statistics of financial inclusion indicators categorized under ownership of accounts and use of

financial products. Table 3 shows the indicators of ownership of accounts and their average financial inclusion scores in urban and rural areas. The urban centers dominate in financial inclusion index scores in all the indicators except savings account and E-Zwich account. Over all the urban centers have a mean financial inclusion score of 2.792 and the rural areas recorded a mean score of 2.734.

Table 3: Ownership of financial account indicators in urban and rural settlements

Own Financial Accounts	Residence					
	Urban		Rural		Total	
	Mean	SD	Mean	SD	Mean	SD
Momo	1.297	0.481	1.272	0.525	1.286	0.499
Current/Cheque	2.934	0.831	2.920	0.997	2.932	0.857
Investment Account	4.235	1.393	2.000		4.111	1.451
Savings Account	2.875	1.014	2.878	0.999	2.875	1.010
Susu Accont	4.909	1.044	3.800	1.304	4.563	1.209
Fixed Deposit	8.000	3.367	5.500	3.536	7.167	3.312
E-Zwich Account	2.125	2.125	3.714	1.604	2.867	1.356

Source: Generated from GLSS (7)

The observations made from Table 4 below are similar to what was observed from Table 3. Again, in Table 4, individuals in urban areas use cheque book, and E-Zwich cards more than individuals in rural areas. Urban areas also have more access to credit and receive more remittances through banks. However, indicators such as ATM card, E-banking, and other were in favour of the rural settlements. This may be due to the fact that bank branches are not adequate enough to serve all potential customers. One interesting

observation from Table 3 and 4 is that individuals in rural communities own more E-Zwich cards but in terms of usage individuals in urban centers recorded higher average scores which may also be due to lack of adequate financial infrastructure to support usage of E-Zwich cards in rural areas.

Table 4: Use of financial products indicators in urban and rural settlements

	Residence					
Use of Financial Products	Urban		Rural		Total	
	Mean	SD	Mean	SD	Mean	SD
Cheque Book	2.398	0.531	2.339	0.558	2.383	0.538
ATM Cards	3.077	0.885	3.404	1.089	3.111	0.913
E-zwich	4.714	1.496	4.333	1.155	4.600	1.350
E-Banking	5.405	1.888	5.500	1.195	5.420	1.785
Access to Credit	3.420	1.507	2.662	1.483	3.058	1.538
Remittance	2.333	1.155	1.750	1.500	2.000	1.291
Other	2.435	0.609	2.638	0.673	2.494	0.633

Source: Generated from GLSS (7)

Another important variable in the financial inclusion literature that has attracted a lot of attention from policy makers and feminist activists is the variable sex. The gender gap between males and females in terms of financial inclusion has been a major concern for policy makers worldwide. The descriptive statistics as shown in Table 5 and 6 below discuss ownership of financial accounts and usage of financial products according to sex of individuals. Average scores of financial inclusion for males and females in all the 14 indicators of financial inclusion have been displayed in Table 5 and 6 below.

Table 5: Ownership of financial account indicators among males and females

Use of Financial Products	Sex					
	Males		Females		Total	
	Mean	SD	Mean	SD	Mean	SD
Momo	1.273	0.516	1.311	0.467	1.286	0.499
Current/Cheque	2.935	0.837	2.917	0.974	2.932	0.857
Investment Acc.	4.188	1.515	3.500	0.707	4.111	1.451
Savings Acc.	2.917	1.053	2.765	0.877	2.875	1.010
Susu Acc.	4.833	1.115	3.750	1.258	4.563	1.209
Fixed Deposit	8.000	2.915	3.000		7.167	3.312
E-Zwich Acc.	3.600	1.949	2.500	0.850	2.867	1.356

Source: Generated from GLSS (7)

As shown in Table 5 above, males in Ghana dominates in all the indicators categorized under ownership of accounts. The mean financial inclusion index score in terms of owning financial accounts for males is 2.8 while that of females is 2.557 confirming the existence of gender gap in financial inclusion. The observations made from Table 6 below are not so different from observations from Table 5.

In Table 6 below, males dominate in five out of the seven indicators categorized under Use of Financial Products. Females recorded financial inclusion index score of 3.0 in remittances as against 1.83 by males in the sample. Interestingly and surprisingly, females use cheque books frequently than their male counterparts though males scored higher than females in terms of ownership of cheque account as depicted in Table 5. Despite females dominating in two indicators the overall scores put males ahead with financial inclusion score of 2.937 and 2.696 for females regarding indicators of usage of financial products.

Table 6: Use of Financial Account Indicators among Males and Females

Use of Financial Products	Sex					
	Males		Females		Total	
	Mean	SD	Mean	SD	Mean	SD
Cheque Book	2.356	0.516	2.453	0.587	2.383	0.538
ATM	3.154	0.935	2.905	0.770	3.111	0.913
E-Zwich	4.714	1.496	4.333	1.155	4.600	1.350
E-Banking	5.595	1.484	4.923	1.553	5.420	1.785
Other	2.494	0.642	2.493	0.626	2.494	0.633
Access to Credit	3.304	1.646	2.585	1.184	3.058	1.538
Remittances	1.833	1.329	3.000		2.000	1.291

Source: Generated from GLSS (7)

Analysis of financial inclusion indicators among sex and residence variables in Tables 3, 4, 5, and 6 above shows financial inclusion in Ghana is still very low. Given the 14 indicators used in calculating the financial inclusion index, the highest score recorded across both sex and residence are less than 5.0. Interestingly the banking products are contributing greatly to financial inclusion as compared to Mobile Money.

The subsequent descriptive statistics focus on financial inclusion across marital status and residence, marital status and sex, and across education and marital status.

Table 7: Financial Inclusion across Marital Status and Residence

Marital Status	Residence	
	Urban	Rural
Married/living together	2.968	2.39
Separated/Divorced	2.642	2.24
Widowed	2.64	2.13
Never Married	3.178	2.78

Source: Generated from GLSS (7)

Table 7 above shows financial inclusion index scores across Marital Status and Residence. The variable Marital Status as used in the regression

model is a categorical variable consisting of four categories; Married/Living together, Separated/Divorced, Widowed, and Never Married. Residence as shown in earlier Tables is made up of rural and urban residences. Inferring from Table 7, one can clearly observe that married individuals or people living together constitute a greater portion of the sample. The married category scored higher financial inclusion index score than categories such as Separated/Divorced and Widowed but lower than the Never Married category. It can also be observed that in all categories Marital Status, individuals living in the urban center had higher financial inclusion scores than individuals residing in rural communities.

Table 8: Financial Inclusion across Marital Status and Sex

Marital Status	Sex	
	Male	Fem
Married/living together	2.768	2.64
Separated/Divorced	2.612	2.46
Widowed	2.583	2.47
Never Married	3.24	2.81

Source: Generated from GLSS (7)

Table 8 above also shows the dominance of males and married individuals in the financial space. Males are known to be more active in the financial space than females and again married individuals often participate in the financial sector than females. It is therefore not surprising to see the results displayed in Table 8 above. From Table 8, males in all categories of Marital Status recorded higher financial inclusion scores than their female counterparts. Once again the gender gap issue in financial inclusion has been depicted in Table 8. It is therefore evident from Table 8 that there is a gender gap in financial inclusion in Ghana, hence; steps need to be taken to increase

the number of women participating in the financial space of Ghana to possibly close the gap or reduce the gap.

Another interesting descriptive statistics that relates to the study is how the dependent variable behaves across educational level and marital status in the sample. Financial inclusion scores across educational level and marital status have been displayed in Table 9 below.

Table 9: Financial Inclusion across Educational level and Marital Status

Educational level	Marital Status			
	Married/living together	Separated/ Divorced	Widowed	Never Married
None	2.336	2.297	2.281	2.421
BECE	2.564	2.351	2.5	2.915
MSLC	2.711	2.621	2.86	2.714
SSS/Secondary	3.043	2.941	3.313	3.281
Voc/Tech/Teacher	3.259	3.04	2.667	3.741
Tertiary	3.97	4.667	2.818	4.519

Source: Generated from GLSS (7)

Education has been an important variable in the financial inclusion equation and as a result has featured in almost every research work on financial inclusion. As cited in earlier chapters of this study, authors such as Zins an Weill (2016), Olaniyi and Adeoye (2016), Gashaw and Gebe (2017), Botric and Broz (2017), Lotto (2018), Agyeman-Badu et al,…. (2018) and several other authors included the variable education in their works. All these authors found a positive relationship between education and financial inclusion. The analysis in Table 9 is therefore a confirmation of results obtain from prior studies. In Table 9 above, the financial inclusion scores for each category of marital status increases as individuals pursue higher education.

Individuals who are married or living together recorded higher scores of financial inclusion than Separated/Divorced individuals in the sample from No education category up to Voc/Tech/Teacher category. However, at the tertiary level the latter category outperforms the former.

Regression Analysis

Financial inclusion as measured as ownership of transaction account by Demirguc-Kunt and Klapper (2012) which was later extended to include mobile money, insurance and remittances (Demirguc-Kunt et al..,2015; Fanta & Mutsonziwa, 2016; Koomson & Ibrahim, 2018) is affected by socioeconomic, demographic, and macroeconomic variables (Agyeman-Badu et al.., 2018; Bakari et al.., 2018). Following the works of Lotto (2018), Agyeman-Badu et al…, (2018), Gashaw and Gebe (2017), and Zins and Weill (2016), variables such as age, residence, marital status, sex, and poverty status were included in the model. The main variables of interest included in the models depended on the objectives of the study. The main objective of the study was to examine the effect of distribution of financial institutions (Bank and Non-bank) on financial inclusion in Ghana. Specifically, the study focused on three key objectives: (i) examine the effects of increase in number of banks on financial inclusion in Ghana; (ii) Analyze the effects of increase in number of banks in rural areas on the rural-urban gap in financial inclusion in Ghana; and (iii) to determine the likelihood that financial inclusion will increase if number of banks increases in Ghana. Consequently, the main discussion of findings in this study has been done according to the three objectives outlined above.

Objective 1: Regression analysis of effect of number of banks on financial inclusion

The Ordinary Least Squares regression analysis for objective one (1) sought to estimate the effect of number of banks, measured as the number of bank and non-bank financial institutions in a district on financial inclusion. Variables used were carefully selected based on reviewed literature on financial inclusion in Ghana and other parts of the globe. The regression model for objective (1) of the study included variables such as number of institutions, age, and square of age, sex, marital status, educational level, poverty status, and residence. The OLS regression results for objective one (1) of this study have been displayed in Table 10 below and it is worth noting that both the main variable of interest, that is, number of banks, and the constant term are significant at 5% and 1% respectively. The high significance of the constant term is an indication that the regression is far from being spurious. The signs for some key variables are also as expected and that gives some comfort.

Table 10: OLS Estimation of Number of Banks and Financial Inclusion

Variables	
Num_Inst	0.025*
	(0.012)
Age	0.001
	(0.009)
AgeSq	0.000
	(0.000)
*Gender (**Base**=Male)*	
Female	-0.137*
	(0.060)
Marital Status (Base=)	
Separated/Divorced	0.098
	(0.082)
Widowed	0.024
	(0.092)
	0.374***
	(0.074)
BECE	0.261***
	(0.076)
MSLC	0.346***
	(0.073)
SSS/Secondary	0.601***
	(0.081)
Voc/Tech/Teacher	0.919***
	(0.087)
Tertiary	1.450***
	(0.105)
*Wealth Status (**Base**=Very Poor)*	
Poor	-0.036
	(0.165)
Non Poor	0.215
	(0.148)
*Locality (**Base**=Urban)*	
Rural	-0.203***
	(0.057)
Constant	2.053***
	(0.291)
No of Observations	*2530*
VIF	*6.65*
Linktest (_hatsq)	*0.265*

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Table 10 above shows the direction of relationship that exist between independent variables and the dependent variable used in the study. The magnitude of effect of independent variables in the model is also depicted in

Table 10. Beginning with the main variable of interest in objective (1), there exist a positive relationship between number of banks and financial inclusion as shown in Table 10 above. At 5% significance level, number of banks positively affects financial inclusion. This is an indication that as the number of banks increases in a community financial inclusion increases in Ghana. It can be inferred from Table 10 that as number of banks increases by 1 financial inclusion increases by 0.025. According to Demirguc-Kunt and Klapper (2012), financial inclusion is affected positively and significantly by access points and as a result increasing the number of bank branches may improve financial inclusion in Africa. Oji (2015) and Olaniyi and Adeoye (2016) also emphasized the positive effect of bank presence on financial inclusion.

The variable age though has the expected positive sign is not significant. The square of age does not also have any significant effect on financial inclusion. Interpretation of these two variables is therefore not necessary as their impact on the analysis is almost zero.

Another important variable in the model for objective (1) is sex (isFemale). As shown in the descriptive statistics in Tables 8 and 9 males are more financially included than females in the sample used for the study, hence; there exist a gender gap in terms of financial inclusion that needs to be bridged. The gender gap has also been revealed in the regression analysis as shown in Table 10 above. The results of the OLS regression analysis in Table 10 shows that females are less financially included that their male counterparts. The results show a gender gap of about 13% in terms of financial inclusion in Ghana. The existence of the gender gap has been confirmed in earlier studies (Demirguc-Kunt & Klapper, 2012; Desalegn & Yemataw,

2017; Lotto, 2018). With females constituting a larger percentage of the Ghanaian populace, there is the need to empower females to participate effectively in the financial space.

Marital status as included in the model to achieve objective (1) has four categories with those in the married category as the base for reference. The regression output as shown in Table 10 indicates that only the variable never married is significant. This means that individuals who have never being married are 37% more included in the financial space of Ghana than the individuals married/living together. This is a confirmation of the descriptive statistics as shown in Tables 7, 8 and 9 above. Intuitively, this may be explained on the grounds that majority of the individuals who have never married are young adults who may be actively involved in the labour force and are likely to be digitally literate than the older generation.

Moreover, the regression results in Table 10 show that a higher education reflects a higher chance of participation in the financial space of Ghana. Financial inclusion is lowest among individuals with no education and highest among individuals with tertiary education. The difference between the no education category and the various educational levels in terms of financial inclusion increases as one move up the education ladder in Ghana. Individuals with Basic Education Certificate Examination (BECE) are 26% more financially included than individuals with no education. The difference between individuals with Middle School Leaving Certificate (MSLC) and individuals with no education is 35% and further increases to 60%, 91%, and 145% between no education and SSS/Secondary, Voc/Tech/Teacher, and Tertiary levels respectively. The effect of educational level on financial

inclusion is significant at all conventional levels of significance. Gashaw and Gebe (2017) reported 79% of account holding for adult with tertiary education and 36% for adults with secondary education in Ethiopia. Similar results have also been reported by Demirguc-Kunt and Klapper (2012).

As shown in Table 10, none of the individuals in the poor and non-poor categories were found to be statistically and significantly more financially included than individuals who were classified as very poor. The non-poor category though had the expected positive sign are not significant at all conventional levels.

The results in Table 10 further shows and confirms an existing gap between individuals living in rural parts of Ghana and those who live in the urban centers as has already been shown in the descriptive statistics in Tables 2, 3, 4, and 7 above. Both the descriptive statistics analysis and the OLS regression analysis shows that individuals living in urban areas in Ghana participate in the financial space more than individuals who resides in the rural areas. The OLS regression results shows that people living in rural areas in Ghana are 20% less financially included than their counterparts in urban centers. The result for the variable residence is highly significant at all conventional levels. This may be due to the fact that banks, especially, commercial banks cite their branches in urban centers. As a result rural folks do travel for longer distances just to undertake financial transactions, thereby discouraging rural folks from operating in the financial space (Desalegn & Yemataw, 2017; Demirguc-Kunt & Klapper, 2012).

In sum variables such as age, square of age, and poverty status were completely insignificant whereas sex, education, residence, and the main

variable of interest, that is, number of banks, significantly affected financial inclusion at 1% and 5% respectively. Out of the three categories of marital status displayed in the regression output in Table 10, only the never married category is significant in relation to the married/living together group in terms of participation in the financial space. The main variable of interest being significant implies that the alternative or research hypothesis for objective (1) has been confirmed, hence; increase in the number of banks in a community leads to increase in financial inclusion in Ghana.

Objective 2: Effects of increase in number of banks in rural areas on the rural-urban gap in financial inclusion in Ghana.

Financial inclusion gap has been identified between urban and rural locations in Europe, Africa, and other parts of the globe (Desalegn & Yemataw, 2017; Lotto, 2018; Agyeman-Badu et al.., 2018; Ansong et al, 2018). Extension of financial services and access points to remote and underserved areas has been proposed as a way of achieving universal access to financial services (Cull, Demriguc-Kunt, & Morduch, 2009; Hermes, Lensink, & Meesters, 2009; Demirguc-Kunt et al.., 2012). The second objective of this study therefore seeks to find out how increase in number of bank and non-bank financial institutions in rural areas will influence financial inclusion in the rural areas.

Table 11: OLS Estimation of Presence of Banks in Rural Areas

Variables	Bank Presence
Num_Inst	0.038*
	(0.015)
Locality ***(Base**=Urban)*	
Rural	-0.032*
	(0.013)
Rural # Num_Inst	0.056*
	(0.023)
Age	0.000
	(0.009)
AgeSq	0.000
	(0.000)
*Gender**(Base**=Male)*	
Female	-0.134*
	(0.058)
*Marital Status**(Base**=Widowed)*	
Married/Living together	-0.020
	(0.087)
Separated/Divorced	0.074
	(0.090)
Never Married	0.352**
	(0.111)
Educational Attainment ***(Base=No Education)***	
BECE	0.262***
	(0.068)
MSLC	0.346***
	(0.070)
SSS/Secondary	0.599***
	(0.087)
Voc/Tech/Teacher	0.917***
	(0.099)
Tertiary	1.445***
	(0.142)
Wealth Status ***(Base**=Very Poor)*	
Poor	-0.019
	(0.069)
Non-poor	0.241***
	(0.069)
Constant	1.982***
	(0.276)
No of Observations	2530
VIF(Mean)	7.39
Linktest(hatSqr)	0.346

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

The regression output as shown in Table 11 shows that financial inclusion will increase by at least 0.038 if number of financial institutions in a community increases. This has already been confirmed in the regression output for objective 1. Further analysis of the regression result shows that the gap between rural and urban residents in terms of participation in the financial space has reduced to 3.2% as a result of extension of financial services to rural areas.

Moreover, the sign of the coefficient for the interaction term is positive indicating positive signs of financial inclusion in rural areas due to springing up of access points for financial services. Differentiating financial inclusion (finc) with respect to the variable Rural gives the equation:

$\frac{\partial Finc}{\partial Rural} = -0.0315 + 0.0559 Num\_Inst$. The effect can be shown by varying the number of financial institutions. The equation indicates that an increase in number of financial institutions in the rural area by 1 will increase financial inclusion by 0.02 in rural areas.

The results for variables such as education, marital status, sex, and poverty status are no different from the results obtained in the regression equation for objective 1. Females are 13.4% less financially included compared with their male counterparts. As mentioned earlier, this differences between males and females in terms of financial inclusion has been reported by Lotto (2018); Gashaw and Gebe (2017); Zins and Weill (2016); Demirguc-Kunt et al.., (2017) and other research works conducted on financial inclusion across the globe.

Marital status has four categories as shown in Table 12 but the only significant relationship exists between Never Married category and the

widows. The results show that individuals who have never married are 35% more financially included than individuals who have lost their partners through death. Non-poor individuals are also 24.1% more financially included than the very poor individuals in the sample.

The relationship is highly significant at all levels of education. Individuals with educational background such as BECE, MSLC, SSS/Secondary, Voc/Tech/Teacher, and Tertiary are more financially included than individuals with no education. The differences are 26.1%, 34.6%, 59.9%, 91.7%, and 144.5% respectively. This implies that as individuals become more financially included as they become more formally educated.

Objective 3: **Determining the likelihood that increase in number of financial institutions leads to increase in financial inclusion.**

Careful review of literature on financial inclusion revealed that financial inclusion can be measured as a binary variable. Following Abel et al.., (2018) and Potrich et al.., (2015), the Logit regression model was employed to determine the likelihood that financial inclusion will increase if number financial institutions in a community increases. This is to confirm the results produced early on by using OLS and measuring financial inclusion as a continuous variable. Table 12 shows the regression output for the Maximum Likelihood Estimation (MLE) of the Logit Model.

Table 12: MLE of the Effect of Number of Institutions on Financial Inclusion

Num_Inst	0.048***
	(0.011)
Age	0.002
	(0.019)
AgeSq	0.000
	(0.000)
Female	-0.242*
Marital Status (Base=Widowed)	(0.122)
Seperated/Divorced	0.205
	(0.165)
Widowed	0.004
	(0.200)
Never Married	0.729***
	(0.138)
Educational Attainment (Base=No Education)	
BECE	0.702***
	(0.153)
MSLC	0.789***
	(0.156)
SSS/Secondary	1.085***
	(0.156)
Voc/Tech/Teacher	1.568***
	(0.165)
Tertiary	2.025***
	(0.203)
Wealth Status (Base=Very Poor)	
Poor	0.369
	(0.671)
Non Poor	1.447*
Locality (Base=Urban)	(0.612)
Rural	-0.474***
	(0.115)
Constant	-2.997***
	(0.809)
Number of Observations	
VIF(Mean)	3.72
Linktest (hatSqr)	0.502

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

The results from estimating the Logit model confirms the results obtained for objective 1 for using the OLS estimation technique. As shown in Table 12 there exist a positive relationship between increase in number of banks and financial inclusion. The implication is that as the number of banks increases, financial inclusion is more likely to increase; hence, individuals living in such communities are more likely to participate in the financial sector. Demirguc-Kunt & Klapper, (2012) found out that increasing access points leads to increased access to credit.

The results show there is a positive relationship between age of an individual and the likelihood to be financially included though it is not significant. The positive relationship implies that as individuals age, they are more likely to participate in the financial space as has already been confirmed by prior studies (Abel et al.., 2018; Zins & Weill, 2016; Desalegn & Yemataw, 2017). The results also reveal that females are less likely to be financially included compared with males. The negative sign shows the existence of a financial inclusion gap between males and females confirming the results of the OLS estimation for objective 1. This finding is supported by earlier studies on financial inclusion (Demirguc-Kunt & Klapper, 2012; Demirguc-Kunt et al.., 2017; Desalegn & Yemataw, 2017; Lotto, 2018)

Education is a very significant factor that has been found to determine the likelihood of an individual's participation in the financial space (Demirguc-Kunt & Klapper, 2012; Zins & Weill 2016; Abel et al.., 2018). The MLE results show that the probability of participating in the financial sector of Ghana increases as people attain higher education. According to Pena et al.., (2014), education helps to assess the ability of an individual to make financial

decisions. It is therefore not surprising that the effect of education on financial inclusion is highly significant at all conventional levels.

It can also be inferred from the regression output that individuals who have never married are more likely to be financially included than the married ones and those living together. The non-poor are also more likely to participate in the financial sector than the very poor. Abel et al.., (2018) reports a positive and significant relationship between income and financial inclusion, implying that as individuals become richer their chances of saving, accessing credit facilities and using other financial products and services increases. Demirguc-Kunt & Klapper (2012) also mentioned lack of money as one major reason why people do not open bank accounts. It is therefore likely that non-poor individuals will be more financially included than the poor and the very poor in a community.

The regression output Table also confirms the financial inclusion gap between rural communities and urban communities as was shown earlier in the OLS regression output. The negative sign indicates that individuals in urban centers are more likely to own and use financial products and services, including accessing credit facilities and remittances, than individuals in the rural areas. Similar finding has been reported by earlier research works (Demirguc-Kunt & Klapper, 2012; Zins & Weill, 2016; Desalegn & Yemataw, 2017; Lotto, 2018).

Dominance Analysis

The general dominance approach was used because it is able to decompose the R-squared of the model and as a result it is able to rank

predictor variables according to their variance contributions to subset models (Nathans et al.., 2012).

Table 13: General dominance statistics: Linear regression

Number of obs = 2530

Overall Fit Statistic = 0.1666

Variables	Dominance Statistics	Standardized Dominance Statistics	Ranking
Num_Inst	0.0092	0.0553	4
Age	0.0023	0.0141	7
Female	0.0071	0.0424	6
Marital Status	0.0086	0.0514	5
Povqual	0.1080	0.6482	1
Pstatus	0.0109	0.0653	3
Rural	0.0205	0.1233	2

Source: Generated from Survey

As shown in Table 13, the general dominance statistics shows a ranking of the variables under consideration. As indicated earlier, the general dominance is able to rank predictor variables based on the additional unique variance contributed by each variable (Nathans et al.., 2012). The general dominance statistics in Table 13 shows that educational level (Povqual) is ranked ahead of all the other variables in the model followed by Rural, pstatus, Num-Inst, Marstat, Female, and Age in that order. This shows education plays a very key role in getting more people to participate in the financial space.

Chapter Summary

The chapter under consideration focused on the descriptive statistics of relevant variables employed for the study and also discussed in detail all major issues and principles that underpins the research work. All empirical models stated in chapter three and estimated were discussed in this chapter. Linear regression model was employed to analyze objectives 1 and 2 whereas Logit model was used for objective 3. These models were estimated using OLS estimation technique and Maximum Likelihood estimation technique respectively.

Chapter four began with a description of how banks and non-bank financial institutions are distributed across Ghana. Separate maps were drawn for the different categories of bank and non-bank financial institutions in Ghana. The categories of financial institutions used for the study includes universal banks, tier 1, tier 2, and tier 3 non-bank financial institutions as shown in figure 1, 2, 3, and 4. As depicted in the maps, bank and non-bank financial institutions have clustered in the urban centers in southern Ghana while the remote areas have few or no institution to assist them financially.

Chapter four also captures the descriptive analysis of variables included in the models used for the study. The variables include financial inclusion, number of financial institutions, sex, marital status, residence, poverty status, age and education. Per the summary statistics there are 2530 observations. Averagely, individuals in urban areas own and use more financial products and services than their counterparts in the rural areas. The statistics also favour the males in the sample in terms of ownership and usage of financial products and services.

The OLS estimation results for objective 1 show a positive and significant relationship between number of institutions and financial inclusion. This implies that as the number of bank and non-bank financial institutions in a community increase, financial inclusion increases. From the output Table for objective 1, one more branch of a financial institution in a community increases financial inclusion by 0.025. The variables Age and Agesq had no significant relationship with financial inclusion though Age had the required sign. Females are 13.7% less financially included than males. Individuals living in urban centers are found to be 20.3% more financially included than their counterparts in the rural areas. Education also proves to be a key driver of financial inclusion in Ghana. As shown in the results, people become more financially included as they pursue higher education.

The study also sought to find out how extension of bank and non-bank financial institutions to rural areas will influence financial inclusion in the rural communities. The regression results for objective two show that one more branch of a bank or non-bank financial institution in a rural area will lead to an increase in financial inclusion by 0.024%. The gap between the urban centers and rural areas in terms of financial inclusion may also reduce to as low as 3.2%. The regression results for objective 2 also confirm the gender gap in financial inclusion. Again, Education is a significant factor in determining financial inclusion in Ghana.

The third objective of the study seeks to confirm the OLS results for objective 1 by modeling financial inclusion as a binary variable. Individuals who do not own and use financial products and services are labeled as not financially included and indicated as zero (0) while individuals who own and

use financial products and services are referred to as the financially included group, indicated as one (1). Modeling the same variables employed for the study with a Logit Model showed that as the number of bank and non-bank financial institutions increases in a community, financial inclusion is more likely to improve in that community. Age and Agesq variables were not significant as was seen in the OLS results in objective 1. Education still proves to be a very important determinant of financial inclusion in the Logistic regression results. Individuals at all levels of education are significantly more likely to be financially included than individuals with no formal education. Females were also found to be less likely to own and use financial products and services, confirming the financial inclusion gap in terms of gender. The Logistic model also confirmed the existence of financial inclusion gap between urban residents and rural residents as shown in the OLS regression output for objective 1. The never married category of the Marital Status variable was found to be significant at all conventional levels. This implies that individuals who have never married all their lives are more likely to be financially included than individuals who are married/living together, widowed, and divorced.

Another interesting exercise that was undertaking in chapter four was to find out the relative contribution of each variable used for the study by using the Dominance Analysis technique introduced by Budescu (2003). The General Dominance Statistic technique was employed because it is able to rank variables according to their relative importance in a model. The General Dominance Statistics in chapter four ranks education as the highest contributor

to the models, followed by Residence, Poverty status, Number of financial institutions, Marital status, Gender, and Age respectively.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

This is the final chapter of the studies and it contains a summary of the entire research work; beginning with chapter one through to chapter four. Conclusions are drawn based on findings of the study and recommendations made for the appropriate institutions to act on them.

Summary

The Sustainable Development Goal 8 is targeting a universal access to credit and banking services by 2030. World leaders and policy makers have plans to extend banking services to rural areas and other underserved communities to help improve financial inclusion across the globe. However, most of the empirical works conducted on financial inclusion have not considered the distribution of banks and the effect of increase in number of banks, especially, in rural areas and other underserved areas on financial inclusion. The general objective of this study is to examine the effects of the distribution of banks in Ghana, in terms of number of banks in a community on financial inclusion in Ghana. It is intended to inform policies regarding extension of banking facilities to rural communities, and improving on financial inclusion in Ghana. The main limitation of the study is that the study could not capture all branches of bank and non-bank financial institutions in Ghana.

Relevant theories and concepts on financial inclusion, and the architecture of Ghana's financial services sector were reviewed. Prior empirical works on financial inclusion and all variables of interest were also

reviewed in this study. The review was done by focusing on methodologies employed in previous empirical works, and most importantly focusing on their findings and how these finding relate to this research work.

Bank and non-bank financial institutions in Ghana as well as laws governing these institutions were analyzed and reviewed. The study reviewed 770 bank and non-bank financial institutions as at January, 2019, comprising 23 fully capitalized universal banks, 37 savings & loans institutions, 144 rural and community banks, 484 microfinance institutions, 70 micro-credit institutions, and 12 Financial non-governmental organizations.

In reviewing the concept of financial inclusion it was revealed that about 1.2 billion adults obtained transaction account between 2011 and 2017, however, about 1.7 billion adults are still without transaction accounts (World Bank, 2018). As a result of the strong connection between financial inclusion and development (Klapper, El-Zoghbi, & Hess, 2015), and the impacts of financial inclusion on 9 out of the SDGs (Schmidt-Traub & Sachs, 2015), world leaders and development practitioners are making efforts to get everybody to participate in the financial space. Working definitions by the World Bank, Bank of Tanzania, and Olaniyi and Adeoye (2016) were also reviewed. Another aspect of the concept of financial inclusion reviewed in this study is how financial inclusion has been measured over the years. It starts with adults with transaction accounts (Demirguc-Kunt & Klapper, 2012) through ownership, access and usage of transaction accounts (Demirguc-kunt et al.., 2015; World Bank, 2018) to construction of indexes for financial inclusion by including variables such as savings, access to credit, insurance, transfers, and remittances (Bakari, Idi & Ibrahim, 2018; Koomson & Ibrahim,

2018). This study followed the multidimensional approach adopted by Koomson and Ibrahim (2018)

Theoretical literature review was also conducted. Theories reviewed include Location Theory, Cluster Theory, and the Theory of Planned Behaviour. Location theory is attributed to the works of Von Thunnen (1826) and Weber (1909). Location theories try to find out the locations of economic activities and why specific locations are chosen (Hanning, 2003; Hanning, 2010). Cluster theory was reviewed because financial institutions are likely to concentrate in cities and urban centers (Ansong et al, 2015). According to Pandit et al.., (2001), financial inclusion grows faster when they locate in clusters, hence; financial institutions prefer to locate in urban centers to rural communities. The third relevant theory, the Theory of Planned Behaviour by Ajzen (1991) helps to explain why people behave the way they do and what factors influence the behaviour exhibited. The Theory of Planned Behaviour is therefore required to explain why people participate in the financial space or otherwise.

Empirical literatures reviewed were studies conducted in Europe, Africa, Ghana, and other parts of the world. Works by Agyeman-Badu et al.., (2018), Bakari et al, (2018), Lotto (2018), Demirguc-Kunt and Klapper (2012) and many others across the globe were reviewed by the authors of this study. The studies mentioned showed that financial inclusion is determined by macroeconomic variables, institutional factors and individual characteristics. Macroeconomic variables such as Gross National Income per capita, poverty rate, Gross Domestic Product, interest rate, inflation, etc., were found to be influencing financial inclusion by Agyeman-Badu et al.., (2018) and Bakari et

al.., (2018). Olaniyi and Adeoye (2016) found that bank presence in a community and macroeconomic variables affect financial inclusion in Africa. Individual characteristics such as gender, age, education level, and residential locations were also found to be influencing financial inclusion (Demirguc-Kunt & Klapper, 2012; Lotto, 2018; Zins & Weill, 2016; Desalegn & Yemataw, 2017; Dabla-Norris et al, 2015).

Inferring from literatures reviewed, the following gaps have been identified:

1. Prior studies did not examine the effects of number of financial institutions in a community on financial inclusion though researchers are advocating for extension of financial services to underserved areas.
2. Earlier research works did not intensively consider the effect of presence of banks in a community on the rural/urban gap in terms of financial inclusion.

This study uses quantitative data to test hypotheses, hence; it follows the quantitative approach (Creswell & Creswell, 2017). The chapter begins with a thorough discussion of various research designs. The study adopted the cross-sectional research design because cross-sectional design is good at finding the prevalence of an issue or problem at a point in time.

Secondary data from the seventh round of the Ghana Living Standard Survey (GLSS7) was obtained from the Ghana Statistical Service. The data was released in 2017 and it contains information on 14,009 households made up of 59,864 individuals in 1000 enumeration areas. Secondary data on registered and licensed banks and non-bank financial institutions in Ghana as at January, 2019 was also obtained from the Central Bank of Ghana. In all

information on location and physical addresses of 770 registered and licensed bank and non-bank financial institutions are included in the data. These bank and non-bank financial institutions include universal banks, savings & loans, rural & community banks, microfinance companies, micro-credit institutions, and financial non-governmental organizations. The analysis was done at the individual level with the version 14 of Stata Statistical Software. The total number of observations reduced to 2530 observations after successfully merging the GLSS datasets with the information on all 770 licensed bank and non-bank financial institutions.

In chapter three, both the theoretical and empirical models for the study have been specified, following Wooldridge (2006); Potrich et al, (2015); and Abel et al, (2018). Objective 1 and 2 are estimated with OLS estimation techniques while objective 3 is estimated with a Logit regression model. Dominance Analysis estimation technique is then used to ascertain the relative importance of all the variables in the model. The study relied on the General Dominance Statistics because of its ability to rank the predictor variables according to their variance contributions.

The study discussed all descriptive statistics of relevant variables employed for the study and also discussed in detail all major issues and principles that underpins the research work. All empirical models stated in chapter three and estimated were discussed in this chapter. Linear regression model was employed to analyze objectives 1, 2 and 3 whereas Logit model was used for objective 4. These models were estimated using OLS estimation technique and Maximum Likelihood estimation technique respectively.

Chapter four began with a description of how banks and non-bank financial institutions are distributed across Ghana. Separate maps were drawn for the different categories of bank and non-bank financial institutions in Ghana. The categories of financial institutions used for the study includes universal banks, tier 1, tier 2, and tier 3 non-bank financial institutions as shown in figure 1, 2, 3, and 4. As depicted in the maps, bank and non-bank financial institutions have clustered in the urban centers in southern Ghana while the remote areas have few or no institution to assist them financially.

Chapter four also captures the descriptive analysis of variables included in the models. The variables include financial inclusion, number of financial institutions, density of banks, sex, marital status, residence, poverty status, age and education. Per the summary statistics there are 2530 observations. Averagely, individuals in urban areas own and use more financial products and services than their counterparts in the rural areas. The statistics also favour the males in the sample in terms of ownership and usage of financial products and services.

The OLS estimation results for objective 1 show a positive and significant relationship between number of institutions and financial inclusion. This implies that as the number of bank and non-bank financial institutions in a community increase, financial inclusion increases. From the output Table for objective 1, one more branch of a financial institution in a community increases financial inclusion by 0.025. The variables Age and Agesq had no significant relationship with financial inclusion though Age had the required sign. Females are 13.7% less financially included than males. Individuals living in urban centers are found to be 20.3% more financially included than

their counterparts in the rural areas. Education also proves to be a key driver of financial inclusion in Ghana. As shown in the results, people become more financially included as they pursue higher education.

The study also sought to find out how extension of bank and non-bank financial institutions to rural areas will influence financial inclusion in the rural communities. The regression results for objective two show that one more branch of a bank or non-bank financial institution in a rural area will lead to an increase in financial inclusion by 0.024. The gap between the urban centers and rural areas in terms of financial inclusion may also reduce to as low as 3.2%. The regression results for objective 2 also confirm the gender gap in financial inclusion. Again, Education is a significant factor in determining financial inclusion in Ghana.

The third objective of the study seeks to confirm the OLS results for objective 1 by modeling financial inclusion as a binary variable. Individuals who do not own and use financial products and services are labeled as not financially included and indicated as zero (0) while individuals who own and use financial products and services are referred to as the financially included group, indicated as one (1). Modeling the same variables employed for the study with a Logit Model showed that as the number of bank and non-bank financial institutions increases, financial inclusion is more likely to improve. Age and Agesq variables were not significant as was seen in the OLS results in objective 1. Education still proves to be a very important determinant of financial inclusion in the Logistic regression results. Individuals at all levels of education are significantly more likely to be financially included than individuals with no formal education. Females were also found to be less

likely to own and use financial products and services, confirming the financial inclusion gap in terms of gender. The Logistic model also confirmed the existence of financial inclusion gap between urban residents and rural residents as shown in the OLS regression output for objective 1. The never married category of the Marital Status variable was found to be significant at all conventional levels. This implies that individuals who have never married all their lives are more likely to be financially included than individuals who are married/living together, widowed, and divorced.

Another interesting exercise that was undertaking in chapter four was to find out the relative contribution of each variable used for the study by using the Dominance Analysis technique introduced by Budescu (2003). The General Dominance Statistic technique was employed because it is able to rank variables according to their relative importance in a model. The General Dominance Statistics in chapter four ranks education as the highest contributor to the models, followed by Residence, Poverty status, Number of financial institutions, Marital status, Gender, and Age respectively.

Conclusions

Considering the commitments of world leaders including the government of Ghana, to extend financial services to rural areas and hard-to-reach areas, this study sought to find the effect of distribution of bank and non-bank financial institutions on financial inclusion in Ghana. In line with the objectives of the study, it has been established that financial inclusion in Ghana is influenced by the distribution of bank and non-bank financial institutions as measured by the increase in the number of banks, education, gender, marital status, and residential location (urban/rural).

In relation to the distribution of financial institutions and financial inclusion, there is an improvement in the latter as the number of bank and non-bank financial institutions increases. Formal education has also been found to be a very potent tool that could be used to enhance financial inclusion in Ghana. This conclusion is arrived at as the findings of the study reveals that financial inclusion increases as individuals move up the formal education lather. Another interesting conclusion that can be drawn from this study is the existence of financial inclusion gap between males and females in Ghana. The study found males to be doing better than females in terms of participation in the financial space of Ghana. Individuals who have never married are more likely to participate in the financial space than the married and divorced.

Moreover, it can be concluded from this study that financial inclusion is higher in urban centers of Ghana than the rural areas. Individuals in the urban centers are more likely to be financially included because of easy access to financial services and infrastructure. Again, the interaction between number of financial institutions and residential location (urban/rural) shows that as the number of bank and non-bank financial institutions increases in the rural areas of Ghana, financial inclusion is likely to increase, thereby reducing the gap between the urban dwellers and the rural folks in terms of participation in the financial space. This study therefore concludes that extending financial services to the rural areas as targeted by world leaders and development practitioners is likely to yield the needed results.

Finally, it can be concluded from the results of the Dominance Analysis technique that formal education dominates all the other variables that

were employed for the study. Hence, more attention is needed in the area of education to help reduce financial exclusion in Ghana.

Recommendations

Based on the conclusions drawn earlier, this study makes a recommendation that the government through the Ministry of Finance and Economic Planning, and the Communication Ministry should make available the needed infrastructure; internet, good roads, markets, etc., that will support the opening of new branches of bank and non-bank financial institutions in all parts of Ghana. This is likely to encourage the introduction of Agency banking in some communities that currently do not have proper infrastructure to support banking activities which will in the end promote financial inclusion.

Moreover, it is recommended that the government of Ghana through the Bank of Ghana should encourage existing bank and non-bank financial institutions to extend their operations to rural areas either through enactment of policies or dialogue. The Bank of Ghana as part of its plans to increase financial inclusion in Ghana can push for parliament to enact a law that makes it compulsory for every bank to have one agency in at least a rural area.

Lastly, formal education is found to be a very positive driver of financial inclusion in Ghana. Therefore, the study recommends that the government through the Ministry of Education and Ghana Education Service should strengthen its compulsory basic education policies and also ensure smooth implementation of its Free Senior High School programme to make formal education more accessible to the citizenry.

Suggestion for Further Research

Further studies may consider researching into the gender gaps that exist in terms of participation in the financial sector and make appropriate recommendations to help close the gap and in turn make gains in financial inclusion in Ghana.

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APPENDICES

APPENDIX A

Variance inflation factor

	VIF	1/VIF
Num_Inst	1.232	.811
Age	40.545	.025
Agesq	37.12	.027
1.isFemale	1.499	.667
1.marstat	1.276	.783
2.marstat	1.667	.6
3.marstat	1.503	.665
2.povqual	1.471	.68
3.povqual	1.378	.726
4.povqual	1.452	.689
5.povqual	1.25	.8
6.povqual	1.21	.826
1.pstatus	3.175	.315
2.pstatus	3.54	.282
1.isRural	1.373	.728
Mean VIF	6.646	.

Source	SS	df	MS	Number of obs	=	2,530
Model	709.875	2	354.938	Prob > F	=	0.000
Residual	3362.242	2,527	1.331	R-squared	=	0.174
Total	4072.117	2,529	1.610	Root MSE	=	1.154

findex	Coef.	Std.Err.	t	P>t	[95%Conf.	Interval]
_hat	0.551	0.388	1.420	0.156	-0.211	1.313
_hatsq	0.077	0.066	1.160	0.245	-0.053	0.207
_cons	0.631	0.556	1.140	0.256	-0.459	1.720

Variance inflation factor

	VIF	1/VIF
Num_Inst	2.087	.479
1.isRural	7.752	.129
1.isRural#c.Num	6.266	.16
Age	40.572	.025
Agesq	37.142	.027
1.isFemale	1.501	.666
0.marstat	3.881	.258
1.marstat	1.931	.518
3.marstat	3.461	.289
2.povqual	1.471	.68
3.povqual	1.378	.726
4.povqual	1.452	.688
5.povqual	1.251	.8
6.povqual	1.212	.825
1.pstatus	3.197	.313
2.pstatus	3.612	.277
Mean VIF	7.385	.

Source	SS	df	MS	Number of obs	=	2,530
Model	711.298	2	355.649	Prob > F	=	0.000
Residual	3360.818	2,527	1.330	R-squared	=	0.175
Total	4072.117	2,529	1.610	Root MSE	=	1.153

findex	Coef.	Std.Err.	t	P>t	[95%Conf.	Interval]
_hat	0.634	0.391	1.620	0.105	-0.132	1.400
_hatsq	0.063	0.067	0.940	0.346	-0.068	0.193
_cons	0.514	0.559	0.920	0.358	-0.582	1.610

Iteration 0: log likelihood = -1610.1497

Iteration 1: log likelihood = -1404.9459

Iteration 2: log likelihood = -1396.2681

Iteration 3: log likelihood = -1396.0529

Iteration 4: log likelihood = -1396.0528

Logistic regression Number of obs = 2,530
LR chi2(2) = 428.19
Prob > chi2 = 0.0000
Log likelihood = -1396.0528 Pseudo R2 = 0.1330

findex1	Coef.	Std.Err.	z	P>z	[95%Conf.	Interval]
_hat	1.013	0.086	11.830	0.000	0.846	1.181
_hatsq	0.010	0.046	0.210	0.837	-0.081	0.100
_cons	-0.002	0.056	-0.040	0.970	-0.113	0.108

Variance inflation factor

	VIF	1/VIF
Bdensity	1.245	.803
Age	40.516	.025
Agesq	37.1	.027
	1.497	.668
1.isFemale		
1.marstat	1.274	.785
2.marstat	1.667	.6
3.marstat	1.504	.665
	1.473	.679
2.povqual		
	1.378	.726
3.povqual		
	1.454	.688
4.povqual		
	1.252	.799
5.povqual		
	1.211	.826
6.povqual		
1.pstatus	3.167	.316
2.pstatus	3.509	.285
1.isRural	1.393	.718
Mean VIF	6.643	.

Source	SS	df	MS	Number of obs	=	2,530
Model	709.188	2	355.649	Prob > F	=	0.000
Residual	3355.048	2,521	1.331	R-squared	=	0.174
Total	4064.236	2,523	1.611	Root MSE	=	1.154

findex	Coef.	Std.Err.	t	P>t	[95%Conf.	Interval]
_hat	0.555	0.388	1.430	0.153	-0.206	1.317
_hatsq	0.076	0.066	1.150	0.249	-0.054	0.206
_cons	0.624	0.556	1.120	0.261	-0.465	1.714

Variance inflation factor

	VIF	1/VIF
Num_Inst	1.232	.811
Age	40.545	.025
Agesq	37.12	.027
1.isFemale	1.499	.667
1.marstat	1.276	.783
2.marstat	1.667	.6
3.marstat	1.503	.665
2.povqual	1.471	.68
3.povqual	1.378	.726
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	VIF	1/VIF
Num_Inst	2.087	.479
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Agesq	37.142	.027
1.isFemale	1.501	.666
0.marstat	3.881	.258
1.marstat	1.931	.518
3.marstat	3.461	.289
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3.povqual	1.378	.726
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Iteration 0: log likelihood = -1610.1497
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Iteration 2: log likelihood = -1396.2681
Iteration 3: log likelihood = -1396.0529
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Logistic regression Number of obs = 2,530
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_hatsq	0.010	0.046	0.210	0.837	-0.081	0.100
_cons	-0.002	0.056	-0.040	0.970	-0.113	0.108

Variance inflation factor

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Bdensity	1.245	.803
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Agesq	37.1	.027
	1.497	.668
1.isFemale		
1.marstat	1.274	.785
2.marstat	1.667	.6

3.marstat	1.504	.665
	1.473	.679
2.povqual		
	1.378	.726
3.povqual		
	1.454	.688
4.povqual		
	1.252	.799
5.povqual		
	1.211	.826
6.povqual		
1.pstatus	3.167	.316
2.pstatus	3.509	.285
1.isRural	1.393	.718
Mean VIF	6.643	.

Source	SS	df	MS	Number of obs	=	2,530
Model	709.188	2	354.594	Prob > F	=	0.000
Residual	3355.048	2,521	1.331	R-squared	=	0.175
Total	4064.236	2,523	1.611	Root MSE	=	1.154

findex	Coef.	Std.Err.	t	P>t	[95%Conf.	Interval]
_hat	0.555	0.388	1.430	0.153	-0.206	1.317
_hatsq	0.076	0.066	1.150	0.249	-0.054	0.206
_cons	0.624	0.556	1.120	0.261	-0.465	1.714