UNIVERSITY OF CAPE COAST

ESSAYS ON FINANCIAL INCLUSION, FINANCIAL LITERACY,

FINANCIAL INCLUSION INEQUALITY, AND   POVERTY IN GHANA

ISAAC KWAME AMOAH-AHINFUL

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FINANCIAL INCLUSION INEQUALITY AND   POVERTY IN GHANA

BY

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A thesis submitted to the Department of Economic Studies of the School of

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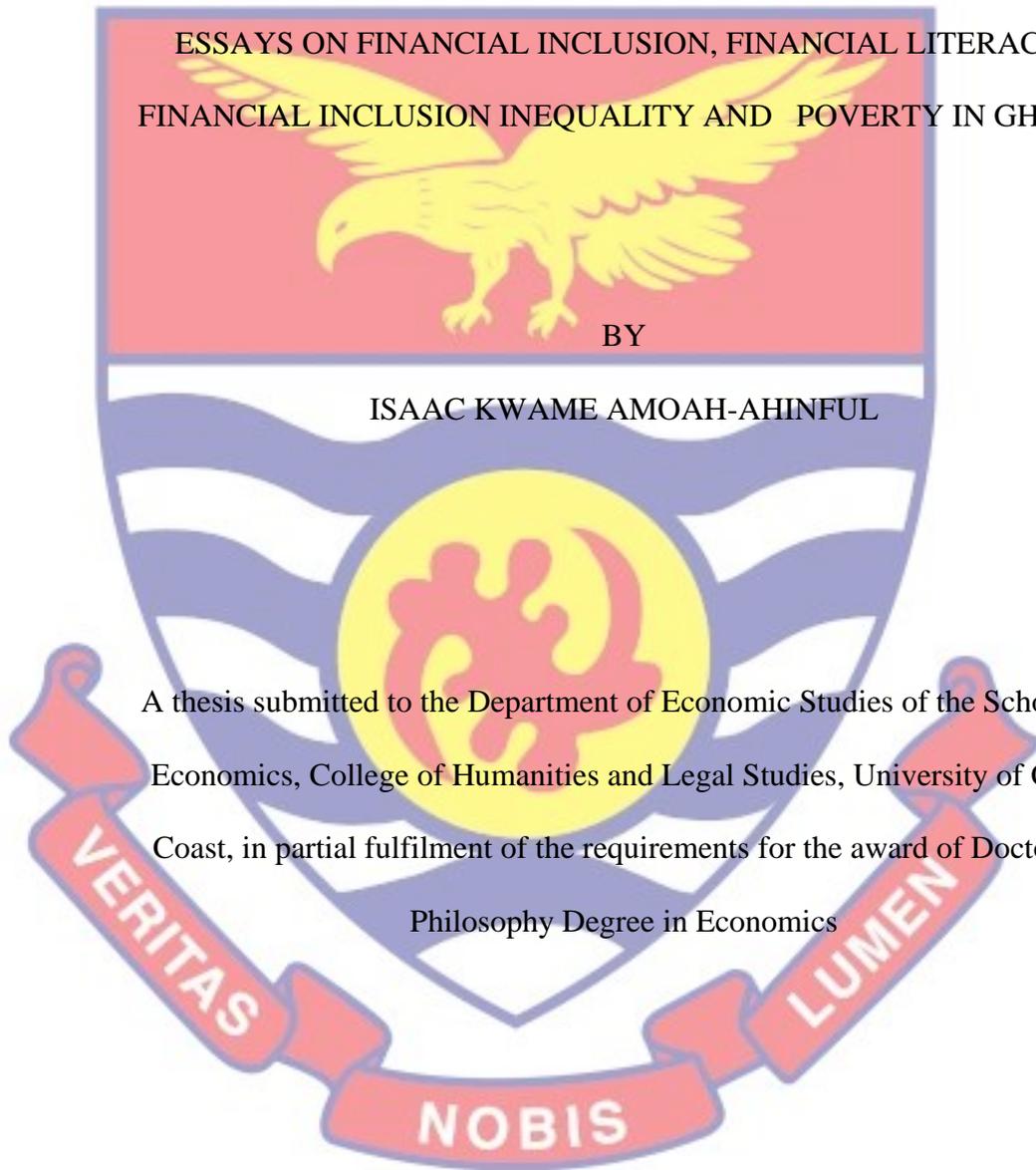
DECEMBER 2021

DECLARATION

Candidate's Declaration

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

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

Name: Isaac Kwame Amoah-Ahinful

Supervisors' Declaration

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

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

Name: Prof Samuel Kobina Annim

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

Name: Prof. James Atta Peprah

ABSTRACT

Access to financial services is crucial for economic activities and reduces poverty irrespective of gender and location. However, the analyses of financial inclusion, financial inclusion inequality and financial literacy on poverty have been neglected. This thesis examines the effects of financial inclusion, financial literacy and financial inclusion inequality on poverty in Ghana. Specifically, the study seeks to determine variations in financial inclusion between males and females, in urban and rural areas and assess whether these gaps have increased over time. Again, the study evaluates the combined and relative effects of financial inclusion and financial literacy on household poverty in Ghana. Finally, the study investigates the effect of financial inclusion inequality on poverty at the district level. The study adopts the counterfactual decomposition, Ordinary Least Square (OLS), Instrumental Variable (IV), and ordered logit estimation techniques. Financial inclusion inequality is calculated using the Generalized Entropy class of inequality measures with data from the Financial Inclusion Insight National survey (2015) and Ghana Living Standard Survey Rounds 6 and 7 (2013/14 and 2016/17). The study finds the existence of financial inclusion gaps with the gender gap reducing by 6.0 percent between 2013 and 2017 and conversely increasing by 42.0 percent between urban and rural areas over the same period. Again, the study finds that financial inclusion and financial literacy reduce multidimensional poverty by 15.4 and 0.9 percent respectively. However, the combined effect reduces multidimensional poverty by 18.9 percent. Finally, the study shows that a one percent increase in financial inclusion inequality presents a 17.9 percent likelihood for a household head to be poor. The study recommends that the Bank of Ghana should revise the capital requirement for financial institutions downwards to encourage financial institutions to operate in rural areas. Also, the Ministry of Communication and Digitalisation should review the existing national telecommunication policy to improve coverage in rural areas. Again, the Management of the District Assembly should liaise with the National Commission for Civic Education to promote financial inclusion at the district level.

KEYWORDS

Financial Inclusion

Financial Literacy

Financial Inclusion Inequality

Poverty

Household

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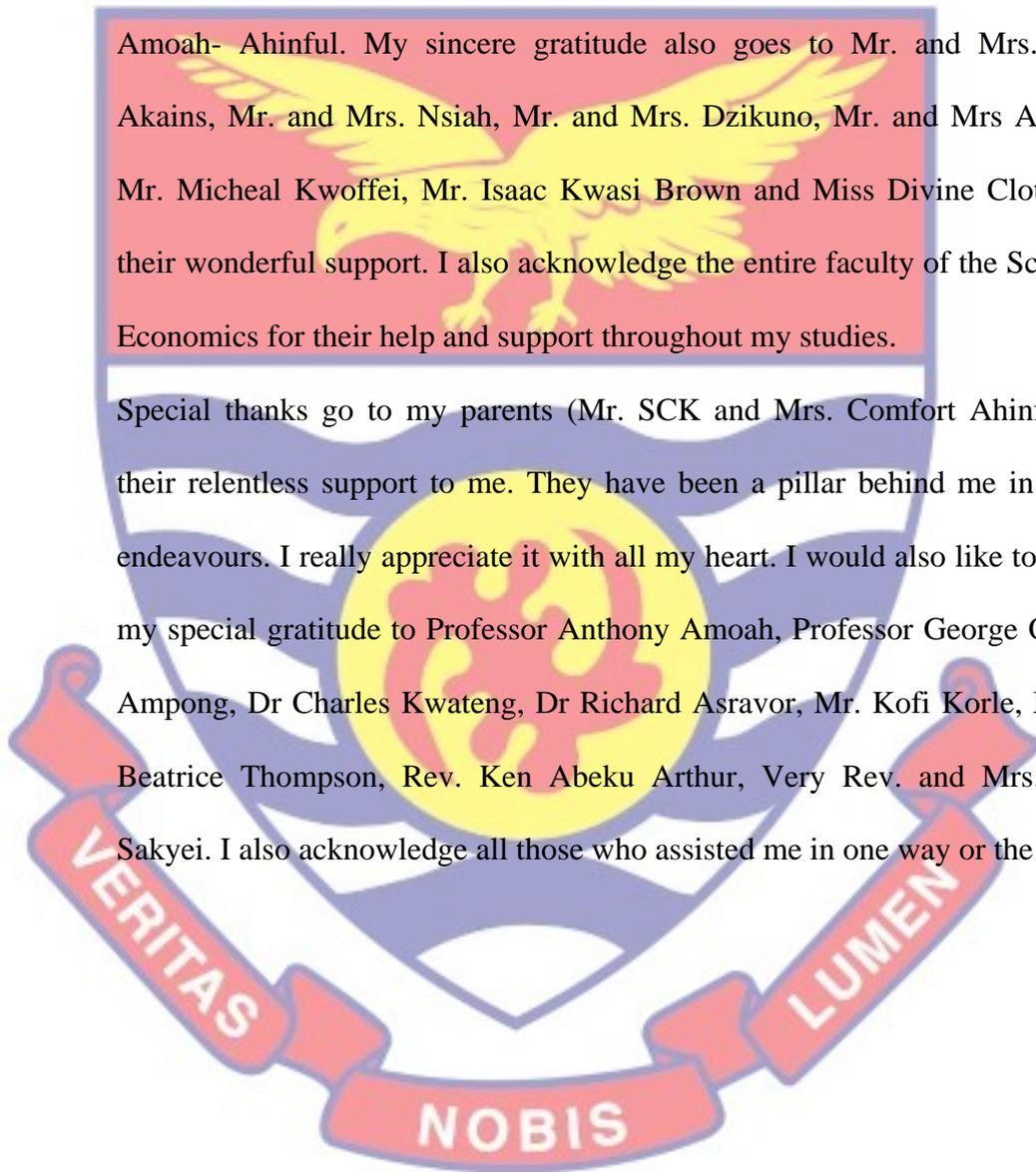
DEDICATION

To my lovely parents Mr. SCK Ahinful and Mrs. Comfort Aba Ahinful

To my wonderful wife Victoria Afia Amoah- Ahinful

To my sons Samuel Kweku Amoah- Ahinful and Caleb Yansah Amaoh-

Ahinful

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LIST OF ACRONYMS

Acronyms	Meaning
GLSS R	Ghana Living Standard Survey Rounds
FI	Financial Inclusion
FL	Financial Literacy
GSS	Ghana Statistical Service
VIF	Variance Inflation Factor
MoE	Ministry of Education
GES	Ghana Education Service
BoG	Bank of Ghana
MoCD	Ministry of Communication and Digitalization
NCCE	National Commission for Civic Education
SDGs	Sustainable Development Goals
MDGs	Millennium Development Goals
SSA	Sub-Saharan Africa
GCB	Ghana Commercial Bank
OECD	Organisation for Economic Co-operation and Development

CHAPTER ONE

INTRODUCTION

Background to the Study

Globally, economies have over the years witnessed transformation in public and institutional policies targeting economic growth and poverty reduction mainly through the financial sectors (Sehrawat & Giri, 2016). Policymakers have embraced microcredits as means of diversifying the financial services since they support income-generating activities of the poor (Islam, 2016). Currently, policymakers have made progress by promoting financial services such as savings, innovative payment methods, insurance, and all forms of credits (loans, leasing and hire purchases) geared towards the poor (Singh, 2017). This has become necessary due to awareness of current developments, demonstrating that access to financial services is crucial for economic activities. Notwithstanding the status such as gender, location and other relevant characteristics, households should have access to reliable, affordable and appropriate financial services that also encapsulates improving financial knowledge, behaviour and attitude of the poor.

Poverty is one of the most critical challenges confronting both developing and developed countries (Ali, 2017). It is the underlying cause of all forms of physical deprivation (Coulthard et al., 2011). Indeed, the adverse effects of poverty go beyond physical deprivation since it causes emotional and social difficulties, intense and prolonged stressors, cognitive slacks, and health issues (Blair et al., 2016). Hence, poverty eradication is goal one of the Sustainable Development Goals (SDGs) (World Bank, 2018). This goal aims to eliminate excessive poverty in all forms by ensuring social protection and

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enhancing access to essential services. Also, the goal seeks to target the most defenseless, assisting societies affected by conflict and climate-related disasters and improving primary resources and services (Gupta & Vegelin 2016). These efforts of the SDGs intervention and that of millennium development goals (MDGs) are making some strides in reducing poverty levels globally.

According to Hussain (2019), the global poverty headcount decreased from 1.9 billion in 1990 to a total estimated figure of 736 million in 2015, though the population went up by 2 billion within that period. This relatively lowered poverty headcount could be attributed to the two most highly populated developing countries, China and India, accounting for about 75 per cent of the world's poverty reduction over the ten years (Hussain, 2019). Notwithstanding this achievement, the consumption shortfall of the poor and people who find themselves below the extreme poverty line globally remain high. According to Roser and Ortiz-Ospina (2019), international research teams from the World Bank, ODI, IHME, Brookings, and World Data Lab have indicated that the achievement of SDG 1 by the year 2030 is not feasible. They indicated further that if the world economy grows at the same rate as recorded between 2005 to 2015, about 500 million people will fall into extreme poverty.

People in extreme poverty category are mostly from developing economies consisting mostly African countries. Though the rest of the world achieved a drastic poverty reduction, the Sub-Saharan Africa (SSA) and Southern Asian regions were not. Eastern and South-Eastern Asia recorded substantial improvement, where the rate declined from 35 per cent to three per

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cent between 1999 to 2013. In contrast, 42 per cent of the population in SSA endured severe poverty situations in 2013. World Bank data for 2018 indicates that as of 2015, the number of poorest countries in the world were 28. Out of this number, 27 had their poverty rate above 30% and are from SSA including Ghana.

Although Ghana's performance on average is better than that of SSA's average performance, the country's poverty level is still endemic at aggregate and disaggregate levels (GSS, 2018). From 1991 to 2013, Ghana witnessed substantial reductions in extreme and incident poverty levels and achieved the MDG 1 ahead of the expected period by 2015. Within 2013 to 2017 period, the poverty level in Ghana reduced marginally from 24.2% to 23.4% and 8.4% to 8.2% for incident poverty and extreme poverty, respectively as depicted in Figure 1.
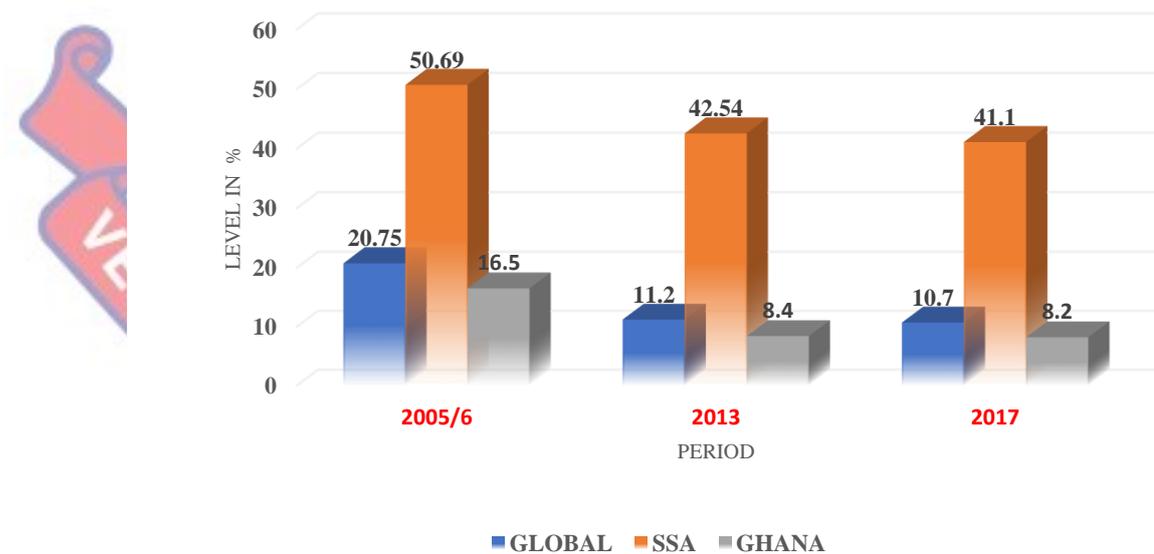
Figure 1: Extreme poverty trend in percentages (2005-2017)
Source: Author's construct (2020)

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Poverty levels in Ghana vary by locality, occupational type, and educational level of the population. In Ghana, the occupation or the type of economic activities of individuals determine their level of poverty. From the report of the Ghana Living Standard Survey (GLSS) Rounds (R) 6 and 7, the self-employed household heads in agriculture have the highest poverty rates, with 42.5 percent falling below the incident poverty line. During the periods (2012/13 and 2016/17), poverty rates among self-employed, inactive, and private employees increased. Poverty levels for either unemployed or self-employed in agriculture were high, especially in rural areas. Retired households had the lowest incidence of poverty, followed by public sector employment (GSS, 2018). Also, household heads without education had a higher poverty incident level than those with tertiary education. For instance, as of 2016/17, the poverty level for a household head with no education was 37% compared to 0.9% for those with tertiary education. This can be attributed to acquiring needed skills and knowledge that would enable one to engage in productive economic activity.

One of the ways to eradicate poverty in a country is to improve the socio-economic status of its citizens (Sundaram, 2012) of which financial development plays key roles. Financial development is critical to ameliorating economic development and eradicating poverty in a country. Studies show that the financial system of a nation should strive to be equitable and efficient in utilising the financial product to encourage economic development and decrease poverty (Koomson, Annim, & Peprah, 2016; Koomson & Ibrahim, 2018; Demirguc-Kunt, Klapper, & Singer, 2017). Hence, there is the need to ensure that the poor own financial products and have access to and utilise

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financial products. Existing literature also suggests that effective financial inclusion (hereafter FI) reduces household poverty shocks (Beck, Demirgüç-Kunt, & Maksimovic, 2008; Arun & Kamath, 2015).

The FI describes access to affordable financial services or products such as credit, savings, remittances, money transfer, insurance, mortgages, and pensions to satisfy the financial needs of the individuals or households (Boateng, 2018) to meet their needs (Singh, 2017). Households can access and or effectively use financial products that can help them to participate in the range of activities that constitute social life. FI reduces the cost of borrowing and creates room for safer investments which minimises some of the avoidable risks associated with financial activities. Being financially included enhances the ability to save for general consumption or for the future.

Over the past decade, Ghana has seen a significant increase in FI with growth exceeding the SSA average as depicted in Figure 2. Specifically, the FI levels at the global, SSA, Ghana and Low Middle-income countries are respectively shown as 68.5%, 42.6%, 57.7%, and 57.8%. In addition, the percentage of adults in Ghana who owned accounts has increased from 29.4% in 2011 to about 58% in 2017 compare to SSA which only increased from 23.3% to 42.6% within the same period.

Figure 2: Financial Inclusion trend in percentage (2011-2017)
Source: Amoah-Ahinful construct (2020)

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Other studies assert that the absence of available, moderate, and fitting FI affects the financial state of individuals as well as the monetary wellbeing of the nation (Demirgüç-Kunt et al., 2017). To achieve economic growth, it is essential that individuals become financially inclusive (Kavidayal & Kandpal, 2016). With access to financial services, people do not soley depend on transactions only in cash or use their mattresses as financial savings cabinets (World Bank, 2018). Financial access interfaces individuals or households into formal financial institutions, enabling them to utilise financial products daily. For example, to take insurance and loan, extend businesses and put resources into health or education, oversee financial stuns and risk, and increase their general wellbeing. Through access to insurance, loans, and other financial services, FI can minimise poverty by providing resources to support investment, consumption, and general economic expansion (Rajan & Zingales 1998; King & Levine 1993). An inclusive financial system plays a vital role in ensuring the deprived get access to formal credit, saving products and other services that help them overcome poverty and reduce income inequality gaps (Allen et al., 2014; Kavidayal & Kandpal, 2016).

Globally, there have been a significant increase in the levels of FI over time. Demirguc-Kunt et al. (2018) indicate that the total number of adults unbanked has reduced from two billion in 2014 to 1.7 billion in 2017, giving the current number of adults owning accounts to 69%. SSA has witnessed growth in FI even though it is still the lowest at the regional level. The region's current record of adults who own accounts is 42.6% in 2017 compared to 34.2% as of 2014, while a rise in the mobile money account constitutes more than 10%.

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Similarly, in Ghana, FI has significantly improved due to the successive government's policies and interventions in improving the financial sector in the country (Demirguc-Kunt et al., 2018). Since its independence in 1957, governments, with the help of its development partners, have introduced several financial policies, reforms, laws, and interventions to improve economic growth and development, which ultimately combat poverty in the country. Among which is price control (1960), Economic Recovery Programmes (1983), Financial Sector Structural Adjustment Programme (1987), Non-banking Financial Institutions Act 1993 (Gwartney et al., 2017).

Though the country made much progress on the supply side of FI, there have been a severe decline since 2016 due to the collapse of banks and other financial institutions. For instance, nine domestic universal banks were closed between August 2017 and December 2018. The assets and liabilities of two of those banks were transferred to one of the state-owned banks, Ghana Commercial Bank (GCB) while that of the remaining seven banks were used to form a bridge bank (Consolidated Bank Ghana, [CBG]). Non-banking financial institutions had operational challenges that made them either stop reporting to the Bank of Ghana (BoG) or fold up. Others were financially stressed and faced liquidity and/or solvency problems. The BoG estimated that around one-third of the 707 Microfinance institutions (MFIs) and Rural and Community Banks were distressed or bankrupt, putting more than 700,000 depositors at risk (BoG, 2017). Since the worst-hit companies have no collectable assets, their liquidation was associated with tax costs. In addition, a significant number of active MFIs do not meet the minimum capital

requirement. In response to these challenges, on May 31, 2019, the BoG revoked the licenses of 347 microfinance companies and 39 microcredit companies.

Another significant challenge in Ghana is ensuring equal access to financial services for all, irrespective of location, age, or gender. Currently, rural dwellers have less access to financial services than urban dwellers. Consequently, individuals in a rural area either fear contracting loans or do not have access to credible financial institutions. Hence, they cannot use appropriate and reliable financial services or products. The only option is to resort to individual money lenders who charge exorbitant and unrealistic interest rates. Others save with fraudulent financial institutions or individuals who end up defrauding them.

Although there could be high FI levels, financial literacy (FL), which entails financial awareness, knowledge, and management of financial products, is equally relevant in reducing poverty. A well-implemented FL policy does not only change the financial attitude of household heads but increases savings behaviour, reduce maxed-out credit cards, and increase timely debt payments (Amoah, 2016). Indeed, Arora (2016) reported that FL could provide avenues through which households acquire the essential knowledge, skills and values to manage the money they possess, build assets, manage debts, and avoid exploitation.

Problem Statement

Despite the significant growth in average FI level in Ghana, there are disparities across gender and location (Demirguc-Kunt et al., 2018). For instance, a report by CGAP (2015) showed that FI gap between urban and

rural communities stood at 14%. The study further confirmed that low FI levels in specific communities in Ghana, particularly for adults in rural communities, stood at 52.5%. CGAP (2015) revealed that about a 10% gap exists between the adult male and female active account holders. Demirguc-Kunt et al (2018), echoed that FI level for women also stood at 53.7% as of 2017. Many existing studies abound on gender and locality disparities in FI. Missing in such studies are the drivers of the disparities and if these disparities gaps have either increased or decreased overtime and what led to that. Thus, this study examines the drivers of unequal access to financial services across locality and gender gaps and assess whether the gaps have increased over time.

As it is expected that the level of FI increases, so also is the level of poverty reduces. The financial inclusion level for Global, SSA, Ghana and Low Middle-income countries are 68.5%, 42.6%, 57.7%, and 57.8% respectively as shown in Figure 2. The percentage of adults in Ghana who own an account has increased from 29.4% in 2011 to about 58% in 2017 compared to that of sub-Saharan Africa which only increased from 23.3% to 42.6% within the same period. However, the FI impact on poverty reduction has not been realised appreciably. While the FI level increased from 41% to 58% between 2014 and 2017, the extreme poverty level dropped marginally from 8.4% to 8.2% as shown in Figure 1.

Again, the disaggregated level of the extreme poverty in Ghana at the regional level shows a clear picture. From Figure 3, it is still as high as more than 27% among the northern part of Ghana. The extreme poverty levels of five regions (Upper East, Upper West, Northern, Brong Ahafo, Volta)

witnessed an increase within the period of 20/13 to 2016/17. This phenomenon requires an in-depth investigation to unravel answers and remedies.
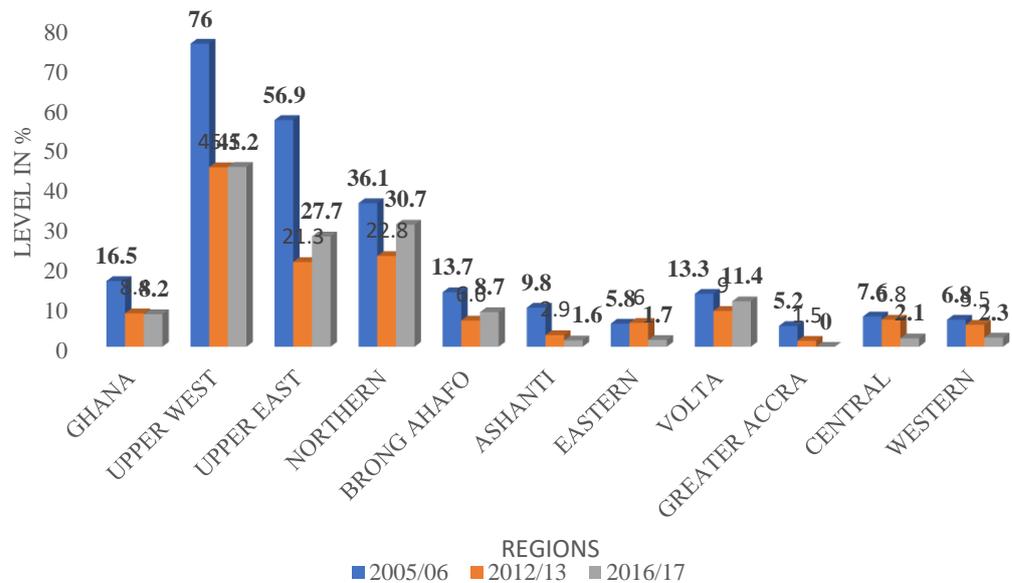
Figure 3: Extreme poverty levels in Ghana (by region) (2011-2017)
Source: Author's construct (2020)

At the district level some households are either ignorant of financial services and related financial instruments or fear contracting loans. Others do not have access to credible financial institutions. Again, some parts of districts have poor mobile connectivity which makes it difficult to transact. They are compelled to use fraudulent financial institution which run away with their savings and investment or use third party mobile phone which has its own challenges. Other financial institutions also charge very high price which makes them worse off. These exclude some people financially which leads to financial inclusion disparities within such geographical areas. Disparities in access to financial services can potentially have adverse effect on poverty alleviation and income inequality. Authors such as Le et al (2019); Kakoroogo (2016); Park and Mercado Jr (2015); Koomson (2020); Annim et al (2012)

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have looked at spatial income inequality and poverty, financial inclusion and poverty, financial inclusion and income inequality, financial inclusion and vulnerability to poverty. However, there is limited empirical literature that measures financial inclusion inequality and estimate the relationship between poverty and district financial inclusion inequality in Ghana.

Existing literature suggests that FI and FL together can play a crucial role in poverty and income inequality reduction (Sabana, 2014; Kalunda, 2014). Ramakrishnan (2011) suggested that developing countries need FI and FL to reduce poverty and inequality. However, the FL level in Ghana is low as the country is ranked at 90th position out of 115 countries by Standard and Poor (Lusardi, & Klapper, 2015). Studies in Ghana such as Mohammed, Mensah and Gyeke-Dako (2017); Nyarko (2018); Koomson (2019); Peprah, et al. (2020), have investigated either FI or FL reduced poverty but have not considered the combined effect of FI and FL on poverty reduction. Focusing on one factor without the other could lead to biased results due to omission of relevant variables if both jointly affect poverty.

Objectives

Given the depth of the study in the relationship between poverty reduction and financial inclusion in Ghana, the main objective this study was to examine the effects of financial inclusion, financial inclusion inequality and financial literacy on poverty in Ghana. Specifically, the study seeks to address the following objectives:

1. examine financial inclusion gender and locality gaps and assess whether the gaps have increased over time.

2. assess the combined effects of FI and FL on poverty in Ghana.

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3. investigate the effect of district-level financial inclusion inequality on household poverty in Ghana.

Research Question

1. What are the FI gender and locality gaps? How has the gap changed over time?

Hypotheses

Based on the objective of the study, the hypotheses to be tested are:

H_0: There is no combined and relative effect of FI and FL on poverty reduction in Ghana

H_a: There is a combined and relative effect of FI and FL on poverty reduction in Ghana

H_0: The district-level FI inequality does not affect household poverty in Ghana

H_a: The district-level FI inequalities have effects on household poverty in Ghana

Significance of the Study

The 2017/18 financial sector crisis in Ghana affected the financial institutions and, more particularly, the individuals and households. Individuals either lost their investment or were still locked up at a specific financial institution. In the face of these developments, it is imperative not to ensure financial inclusivity but also financial literacy. This research provides essential evidence on how Ghana can address challenges associated with poverty.

Secondly, the adult female population in Ghana constitutes about half of the total population. This implies that any poverty intervention that aims to eradicate all types of poverty in the country but are biased toward females may not achieve its intended purpose. Thus, the study, provides a summary

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measure of inequality across gender. The study also seeks to unearth the causes of the FI gender gap and the effect of the gender gap on poverty alleviation.

An issue about poverty is a great concern to every policymaker. Poverty has been recognised as one of the fundamental problems confronting the world. Given this identifier, coupled with the UN Sustainable Development Goals, which are supposed to be achieved by 2030, it has become critical for every policymaker to ensure that it is achieved. FI and FL can reduce poverty if not eradicate it. The study will provide valuable strategies that policymakers could adopt to eradicate poverty.

Lastly, the study will improve the prevailing literature on FI and poverty, especially in Ghana. Specifically, this study intends to close the FI and poverty knowledge gap, such as inequality in FI and effect of FL and make recommendations for effective poverty management in Ghana.

Scope of the Study

This is a cross-sectional study analysing poverty, FI, FL, and financial inclusion inequality by specifically examining financial inclusion inequality and how it affects poverty in Ghana. It further investigated the gender and locality differences in FI in Ghana. GLSS R6 and R7 data sets collected by the Ghana Statistical Service covering two respective periods (2013/ and 2016/17) were used. The study also reviews the relative and combined effects of FI and FL on poverty (multidimensional poverty, income poverty), and the financial inclusion insight 2015 data set was used. All three sub-studies covered Ghana only, and the unit of analysis is at the household level.

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Limitations of the Study

One of the limitations of the research was insufficient data to extend the study to the period of 2005 (GLSS 5). The researcher believes that what constitutes FI is broad, which requires constructing an index. The GLSS 5 has scanty information compared to the two preceding data, making it impossible to extend the study to 2005.

Again, the consumption basket underlying the poverty line in GLSS was updated in Round 6 (2012/13), making it challenging to include the previous GLSS Rounds such as Round 5 and others in the study. The study limited the analysis of FI and FL on poverty in Ghana to only 2015 data although cross sectional data usually lacks time dimensions hence the effect of financial inclusion on poverty and welfare cannot be easily determined in the future.

Also, the use of distance as an instrument for digitisation drive might not be a strong instrument in the future. However, with current barriers and challenges in Ghana, it fits the purpose of this study. Also, there is no current data on Ghana that contain both FI and FL at the micro-level, which can be used to construct an index. The preceding Financial Inclusion Insight data was published in 2018 and did not include that of Ghana.

Lastly, the use of consumption expenditure as a measure of welfare has some inherent limitation. The consumption expenditure does not capture non-market activities nor costs and benefits in relation to preferences. Again, Aggregation may not be straightforward and it has a limitation of providing temporal link between the outcome and the exposure which cannot be determined because both are examined at the same time.

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Organisation of the Study

The study is structured into seven sections. Chapter One begins the research. It covers the study's background, the problem statement, the study's objectives, the hypotheses of the study, the importance of the research, the delimitation, and finally, the organisation of the study. Chapter Two encapsulates a review of theoretical and empirical literature on FI, FL, and poverty concepts.

Furthermore, Chapter Three highlighted the various methodologies employed to achieve the objective of the research. The research presents outcomes and discussion in Chapters Four, Five and Six. Finally, Chapter seven describes the summary of findings, conclusion and recommendations of the study.
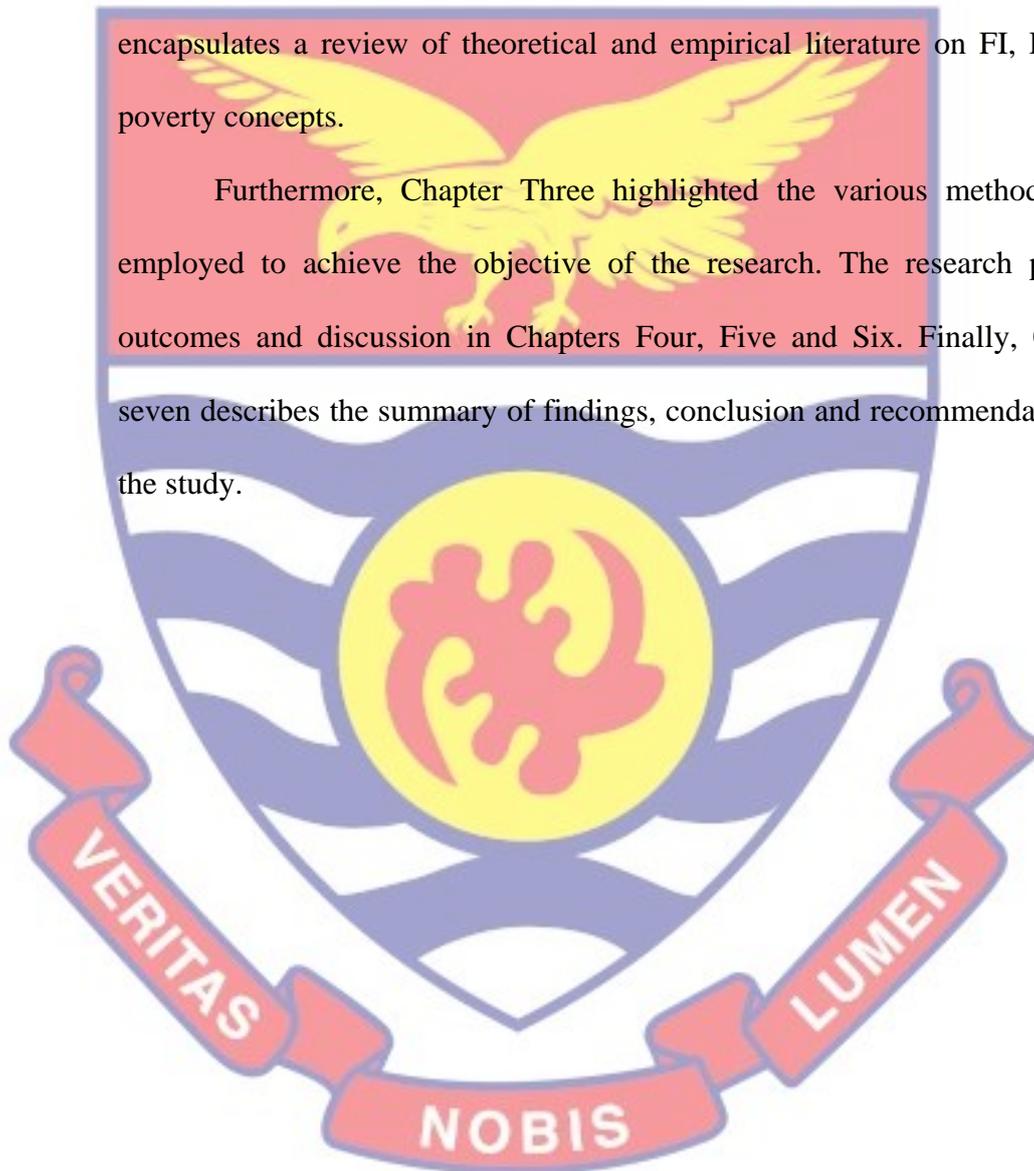
CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter presents critical reviews of the theoretical and empirical literature on poverty, FI, financial inclusion inequality, and FL seeking to position the study firmly. It begins with the concepts of poverty, FI, and FL. This chapter discusses theories of poverty, FI, and FL. Empirical reviews of poverty, FI and FL are also discussed in this chapter.

Concept of Financial inclusion

Rural residents, poor and low-income earners worldwide have been directly or indirectly discriminated against in terms of having access to formal financial services, which stifle their effort to overcome poverty. FI provides individuals and households access to financial products/services such as savings and credit, which improve their consumption level or indirectly through income and consumption (Wang & He, 2020). Though the aim is to make formal financial services and products accessible to all, there is the need of the suppliers to factor in their additional cost. This denotes that voluntary exclusion and the adverse risk-return nature of the services may prevent an individual, including minors, from participating in financial sector engagements by utilising one or more financial services/products. This limits the idea of ensuring total FI of everyone.

FI measurement has evolved from various levels. Initially, it was based on only ownership of accounts at formal financial institutions to a more comprehensive level which comprises account ownership, access to financial services and usage of the financial products (Koomson, et al. 2016). The

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transformation in mobile technology has led to the introduction and higher mobile money usage (Demirgüç-Kunt et al., 2015). This has extended the limit of financial services/ products being offered by formal financial institutions to include those offered through mobile money accounts.

Concept of Financial Literacy

FL is a multi-dimensional concept encompassing numeracy skills and comprehension of financial concepts (examples: compounding, discounting, diversification, inflation, interest rates, knowledge on working out of risk and return); understanding of financial terms and instruments (bonds, stocks, investment funds); and the skill and confidence to undertake financial activities especially in preparation for the future and insurance (Atkinson & Messy, 2012; Bendre & Singh, 2017). Noctor et al. (1992) defined FL as "*the ability to make informed judgements and to take effective decisions regarding the use and management of money*" cited by Pokrikyan (2016, p. 5).

Other scholars such as Mason and Wilson (2000) saw FL to be "*an individual's ability to obtain, understand and evaluate the relevant information necessary to make decisions with an awareness of the likely financial consequences*" (p. 15). Also, Lusardi and Tufano (2009) described it as "*the capacity to make basic choices concerning financial liabilities, particularly how general understanding about interest compounding is applied in the context of daily financial decision-making*" (p. 1). Atkinson and Messy (2012) explained that FL is the awareness, attitude, behaviour, knowledge, and skill required to make effective monetary choices and achieve personal financial soundness. As a result, the FL concept has been broadened to include skills devoted to applying that knowledge, reinforcing behaviours

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and encouragement to be financially included, and sound investment behaviour. The OECD concept of FL provides a much broader spectrum to encapsulate financial knowledge (diversification of investment, time value for money, interest rate, inflation, risk and returns), financial behaviour (financial decision and budgeting) and financial attitude (Janor, et al 2016).

Theories of poverty.

Poverty in developed countries is often seen as a personal or structural defect whereas in developing countries is more severe due to a lack of government funding. This study reviews theory such as the individual theory of poverty, structural theory of poverty, cyclical theory of poverty and transient theory of Poverty were reviewed.

The Individualistic Theory of Poverty

A person is the source of his or her deprivation since he or she is a slacker. This viewpoint arose from the colonial conviction that poverty was the "*natural consequences of a person's deficiencies in ambition or capabilities*" (Schiller, 1998, p. 5). Individualistic theorists argue that the poor may have prevented or resolved their issues through personal effort and informed decisions. Individuals' digital financial exemption decisions, for example, may leave them impoverished. Beside the idleness regarded alongside the needy, others within this theoretical heritage ascribe the problems of poverty to a person with low intellect (Bradshaw, 2007). In the 19th century, these beliefs resulted in the emergence of the Eugenics movement, also known as the Puritanical Humane Society. The Eugenics movement advocated for the sterilisation of gifted individuals. Green and Hulme (2005) cited Biber's (1901) article on the relationship between poverty

and leprosy in medieval England when leprosy was considered a contagious disease that warranted the eviction of lepers. A belief that shifts have heavily influenced social attitudes mainly changes intolerance toward the poor. This is because there was no increase in mortality rates in leprosy-affected areas during this period, which would have justified leper treatment (Biber 1991, p. 73 cited in Green & Hulme 2005, p. 872).

Green and Hulme (2005) suggested that comparable notions about poverty exist in societies where the poor are associated with "*a hazardous moral depravity, such as in modern United States political mythology about the 'underclass'*" (Green & Hulme, 2005, p. 872). The Puritanical Humane Society's idea that sorrow was designed "by a reasonable and rigid rule of Providence" to follow immorality captures the essence of this perspective, which is frequently referred to as the "*Flawed Characters*" (Schiller, 1998, p. 3). The viewpoint is also recognised as the Social Darwinian Theory of Poverty. It is based on Charles Darwin's evolutionary explanation, in which he proposed that living beings who could not endure the circumstances during their development possess weak characteristics and would ultimately die off. Herbert Spencer has criticised the poor for their poverty and invented the popular expression of the survival of the fittest in a similar vein (Connolly, 2002). The poor might avoid poverty by accessing financial goods such as loans, savings, and remittances provided through FI.

At this step, evaluating this theoretical perspective exposes the theory's obvious shortcoming. Financial exclusion, for example, arises not because the poor do not utilise it but because it is inaccessible to them. To utilise financial services, the user must have a current bank account that they control (or third-

party accounts to use) and sufficient monies in their accounts to perform cash transactions or receive income, such as smartphones, computers, or the internet (Ozili, 2018). "*Survival of the fittest*" appears to communicate the notion that creatures (including human being) that are unsuitable for enduring the extreme level of competition global die out altogether, leaving the capable ones behind (Abdul & Shamshiry, 2014). However, in the context of poverty, instead of fading out totally, the population of the poor is continuously increasing. This study is with the firm conviction that with the necessary means, the "*idle*" poor people who are impoverished owing to their laziness may be freed of their laziness to evade poverty through digitalization and FI.

Financial inclusion has contributed immensely to this. Savings, loans, remittances, mobile money, and other e-payments can help to alleviate the problem. The "*lazy persons*" must be discovered and provided with capital and other necessary possibilities to either begin a trade or acquire a vocation, and they may be encouraged regularly through the use of financial services. The link between digital finance and FI is based on the assumption that a considerable proportion of the excluded population has a mobile phone, and that providing financial services through mobile phones and similar devices can increase access to funding for the excluded people (World Bank, 2014).

The individualistic theory was subjected to a theological interpretation, with some theorists arguing that persons who find themselves in unpleasant circumstances, such as being financially excluded and including the destitute, are atoning for their sins or the crimes of their parents. In contrast, they contended that prosperous people, particularly monetarily and in excellent health, are those whom God blesses. The finding concurs that God favours

some over others in evaluating this case. However, the so-called favours and disasters may be disguised trials to discern His true believers among His creation.

Furthering the individualistic view, neoclassical economists stated that everyone had a set of talents that can be improved by investment. According to the economic notion of human capital, if some people select and act in ways that do not promote their well-being, they should be held totally accountable for their dilemma (Schiller, 1998). Despite the abundance of data supporting the necessity of financial sector growth, the use of financial services is skewed toward the wealthy and those who are already well-off, leaving the poor and those living in remote places out (Singh & Tandon, 2012; Martinez & Mckay, 2011). According to Akpandjar et al. (2013), the large concentration of banking firms in metropolitan regions explains why most Ghanaians cannot bank. According to this study, these socioeconomic systems create inequities that have essentially doomed more people to poverty. As a result, there is an urgent need to ensure ethnically diverse dispersion of national and global cakes and financial services within and beyond nations.

The Structural Theory of Poverty

The structural theory of poverty has its roots in Marxist philosophy, which holds that the presence of a low-income class is a strategy for control of the capitalist economic system or the bourgeoisie. This necessitates government action to ensure a level playing field for equitable and defensible wealth acquisition and redistribution. Poverty, according to structural theorists, is caused by the structure of the wider socioeconomic system. The macrostructure of society produces inequality, which contributes to

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impoverishment (Abduli & Shamshiry, 2014). Schiller (1998), referring to this viewpoint as "*limited opportunity*," stated that the poor are poor since this system has discriminated towards them. Such people had limited access to education, employment, and housing, among other things. They do not receive any tax advantages or many of the public utilities. With such severe external impediments or structural bottlenecks, the poor have little prospect of escaping poverty. According to Bici (2017), education level is a significant factor that determines not just the chance of getting a decent, well-paying work, but also the individual's notion of a higher quality of life, better health care, and not being alienated.

As asserted by Hickey and Bracking (2005), chronic poverty is a sign of its institutionalisation inside social and political rules and customs, as well as its legitimisation within a political discussion. Hence, Hickey and Bracking (2005) advocated for resource reallocation and distribution and a shift in the power structures that underpin structural poverty. Ozili (2018) explained the favourable association between digital financial inclusion and education. Other studies, such as Kempson et al. (2013), and Ozili (2018), found that a low level of FL and poor knowledge of financial networks can reduce clients' patronage of financial channels to perform essential financial platforms. Richardson Jr and London (2007), focusing on rural poverty, revealed that the relationship between deprivation and systemic inequalities is systemic and causal. They advocated for an approach to break down these barriers and then promote rural economies. Nonetheless, Katz (2013) said unequivocally that the fight against structural poverty is targeted solely at increasing the poor's

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ability to fend for themselves, not at changing individuals into passive and permanent users of aid programmes.

According to Triki and Faye (2013), innovation is required to guarantee that adequate financial services and instruments are put in place for the benefit of the poor and other vulnerable groups in order to continue the spread of financial services to the groups who have yet to be reached. Chakrabarty (2012) highlighted that the growing penetration of technology worldwide had elevated the significance of technology in FI, emphasising the need to incorporate technological advancements in FI activities.

The cyclical Theory of Poverty

Cyclical poverty was explained as pervasive poverty; the period of its presence is brief (Sen, 2008). This type of poverty occurs when people or family units cannot unexpectedly give out their basic needs caused by unexpected catastrophes. Relating to the influences of cyclical poverty in agricultural and industrial communities, the primary stimuli of cyclical poverty in agrarian economies are a natural occurrence and/or poor agricultural preparation, which result in an interim lack of food. In industrialised economies, cyclical poverty is triggered mainly by variations in the business cycle, with rising unemployment throughout periods of depression or severe economic downturn. The global recession of 2008, caused by the financial crisis, is an example of cyclical poverty causative factors. Following this economic recession, most of the workforce who are well above the poverty threshold tumbled into poverty.

Conversely, Green and Hulme (2005) stated that persistent poverty within the shorter-term cycles of exclusion that people feel the consequences

of seasonal changes, a recession in the economic cycle, or momentary shocks in household rates. Transitory poverty, unlike chronic poverty, is when individuals move in and out of poverty (Hickey & Bracking, 2005), cyclical poverty could seem short-lived in part as individuals who suffer it can transition in and out at the beginning of its causes. In that view, several practical policy actions should be adopted, with the government in the lead, to contain the adverse effects of cyclical poverty.

Blank Theories of Poverty

According to Blank (2003), six primary theoretical methods define the essential causes of individual and household poverty. Starting from the first theoretical perspective, poverty is caused by poor economic performance. That is, households and people are impoverished because their market mechanisms are ineffective and inefficient such as are weak and unproductive financial market systems. Blank maintains that this phenomenon is widespread in developing economies including Ghana. So here, households' lack of access to credit, poor microinsurance provisions including accessibility, lack of bank accounts for savings and receipt of remittances are all due to ineffectiveness and inefficiencies of the financial market systems. Thus, the prevalence of flaws and bottlenecks in financial market structures prevents households from making long-term investment choices, causing them to remain impoverished (Blank, 2003). Using third-world poverty as an example, Bank (2003) proposed decreasing poverty by expanding marketplaces to poor households facing economic stagnation.

According to Blank's (2003) second theoretical approach, poverty emerges because certain people in financial markets are either unwilling or

unable to engage successfully. According to Blank, advocates of this theoretical approach think that impoverished families and individuals are poor for the reason that they either lack the necessary skills to equip them for effective market involvement or are just too young or too elderly to participate in the market. From this theoretical approach, it follows that the age and educational level of the household head has a strong influence on the home's poverty level. In a larger sense, this viewpoint incorporates the number of dependents (young or old) in a home as factors of the household's poverty. For people who are not participating in the market because they lack productive skills or resources, launching appropriate education and ensuring supplies more available can quickly alleviate their difficulties.

According to the third theoretical viewpoint, the market is defective and causes poverty. Blank's third theoretical position asserts that the "market is intrinsically broken," resulting in poverty. According to this Marxist position, the bourgeoisie lowers the cost of labour by threatening unemployment, leaving the people in poverty. In this case, a household head's degree of work is a primary determinant of the home's poverty level. According to the fourth theoretical approach, poverty is caused by political and social processes outside of the market. This fourth viewpoint highlights "social and political dynamics" that arise at the external market and lead to poverty, such as governmental favouritism and racism.

Poverty is related to "individual behavioural qualities and choices," such as size of family, marriage or substance or alcohol misuse, according to the fifth theoretical approach. According to this theoretical approach, the poverty level of households is determined by the size of the household and the

marital status of the household head. The sixth and seventh viewpoint contends that poverty is produced by means to lessen venerability, this is termed to as "*welfare dependency or poverty traps*." Economists feel that wellbeing offers a definite monetary return, whereas taxes create work disincentive. Time-limited aid and job restrictions are viewed as acceptable strategies.

Jung and Smith (2007) developed a conceptual map that connects Blank's six poverty viewpoints to their theoretical underpinnings in economics into three theories. The first two viewpoints (lack of human capital and economic underdevelopment) are widely held in "liberal economics," which holds that the market may foster economic growth. The second and third are "Marxian" or "political-economic" ideas (capitalism creates poverty) (economic and social forces cause poverty). The last set of opinions (individual behaviours produce poverty and welfare reliance causes poverty) reflects "classical economics" conventional viewpoints. Thus, inadequate access to credit, bank accounts for deposits and receipt of remittances, family size, educational level, age and household head can determine the household's poverty rate.

Transient Theory of Poverty

According to Jalan and Ravallion (2000), transient or transitory poverty is defined as the influence of consumption flexibility over time to likely consumption poverty. This form of poverty results from people's susceptibility to a decline in their living standards; typically, non-poor people could suddenly fall into poverty, or people who do not live far below the poverty line could suddenly fall into severe poverty. Transient poor are

households whose food expenditures are expected to fall below the national food poverty line (Mehta & Shah, 2003). Transient or transitory poverty is often caused by vulnerability resulting from lack of access to credit, savings and microinsurance (Jalan & Ravallion, 2000).

Transitory poverty theory holds that microinsurance and income-stabilisation schemes such as credit, savings and remittances can help protect households against income shocks hence keeping them out of transitory poverty. Thus, microinsurance and income-stabilization schemes are critical policy interventions when poverty is transient (Jalan & Ravallion, 2007). Hulme and Shepherd (2003) held a similar stance several years later, arguing that micro-credit is highly acceptable in countries where poverty is largely a transitory phenomenon. Recent studies confirm that household vulnerability is dependent upon factors like lack of access to loans, microinsurance and savings, which increase the likelihood of exposure as well as limit their ability to cope with the consequences (Abraham, 2018; Devereux, 2002; Dorward, Kydd, Maorrison & Urey, 2004).

Empirical Review

This section presents the empirical review of already existing studies on the subject matter of this study. Specifically, empirical literature on the objectives of the study is presented in this section.

Financial Inclusion, Gender Inequality and Locality

Earlier studies have shown that financial inclusions remained driven by gender, age, employment status, income, education, marital status, residence area, household size and degree of confidence in financial institutions. According to extant empirical research, access to finance helps to

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decrease poverty and inequality by increasing and flattening consumption, making education, savings, and healthcare more accessible, and strengthening users' social standing (Hawkins, 2009; Cull, Ehrbeck & Holler, 2012; Levine, Loayza & Beck, 2000). On the other side, there is evidence of worsening welfare states due to household access to finance (Diagne & Zeller, 2001). In this context, it is self-evident that the link between financial inclusion and wellbeing is non-linear and inconclusive. It is crucial to generate the welfare advantages of access to finance to ensure that eliminating poverty and inequality is required for inclusive growth.

Gender appears to be a significant determinant of broader macroeconomic results, including economic growth (Duflo, 2012). Many gender inequality issues (such as wage, employment, and income gap) are relatively well documented in both developed and developing countries. A gender perspective is even more relevant, given that women are often marginalised in societies. Such marginalisation of access and use of financial services may negatively affect women's welfare and communities as a whole (Aterido, Beck & Iacovone, 2013). A gender gap in financial inclusion is confirmed chiefly, especially in developing countries, due to high gender inequality in wage, employment, income, and education. Demirgüç-Kunt, et al. (2013) show that, in the case of developing countries, women are more often excluded from the use of financial services and that the consequences of their financial exclusion are related to inequality in terms of income, education and employment status. Malapit (2012) discovered that as compared to men, women are 11% more credit constrained in the Philippines. In the case of

SSA, Aterido, Beck, and Iacovone (2013) provide evidence supporting a gender gap in the use of financial services.

However, while paying close attention to gender issues in financial inclusion is increasingly important, achieving a gender balance remains a challenge (Ghosh & Vinod, 2017). Since women are disadvantaged in ownership, access, and use of productive resources, males are more likely to be financially included than females (Swamy, 2014; Gosh & Vinod, 2017; Quisumbing & Pandolfelli, 2010). According to surveys and randomised control trials, women who have finance benefit from it (Ashraf, Karlan & Yin, 2013; Karlan & Zinman, 2010). Furthermore, most studies concentrate on disparities in access to finance (for enterprise or consumption) rather than the welfare consequences of this access and seldom include a gender perspective. For instance, Aterido et al. (2013), Asiedu et al. (2013), Presbitero et al. (2014), Kairiza et al. (2017) and Muravyev, et al. (2009) look at gender differences in access to finance for entrepreneurship, but not at the welfare effects of this access. They all show that female entrepreneurs are not as likely as their male counterparts to be financially involved in the informal financial markets.

Advocates of the gender gap in financial inclusion point out that female entrepreneurs frequently confront unique challenges that keep them out of traditional financial markets (Coleman & Robb, 2009; Carter & Shaw, 2006). They point out that conventional financial institutions have strict and precise standards for one to be financially integrated, such as collateral or evidence of domicile, which female entrepreneurs are often unlikely to be able to meet. This is due, in part, to existing land and property rights and cultural

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norms that discriminate against them (Fletschner, 2008; Demirgüç-Kunt et al., 2013). According to Demirgüç-Kunt et al. (2013a), nations with laws encouraging women to own assets have more women owning accounts. Women are less likely to be official land, property, or asset owners. Only a quarter of women in Uganda, for example, own the land on which they cultivate. Furthermore, it is proposed that formal financial institutions experience knowledge asymmetry because of a lack of trustworthy information on women, resulting in MSME financial inclusion for women who are disproportionately affected by these restrictions (Buvinic & Berger, 1990). Female entrepreneurs, in general, have less experience interacting with official institutions, such as formal positions. Such interactions with formal institutions typically produce an audit trail of information that formal financial institutions may utilize to provide services. Female entrepreneurs are likely to be excluded from formal financial markets due to these obstacles. Yet, these insightful studies have completely neglected the case of Ghana. There are limited empirical studies on gender issues related to financial inclusion and literacy in Ghana.

Exploiting disaggregated household-level data for India, Ghosh and Vinod (2017) revealed that on average, female-headed households are eight per cent less likely to access formal finance compared to households that are headed by males. As a consequence, households headed by females use 20 per cent less cash loans as compared to male-headed households. The literature widely recognises that removing the gender gap in financial inclusion is essential to promote women's economic and social empowerment and boost countries' development (Ghosh & Vinod, 2017). In a recent study Koomson,

Villano, and Hadley (2020) found that female-headed households are more likely to experience the positive effects of greater financial inclusion in terms of poverty reduction than male households. Furthermore, financial inclusion reduces poverty and vulnerability to poverty more in rural than in urban areas. All these insightful studies have ignored the females in Ghana.

According to studies (using value-added per worker as a measure of firm performance), women are six percent less productive than males in Sub-Saharan Africa (Hallward-Driemeier, 2011). Female-owned MSMEs outperform male-owned MSMEs, according to research on Micro, Small, and Medium Enterprises (MSMEs) (Sirec & Mocnik, 2012; Watson & Robinson 2003; Welch et al. 2008). Gender inequalities in financial inclusion have been proposed as one of the defining factors for female entrepreneurs' underperformance (Allen, 2014; Brush et al., 2018; Cull et al., 2007; Demirgüç-Kunt & Klapper, 2012; Dupas &Robinson, 2013). The World Bank's 2011 Women, Enterprise, and Law index and the African Development Bank's 2015 Gender Equality Index demonstrate significant gender discrimination in access to financing, particularly for business. According to the World Bank, women suffer disproportionately large financial hurdles to participating in and improving their lives. This has ramifications for economic growth, as women account for over 40% of the worldwide workforce.

However, few of this studies target developing countries such as Ghana. Cross-country and country-specific research have shown contradictory findings of the role of gender in affecting an individual's level of financial inclusion. Aterido et al. (2013), Zins and Weill (2016), and Fanta and

Mutsonziwa (2016) discovered no support for gender inequalities in access to finance. This calls for the need to conduct such studies in Ghana due to the difficulties in distinguishing rural and urban features in cross-country surveys. Also, data from individual countries show that urban residents, particularly in developed countries, have significantly more access to finance than rural communities (Demirgüç-Kunt et al., 2018), implying that the correlations between FI, poverty, are likely to show gender and locational variations (Swamy, 2014), which should be investigated. In order to lift these rural unbanked people out of extreme poverty and other hardship, they must be included in the banking system (Chhikara & Kodan, 2013).

The salary disparity between cities and rural areas accounts for a sizable share of overall income inequality (Young, 2013). Because of the different levels of existing infrastructure, the rate at which financial services expand varies by region (Beck, Demirguc-Kunt, & Peria, 2007; Andrianaivo & Kpodar, 2011). Starting a branch in a developed location with a well-established infrastructure is substantially more straightforward. It takes time to build networking facilities and educate workers to utilize them. As a result, financial inclusion would be simpler to attain in urban regions, and the benefits of financial inclusion would be recognized sooner, leading to an increase in the urban-rural gap. Furthermore, the low level of education in rural populations might limit access to financial services and reduce the impact of financial inclusion (Ardic et al., 2011; Atkinson & Messy, 2013; Cole, Sampson, & Zia, 2011). In the long run, when individuals in rural places get more education, the income-boosting effect of financial inclusion will occur, lessening urban-rural disparity.

According to the evidence, the exclusion distance has spatial and geographic aspects. Beck et al. (2009) underlined that wealthier locations are preferred by formal mainstream financial service providers over impoverished neighbourhoods. Geographic location was identified as a critical impediment to financial access among poor households in LICs. Empirical research suggests that households closer to banks are far more likely to possess and use financial products and services than those further away (Brown, Guin, & Kirschenmann, 2015). In Ghana, Ackah and Asiamah (2014) discovered a similar urban-rural difference in credit access. This gap might be partly explained by high illiteracy, inequality, and fees (Beck & Demirgüç-Kunt, 2008). However, there is limited empirical literature that measures financial inclusion inequality and FI gap and what cause those gaps to exist in Ghana. Hence, this study seeks to fill the gap in the literature by evaluating the drivers of financial inclusion gender and locality gaps and assess whether the gaps have increased over time in Ghana.

Combined effect of Financial Literacy and Financial Inclusion on poverty

Despite the fact that various financial products are available nowadays (Pepinsky, 2013), the public must have financial intelligence to effectively use it. In other word, the community is expected to make the most out of the money they already have by applying intelligent and accurate management procedures (Mosley & Hulme, 1998). Individuals and households with financial literacy can analyze the risks associated with sophisticated financial products. It is also well recognized that the importance of financial literacy helps not only society but also financial institutions (Prete, 2013). People will be obliged to purchase one goods once they comprehend them—

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for instance, insurance, bank loans, or savings in a bank. People who previously saved their money on their own will now save it at a bank after learning about financial services. Financial literacy refers to the capacity to make well-informed judgments and make effective choices about capital consumption and management, such as balancing a bank account, setting budgets, saving for the future, and mastering debt management and avoidance tactics (Marcolin & Abraham, 2006). Customers that are highly educated execute better financial decisions for themselves and their businesses, contribute to the efficiency of the financial system by seeking better innovative financial services, and seek financial inclusion. If financial literacy does improve financial inclusion, there appears to be a significant policy message here (Grohmann et al., 2018)

Research on the relationship between financial literacy (FI) and financial inclusion has advanced. Studies demonstrate that financial literacy has a favourable influence on financial market involvement, particularly in developed nations (Chen & Volpe, 1998; Grohmann, Klühs, & Menkhoff, 2018; Sangeetha, Mathew, & Francline, 2017). Recent research, however, is focusing efforts on finding this critical relationship in developing economies (Tustin, 2010; Warchira & Mkihiu, 2012). According to the FinScope Survey in Uganda, the nation has a generally poor level of financial literacy, with most persons lacking fundamental personal financing concepts and being unable to grasp topics such as interest rate, discount rate, and cash lending, resulting in limited access to credit (Akileng, Lawino, & Nzibonera, 2018). According to Yushita and Amanita (2017), the degree of financial literacy in industrialised countries is often poor.

MSMEs' performance and sustainability might benefit from improved financial knowledge (Aribawa, 2016 & Klapper et al., 2012). Widayanti et al. (2017) discovered that financial literacy has a 28.9 per cent impact on the survival of SMEs. Individuals living in cities are more likely to be financially literate than those living in rural regions. According to Akshita (2016), women in urban regions are significantly more knowledgeable than women in rural areas, implying that many women have a favourable attitude toward money and finance, reflecting their caution, attentiveness, and vigilance while dealing with home finances. A survey conducted in the US by the Employee Benefit Research Institute (VanDerhei, & Copeland, 2010) discovered that financial literacy is useful in life stages where appropriate choices are taken, and as such, financial education at these stages can effectively alter behaviour relating to retirement planning and saving.

However, there is limited empirical literature that measures the combined effects of financial inclusion inequality and financial literacy in estimating the relationship between poverty and district financial inclusion inequality in Ghana. There have been few research on the relationship between Financial Literacy (FI) and Financial Inclusion (FI) in Ghana. Berry et al. (2015) revealed that the FL substantially influenced FI through their savings behaviour in two randomly delivered school-based programs. Mireku (2015) examined 3,932 students from 12 colleges and discovered that FL had a favourable influence on students' financial attitudes, decisions, and behaviours. According to Boakye and Amankwah (2012), there is a strong and favourable relationship between the FL and the usage of financial goods. Nunoo and Andoh (2012) discovered that the FL level of SME owners is

critical to explaining their FI level. Chowa (2015) used the RCT to promote the Youth FI program and proposed a call for the FL to promote the FI (savings). All these studies completely ignored the combined effect of both FI and FL on poverty and inequality reduction in Ghana. Hence, this study seeks to fill the gap in the literature by evaluating the effect of combined effect of FI and FL on poverty in Ghana.

Financial Inclusion and Poverty

The section reviews empirical works done by others on the effect of FI on poverty and income inequality. Several works have been done in both developed and developing countries about the effect of FI on poverty, and these studies have precipitated mixed findings in some instances. Again, some studies have focused on the macro-level, while others have been concerned with the micro-level.

Sharma (2016) asserted that the availability of credit through well-developed financial institutions, particularly cooperative banks, acts as a stimulus for socioeconomic resilience and economic progress. This access aids in the development of self-confidence, the promotion of social inclusion, the acquisition of financial empowerment, and, as a result, the social and economic empowerment of the rural population, particularly the poor, socially deprived, weak rural families and women (Divya, 2014; Uma et al., 2013; Paramasivan & Ganeshkumar, 2013). Micro data surveys (Allen et al., 2014; Demirguc-Kunt, Klapper, & Singer, 2017) often look at financial inclusion drivers one at a time. Swain (2002) examined the level of credit restriction in rural India and discovered that at least 60% of families were credit-deprived for not satisfying their official credit requirement.

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Financially literate consumers have been shown to own more financial goods and to be productive investors, implying that financial literacy has had a positive and significant influence on investment decision-making (Atkinson & Messy, 2013; Huang et al., 2021; Cohen & Nelson, 2011; Putri et al. 2019; Van Rooij et al. 2011a; Capuano & Ramsay, 2011). Financial efficiency is the product of financial knowledge (Capuano and Ramsay, 2011). The usage of financial goods and expenditures without squandering money or incurring unnecessary fees is financial efficiency. Consequently, the most outstanding value product and the lowest possible price for a particular product or service on the market are chosen. Consequently, financial literacy allows clients to live more efficiently, eliminating unnecessary expenditures and waste.

Huang et al. (2021) showed that access, depth, efficiency, and overall development of financial institutions significantly impact economic growth in European countries. Emara and Said (2021) empirically investigated the relationship between financial inclusion, governance, and economic growth in 44 emerging markets (EMs) and MENA over the period 1990 to 2018 and find that financial inclusion has a positive and statistically significant impact on economic growth, but requires better institutional quality. Cabeza-García et al. (2019) provided evidence which suggests that greater financial inclusion of women, measured by bank account ownership and credit card access, has a positive effect on economic development. Chuc et al. (2022) investigated the joint impact of international remittance inflows and financial inclusion on income growth in 60 low- and middle-income countries from 1996 to 2017.

The results show that financial inclusion could strengthen the growth-enhancing effect of remittances.

Amponsah et al. (2021) indicated that financial inclusion exhibits an inverted- U-shaped relationship with inclusive growth in Sub-Saharan Africa. Kim (2016) found that financial inclusion improves the relationship between income inequality and economic growth. The reduction in income inequality through financial inclusion changes the negative relationship between income inequality and economic growth into a positive relationship. Individuals require a variety of savings and investment products for wealth creation, depending on their level of financial literacy and risk tolerance of which these studies have ignored.

Farmers can satisfy consumer and social needs (food, health care, school fees, and funeral costs) because financial inclusion expands access to financial services such as loans, deposits, insurance, and other non-financial commodities without diverting funds from agricultural projects (Adeola & Evans, 2017, Brune et al., 2016). This method will spend the required capital in agriculture, improving productivity and output capacity. Farmers may also borrow at low-interest rates, make timely investment decisions, effectively deploy productive capital, and improve their productive capacity in an inclusive financial system (Adeola & Evans, 2017; Evans & Lawanson, 2017; Olaniyi, 2017; Sarma & Pais, 2011).

Much empirical research has revealed that a lack of access to continuous financial services is a key issue in poverty and economic inequality, particularly in developing countries (Beck & Demirgüç-Kunt, 2008; McKenzie & Woodruff, 2008). According to Beck et al. (2007), the

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increase of bank branches would reduce financial inequality in the United States. There have also been studies on commercial bank deregulation and income disparity reduction. Financial inclusion through the expansion of bank branches and access, according to Beck, Levine, and Levkov (2007) in the US, Burgess and Pande (2005) in India, Giné and Townsend (2004) in Thailand, and Karlan and Zinman (2006) in South Africa, would lead to a statistically significant decrease in income inequality. Increased financial inclusion, as recommended by Dabla-Norris (2015), will reduce income inequality by extending access (or decreasing participation costs) to the underprivileged.

Financial inclusion is viewed as pro-poor and pro-growth (Sarath and Manju, 2010; Beck et al., 2007; Sarma and Pais, 2010). According to Sarma and Pais, (2010) this research, financial inclusion enables low-income households to access essential financial services such as savings, credit, and insurance, promoting financial autonomy and accelerating economic growth. They contended that better financial services drive economic growth while lowering poverty and wealth inequality. Financial inclusion drastically decreases poverty rates, emphasising the importance of rising income levels in decreasing poverty rates, which tends to be pro-poor at the end (Cyn-Young and Rogelio,2015),). Credit availability has been shown to have a favourable consumption-smoothing impact on low-income households (Johnston & Morduch, 2008). In most circumstances, the indirect effect of financial inclusion is growth-inducing.

According to a 2015 Microcredit Summit Campaign report, 3,098 MFIs touched more than 211 million clients in 2013, with 114 million of them living in extreme poverty. Women made up 82.6 per cent of the lowest

clientele (more than 94 million). According to Zhuang et al., 2009, microfinance improves households' economic and social well-being while eliminating poverty. Bolivia, India (Imai, Arun, & Annim, 2010), Nigeria (Okpara, 2010), Sri Lanka (Shaw, 2004), Central America (Hiatt & Woodworth, 2006), and Africa have all acknowledged the good effect of microfinance in poverty reduction (Navajas, Schreiner, Meyer, Gonzalez-Vega, & Rodriguez-Meza, 2000).

Additional evidence that if individuals have access to structured insurance, they will pursue higher risk and return technologies (Rosenzweig and Binswanger, 2016). Using a randomised control experiment in China, Cai et al. (2010) discovered that offering structured insurance to small pig farmers improves the number of sows reared significantly. Conversely, Van Rooyen, Stewart, and De Wet (2012) evaluated the impact of microcredit and micro-savings on SSA impoverished people. They discovered that microfinance might increase poverty, lower education levels, and empower women in some cases. Weiss and Montgomery (2005) studied data from Asia and Latin America and found no indication that microfinance reaches the poorest people in these countries. Chowdhury (2009) critically evaluated the dispute over the usefulness of microfinance as a standard tool for poverty alleviation and found that the influence of microfinance on poverty alleviation remained debatable. Yet, all these studies are conducted in advanced countries and have neglected the case of Ghana.

Financial Inclusion is primarily concerned with unrestricted access to accessible financial transactions, critical for the economy's growth. As a result, the impact of fair access to and use of financial products and services as key

factors in overall national growth must be explored. The reality is that some of the households in Ghana's rural areas either lack access to or are ignorant of the financial services and related instruments available in the financial ecosystem. There have been investigations in the case of Ghana as to whether FI only or FL alone reduce poverty but the issues concerning the effect of district-level FI inequality on poverty in Ghana has not been addressed. These pose a gap in the literature which the study seeks to investigate. Hence, this study seeks to investigate the effect of district-level financial inclusion inequality on household poverty in Ghana.

Summary of the chapter

In conclusion, this literature review has highlighted the theoretical foundations for the study. It concentrates on the importance of the theories, measurements, and the relations between the theories. It also considers the hypotheses that have been used to investigate the relationships. It also considers the hypotheses that have been used to investigate the relationships between financial inclusion and household poverty alleviation, financial inclusion and disparities in locality and gender, and financial literacy and financial inclusion both theoretically and empirically. The literature review discloses that there have been investigations in the case of Ghana as to whether FI only or FL alone reduce poverty but have not considered if both can further reduce poverty. This poses a gap in the literature. Hence, this study seeks to analyse FI gender and locality gaps, evaluate the combined effects of FI and FL on poverty and finally investigate the effect of district-level financial inclusion inequality on household poverty in Ghana. Finally, a conceptual structure is used to demonstrate the links between financial

inclusion, financial literacy, and household poverty, which will serve as the study's foundation.

CHAPTER THREE

RESEARCH METHODS

Overview

This chapter entails the study's procedure, focusing on the study design and the theoretical framework of the study. The empirical model strategies and techniques are also presented in this chapter. It also offers model definitions, rationale, variable measurement, data sources, estimate strategies, and post-estimation diagnostics.

Research Design- Positivist Philosophy

The hypotheses of the study are addressed by using the quantitative research technique consistent with positivist philosophy. The selection of this research strategy is necessary due to not only the quantitative nature of the study but also because it has been determined to help analyse a condition, phenomenon, or problem by evaluating a sample of the population at one moment in time (Litvin et al., 2008). This philosophy makes reproductivity and duplication possible and comparable. Once the positivist research assumptions are satisfied, it has a high possibility of dependability, allowing confident replication or repeats in similar contexts.

The positivist belief holds that the factual experience pursued methodically by researchers is founded on interactive rules (Acquah et al., 2013). Furthermore, positivist viewpoint implies that knowledge is externally objective and that researchers hold rigorously impartial and detached views toward the thing being studied. Such a posture assures that the researcher's views and prejudices do not influence the study and jeopardise its validity (Eberhardt & Teal, 2011). Positivists assess the rigour of quantitative research

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based on their validity, reliability, objectivity, accuracy, and generalisability, intending to describe, predict, and verify empirical correlations in relatively controlled environments based on a scientific method of enquiry. The study adopted this design because data on the respondents' already observable characteristics were analysed.

Sources and type of data

Secondary data sources were used for the analyses of this study which were based on the objectives of the research. Objectives one and three were analysed using the sixth and seventh rounds of the Ghana Living Standards Survey, respectively (GLSS R6 and R7) data. The GLSS data is a household probability sample survey that provides various analyses across several domains of interest. The data was collected in the whole of Ghana. Over 16,772 families were chosen for the sixth round (R6) of interviews, while 14,009 households were also chosen for the seventh round (R7). They comprised the study's sample size. The focal sections of the GLSS R6 and R7 were credit, assets, savings, and usage of financial services and additional sections on household demographic and economic variables. Other variables gathered from the GLSS R6 and R7 on household demographic and economic indicators sections. These included the age and gender of the household head, household size, location, educational level, marital status, employment status, religion, and region.

Also, the InterMedia's Financial Inclusion Insight (FII) survey (2015) data was used to analyse the results of objective two. The FII team conducts regular survey and mixed-method research in Rwanda, Ghana, Kenya, Tanzania, Uganda, Nigeria, India, Pakistan, Bangladesh, and Indonesia to

track access to and demand for financial services in general and the uptake and use of DFS in particular; measure adoption and use of DFS among key target groups (females, rural, unbanked, etc.); identify drivers and barriers to further DFS adoption; evaluate agent experience and mobile money

A nationwide representative sample of Ghanaian homes was interviewed with the maximum of 64 minutes (CGAP, 2015). Using a multi-stage sampling approach, the survey was conducted during a two-month period (from the 1st of December 2014 to the 3rd of January 2015). Other modules addressed in the survey include education, health, employment, agriculture, and demographic variables. The Grameen Progress Out of Poverty Index was used to calculate poverty levels. Access/use of mobile devices, access/use of mobile money, access/use of formal financial services (e.g., bank accounts), access and use of semi-formal and informal financial services (e.g., SACCO, MFI, SUSU, cooperatives, self-help groups), FL and preparedness, and financial module technical literacy were among the variables collected.

Modelling effects of Financial Inclusion, Financial Literacy and Financial Inclusion Inequality on poverty

This aspect of the chapter deals with the modelling and empirical estimation of the study. Specifically, it involves the theoretical model specification and empirical economic model specification.

Theoretical Model Specification

Following the theoretical poverty framework of Jung and Smith (2007) and Blank (2003), poverty emanated from six factors: individual characteristics and behaviour; human capital development; social and political factors; anti-poverty programmes; market dysfunction; and economic under-

development. The transitory poverty theory holds that microinsurance and income-stabilisation schemes such as savings and remittances are more important policy instruments for combating poverty (Jalan & Ravallion, 2000; Lipton & Ravallion, 1995). Following these theories, we specify that lack of access to credit, bank accounts for savings and receipts of remittances, which is indexed as FI, FL, household size, age and educational level of household head keenly determine the poverty level of the household, therefore, the theoretical poverty model is stated in equation (1) as:

$$y_i = \int (a_0 . a_i x_i, a_{ii} x_{ii}, \dots, a_n x_n) \tag{1}$$

Where y_i is the household poverty $a_{ii} x_{ii}$ is the vector of household or community characteristics that affect the poverty level of household and $a_i x_i$ is also the financial services/ products.

Poverty $= \int$ (employment, education, financial inclusion, financial literacy, marital status, region, locality, gender, household size and age) $\tag{2}$

Modelling of FI Differences between Gender and Locality

This part of the chapter indicates the methodological part of objective one of the thesis. It comprises the FI differences that exist in gender and locality for GLSS rounds 6 and 7. The study adopted the counterfactual decomposition technique which encapsulates Oaxaca decomposition and other related decompositions such as Cotton, Reimers and Neumark.

Counterfactual Decomposition Technique

Although this approach has been frequently utilised in economics to investigate gender and race discrimination in the labour market, it may be used to explain variations in any continuous result between any two groups (Armah et al., 2016). The Blinder-Oaxaca decompositions (Oaxaca, 1973 & Jann,

2008) counterfactual decomposition approach employed in this study explains the discrepancy in the means of FI between two groups (in this case, male and female; urban and rural) in Ghana. The gap is divided into two parts: the portion caused by group variance in the magnitudes of the determinants of FI, on the one hand, and the part caused by group variations in the impacts of these determinants, on the other. Individuals in rural Ghana, for example, may be less financially integrated not just because they have fewer banking facilities but also because they are less aware of how to acquire the best financial goods (World Bank, 2018; CGAP, 2015). Financial inclusion is our outcome variable of interest. There are two groups—urban and rural and male and female. Adopting Armah et al. (2016) model, we assume FI is explained by a vector of determinants, x, in equation (3):

$$y_i = \{\beta_{xi}^{rural} + \varepsilon_i^{rural} \; if \; rural \; \beta_{xi}^{urban}$$
$$+ \; \varepsilon_i^{urban} \; if \; urban \qquad\qquad (3)$$

where the vectors of β parameters comprise intercepts and locality. In the instance of a single regressor, the urban regression line is presumed to be more favourable than the rural regression line. The outcome, y, improves with increasing x. Furthermore, the urban is supposed to have a higher mean x. As a result, rural areas have a lower mean value of y than urban areas. In the case of the rural, we explain the equation for the rural above x^{rural}, giving a value of y equal to y^{rural}. In the case of the urban, we translate the equation for the urban above x^{urban}, giving a value of y equal to y^{urban}.

The gap between the mean outcomes, y^{urban} and y^{rural}, is equal to

$$y^{urban} - y^{rural} = B^{urban} x^{urban} - B^{rural} x^{rural} \qquad\qquad (4)$$

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where x^{urban} and x^{rural} are vectors of explanatory variables evaluated at the means for the urban and the rural, respectively. Assuming exogeneity, the conditional expectations of the error terms are zero. For example, if we have just two x's, x_1 and x2, we can write the following:

$$y^{urban} - y^{rural} = (\beta_0^{urban} - \beta_0^{rural})(\beta_1^{urban} x_1^{urban} - \beta_1^{rural} x_1^{rural}) +$$

$$\beta_2^{urban} x_2^{urban} - \beta_2^{rural} x_2^{rural} = G_0 + G_1 + G_2 \tag{5}$$

So the variation in y between the urban and rural may be attributed to (i) differences in the slope (G_0), (ii) differences in x_1 and β_1 (G_1), and (iii) differences in x_2 and β_2 (G_2). For example, G_1 might measure the part of the gap in mean FI status (y) caused by differences in educational attainment (x_1) and the effects of educational attainment (β_1), and G_2 might measure the part of the gap due to the gap in accessibility to financial institution (x_2) and differences in the effects of accessibility to financial institution (β_2). Estimates of the difference in the gap in mean outcomes can be obtained by substituting sample means of the x's and estimates of the parameters β's into equation 5.

Oaxaca's Decomposition

Furthermore, we might wish to go a step further and ask how much of the overall gap or the gap specific to any one of the x's (e.g., G1 or G2) is due to (i) differences in the x's (often referred to as the explained component) rather than (ii) differences in the β's (sometimes called the unexplained component). In this context, the Oaxaca (1973) and related decompositions allow us to do so.

It is clear that the gap between the two outcomes could be expressed in either of two ways:

$$y^{urban} - y^{rural} = \Delta x \beta^{rural} - \Delta \beta x^{urban} \tag{6}$$

Where $\Delta x = x^{urban} - x^{rural}$ and $\Delta\beta = \beta^{urban} - \beta^{rural}$, or as

$$y^{urban} - y^{rural} = \Delta x\beta^{urban} - \Delta\beta x^{rural} \qquad (7)$$

In the first, the variations in the x's are measured by the rural group's coefficients and the differences in the coefficients are measured by the urban group's x's, whereas in the second, the variations in the x's are weighted by the urban group's coefficients and the differences in the coefficients are weighted by the rural group's x's. In any case, we may divide the disparity in outcomes between rural and urban areas into two parts: one related to the rural having worse x's than the urban, and the other attributable to the rural having worse $\beta's$ than the urban. These formulations are expressed as follows:

$$y^{urban} - y^{rural} = \Delta x\beta^{rural} + \Delta\beta x^{rural} + \Delta x\Delta\beta = E + C + CE \qquad (8)$$

As a result, the disparity in mean outcomes may be viewed as a result of a disparity in endowments (E), a disparity in coefficients (C), and a disparity resulting from the interplay of endowments and coefficients (CE). Equations 8 and 9 are exceptional cases in which

$$y^{urban} - y^{rural} = \Delta x\beta^{rural} + \Delta\beta x^{urban} = E + (CE + C) \qquad (9)$$

and

$$y^{urban} - y^{rural} = \Delta x\beta^{urban} + \Delta\beta x^{rural} + \Delta x\Delta\beta = (E + CE) + C \qquad (10)$$

As a result, the first decomposition positions the interaction in the inexplicable component, whereas the second positions it in the explanatory section.

Related Decompositions

Oaxaca's decomposition can alternatively be written as a subset of another decomposition:

$$y^{urban} - y^{rural} = \Delta x[D\beta^{urban} + (I - D)\beta^{rural}] + \Delta\beta[x^{urban}(I - D) + x^{rural}D)], \qquad (11)$$

Where I is the identity matrix and D is a weights matrix. In the simplest instance, x is a scalar instead of a vector, I is one, and D is a weight. D = 0 in the first decomposition, equation 8, and D = 1 in the second decomposition, equation 9. In the case of x being a vector, we have

$$D = O \ (Oaxaca) \ (equation \ 8) \tag{12}$$

$$D = 1 \ (Oaxaca) \ (equation \ 9) \tag{13}$$

There have been several formulations proposed. Cotton (1988) proposed weighting the x's differences by the mean of the coefficient vectors, yielding;

$$diag(D) = 0.5(Cotton), \tag{14}$$

where diag(D) is the diagonal of D. Reimers (1983) proposed weighting the coefficient vectors by the fractions in the two groups so that if f_{NP} is the sample proportion in the urban group, we obtain

$$diag(D) = f_{NP}(Reimers) \tag{15}$$

In addition to Oaxaca's two decompositions and the two provided by Cotton and Reimers, Neumark (1988) proposes a fifth, which uses the coefficients derived from the pooled data regression., β^p:

$$y^{urban} - y^{rural} = \Delta x \beta^p + [x^{urban}(\beta^{urban} - \beta^p) + x^{rural}(\beta^p - \beta^{rural})] \ (Neumark) \tag{16}$$

Four counterfactual decomposition techniques were used to disaggregate FI according to group differences in gender and locality into explained and unexplained, given our two groups, males and females and the outcome variable, FI, and predictors of FI. Equations 3 to 16 are also applicable to gender (male and female) FI decomposition for the household heads in Ghana since the approach, data and methodology are the same.

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Relative and Combined Effects of FI and FL on Poverty

The study's second objective entails the combined effect of FI and FL on multidimensional poverty and unidimensional poverty and the relative importance of FI and FL. The study adopted The Instrumental Variable (IV) regression and IV probit estimation techniques for the combined effect, while the relative dominance analysis technique was also adopted to determine the relative importance FI, FL and other determinants of poverty.

Multidimensional Measure of Poverty

Poverty has several dimensions, including poor health, nutrition, a lack of proper sanitation and clean water, social marginalization, a lack of education, terrible living conditions, violence, humiliation, disempowerment, and much more (Alkire & Foster, 2011; Santos & Alkire, 2011). The United Nations since 2009 has been using the human poverty index (HPI) as a comprehensive measure of poverty since poverty is a multidimensional phenomenon and not unidimensional as mostly conceived. Alkire and Santos (2011) developed the multidimensional poverty ndex (MPI). The MPI was principally introduced to improve the HPI with the strong need to move away from the unidimensional space to a multidimensional one (Alkire, Foster & Santos, 2011; Neumayer, 2012).

In two respects, the MPI differs from spending and income poverty measurements. First, the MPI shifts from a one-dimensional income (or consumption) to a multidimensional one. According to the income measure (unidimensional space), a household is poor if it is merely deprived of income. In contrast, a household is poor if it is deficient in many indices simultaneously, according to the MPI. The second way MPI deviates from the

income or spending approach is by shifting from means to ends. Thus, the MPI investigates if anybody in the home is malnourished and whether anyone has died, both of which are clear indicators of dysfunction (ends rather than means to ends). MPI does incorporate indices of resources, such as living conditions and education, although these are more direct markers of deprivation than income (Alkire, Foster, et al., 2015; Alkire, Roche, et al., 2015; Alkire & Santos, 2010; Alkire et al., 2011).

Most crucially, the MPI identifies which families are experiencing critical MDGs deprivation at the same time. Eight of the MPI's ten indicators are linked to MDG goals. As a result, the MPI is a superior tool for identifying the most vulnerable families and diverse patterns of deprivation - clusters of deprivation shared by different households. Again, the MPI is utilised to analyse the relationships between deprivations. It aids in more effectively targeting aid to the most disadvantaged, identifying poverty traps, and, as a result, strengthening the effectiveness of initiatives necessary to fulfil the MDGs (Alkire & Santos, 2011; United Nations, 2010)

Finally, the MPI's significant innovation is detecting households with overlapping deprivation. In the MPI, each household has its own profile of multidimensional poverty, which may be broken down by indicator to reveal the proportion of multidimensional poverty across various regions, ethnic groups, households, or any other demographic sub-group, with policy consequences (Alkire, & Santos, 2011).

Composition of MPI

The MPI has 10 indicators, including two for health, two for education, and six for living standards explained in details below.

Education

Within the educational component, the MPI employs two indicators that supplement one another: one looks at finished years of schooling of household members, and the other at if children are attending school. Years of education serve as a surrogate for household members' degree of knowledge and awareness. In terms of deprivation cut-offs for this dimension, the MPI requires at least one member in the family to have completed five years of schooling and that all children of school age are enrolled in grades 1 through 8.

Health

The MPI uses two health indicators. Although the two measures are connected, they differ significantly from typical health markers. The first indication examines the nutritional status of family members. Malnutrition can have long-term consequences on children's cognitive and physical development. Adults and children who are malnourished are more prone to various health problems; they are less able to study and focus and may do poorly at work. As a result, the nutritional levels of the household, particularly the youngsters, are recorded. The second indicator is based on child mortality statistics. Most child fatalities are avoidable and result from an infectious illness or diarrhoea. Child malnutrition is also a factor in child mortality. In the MPI, each household member is deemed deprived if at least one observed child death (of any age) has occurred in the family. It is critical to note that this indicator differs from typical mortality numbers.

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Living Standards

The MPI considers six characteristics when determining a person's level of living. It comprises three MDG indicators relating to health and living conditions that are especially vital for women: access to safe drinking water, better sanitation, and the use of adequate cooking fuel. (Alkire, Foster & Santos, 2011). It also contains two non-MDG indicators: electrical availability and flooring material. The last indication pertains to the possession of certain consumer items such as a radio, television, telephone, bicycle, motorcycle, automobile, truck, and refrigerator. This study used principal component analysis (PCA) to estimate the MPI.

Measuring Financial Inclusion and Financial Literacy

Since mobile money is now part of the general banking methods in today's financial sector in both developing and developed countries, the measurement of FI and FL has progressed from adults who owned accounts with formal financial institutions being considered financially included (Demirguc-Kunt & Klapper, 2012) also but with mobile money providers (Demirgüç-Kunt et al., 2015). Recent FI measures now broadly cover ownership and use of a variety of financial products and services in the financial system, including access to loans, ownership of savings accounts and insurance products, remittance receipt, and other forms of financial transfers (Demirgüç-Kunt et al., 2015; Fanta & Mutsonziwa, 2016).

Following Koomson and Ibrahim (2018), this study differs from the traditional measure of FI and FL by employing a multidimensional construct, where 14 indicators of FI— grouped under ownership of financial products, use of financial products, access to credit, and receipt of remittance, and 10 of

FL were used—grouped under knowledge in FL, financial attitude, and financial behaviour. Because all the indicators are binary, it is predicted that FI will have a minimum value of 0 and a maximum value of 14 (where 0 indicates low FI and 14 indicates high FI), and FL will have a minimum value of 0 and a maximum value of 10 (where 0 implies low FL and 10 implies high FL).

Composite indicators for FI and FL may be generated using principal component analysis (PCA) and multiple component analysis (MCA) (Amidic, Massara, & Mialou, 2014; Aslan et al., 2017; Koomson et al., 2020). MCA is more appropriate than PCA when categorical variables are compared to these two-component analyses. MCA is likewise non-parametric and does not require multivariate normality or linearity as a prerequisite (Aslam et al., 2017). Aslan et al. (2017) utilised MCA to create a unique FI index for 8 and 12 variables using World Bank Findex data from 2011 and 2014. Unlike PCA, MCA considers the percentage contribution of the dimensions while constructing an overall index. Across the many writers, a similar technique to dimension selection has been used (Peprah et al., 2020; Aslan et al., 2017). FI and FL are continuous variables in which a unit increase implies an increase in FI or FL. This study followed their footsteps by verifying that all factors utilised are connected to FI and FL. Individual and environmental factors that might impact empirical estimates were also excluded.

The study scales the coordinates by the primary inertias by applying the Burt technique to MCA and principal normalisation. Dimensions 1 in appendices 15 and 16 explain 63.05 per cent and 72.73 per cent of the changes in the FI index using GLSS data, respectively. Appendix 17 also indicates that

dimensions 1 explain 72.29 per cent of the changes in FI index using FII whiles Appendix 18 shows that when FI insight data is included, dimensions 1, 2, and 3 explain 84.82 per cent of the differences in the FL index.

Estimation Technique of Instrumental Variable (IV)

The IV regression and IV probit estimation approaches were used in this study to investigate the joint effect of FI and FL on MPI and Income poverty, respectively. The IV approach was used because FI is endogenous (Koomson et al, 2020; Koomson & Ibrahim, 2018; Swamy 2014). Endogeneity is traced back to unobserved transaction costs connected to FI and poverty; hence, proximity to the closest financial institution (kilometers) is employed to address the problem. To do this, we require an instrument or instruments that have a direct impact on FI (endogeneity) but have no direct association with (dependent variable) poverty (Cameron & Trivedi, 2010).

The proximity to the closest financial institution satisfies both conditions because it is directly related to FI; the longer the distance to the nearest financial institution, the higher the financial, material, and physiological cost, and the lesser the access level to financial services and products (Koomson, 2020; Demirg-Kunt & Klapper 2012a). In Ghana, the economy is still cash base which require withdrawing of cash from either mobile agents or financial institution. The instrument's validity was also assessed from a rural-urban perspective by referring to government initiatives aimed at increasing access to other financial institutions in Ghana to serve the needs of the rural poor first and foremost. The Wald test of exogeneity, Cragg-Donald Wald F statistic, Stock-Yogo weak ID test critical values, Under

Identification test, and Sargan statistic tests were performed to establish their validity and reliability.

In two stages, the empirical models for the predicted impacts of FI and FL are provided. The calculated link is shown in the first stage regression, where FI and FL are estimated against the variables and specified instruments. The second stage regression is then shown to illustrate the impacts of FI and FL and other variables calculated between multidimensional poverty and unidimensional poverty (income) while using the specified instruments from Koomson and Ibrahim (2018).

Empirical Model for Multidimensional Poverty

Reduced form equation (Stage 1)

$$FI_i = a_o + a_1 Age_i + a_2 Gwelfare_i + a_3 Rural_i + a_4 Male_i + a_5 DiMM_i +$$
$$a_6 HolHsize + a_7 EducLev_i + a_8 Maritstat_i + a_9 Main\,job_i +$$
$$a_{10} Gwelfare_i + \varepsilon_i \qquad (17)$$

Structural Equation (Stage 2)

$$MPI_i = \beta_o + \beta_1 Age_i + \beta_2 LOwner_i + \beta_3 EduLev_i + \beta_4 HolHsize_i +$$
$$\beta_5 Male_i + \beta_6 MaritStat_i + \beta_7 FI_i FL_i + \beta_8 FI_i + \beta_9 FL_i + \beta_{10} Rural_i +$$
$$\beta_{11} Main\,Job_i + \varepsilon_i \qquad (18)$$

$$FI_i = a_o + a_1 Age_i + a_2 Gwelfare_i + a_3 Rural_i + a_4 Male_i + a_5 DiMM_i +$$
$$a_6 HolHsize + a_7 EducLev_i + a_8 Maritstat_i + a_9 Main\,job_i +$$
$$a_{10} Gwelfare_i + \varepsilon_i \qquad (19)$$

Empirical Model for Income Poverty

Reduced form equation (Stage 1)

$$FI_i = a_o + a_1 Age_i + a_2 Gwelfare_i + a_3 Rural_i + a_4 Male_i + a_5 DiMM_i +$$

$$a_6 HolHsize + a_7 EducLev_i + a_8 Maritstat_i + a_9 Main\ job_i +$$

$$a_{10} Gwelfare_i + \varepsilon_i \tag{20}$$

Structural Equation (Stage 2)

$$PI_i = \beta_o + \beta_1 Age_i + \beta_2 LOwner_i + \beta_3 EduLev_i + \beta_4 HolHsize_i +$$

$$\beta_5 Male_i + \beta_6 MaritStat_i + \beta_7 FI_i FL_i + \beta_8 FI_i + \beta_9 FL_i + \beta_{10} Rural_i +$$

$$\beta_{11} Main\ Job_i + \varepsilon_i \tag{21}$$

$$FI_i = a_o + a_1 Age_i + a_2 LOwner_{i_i} + a_3 Rural_i + a_4 Male_i + a_5 DiMM_i +$$

$$a_6 HolHsize + a_7 EducLev_i + a_8 Maritstat_i + a_9 Main\ job_i +$$

$$a_{10} Gwelfare_i + \varepsilon_i \tag{22}$$

Where PI is dummy variable where 0 is below the poverty line and 1 is above the poverty line; FI is an index of 14 indicators; FL is an index of 10 indicators; Rural is a dummy variable for location, where 0 is for urban and 1 is for rural; Male denotes gender, where 0 is female and 1 is male; Age is the household head's age and Gwelfare represent government welfare support; Main Job is the type of employment of the household; HolHsize is household size; DiMM represent the distance to financial institution MariStat represents the marital status of the household head; and EduLev is a categorical variable for household' formal educational status where those with no formal education is the base category.

Relative Importance of FI and FL on Poverty

Dominance analyses were used to determine the relative relevance of FI and FL. Although many researchers employ regression coefficients from multiple regression analyses, these coefficients indicate the amount of unique

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variation predicted by any predictor. If the predictors are associated, as is predicted for nurse manager stressors, then regression coefficients do not effectively describe how well one predictor performs when matched to all possible permutations of the other variables. This is precisely what dominance analysis calculates: how much variation is accounted for in comparison to all other predictor combinations in the model (Azen & Budescu, 2003; Kath, et al., 2013).

A k-predictor model can be used to illustrate dominance analysis. The R^2 value for the model containing X_i as a predictor would be compared to the R^2 value for the model containing only X_k. This would indicate the R^2 contribution (ΔR^2) of X_i over X_k. Similarly, the R^2 value for the model containing X_i and X_{k-1} as predictors would be compared to the R^2 value for the model containing only X_k. This would indicate the R^2 contribution (ΔR^2) of X_i over X_k. Finally, R^2 value for the model containing X_i, X_{k-1}, and X_k as predictors would be compared to the R^2 value for the model containing only X_2 and X_3. This would indicate the R^2 contribution (ΔR^2) of X_1 over X_{k-1} and X_k. The general dominance would be calculated by averaging all three ΔR^2 values.

Dominance analysis is a simple and attractive method for identifying predictor significance that uses simply a metric of model fit (e.g., R^2) to calculate the extra contribution of every given predictor to any specified subset model. The same R2 measure is achieved in linear regression, whether the model fit is defined as the fraction of variance in the response accounted for by the predictors or the squared correlation between the observed and predicted responses. This is not the case with logistic regression. To use

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dominance analysis to probit regression, it is crucial to specify a predictor's additional contribution to the prediction model and how to assess this contribution. To extend dominance analysis to logistic regression, probit regression model fit measurements that can act as R^2 counterparts are required (Azen & Traxel, 2009).

Because general dominance needs just one comparison for each pair of predictors, this preliminary study of inferential techniques concentrated on establishing the general dominance connections among p estimators in a logistic regression model. The general dominance of one predictor (X_t) over another (X_j) was defined as the quantitative difference

$$G_{ij} = G_i - G_j \tag{23}$$

Where G_i refers to the general dominance measure associated with the predictor X_i and G_j refers to the general dominance measure associated with the predictor X_j ($i \neq j = 1, 2, .., p$). In addition, the qualitative measure D_{ij} was defined as

$$D_{ij} = \{0 \; if \; general \; domiannce \; cannot \; be \; established; that \; is, G_{ij} = 0 \; 1 \; if \; X_i \; generally \; dominates \; X_j \; so \; G_{ij} > 0, \; - 1 \; if \; X_j \; generally \; dominates \; X_i \; so \; G_{ij} < 0 \tag{24}$$

Although dominance analysis was done using all four R^2 measures, only the McFadden measure was presented since the R^2_{yy} and R^2_N, measures do not meet all four of the desirable features of R^2 analogues. Furthermore, while both the R^2_E and R^2_M measures meet all four of the desirable features of R^2 analogues, this study chose to offer just the R^2_M results since it is more understandable and mathematically simpler than the R^2_E measure. Furthermore, while the R^2_M measure may provide different quantitative results

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(D ij values) than the other log-likelihood R2 measures, the qualitative dominance outcomes obtained by these measures (D ij values) will always concur (Azen & Traxel, 2009).

McFadden's (1974) measure is denoted by $R^2{}_M$ and defined as:

$$R^2{}_M = \frac{ln(L_M)}{ln(L_0)} = 1 - \frac{ln\,ln\,(L_M)}{ln(L_0)} \qquad (25)$$

McFadden's measure typically ranges between 0 and 1 (Estrella, 1998; Menard, 2000) and is dimensionless because it is unaffected by the units of measurement of the variables in the model (Menard, 2000). The metric is also monotone (Liao & McGee, 2003; Menard, 2000). Furthermore, because it is based on log likelihoods, its value is assured not to decrease when more predictors are added to the model (Liao & McGee, 2003). Finally, theoretically and statistically, this metric closely mirrors R^2 in linear regression (Menard, 2000). Menard (2000) claims that this metric has the most intuitively logical interpretation as a proportionate decrease in error measure. As a result, $R^2{}_M$ meets all four requirements (Azen & Traxel, 2009).

Empirical Model Specification for FI Inequality and Poverty

To examine the effects of district-level financial inclusion inequality-credit, savings, remittances, and micro-insurance—on household poverty, the study used OLS and Ordered Logit regression models. The poverty model in equation (1) is specified as:

$$y_i = a_0 + \delta DisInqF_i + a_1 x_i + \varepsilon_i \qquad (26)$$

Where y_I is the consumption expenditure per adult equivalent (welfare) for household i. measured as real total household welfare status, $DisInqF_i$ is district-level financial inclusion inequality, $x_i\ are$ the other determinants of the poverty level of a household i, measured as their

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household characteristic, ε_i is the error term, measured as other factors that determine household welfare level, a_0, a_1, and δ are the coefficients of elasticity for determinants.

For this study, determinants $(DisInqF_i)$ per the theoretical perspectives, is assumed as a function of access to credit, Savings, Remittances, Micro-insurance and other exogenous factors of financial access and usage (ε_i). The formulated Equation (27) as;

$$DisInqF_i = f(\ Credit_i, Savings_i, Remitances_i, Insurance_i)$$

$$DisInqF_i = Credit_i + Savings_i + Remit_i + Insurance_i \qquad (27)$$

Where:

$Credit_i$ = credit of a household i, measured as a dummy variable with a value of 1 for the household that have credit and 0 for household that do not have credit.

$Savings_i$ = savings of a household i, measured as dummy variable with a value of 1 for the savings of household and 0 for households that do not have savings. $Remit_i$ = remittances of a household i, measured as a dummy variable with a value of 1 for the household that receives remittances and 0 for households that do not receive remittances. $Insurance_i$ = insurance policy of a household I, measured as dummy variable with a value of 1 for the households that have insurance policy and 0 for households that do not insurance policy.

For the OLS model estimation and robustness checks, the study specified the model analogous to the Annim et al. (2012) and Coulombe & Wodon (2007). The multiple regression models as specified in Equation (28) estimate the determinants of household welfare. The multiple regression

model as specified in equation (27) was used. There is an inverse relationship between welfare and poverty since an increase in the welfare level will bring about a decrease in poverty level. The empirical model for the objective is stated as:

Empirical Model for Welfare

$$welfare = a_0 + a_1 EducLev_i + a_2 Age_i + a_3 Male_i + a_4 HHsize_i +$$
$$a_5 HHsizesq_i + a_6 Agesq_i + a_7 Rural_i + a_8 Employment_i + a_9 Mast_i +$$
$$a_{10} Region_i + a_{11} \delta DisInqF_i + \varepsilon_i \quad\quad\quad (28)$$

Equation (28) is a multiple regression model and was estimated using the OLS regression. Deaton (1997) stated that level regression in poverty utilises the information on the distribution of household consumption in its entirety. Where $a_o,..,a_{10}$ and δ represent the parameters to be estimated and ε_{ij} represents the error term. The OLS estimation treats districts as independent and estimates coefficients for each district. The t-statistic for the test of significance for each of the following coefficients was estimated. The null hypothesis for the t-test for each tested coefficient is that the said coefficient is equal to zero. At 1 per cent, 5 per cent and 10 per cent levels of significance, if the test statistic is significant, the null hypothesis of the said variable ($DisInqF$) does not affect household poverty in Ghana is rejected, and hence the study concludes that the state of this factors, on the average, affect household poverty. However, if the test statistic is not significant, the null hypothesis not rejected.

The Ordered Logit Model Specification

Here, the study is interested in assessing the probability of a household being in particular poverty status. The outcomes of this binary variable occur

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with probability π_i which is a conditional probability on the explanatory variables. For a (sampled) household (i) identified in poverty status, this is represented as:

$$\pi_i \equiv \Pr(Y_i) \equiv \Pr(Y_i \mid X_i) \tag{29}$$

and thus, the conditional mean equals the probability as follows:

$$\mu Y_i \mid X_i = \pi_i \times 1 + (1 - \pi_i) \times 0 = \pi_i. \tag{30}$$

A Bernoulli distribution gives the conditional distribution of the dependent variable or random component in a Generalised Linear Model (GLM) for a binary model. Thus, the probability function of Y_i is:

$$P_Y(yi) = \pi i^{y_i}(1-\pi_i)^{1-}y_i \tag{31}$$

To ensure that the conditional mean given by the conditional probability stays between zero and one, a GLM logit link function (g) is commonly employed. The study used the logit model, $\Phi(\cdot)$ and $\Lambda(\cdot)$ are the cumulative distribution functions of the standard-normal and logistic distributions, respectively. In the binary model, the conditional mean μi is the conditional probability πi. The logit of π is the natural logarithm of the odds that the binary variable Y takes a value of one rather than zero. In that regard, this gives the relative chances of a household being multidimensionally poor. If the odds ratio is equal to one—the corresponding probability (π) of falling into the category, poor or non-poor, is 0.5, and the logit is zero. The logit model in a linear, additive form for the logarithm of odds is specified as:

$$ln\frac{\pi_i}{[1-\pi_i]} = \eta_i = \beta_0 + \beta_1 X_{ij} + \ldots\ldots\ldots + \beta_k X_{ik} \tag{32}$$

For the logistic, the multiplicative model for the odds is specified as:

$$\frac{\pi_i}{[1-\pi_i]} = e^{\eta_i\prime} = e^{\beta_0}(e^{\beta_k})^{\text{xi1}+1}\ldots\ldots(e^{\beta_k})^{\text{xik}} \tag{33}$$

The conditional probability π_i is then:

$$\pi_i = \frac{1}{[1 + e^{-\eta_i}]} = \frac{1}{[1 + e^{-\sum_{j=0}^{k} \beta_j X_{ij}}]} \tag{34}$$

The partial regression coefficients (β_j) are interpreted as marginal changes of either the logit or odds ratios. For logit, thus, the coefficient β_j indicates the change in the logit due to a one-unit increase in X_j. On the other hand, the odds ratio is interpreted as multiplicative effects on the odds. Thus, e^{β_j} is the multiplicative effect on the odds of increasing X_j by one, while holding constant the other explanatory variables. For example, if the first explanatory variable increases by one unit, the odds ratio in equation (b) associated with this increase is $e^{\eta_{i'}} = e^{\beta_0} (e^{\beta_k})^{xi1+1} \ldots (e^{\beta_k})^{xik}$ and $e^{\eta_{i'}} \div e^{\eta_i} = e^{\beta_1}$. For clarity;

e^{β_0} = the odds that the characteristic is present in an observation i when X_i = 0, i.e., at baseline.

e^{β_1} = for every unit increase in X_{i1}, the odds that the characteristic is present is multiplied by e^{β_1}.

In a nutshell, e^{β_j} is known as the odds ratio associated with a one-unit increase in X_j. But to determine the percentage change in the odds, we consider the sign of the estimated parameter. For instance, if β_j is negative, the change in X_j denotes a decrease in the odds; this decrease is obtained as (1 e^j)*100. Similarly, if β_j is positive, the change in X_j indicates an increase in the odds. In this case, the increase is obtained as (e^j 1)*100.

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In general, the logistic model stipulates that the effect of a covariate on the chance of "success" is linear on the log-odds scale, or multiplicative on the odds scale. Thus, If $\beta_j > 0$, then $e^{\beta_j} > 1$, and the odds increase.

If $\beta_j < 0$, then $e^{\beta_j} < 1$, and the odds decrease.

Empirical Model for poverty status

Therefore, the empirical ordered logit regression model is specified as:

$$PS_i = a_o + a_1 EduLev_i + a_2 Age_i + a_3 Male_i + a_4 HHsize_i + a_5 HHsizesq_i + a_6 Agesq_i + a_7 Rural_i + a_8 Employment_i + a_9 Mast_i + a_{10} Region_i + \delta DisInqF_i + \varepsilon_i \tag{35}$$

Where PS is the poverty status, Age is age of the head, $Male$ is Sex of the head, $HHsize$ is number of persons living in a household. Rural is location (captured as dummy urban=1, rural =0), $EduLev$ is the level of education of the head categorised into BECE, Secondary and Tertiary, no education is the reference category. $Mast$ is marital status of the head categorized into Widowed, Divorced, Consent union, Separated and Married marriage, Never Married as a reference category. $Employment$ is the employment level of the head also categorised into employed, retired, inactive, and unemployed. The reference category is unemployed.

Econometric specification and estimation

The type of econometric estimation techniques used in the study is the OLS and logit estimation techniques. The measurement informs the choice of OLS technique of the dependent variable (household welfare), which is continuous, with relevant explanatory variables and key hypotheses for empirical validation. The logit model mainly captured estimations on the poverty status, which was a binary dependent variable. Probit and logit models

yield quantitatively similar results where $\hat{\beta}_{logit} = 1.6\hat{\beta}_{probit}$ when the data are centred on the mean (Amemiya, 1981); however, the current study employed the ordered logit model.

The study employs the average marginal effect (AME) to analyse this objective. This study interprets AME because averaging the dummy variables in MEA will not be meaningful. The AMEs are calculated as:

$$AME = \frac{1}{n}\sum_{i=1}^{n} \blacksquare \frac{\partial E(L_i|\omega)}{\partial \omega_i} = \frac{1}{n}\sum_{i=1}^{n} \blacksquare [\lambda(\beta'\omega_i) * \beta_i] \qquad (36)$$

Where n is the number of households.

Measurement of Poverty Scores

The study measured poverty from consumption expenditure per equivalent adult (welfare). This is to give details on the dimensions of poverty. The expenditure measure consisted of household total consumption expenditure. Detail composition of each of the poverty measures is as follows:

Total Household Consumption Expenditure Measure

Consumption: The dependent variable for the regression model for the relationship between poverty and inequality is captured as a log of Welfare. This is a continuous variable representing consumption expenditure per equivalent adult in the household. Household consumption expenditure, derived from GLSS R6 and R7 data, is the total quantity of services and goods bought by households, eaten from domestic production, or exchanged as gifts or compensation in kind. The factors of consumer spending used to generate this total are divided into the following categories: 1) food consumption, 2) non-food goods (including health, education, utilities, rent, consumer durables, and other non-food expenditures). Although the process for creating household consumption has remained similar throughout time,

modifications to the household expenditure construction in the GLSS R6 were made based on the following: vacuum cleaner, VCD/DVD/mp4 player/iPad, rice cooker, electric kettle, toaster, electric kettle, water heater, tablet PC, water heater, and mobile phone user values (GSS, 2014).

Food consumption includes food consumed within the home from various sources (self-produced food, food purchases, food received as presents, transfers, and payments in kind) and food consumed outside the household (restaurants, etc.).

Education (such as tuition fees, textbooks, and so on), health (medical care and health expenses), and a variety of other non-food expenses (such as domestic fuel and power, tobacco products, clothing and footwear, transportation, recreation, personal care, miscellaneous goods and services) are examples of non-food items (GSS, 2014).

In developing nations, statistical systems employ spending statistics to analyse poverty, inequality, and social exclusion (ILO, 2003). Given the prevalence of self-employment and non-monetised economic activity in various economies, including Ghana, income figures can only be of limited utility (ILO, 2003). Furthermore, because households tend to average out their spending, consumption expenditure is a more stable indicator of poverty over time. It is also more conceptually simple, less sensitive, and likely more correctly assessed.

In addition, Deaton and Zaidi (2002) contend that consumption better represents long-term income since it is less sensitive to short-term variations in income and is smoother and less volatile than income. Seasonal trends are more likely to affect income, resulting in underestimating or overestimating

real income. Furthermore, consumption is steadier, particularly in agricultural countries, because it is smoothed across the seasons, better representing (or approaching) the accurate living level. Finally, money is considered a more sensitive subject for respondents than consumption, and there is some evidence that well-off families are less inclined to participate in or reply to surveys, resulting in an underestimating of household income disparity (Korinek et al., 2006).

Estimation of District Financial Inclusion Inequality

Theil's inequality index (1967) was derived from the concept of entropy in the information theory to estimate district financial inclusion inequality. The probability of a specific event occurring was denoted by x, and the information content was denoted h(x). The information content h(x) of noticing that an event did occur was noted as a decreasing function of x. taking the natural logarithm of the reciprocal of x;

$$h(x) = ln\frac{1}{x} \tag{37}$$

With n possible events, 1…, n, the respective probabilities were, $x_1,…, x_n$

such that $x_1 \geq 0 \; and \; \sum_{i=1}^{n} x_i = 1$. The entropy (the expected information content) can be expressed as the sum of the information content of each event weighted by the respective probabilities.

$$h(x) = \sum_{i=1}^{n} x_i h(x_i) = \sum_{i=1}^{n} x_i \, ln(\frac{1}{x_i}) \tag{38}$$

In applying this to inequality, Theil proposed that each xi be interpreted as the relative share of FI accruing to household i. Thus; $x_i = \frac{y_i}{n\mu}$.

The closer each xi is to $\frac{1}{x}$, the greater h(x) will be equal to ln(n). According to

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Theil if the entropy, h(x) is subtracted from the maximum value, an index of inequality will be generated. Thus, the Theil measure of inequality is defined as;

$$T = ln\ ln\ (n) - h(x) = \sum_{i=1}^{n} \quad x_i\ ln(nx_i) \qquad (39)$$

In the case of perfect equality, h(x) is equal to log n, and hence $T = 0$. When there is complete inequality, (where one household is highly financial included), $T = ln\ ln\ (n)$.

The Gini coefficient and the Generalized Entropy (GE) class of inequality metrics were utilized in the study to determine FI inequality. The Gini coefficient, the most generally used standard measure of inequality in empirical studies, is employed in this study to examine variations in FI inequality across the study period. The GE is chosen to break down the country's observed trend in FI inequality. The Theil Index, a member of the GE measures, is explicitly used. However, providing estimates for various indicators allows for a more comprehensive analysis of inequality in Ghana. The GE indices benefit from decomposability, which allows for the identification of the relative proportions of between and within group inequality. Variations in within-group and between-group disparity will indicate the causes of changes in FI inequality, specifically whether the growing disparity is due to high within-group disparity rather than rising between-group disparities.

The Gini Coefficient

Following Pyatt, Chen and Fei (1980), the Gini coefficient (G) is given as:

$$G = \frac{2COV(y,r)}{Ny} \qquad (40)$$

where, $2Cov(y,r)$ is the covariance between individual FI (y) and ascending rank of the individuals in the population according to the level of their FI (y,r). Hence, the less financially included individual in the population gets a rank of 1 whereas the highest financially included is ranked N. The Gini is described as "the proportion of the region between distribution's Parabola and the homogeneous distribution's parabola to the area under dispersion." The Gini coefficient ranges from 0 to 1, with 0 indicating an excellently equal distribution of FI and 1 indicating a perfectly uneven dispersion of FI.

Generalised Entropy (GE) Index

This study employed one of the General Entropy (GE) measures of inequality (Theil's index). In its most general form, decomposition of inequality measures requires a consistent relation between overall inequality and its parts. More specifically, there is a need to distinguish between within-inequality (W) and between inequalities (B), when dealing with decomposition. In this study, the between-group inequality indicates the proportion of the overall inequality caused by variations in FI distribution across the state's geographical areas, whereas the within-group inequality refers to the portion caused by differences in dispersion within the person geographical areas. The GE has the general formula as:

$$G(a) = \frac{1}{a^2 - a} \left[\frac{1}{n} \sum_{i=1}^{n} (\frac{y_i}{\underline{y}})^a - 1 \right], c \neq 0,1 \qquad (41a)$$

Where n represents the sample size, y_i is for financial inclusion, where $i \in (1, 2. . . n)$ and $\underline{y} = \frac{1}{n}\sum_i y_i$ represents the arithmetic mean of FI. GE class measures are sensitive to changing the value of α, which captures the differences of FI at various parts of the FI distribution. The value of GE

ranges from 0 to ∞. The values mainly used for α are 0, 1 and 2, though they take on other real values. The GE is, therefore, given by.

$$(\alpha) = \frac{1}{n}\sum_i \quad \frac{y}{y_i}log\frac{y_i}{\underline{y}}, \quad c =$$

1   (41b)

Post Diagnostic Test

For the estimates to be efficient and consistent, ε must be normally distributed. The goodness-of-fit test and linktest for the OLS and ordered logit model specification were performed to test for this. Various statistical tests such as the variance inflator factor and other tests were employed to minimise the possible threat to validity, if not eliminated entirely. In addition, multi-collinearity and correlation matrices were also performed in Appendices 3 to 5 and 10 and 11.

A test for robustness and p-value using Blinder-Oaxaca decomposition three-fold were conducted, and the results are attached in Appendices 6 to 9. The results indicate that the financial inclusion means coefficient of gender (male, female, gender gap and endowment) and locality (urban, rural, locality gap and endowment) are all significant at 1 per cent alpha level.

To confirm that the model results were reliable for the third aim, the study used the Durbin (score) and Wu-Hausman statistics to check for endogeneity in the model. The Cragg-Donald Wald test and the Sargan statistic were used in the study to examine for poor identification, under-identification, and overidentification. The instruments are weakly recognized, according to the notion for weak identification. Sargan null hypothesis instruments, on the other hand, are reliable. As a result, the research is

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expected to reject the null hypothesis for the weak identification test but not for the overidentification test.

When two or more of the independent variables are correlated, this is called multicollinearity. To determine multi-collinearity, correlation analysis and variance inflation factors were utilised. The multicollinearity test examined if the model's independent variables exhibit similarity features, which indicates a strong connection between the variables. According to Vatcheva et al. (2016) and Amoah et al. (2018), multicollinearity does not arise when the VIF value is between 1 and 5. The average VIF for the exam was 1.16 as depicted in Appendix 11.

Definitions, justification and measurement of variables

This section defines and explains how the variables used in the estimation were selected and measured with their a priori expectations.

Log of welfare

The dependent variable for the regression model for the relationship between poverty and inequality is captured as log of welfare. This is a continuous variable, and it represents consumption expenditure per equivalent adult in the household. This comprises of both food and non-food expenditure weighted using the consumer price index. Because welfare differs across sections of the sample it was likely to be affected by outliers which could eventually bias the estimates with its capability of pulling the regression line towards itself, thus distorting the Slope of the regression line (Gujarati & Porter, 2004). This was the reason for the logarithmic transformation of the welfare variable.

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Employment Sector

Employment status of household head is expected to affect consumption positively or negatively. Employment is included in this study to capture the differences in poverty emanating from the various employment categories. This variable was measured as a categorical variable detailing the various categories of employment which include the employed, retired, inactive and unemployed. The sign of this variable is indeterminate.

Educational Attainment

Education is expected to affect poverty significantly. This variable is captured as categorical to show the variations in poverty patterns between the various educational levels (i.e, primary, JSS/MLSC, SHS/SSS, tertiary and no schooling). The human capital theory postulates that education correlates negatively with poverty. This variable was included in the estimation to determine how poverty varies across the various levels of education in Ghana. Studies conducted by Cooke et al. (2016) for Ghana, points to the fact education have a significant impact on wellbeing of the people.

Region

To control for the variations in poverty levels that may arise because of regional differences, a set of regional dummies was introduced in the model to capture these effects. Even though Ghana currently has 16 administrative regions the previous 10 regions were used since the data were collected before the six new regions were created. These regions come with unique characteristics in terms of geographical endowment, and composition of ethnic groups.

Age

Age of the head of household captured by the study in years is said to have a curvilinear relationship with welfare. As indicated by the human capital theory, consumption for an individual tends to be low at early ages since the individual will tend to save more when he or she is and consume more when he is old. The study included both age and the squared of age to capture this curvilinear relationship. Age is expected to have a negative effect on welfare because as one ages, his labour earnings decline so the welfare.

Land Ownership

As indicated in the work of Akerele (2012), the area of land owned by household influences the poverty level of the household. That is to say, there is a negative relationship between the area of land owned and the poverty level of the household. In the study, the area of land owned is captured as dummy variable measuring the area ownership. This variable is expected to have a negative sign in the estimations.

Marital statues

Marital status is expected to affect poverty significantly. It is captured as categorical to show the variations in poverty patterns between the various marital statues (i.e, married, separated, widowed, cohabit and single. The sign of this variable is indeterminate.

Table 1 presents the summary of definition and measurement of the variables used in the study. The apriori signs are also given.

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Table 1: Definition and Measurement of Variables

Variables	Type/ Measurement	Definition	Apriori Sign
Employment	Categorical	Employment-status of HH Head	-
Education	Categorical	Educational level attained by household head	-
DFI ineq	Continuous	District level Financial Inclusion Inequality	+
Male/female	Dummy	Sex of HH head	+/-
Marital status	Categorical	Marital status of household head	+/-
Urban/ Rural	Dummy	The location of household head	+/-
Household size	Continuous	No. of individuals in a household	-
Age	Continuous	Age of household head	+/-
Age square	Continuous	The squared of age	+/-
Religion	Categorical	Religious affiliate of household	
logWelfare	Continuous	Log of consumption expenditure adult per equivalent	-
Main Job	Categorical	Employment status of household head	-
FL	Continuous	Financial Literacy index	-
Land ownership	Dummy	Land owned by household head	-
FI	Continuous	Financial Inclusion index	-
Pstatus	Categorical	Poverty status	
PI	Dummy	Income poverty	
MPI	Continuous	Multidimensional Poverty Index	
Welfare	Dummy	Government welfare support to the household head	-
Region	Categorical	Regions in Ghana	-

Source: Author's construct (2019)

Chapter Summary

This chapter described the research methods that was used to analyze the data for this research. The positivist strategy to studies was first explained in the study design. The data type and source followed this. The Ordinary Least Square, ordered logit model, counterfactual decomposition technique and the instrumental variable inference procedures were specified, and a post estimate test of the model specification was stated to aid in selecting the suitable estimation procedures. The decomposition of the relative importance using the dominance analyses were also stated.

CHAPTER FOUR

FINANCIAL INCLUSION DECOMPOSITION FOR GENDER

AND LOCALITY

Introduction

The gender and location decomposition analysis for FI is presented in this chapter. The results are organised as follows: FI gender and locality status in Ghana, Decomposition of FI by gender and locality using GLSS R6 (2012/13), Decomposition of FI by gender and locality using GLSS R7 (2016/17) and variation in FI over time (2012-2017) for gender and locality.

Descriptive Statistics

Table 2 presents the descriptive statistics for the various continuous variables used in the analysis. As noted from Table 2, the mean household welfare of R7 was 8.027 with a standard deviation of 0.903. This indicates that household welfare has increased over time from the previous GLSS survey (R6) with a lower mean value of 7.7494. The Gini index of district FI inequality reported a mean of 0.5007 for the R6 and 0.5170 for R7. The average age of the household head for GLSS R6 is about 28 years, while that of GLSS R7 is about 46 years.

Table 2: Summary Statistics for Continues and Dummy Variables 2012-2017 (GLSS Round 6)

Variable	Observation	Mean	Std. Dev.	Min	Max
DFI ineq	16,745	0.500	0.076	0.178	0.624
Welfare	16,726	7.7494	0.8280	3.6639	11.4764
Age of HHHead	16,726	28.4967	21.007	15	99
Age square	16,726	1253.331	1615.976	0	9801
Sex of HH Head	16,726	1.500	0.5000	0	1
Financial Inst	16,745	0.416	0.493	0	1
Locality	16,726	1.556	0.497	0	1

GLSS R7 Variables

Variable	Observation	Mean	Std. Dev.	Min	Max
DFINineq	14,009	0.517	0.071	0.1986	0.659
Welfare	14,009	8.027287	0.90693	3.6642	12.204
Age of HH Head	14,009	46.241	15.912	15	99
Age square	14,009	2391.365	1635.471	225	9801
Financial Inst.	14,009	0.4829	0.500	0	1
Sex of HH Head	14,009	1.312	0.463	0	1
Locality	14,009	1.570	0.495	0	1

Source: Author's construct (2020)

The Table 3 shows the summary statistics of categorical variables and compares the two periods (GLSS R6 & R7). The percentage of household heads employed under GLSS R6 is 89.37 percent, while GLSS R7 is 79.15. This implies that the unemployment level has increased.

Table 3: Summary Statistics of Categorical Variables GLSS Round 6&7)

	Descriptive	GLSS R7 %	OBS	GLSS R6%	OBS
Marital Status	Married	55.1	7719	41.10	20,171
	Consent Union	8.99	1260	6.24	3,064
	Separated	4.37	612	1.87	918
	Divorced	6.18	866	2.87	1,410
	Never Married	12.52	1754	42.10	20,660
	Widowed	12.83	1798	5.82	2,855
	Total	**100**	**14,009**	**100**	**16,745**
Poverty Status	Very Poor	10.86	1,522	9.82	1,646
	Poor	14.70	2,060	14.11	2,366
	Non Poor	74.43	10,427	76.07	12,753
	Total	**100**	**14,009**	**100**	**16,765**
Employment	Unemployed	8.75	1,201	2.92	489
	Employed	79.15	11,088	89.37	14,965
	Retired	0.9	126	1.00	168
	Inactive	11.38	1,594	6.71	1,123
	Total	**100**	**14,009**	**100**	**16,745**
Religion	Christianity	67.39	9,440	71.69	11,977
	Islam	18.59	2,650	18.79	3,106
	Traditionalist	0.2	28	4.78	798
	Other Religion	7.64	1,070	0.06	10
	No Religion	5.86	821	4.88	815
	Total	**100**	**14,009**	**100**	**16,745**
Education	None	53.45	7,488	50.69	8,478
	Basic	26.6	3,726	30.56	5,111
	Secondary	9.12	1,277	8.5	1,421
	Tertiary	1,518	1,518	10.26	1,716
	Total	**100**	**14,009**	**100**	**16,745**

Source: Author's Estimate (2020)

The data again indicates that with except of tertiary education, literacy levels over time has reduced. The results indicate that the percent of the household heads with no education has increased from 50.69 percent to 53.45 percent. Similarly, the percent of household heads with only basic education has reduced from 30.56 to 26.6 percent. This finding indicates that more needs to be done to improve literacy rates that the basic level.

Decomposition of FI by Gender (GLSS R6 and R7)

In Table 4, we present the results for the decomposition analysis. The first column represents the results based on R6 data whiles column 2 represent the results based on R7 data. From column 1, the FI mean for males is 0.154 and that of females is also -0.075. This supports the available evidence that the FI gender gap exists and favours males. Thus, the difference between the mean FI for male headed households and female headed households is 0.228. This mean gap is further divided into three parts: the endowment, coefficient, and interaction. The endowment value of 0.135 indicates that differences in variables such as access to the financial institution, marital status, educational levels and employment status (employed and retired) account for about 59.21 percent of the FI gap. The coefficient 0.064 quantifies the change in females' FI level when applying the males' coefficients to the females' characteristics, constituting 47.41 percent. The third part, the interaction term (0.030), measures the simultaneous effect of differences in endowments and coefficients, and it accounts for 13.16 percent.

Table 4: Summary of decomposition result: FI Gender Gap

GENDER	DIFFERENTIAL	
	GLSS R6	GLSS R7
Mean prediction high (Male):	0.154	0.177
Mean prediction low (Female):	-0.075	-0.037
Raw differential (Gap) {H-L}:	0.228	0.215
Due to endowments (E):	0.135	0.214
Due to coefficients (C):	0.064	0.035
Due to interaction (CE):	0.030	-0.034

Source: Author's Estimate (2020) GLSS rounds 6 & 7

From column 2, it can be observed that the FI mean value for the household males and females are 0.177 and -0.037, respectively while the gap R (H-L) is 0.215 in favour of male headed households. The breakdown of the FI gender gap is endowments (E) is 0.214; the coefficients (C) is 0.035; the interaction (CE) is also -0.034. Both R6 and R7, the mean prediction for male headed households, are more significant than females; it confirms that the FI gender gap exists and favours male household heads. Again, the gap mainly came from endowment, indicating differences in the explanatory variables. The researcher conducted a test for robustness and p-value using Blinder-Oaxaca decomposition three-fold, presented in Appendices 6 and 8. It revealed that the mean FI coefficient for males, female, gender gap, and endowments are all significant at 1 per cent alpha level.

Table 5 reveals how the unexplained and explained segments of the gap in FI vary. Columns one and two relate to the Oaxaca decomposition, where D = 0 and D = 1, respectively. Columns three and four also agree to Reimers' and Cotton's decompositions, where the transverse of D equals 0.5 and f = 0.666, respectively. The final column identified "*" is Neumark's decomposition. It is imperative to note that numerous differences of

calculating counterfactuals do not modify the primary outcomes numerically irrespective of the decomposition used which corroborates the studies by Armah et al. (2016) and Armah *et al*. (2013). The explained component accounts for most of the disparity in FI between male headed and female headed households in Ghana. For instance, from Table 5, using GLSS round 6 where Oaxaca's decomposition D=1, differences in the mean values of x's (explained) account for about 72 per cent of the differentials in FI between the males and females. Based on Cotton's, Reimer's and Neumark's decompositions, the explained account for 65.6 percent, 68 percent and 72.4 percent respectively of the differentials in FI between the male and female household heads.

Table 5: Proportion of explained and unexplained components: FI Gender Gap

	GLSS R6					GLSS R7				
	1	2	3	4	5	1	2	3	4	5
Decomposition	0	1	0.5	0.69	*	0	1	0.5	0.67	*
Unexplained	0.09	0.06	0.08	0.07	0.06	0.00	0.04	0.19	0.02	0.01
Explained	0.14	0.16	0.15	0.16	0.17	0.21	0.18	0.20	0.19	0.21
% unexplained	40.9	28.0	34.4	32	27.6	0.5	16.2	8.4	11.0	4.7
% explained	59.1	72.0	65.6	68	72.4	99.5	83.8	91.6	89.0	95.3

*Source: Author's Estimate (2020) * is Neumark decomposition*

Again, using GLSS R7 data, the result indicates that majority of the FI gender differences can be accounted for through explained component. From the Oaxaca's decomposition perspective, 0.18 (83.8%) could be attributed to the FI gender gap decomposition's explained part. For Cotton, explained portion is 0.20 (91.6%) while Reimer's and Neumark's decompositions, the explained accounts for 0.19 (89.0%) and 0.21 (95.3%) respectively of the differentials in FI between the male and female. This confirms that the FI

gender differences exist mainly due to socioeconomic characteristics that favour males.

Table 6 indicates the behaviour of individual variables that explain the FI gender gap. Variables with positive figures favour (increase) the gender gap while the negative figures show otherwise. It is observed that each of the socioeconomic variables such as income, access to a financial institution, employment and educational attainment and religion contribute to the overall explained gap of all the four decompositions. This provides exciting insight into the relative importance of each of the variables.

The result indicates that the household's income plays a crucial role in widening the FI gender gap. Income has been established by researchers such as Nandru, et al. (2016) to improve FI levels. For example, focusing on Column four Oaxaca decomposition underweight (D) 1 using GLSS R6, income constituted 27.44 percent of the overall explained gap in FI between the male household head and female counterpart. It also contributes 20.67 percent, 23.23 percent and 22.42 percent under Cotton (column 5), Reimer (column 6) and Neumark (column 7) decompositions, respectively. This supports the assertion that in Ghana household income levels are skewed in favour of males (GSS, 2018; Cooke et al., 2016) and this presupposes that any increase in income levels within the country will widen the FI gender differences further. According to Nandru et al, (2016), income has a positive relation with FI. As income levels of household heads increases, the chances are that their FI levels will improve, hence deepening the FI gender gap.

In all four decomposition estimations, access to formal financial institutions contributes the highest to the FI gender gap. Financial institution is

the medium through which the household heads access financial services or products. From the GLSS R6 result, Oaxaca and Cotton have 42.07 percent and 40 percent, while Reimer and Neumark also have 40.65 percent and 38.79 percent, respectively. This is evident as more males own financial accounts than females in Ghana (Demirgüç-Kent et al., 2018) contrary to the views of Babajide et al. (2020). Access to the financial institution may motivate people to participate in financial institution activities such as savings, deposit mobile money and credit, which promote FI (Oji,2015; Bourreau, & Valletti, 2015). In Ghana, some females do not want to transact business with formal financial institutions due to certain socio-economic and cultural factors, including financial institutions' requirements and feeling inferior (Demirgüç-Kent *et al.*, 2018). This prevents them from accessing the banking halls and visiting mobile money agents. It implies that as the access to financial institutions improved; it benefited males in the society hence females became less financially inclusive.
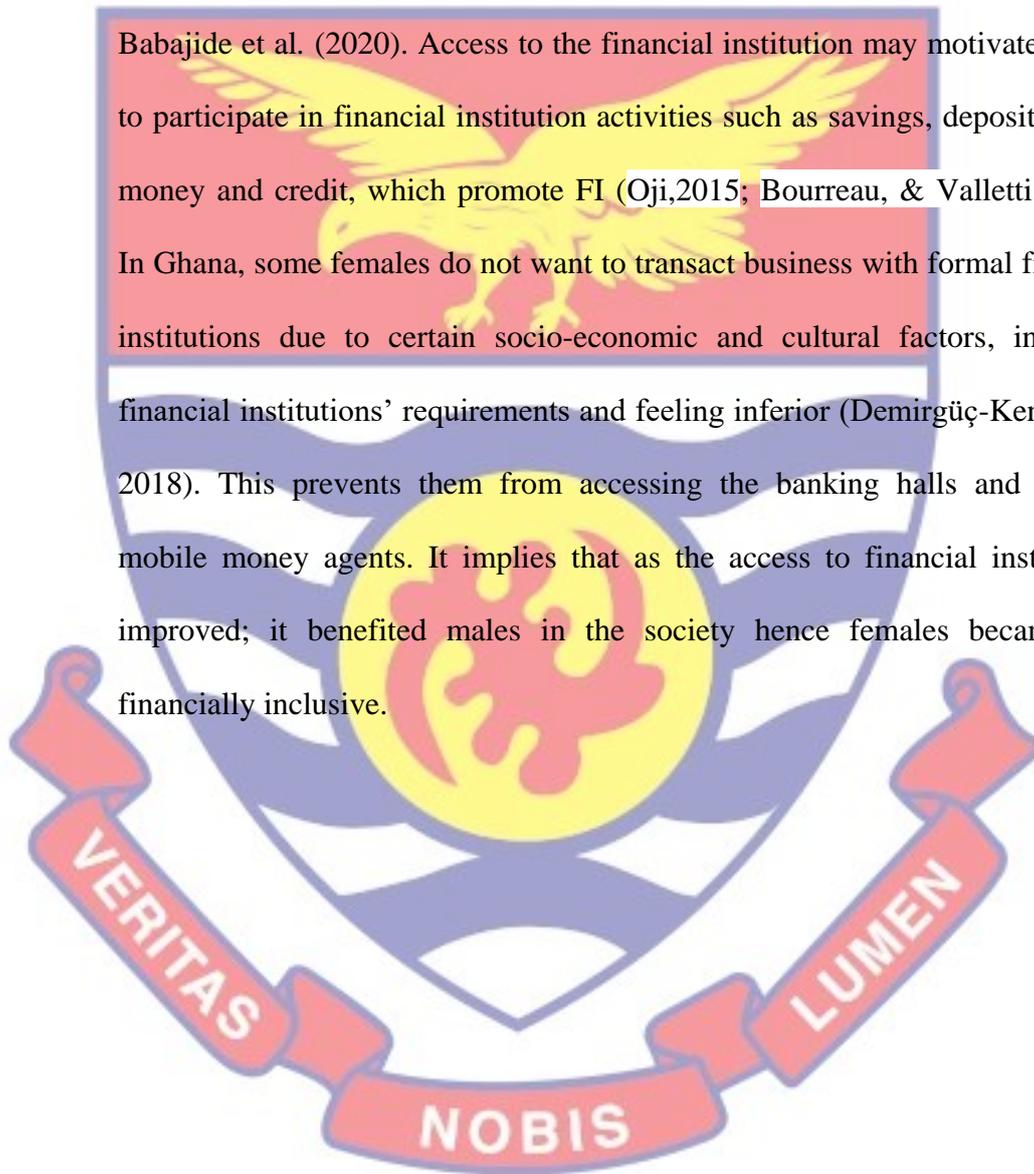
Table 6: Decomposition results for the variables (Explained) GLSS R 6 and R 7- Gender

Variables	E(D=0)	C	CE	1	0.5	0.688	*	E(D=0)	C	CE	1	0.5	0.666	*
	1	2	3	4	5	6	7	1	2	3	4	5	6	7
			GLSS R6							GLSS R7				
Log Income	0.017	1.166	0.027	0.045	0.031	0.036	0.037	0.011	0.023	0.000	0.012	0.011	0.011	0.011
Locality	0.003	-0.011	-0.003	0.000	0.002	0.001	0.002	-0.001	-0.027	-0.003	-0.004	-0.003	-0.003	-0.003
Marital Statues														
Widowed	0.003	0.010	-0.003	0.002	0.003	0.002	0.004	-0.000	-0.006	-0.000	-0.000	-0.000	-0.000	-0.000
Divorced	-0.006	-0.006	-0.011	0.005	-0.004	-0.003	-0.003	0.000	0.010	-0.010	-0.010	-0.005	-0.006	0.002
Separated	-0.010	-0.007	-0.007	0.005	-0.007	-0.006	-0.004	-0.004	-0.007	0.006	0.002	-0.001	-0.000	-0.001
Consent union	0.006	0.003	-0.002	0.004	0.005	0.005	0.007	0.011	0.016	-0.013	-0.002	0.004	0.002	0.008
Married	0.000	-0.006	-0.006	-0.006	-0.003	-0.004	-0.005	-0.001	-0.004	-0.002	-0.002	-0.001	-0.002	-0.002
Financial Inst	0.051	-0.086	0.017	0.069	0.060	0.063	0.064	0.155	-0.026	0.006	0.081	0.058	0.059	0.059
Employment														
Employed	-0.000	0.159	0.015	0.015	0.007	0.010	0.001	0.007	-0.037	-0.004	0.003	0.005	0.005	0.005
Retired	0.004	0.000	0.001	0.005	0.005	0.005	0.005	0.000	-0.001	-0.000	0.000	-0.000	-0.000	-0.000
Inactive	-0.000	0.042	-0.026	-0.026	-0.013	-0.018	-0.015	-0.004	-0.007	0.003	-0.001	-0.003	-0.002	-0.003
Education														
Basic	0.006	0.001	0.000	0.007	0.007	0.007	0.007	0.005	-0.014	-0.005	-0.000	0.002	0.001	0.002
Secondary	0.014	-0.002	-0.002	0.013	0.013	0.013	0.014	0.004	0.006	0.006	0.010	0.007	0.008	0.010
Tertiary	0.036	0.009	0.005	0.041	0.039	0.039	0.040	0.019	-0.010	-0.006	0.048	0.036	0.035	0.035
Religion														
Christianity	0.009	-0.024	-0.011	-0.003	0.003	0.001	0.002	0.011	0.003	0.006	0.002	0.004	0.005	0.006
Islam	-0.057	-0.623	0.090	0.033	-0.012	-0.005	0.000	-0.014	0.228	-0.044	0.037	0.035	0.043	0.050
Traditional	0.048	-0.076	-0.073	-0.024	0.012	-0.002	0.001	0.010	0.025	0.022	0.012	0.011	0.014	0.019
Other Religion	0.009	-0.014	-0.013	-0.004	0.003	0.000	0.001	0.003	0.004	0.003	0.007	0.005	0.006	0.006

*Source: Author's Estimate (2020) * is Neumark decomposition*

Access to financial institution can be attributed to the effect of both formal financial institutions on FI as the latter improves the former (Yue, et al., 2019). Again, inferring from 2012 to 2017 data, household men have more financial institutions than women (GSS, 2013; 2017). Hence the FI gap favours male households' head. Oaxaca, Cotton, Reimer and Newmark attribute 45 percent, 29.44 percent, 30.89 percent and 28.78 percent, respectively to the FI gender gap resulting from male household heads having higher access to the financial institution. This is in line with GLSS round 6 results.

Another variable that contributes to the FI gender gap is employment. When more people are employed, the FI gender gap widens in favour of males. As people get employed, they earn income, allowing them to participate in financial activities. Employment, be it an employee or self-employed enables one to either access credit, save part of their income or receive salary/wages making them not financial excluded. One's ability to get employed depends on certain factors such as educational attainment level, experience and willingness to get employed which mostly do not favour females. In Ghana, more males get employment than their female counterparts (GSS, 2018) hence employment favours the FI gender gap. Using Oaxaca decomposition, the contribution of employment variable to the FI gender gap is 1.67 percent, while that of Cotton is 2.54 percent. Reimer and Nuemark decomposition techniques indicate 2.62 percent and 2.44 percent respectively. This confirms the GLSS R6 results that indeed employment determine the FI gender gap.

The contribution of educational attainment to the gender gap at both secondary and tertiary levels cannot be overemphasised. For instance, the secondary education attainment under Oaxaca contributes 7.93 percent and 8.67 percent for Cotton, 8.38 percent for Reimer and 8.48 percent for Neumark. The tertiary levels contribute to the gap, but its contribution to the FI gender gap is relatively higher than the secondary school level. The study indicates that the tertiary level of educational attainment contributes 25 percent under Oaxaca and 26 percent under the Cotton decomposition estimate. Reimer and Neumark decompositions indicated a contribution of 25.16 percent and 24.24 percent respectively. Higher education levels attainment improves the chance of getting gainful employment which prevents one from being financially excluded (Mzobe, 2015). However, in Ghana, more males have completed higher education than females (Nguyen & Wodon, 2014) and this may explain why higher education widens the FI gender gap.

The secondary and tertiary education variables under GLSS R7 results follow a similar trend as GLSS R6 results as both rounds increase the FI gender gap. Secondary education contributes 5.56 percent under Oaxaca while Cotton, Reimer and Nuemark are 3.55 percent, 4.19 percent and 4.88 percent respectively. Under the tertiary level, the FI gender gap is higher than the secondary level for the four decompositions. For instance, Oaxaca, Cotton and Reimer decomposition techniques have 15.56 percent, 13.20 percent, 13.09 percent and 12.20 percent respectively of the total FI household heads gender gap. This indicates that as the education completion level improves from basic education to either secondary or tertiary, FI levels of men also improve much better than women.

Also, Table 6 shows an interesting result concerning religion and the FI gender gap. Islamic religion contributes the third-highest percentage (20.12%) towards Oaxaca decomposition. However, other decompositions have a different story. Islamic religion indirectly restricts females from participating in specific socioeconomic roles independently without prior approval from their male counterparts (Galloway, 2014; Rahman, 2019). This affects their participation in financial activities such as taking a loan, owning an account and this, by extension, affects their FI level. According to the GLSS R7 result, just like GLSS R6, Islam constitutes one of the key variables explaining the FI gender gap. For instance, the contribution of Islamic religion constitutes 20.56 percent of the FI gender gap under Oaxaca while Cotton, Reimer and Nuemark decomposition techniques have 17.77 percent, 22.51 percent and 24.39 percent, respectively. Interestingly, Islamic religion's contribution to the FI gender gap for the household heads during the period was higher than the impact of income, employment and secondary education attainment.

Table 6 again reveals the GLSS R7 results for the FI gender gap. The income of the household affects the FI gender gap positively. Like GLSS round 6, income levels in the country contribute to the higher FI level for male household heads at the expense of their female counterparts. As the income levels in the country increase, more men become financially included than women since income levels are skewed in favour of men. For instance, Oaxaca and Cotton decomposition attributed 6.67 percent and 5.58 percent of the FI gender gap to the income levels in the country while Reimer and Neumark

decomposition reveal 5.76 percent and 5.37 percent FI gender gap, respectively.

Decomposition of FI by Locality (GLSS R6 and R7)

Table 7 shows the mean differential values for household head FI levels for urban and rural dwellers and their differences for GLSS R6 and R7. Under GLSS R 6, the mean FI value for urban household heads is 0.228 while that of rural is -0.110 given FI locality gap of 0.333. It is further observed that the value for the endowments (E), which is the highest, is 0.318 while the coefficients (C) is -0.046 and that of the interaction (CE) is 0.066.

Table 7: Summary of decomposition result: FI Locality GLSS Gap

LOCALITY	DIFFERENTIAL	
	GLSS R 6	GLSS R7
Mean prediction high (Urban):	0.228	0.271
Mean prediction low (Rural):	-0.110	-0.202
Raw differential (Gap) :	0.333	0.473
Due to endowments (E):	0.318	0.402
Due to coefficients (C):	-0.046	0.001
Due to interaction (CE):	0.066	0.070

Source: Author's Estimate (2020), GLSS R6 & R7

Table 7 again depicts the mean values differential for household head FI levels at the locality level (urban and rural dwellers) using GLSS R7. The mean FI value for urban household heads is 0.271, and that of rural dwellers is -0.202; hence, the FI locality gap is 0.473. This implies that the gap favours household heads who dwell in urban areas. The results under GLSS R7 reveal further that the value for the endowments (E) which is the highest, is 0.402, while the coefficients (C) is 0.001 and the interaction (CE) also gives 0.070. A test for robust and p-value using Blinder-Oaxaca decomposition three-fold was conducted and the result is presented in Appendix 7 and 9. It revealed that

the means of FI coefficient for urban, rural and locality gaps are all significant at 1 percent alpha level. This also includes that of endowment, coefficients and interaction.

Table 8 depicts FI decomposition at the locality level. It shows the explained and unexplained portions of the FI locality gap. The columns one and two matches the Oaxaca decomposition in table 8 under GLSS R6, where D = 0 and D = 1, respectively. The columns three and four also match Cotton's and Reimers' decompositions, where the diagonal of D equals 0.5 and f= 0.687, respectively. The final column labelled "*" is Neumark's decomposition. In all the four decomposition estimates, it was obvious that the difference in the mean values of the x's (explained component) accounts for the higher proportion of the difference in FI between household heads in urban and rural places in Ghana.

It is evident that the Oaxaca's decomposition under the weight D=1 gives explained to be 113.7 percent (0.38) of the differentials in FI between the urban dwellers and rural dwellers household heads. Cotton's, Reimer's and Neumark's decompositions also give the explained to be 103.9 percent (0.35), 105.3 percent (0.36) and 102.5 percent (0.35) respectively of the differentials in FI between the urban and rural household heads dwellers. Careful analysis of the results from all four decomposition techniques indicates that the control variables explain more than the whole difference in financial inclusion. This means, if you gave urban the same values of the control variables as rural, you'd expect urban to have greater financial inclusion than rural.

Table 8: Proportion of explained and unexplained components: FI Locality Gap

	GLSS R6					GLSS R7				
	1	2	3	4	5	1	2	3	4	5
Decomposition	0	1	0.5	0.56	*	0	1	0.5	0.57	*
Unexplained	0.02	-0.05	-0.01	-0.01	-0.01	0.07	0.00	0.04	0.04	0.04
Explained	0.32	0.38	0.35	0.36	0.35	0.40	0.47	0.44	0.43	0.44
% Unexplained	5.9	-13.7	-3.9	-5.3	-2.5	15	0.2	7.6	8.6	7.4
% Explained	94.1	113.7	103.9	105.3	102.5	85.0	99.8	92.4	91.4	92.6

Source: Author's Estimate (2020) * *is Neumark decomposition*

Based on Oaxaca's decomposition D=1, explained account for 99.8 percent (0.47) of the differentials in FI between the household heads who dwell in urban and rural centers. Cotton's decomposition constitutes about 92.4 percent (0.44) of the differentials in FI between the urban and rural dwellers. About 91.4 percent (0.43) and 92.6 percent (0.44) of the differentials in FI between the household heads of urban and rural dwellers is explained by the mean values of x's (gaps in endowments) using the Reimer's and Neumark's decompositions, respectively.

Table 9 shows socioeconomic variables that explain the occurrence of the FI locality gap using GLSS R6. Some of the variables give positive figures indicating an increase (favours) in the FI gap between urban and rural household dwellers while others had negative figures representing a decrease (disfavour) of the gap. However, for this study, the discussion will be based on only variables that favour the gap (income, access to financial institutions, employment and education and religion). Again, all the results from the four decomposition estimation techniques were similar except for religion.

GLSS R6 shows that income levels of household heads contribute to the urban-rural FI gap. This can be seen in the four decomposition results. Oaxaca

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decomposition underweight (D) 1, has income contributing 30.46 percent towards the overall explained gap in the locality concerning FI. Cotton (Colum 5), Reimer (column six) and Neumark (Colum seven) decompositions also have income contribution levels of 21.63 percent, 32.64 percent and 21.68 percent respectively. In most cases, income levels for the urban dwellers are higher than that of rural dwellers (Cooke et al., 2016). Urban dwellers mainly receive their income from employment. However, incomes from non-farm and self-employment are higher than those from peasant agricultural activities (Maloma, 2016). Other researchers such as Zins and Weill (2016) and Mhlanga & Denhere, (2020) have also claimed that FI positively correlates with income. Another reason is the unstable income at the rural areas since most of them engage in farming except those into cocoa farming who enjoys stable income from the Cocoa Marketing Board. This implies that income inequality also affects FI disparity at the local level.
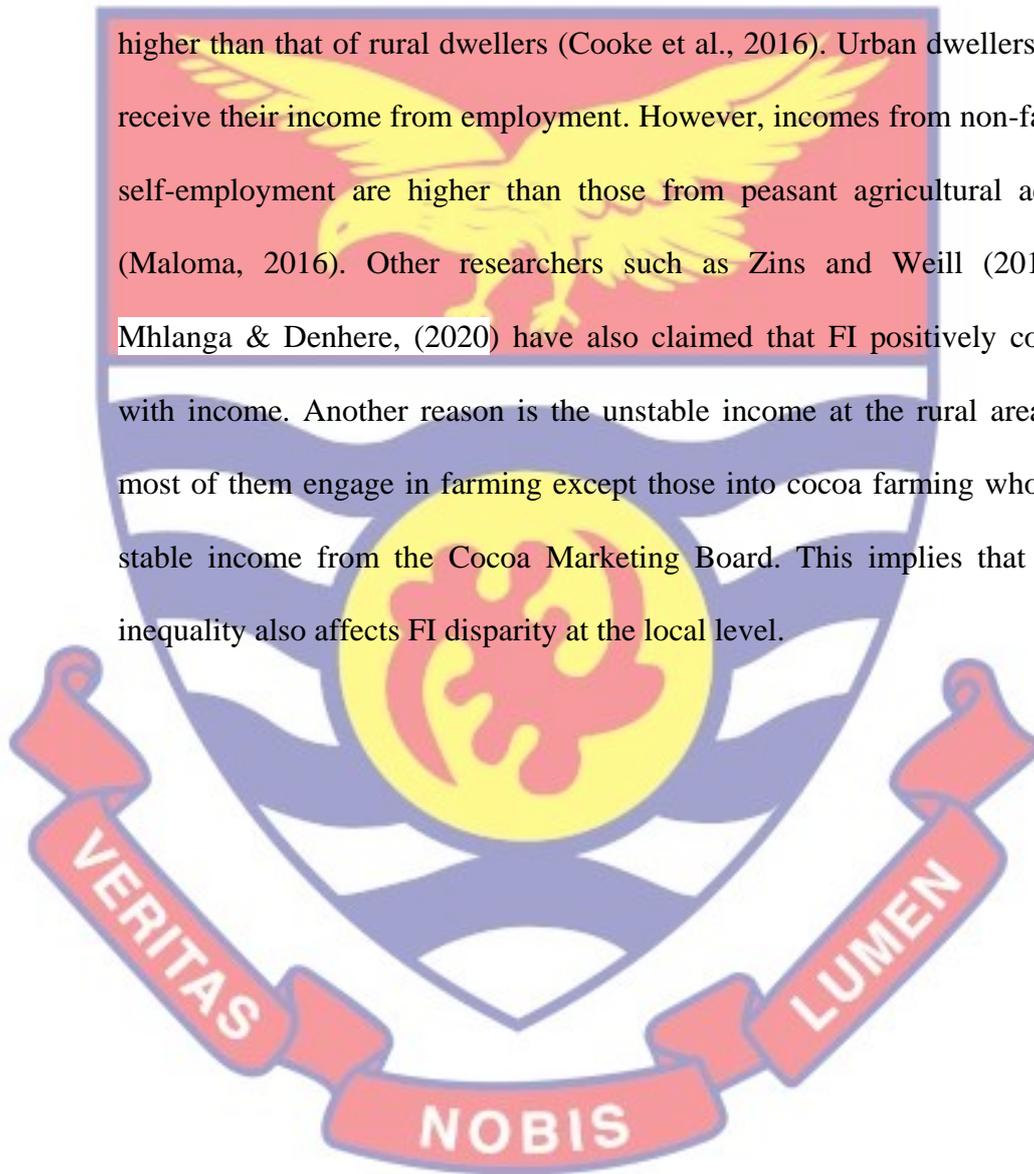
Table 9: Decomposition results for the variables (Explained) GLSS R 6 and R 7- Locality

Variables	E(D=0)	C	CE	1	0.5	0.570	*	E(D=0	C	CE	1	0.5	0.430	*
	GLSS R 6							GLSS R7						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Log Income	0.020	2.070	0.101	0.120	0.070	0.077	0.075	0.036	0.174	0.013	0.149	0.142	0.141	0.144
Gender	0.004	-0.148	-0.008	-0.004	0.000	0.001	0.001	-0.007	-0.150	-0.008	0.001	-0.003	-0.003	-0.003
Marital Statues														
Widowed	-0.001	-0.006	-0.001	-0.000	-0.001	-0.003	-0.004	-0.001	-0.006	0.001	-0.000	-0.001	-0.001	-0.000
Divorced	-0.000	0.007	-0.002	-0.002	-0.001	-0.002	-0.002	0.001	-0.004	-0.001	-0.000	0.000	0.000	0.000
Separated	-0.000	0.012	0.000	0.000	0.000	0.000	0.000	-0.000	-0.003	0.001	0.001	-0.000	-0.000	-0.000
Consent Union	-0.000	-0.006	0.000	0.000	0.000	0.000	0.000	-0.001	-0.009	0.001	0.001	0.000	0.000	0.000
Married	0.001	-0.012	0.004	0.004	0.004	0.003	0.003	-0.009	-0.093	0.015	0.007	-0.001	-0.002	0.001
Fin Instit	0.317	-0.118	0.052	0.157	0.343	0.339	0.341	0.317	-0.118	0.052	0.159	0.143	0.139	0.141
Employment														
Employed	-0.002	0.087	-0.004	-0.005	-0.004	-0.004	-0.004	0.001	0.000	0.000	0.001	0.001	0.001	0.001
Retired	0.002	0.001	0.004	-0.007	0.004	0.005	0.004	-0.001	0.000	0.003	0.002	0.001	0.001	0.0002
Inactive	0.002	0.004	0.001	0.003	0.002	0.002	0.003	-0.001	-0.002	0.000	-0.000	-0.001	-0.001	-0.001
Education														
Basic	0.001	0.032	0.005	0.006	0.003	0.004	0.003	0.003	0.001	0.000	0.003	0.003	0.003	0.003
Secondary	0.022	-0.003	-0.005	0.017	0.019	0.019	0.017	0.014	-0.002	-0.003	0.015	0.013	0.013	0.013
Tertiary	0.139	-0.014	-0.036	0.103	0.121	0.119	0.112	0.039	-0.005	0.011	0.128	0.134	0.134	0.134
Religion														
Christianity	-0.001	0.004	-0.002	-0.003	-0.002	-0.002	-0.003	-0.004	0.010	-0.004	0.008	-0.006	-0.006	-0.006
Islam	-0.001	-0.038	-0.004	0.005	0.003	0.003	0.001	0.016	0.114	0.019	0.011	0.015	0.014	0.016
Traditionalist	-0.001	0.010	0.001	-0.000	-0.000	-0.000	-0.000	0.004	0.037	0.006	0.005	0.007	0.007	0.008
Other Religion	0.001	0.003	-0.003	-0.002	-0.000	-0.000	-0.001	-0.017	0.015	-0.014	-0.016	-0.014	-0.013	-0.018

Source: Author's Estimate (2020) GLSS R6 and R7 * *is Neumark decomposition*

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Access to financial institutions also contributes to the FI locality gap. In Ghana, most formal financial institutions, for obvious reasons such as profitability and the effect of the market size (Akorsu, et al., 2015), reside in urban centres. In some instances, the mobile money agents are either few in rural locations or far away, including poor communication networks. This excludes the rural dwellers from participating in the financial activities hence less financially included. The results from all the four decomposition estimations as follows: Oaxaca (39.85%), Cotton (66.67), Reimer (67.10), and Neumark (66.90) indicate that access to financial institutions widens the FI gap between urban-rural dwellers. This finding aligns with Lopez and Winkler (2017) that access to financial institutions affects FI at the locality level differently. However, Zulkhibri (2016) also believes that the obstacle to FI for the rural folks is the great distance between communities and bank branches or mobile money agents. CPAP and World Bank (2010), cited by Zulkhibri (2016), attribute the FI gap between urban dwellers and rural by concluding that poor infrastructure, low level of communication technology and bank branch regulations restrict geographical expansion of their branches or presence in a certain locality.

The secondary and tertiary education completion levels also contribute to the FI gap. From GLSS R6 result in Table 9, the secondary level under Oaxaca contributes 4.31 percent and 5.41 percent for Cotton levels, 5.34 percent for Reimer, and 4.93 percent for Neumark. The tertiary level of educational attainment also contributes 26.14 percent under Oaxaca decomposition, 34.47 percent under Cotton decomposition estimate. Reimer and Neumark decompositions each contribute 33.43 percent and 32.67 percent, respectively.

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This could result from poor socioeconomic infrastructure and income disparity, which deprive people who find themselves in the rural part of the country. The impact of tertiary education attainment level on the FI locality gap is higher than that of secondary attainment. This also may result from higher investment associated with higher educational levels such as tertiary, in which rural folks do not have enough resources to partake. Lower education attainment affects their employment level and desire to be financially inclusive. The results support the assertion that a higher educational level improves FI; hence urban household heads are more financially inclusive than rural household heads (Chen & Jin, 2017).

Islamic religion also contributes to widening the gap between urban household heads and that of rural household heads concerning the FI level. Oaxaca decomposition indicates that Islam contributes 1.27 percent of the urban-rural dwellers' FI gap. Cotton, Remier and Neumark decomposition techniques also estimated that Islamic religion contributes 0.85 percent, 0.84 percent and 0.87 percent, respectively to the FI locality gap. This may be due to the Islamic belief towards the operations and services of existing financial institutions such as conventional debt base financing. This agrees with Zulkhibri (2016), that community or society members who are deep-rooted in the Islamic religion are likely to participate less in current FI activities. In most cases, Muslims in rural communities can voluntarily exclude themselves from existing financial services that do not follow the Islamic faith. However, those in the urban areas are compelled to be more financially inclusive due to the payment system associated with some of the urban activities.

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Variation in FI over time (2012-2017) by gender

Figure 4 depicts the FI gender gap between male household heads and female household heads using GLSS R6 and R7. From Figure 4, during the year 2012/2013 (GLSS R6), the FI mean value for male household heads was 0.154, and that of the female was -0.075 giving a difference (gap) of 0.228 (22.8 percent.) The other period, 2016/17 (GLSS R7), also have the FI mean value for household men and women to be 0.177 and -0.037, respectively, with a gap of 0.215 (21.5 percent). The two periods agree with Fanta and Mutsonziwa (2016) that an FI gender gap exists in favour of men. The study further reveals that the FI gender gap has decreased during the two periods, implying that women are gradually becoming more financially inclusive. However, the FI gender gap still exists that makes women still more likely to be financially exclusive than men, affecting the achievement of SDG targets such as goals one, two, five and ten.
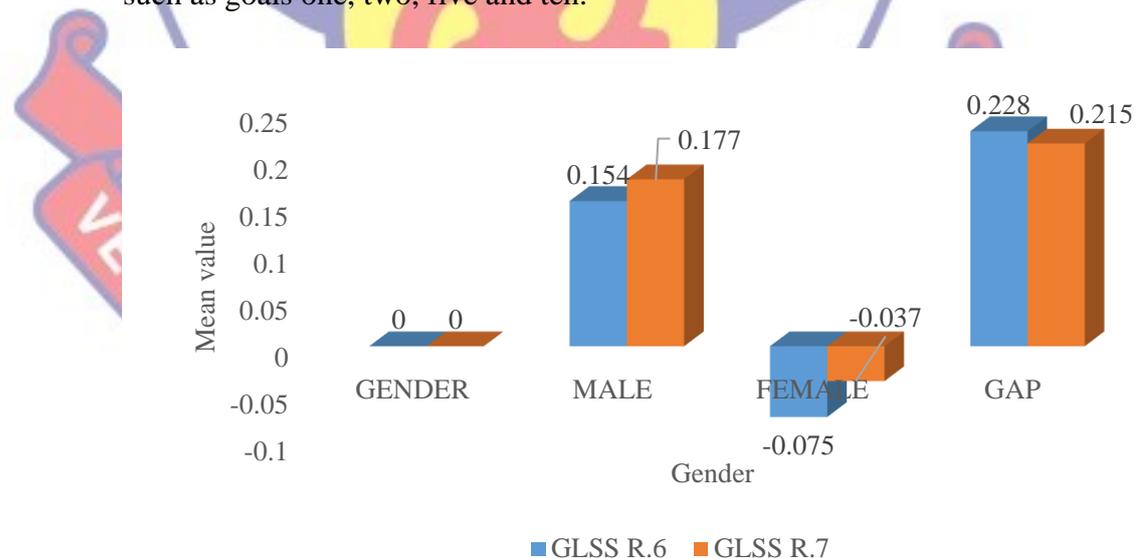
Figure 4: Gender gap differential: GLSS R6 and R7
Source: Author's Estimate (2020)

Figure 5 presents key socioeconomic variables that explain the FI gender gap and their behaviour within the period of study (2012-2017). From Table 6 it is evident that indeed income levels for household heads contribute to the FI gender gap. Figure 5 reveals that household heads income levels, though contribute to the FI gender gap, the magnitude of the gap has reduced over the period. This could be due to increased employment level, improvement in the quality of jobs, improvement in knowledge and experience for women. As the income levels increase in Ghana, women's FI level still contributes to the FI gender gap; its magnitude has decreased. This means efforts are being made to increase the income levels of women, the magnitude of the FI gender gap is reducing gradually.

Another socioeconomic variable that explains the FI gender gap among household heads is access to a financial institution. The initial Table 6 establishes that access to formal financial institutions contributes to the FI gap between male household heads and female counterparts. Careful analysis of the level of access to the financial institution during the two periods reveals that the impact of access to financial institutions has increased the FI gender gap over the period, as indicated in Figure 5. In Ghana, as indicated early on, some females do not transact business with formal financial institutions due to certain socio-economic factors, including financial institutions' requirements and feeling inferior. As the magnitude of access to financial institution increase over the period (2012-2017), it becomes evident that as more formal financial institutions are established, the FI level of males' increases while females are financially excluded voluntarily.
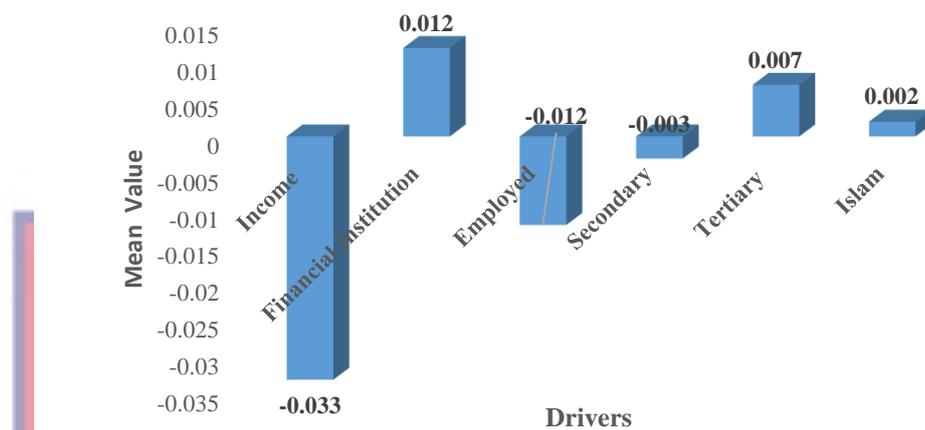
Figure 5: Variation in explained variables between GLSS R6 & R7- Gender
Source: Author's Estimate (2020)

Education completion influences the level of FI significantly (Mzobe, 2015). Education levels (secondary and tertiary) also increased the FI gender gap, as shown in Table 6. Figure 5 indicates missed variation (GLSS R6 and R7) results for high educational attainment. The secondary educational attainment has reduced marginally, while the tertiary education level has also increased over the period. The contribution of educational (Secondary and tertiary levels) attainment to the FI gender gap for household heads has widened within GLSS R6 and R7 periods as retreated earlier. The government of Ghana has introduced free education at the second cycle education level. This promotes equal access to education, which gradually closes female education attainment level and may explain the reduction of the magnitude of the secondary education level on the FI gender gap.

On the other hand, the study observes different tertiary attainment levels. Comparing the magnitude of tertiary educational attainment level for the two periods indicates that its impact on the FI gender gap has gone up.

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This implies that fewer females can now attain tertiary educational levels (2016/17) than in the past (2012/13). This may be attributed to economic and cultural issues that prevent females from attaining education than males.

Figure 5 again shows a negative effect of employment towards FI gender perspective over the period. Though Table 6 all indicate that employment contributes to widening the FI gender gap, its net effect between the two periods (2012/13 and 2016/17) is negative. This explains that the impact of employment on the FI gender gap has reduced over the period. As more Ghanaians get employed, relatively more women become financially inclusive than previously. This may be due to government policies creating employment for less educated people and ensuring equal access to jobs.

Lastly, the influence of Islamic religion on the FI gap between male household heads and female household heads has also contributed to the gap. Islamic religion explains part of the FI gender gap from 2012 to 2017, as shown in Table 6. This could be due to the religious factor that prevents females from participating in some socio-economic activities. Figure 5 indicates the positive variation of Islamic religion over the period. The level of influence of Islam has increased over the period since 2016/17. It has recorded a higher impact on the level of FI compared to that of 2012/13. This implies that as the Islamic population increases, the gender gap keeps increasing.

Variation in FI over time (2012-2017) by Locality (urban and rural)

Figure 6 shows the FI mean values for urban and rural dwellers household heads at the locality, including their various gaps. The GLSS R6 has FI mean value for urban household heads to be 0.228 and rural household

heads also had -0.11 given a gap of 0.333. (33.33%). Focusing on GLSS round 7, FI mean value for the household heads living in urban place is 0.271 while those who live in the rural areas also have a mean value of -0.202, giving the gap between the two to be 0.473 (47.3%). From Figure 6, it is evident that the level of FI at locality gap within the period of 2012 to 2017 has up. This implies that Ghana's effort of achieving some of the SDGs such as goal one, two, and three, may not be possible by the year 2030.

Figure 6: Locality differentials: GLSS R6 and R7
Source: Author's Estimate (2020)

Figure 7 shows the variations of the levels of drives that explain FI locality gaps over time. It reveals the variations in key variables that explain the FI locality gap between urban and rural household heads.

Socioeconomic variables such as income play a vital role in explaining the FI locality gap between urban household heads and that of their rural counterparts, as shown in Table 9. Figure 7 reveals that the income level impact on the financial inclusion locality gap has reduced over the period between 2012 to 2017. This implies that the effect of income on the FI gap between urban and rural counterparts is reducing even though the magnitude of the income on the FI gap is high and requires more effort. Whenever

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income levels increase in the country, those who live in urban places can become more financially inclusive compared to those who dwell in rural places.

Another critical variable of interest is employment. From Figure 7, employed values show negative variation, which implies that comparing the two periods, the employed statues have contributed to reducing the FI locality gap during the latter period (2016/17) than the former (2012/13). The reasoning is that generally, employment does favour rural folks since it includes farming and petty trading. Though the gap indicates negative, using GLSS R7, the disparity favours urban dwellers, which means even with general employment, it is gradually tilting in favour of urban folks. As many Ghanaians get employed, it improves the FI level of urban dwellers than those in rural areas. As people get employed, they are paid through a bank account, which aids in further transactions, making them financially inclusive.

Access to formal financial institutions from Table 9 indicates that it contributes to the increase in the FI by locality gap over the period under review. In comparing the two periods (GLSS R6 and R7), it is evident that access to the formal financial institution has increased the FI locality gap over the period. This may be due to certain factors such as small market size, poor socio-economic infrastructure, and lack of telecommunications infrastructure. For instance, even though mobile money is spread across the country, poor communication networks and long distances to mobile vendors place has made access to those institutions difficult to the rural folks. Like that of mobile money, formal financial institutions also fail to establish their branches or agency in rural areas due to the high cost of operation but low revenue-making

businesses not profitable. As the magnitude of access to financial institutions increases, the FI disparity by locality keeps widening. This results from both voluntary and voluntary closure and collapse of financial institutions or their branches located in rural areas.
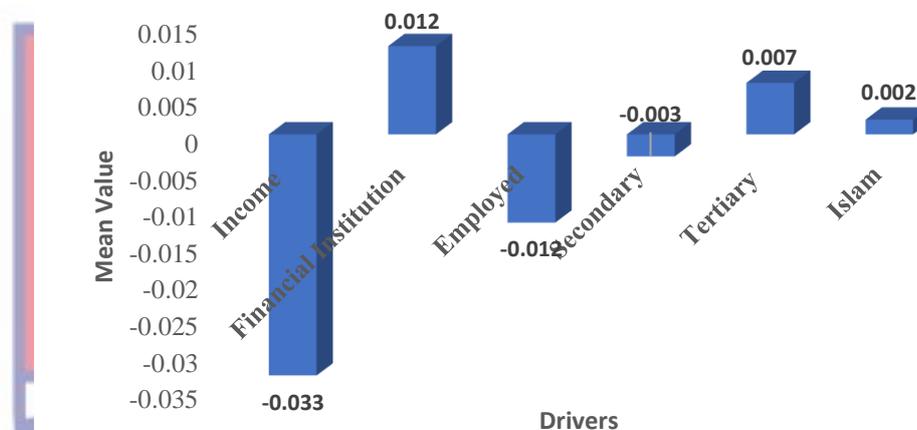
Figure 7: Variation in explained variables between GLSS R6 & R7- Locality
Source: Author's Estimate (2020),

Also, the tertiary education attainment level has also contributed to the increase of the FI disparity at the locality level. Tertiary educational completion level, just like access to financial institutions, contributes to widening the FI by locality gap from 2012 to 2017, as shown in Table 9. Referring to Figure 7, the net FI by locality gap shows positive, which implies that the magnitude for tertiary education attainment has increased over the period, contributing to the overall FI disparity by locality. Most people in the rural areas are deprived of attaining tertiary education due to factors such as income, motivation, good qualification and other socioeconomic issues. As more Ghanaians attain tertiary levels of education, the FI gap between urban dwellers and those who dwell in rural places increases. The impact of secondary school attainment on the FI disparity at the local level is due to

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certain factors, such as the government policy on supporting pupils at the secondary school level.

Lastly, the contribution of the Islamic religion cannot be overlooked. Islam variable contributed to the FI by locality gap during the period under study as shown in Tables 9, and the magnitude has increased over the period. Figure 7 indicates a positive variation regarding Islamic religion, which implies that Islamic religion's contribution towards the FI by locality gap has increased over time (2012 to 2017). Islamic region, in general, does not accept the modules of operations of the traditional financial services hence low patronage. The result shows that the gap has gone up, meaning more rural Muslims may have strictly followed their beliefs and practices.

Chapter Summary

The chapter presented the detailed analysis of FI decomposition and drivers within a period of time (2012-2017) by gender and locality. Concerning FI by gender using GLSS R6 (2012/13), the gap between male and female household heads is 0.228 while GLSS R 7 is also 0.215, all in favour of men. The FI gender gaps for the two periods (2012/31 and 2016/17) were significant at 1 percent. The study revealed that the endowment (differences in the explanatory variables across gender) accounted for the bulk of the FI gender gaps and were also significant at 1percent. The drivers of FI by gender gap are income, education (secondary and tertiary), access to financial institution employment and religion (Islam). The study concluded that FI by gender gap has reduced by 6 % during the period 2012 - 2017.

This study looked at FI decomposition by locality and its drivers for GLSS R 6 and R7. The result indicated that the FI gap between urban and

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rural is 0.333 for GLSS R6. It again showed that the FI gap between urban and rural gap is 0.473 using GLSS R7, and all (GLSS R6 and R7) favour urban dwellers. The P-value result indicated that the FI gap between rural and urban was significant at 1 percent for 2012/13 and 2016/17. The study again identified that the endowment accounted for most of the FI gender urban-rural and was also significant at 1percent. Some of the main drivers of FI by locality gap are income, access to financial institutions, employment, education (secondary and tertiary) and (religion) Islam. The result revealed further that FI by locality gap has gone up over the period (2012-2017) by 42.

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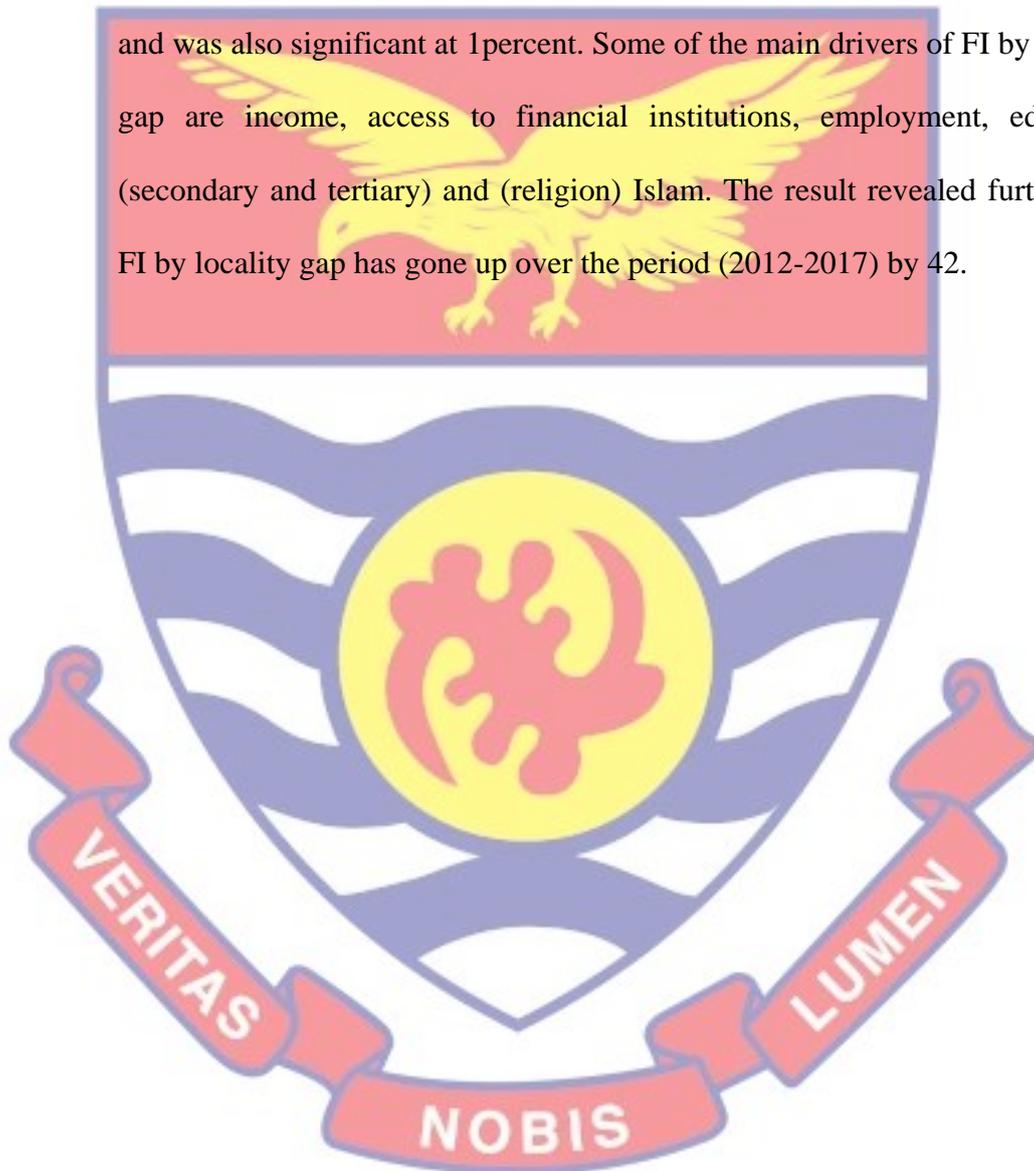
CHAPTER FIVE

FINANCIAL INCLUSION, FINANCIAL LITERACY AND

HOUSEHOLD POVERTY IN GHANA

Introduction

This chapter of the study presents presents the study's findings on the relative and combined effects of FI and FL on poverty in Ghana using both multidimensional poverty and income (unidimensional) poverty. The results are organised into three groups, namely: descriptive statistics; the combined effects of financial inclusion and financial literacy on poverty in Ghana using OLS, IV, Probit and IV probit; and the relative importance of financial inclusion and financial literacy in Ghana using dominance analysis approach.

Descriptive Statistics

Distribution of poverty level across the various localities in Ghana using financial inclusion insight 2015 data are presented in Figure 8. It shows poverty at the urban and rural and national level. Figure 8 reveals that about 73.75 percent of the household in Ghana fall above the poverty line of $2.50per day while 26.25 falls below the poverty line. At the locality level, about 13.37 percent of households who reside at the urban centers fall below the income poverty level and 86.63 percent also fall above the income poverty line of $2.50per day. With regard to rural dwellers, about 58.14 percent of the household fall above the poverty line of $2.50 per day, while about 41.86 of the household falls below the income poverty line. This is consistent with Cooke et al. (2016) and GSS Report (2018) that the poverty level in urban places is lower than that of rural. In Sub-Saharan Africa, including Ghana, the majority of the active working people who dwell in rural areas engage in

agriculture as their main occupation (Mahendra, 2018), which pays very little income, which may explain why income poverty levels are high in such places. The study concludes that poverty in Ghana is predominately rural, as indicated in Cooke et al. (2016).
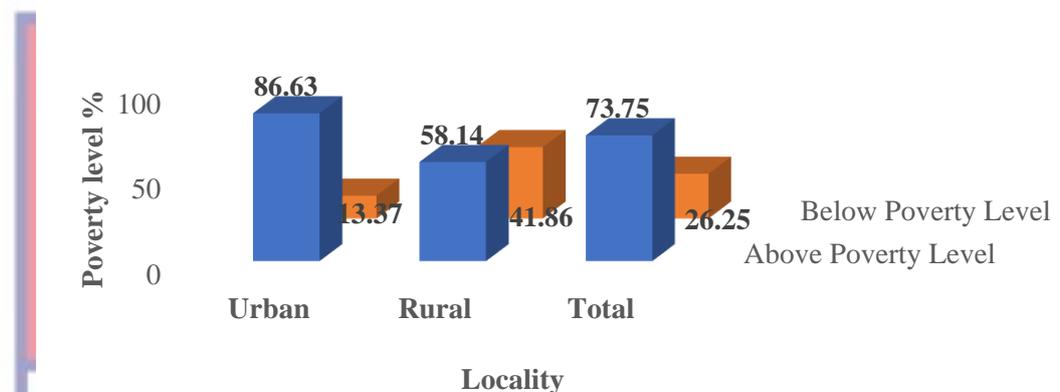
Figure 8: Poverty level by the locality in Ghana,
Source: Author's estimate (2020)

The gender of the household head affects the poverty level in a particular household in question (Cooke et al., 2016). Figure 9 presents the relationship between income poverty status and gender of a household head using FI insight 2015 data. From the graph, 27.14 percent of the male household heads fall below the poverty line of $2.50 per day, while 25.59 percent of female household heads fall below the poverty threshold. Comparing the national income poverty level of 26.25 percent in the data with that of male household heads, the male household head poverty level (27.14%) is above the national average. However, the female household head has a lower poverty level of 25.59 percent compared to the national average of 26.25 percent. This implies that the poverty level of a household headed by a male is higher than a household headed by a female which confirms the study of Twerefour et al. (2014). One of the main reasons is the polygamous nature

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of the Ghanaian society and absentee male heads who still remit the temporal head of household (female) to boost their income level, which agrees with Zheng (2015).
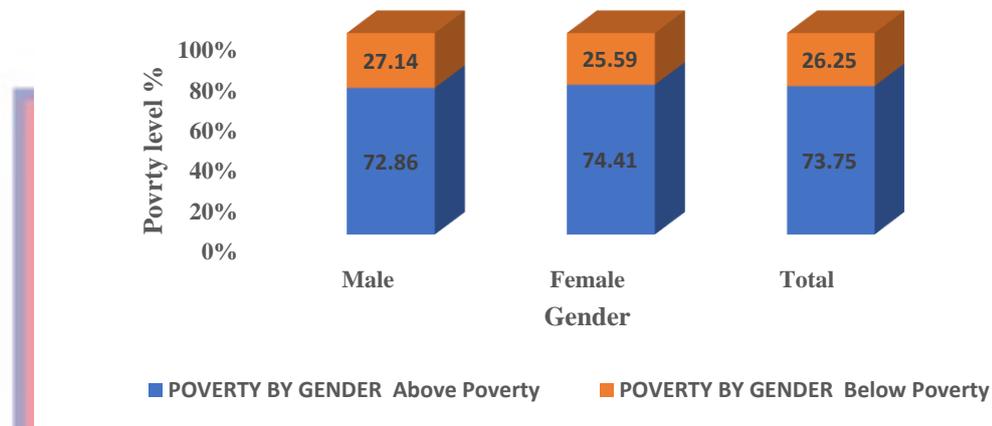
Figure 9: Poverty level by Gender in Ghana
Source: Author's estimate (2020)

Figure 10 indicates that in Ghana, 29.93 percent of the single (never married) category; 32.26 percent of those married people; 23.81 percent of those who have divorced or separated; 33.33 percent of the widow; 26.16 percent cohabitation category and 75 percent of other group falls below the poverty line of \$2.50 per day. Again, Figure 10 indicates that all the category except the single category have their income poverty higher than the national average level of 26.18 percent in the data. Among all the marital status various categories, those who never married have the lowest poverty level while the others have the worst poverty level. This could result from higher family responsibilities such as dependency that married and widowed may bear in our society. In Ghana, the average household size is about 4, which a married or widowed is supposed to cater for, and this increases their chances of being poorer compared to those who unmarried. This supports the assertion of

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Anyanwu (2014) that married people have a higher tendency to become poorer than never married.

N=3002
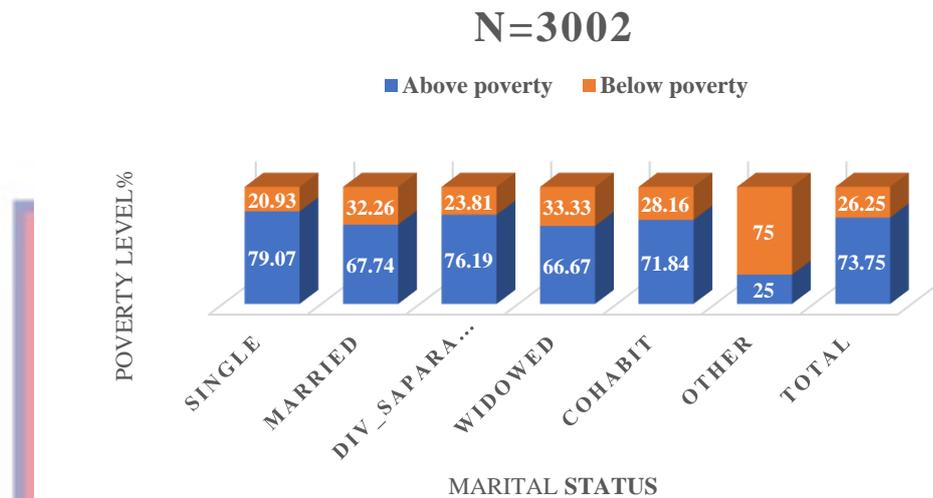
Figure 10: Poverty level by marital status in Ghana
Source: Author's estimate (2020)

Again, Figure 11 indicates that six regions (Western, Brong Ahafo, Volta, Northern, Upper East, and Upper West) have their income poverty level higher than the average national poverty level of 26.25 percent. For instance, the percentage of households that fall below the poverty line of $2.50 per day among the three northern regions ranges from 55.56 percent to 69.63 percent while the percentage of households in the three southern regions (Ashanti, Accra, and Eastern) who fall below the poverty threshold ranges from 6.1 percent to 7.96 percent.
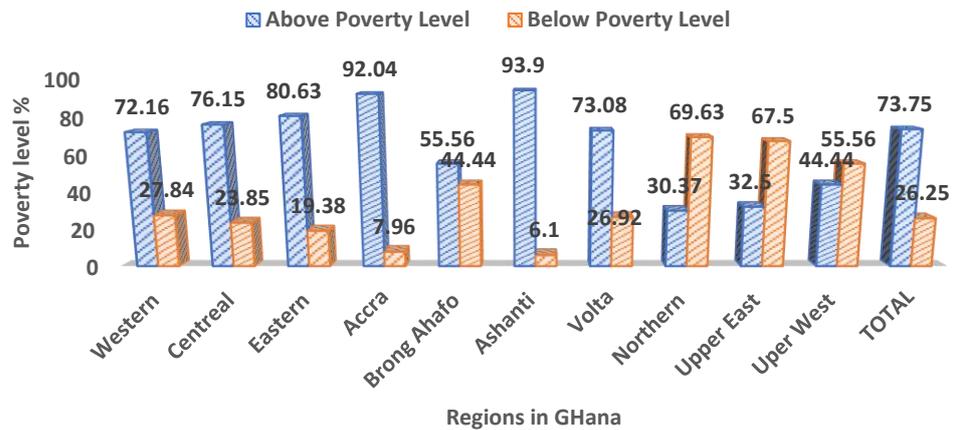
Figure 11: Poverty level by region in Ghana.
Source: Author's estimate (2020)

The descriptive information in Figure 11 shows another interesting result concerning the three northern regions of Ghana. The result indicates that all three regions also have households whose income levels fall below the poverty line of $2.50 per day and are more than those whose income levels fall above the poverty threshold of $2.50 per day. In Ghana, many households in the three northern regions mainly engage in peasant agriculture activities (Yin, et al., 2016) which gives them lesser income compared to their counterparts in the southern part of the country who are into different occupations such as industry and services (GSS, 2016). This implies that the average income levels of northern Ghana are lower than that of the southern part of the country, as indicated by Ofori-Boateng (2015) and GSS (2015).

Figure 11 again tells another story about regional poverty distribution. From the graph, Greater Accra and Ashanti Regions have the lowest income poverty level of 7.96 percent and 6.1 per cent respectively. This can be attributed to the level of commercial activities in these two regions. In Ghana, these regions are highly commercialised with many business activities, which improve the income level of those domiciled in the region (GSS, 2012).

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Another aspect worth discussing concerning income poverty and educational attainment in Ghana is comparing non-formal education with basic education attainment. Figure 12 denotes that household that belongs to the non-formal education and basic education attainment category have 60.62 percent and 29.45 percent of their people falling below the poverty line of $2.50 per day, respectively which are also above the national average income poverty of 26.25 percent. Those households with either secondary or tertiary education attainments category have 17.93 percent and 9.48 percent of their people, respectively, falling below the poverty line of $2.50 per day.
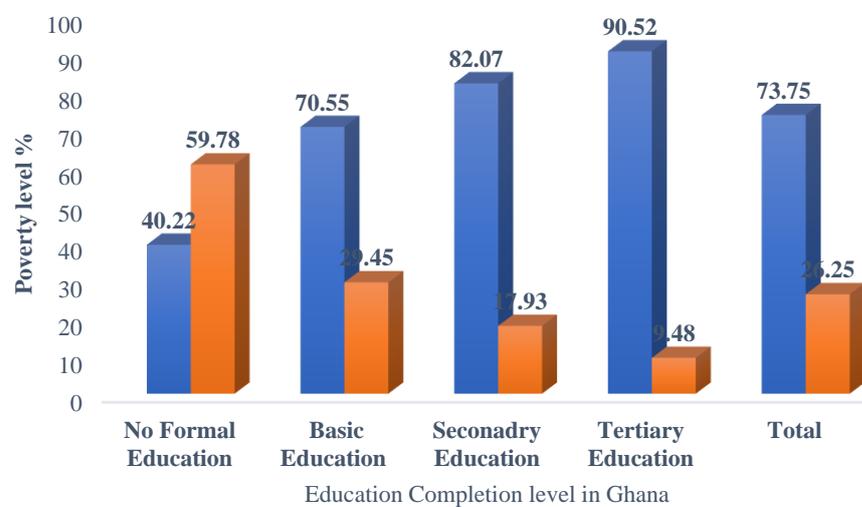
Figure 12: Poverty level by Education level in Ghana
Source: Author's estimate (2020)

Also, Figure 12 reveals that households who do not have any form of formal education had 60.62 percent of its people below the poverty line of $2.50 while only 39.38 percent of those into the same category also fall above the income poverty line of $2.50. This implies that a more significant proportion of Ghanaians who have not attained any form of formal education

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are poor, and this agrees with the works of Jabir (2015) and Dzidza, et al. (2018) that majority of uneducated people belong to the poor category.

A careful look at Figure 12 again shows another interesting trend of the income poverty level of households in Ghana based on their respective education attainment level. It is observed that those with no formal education attainment level, those whose income level falls below the income poverty line of $2.50 per day was 60.63 percent. Those who attained primary education had a lower poverty percentage of 29.45 while those who attained secondary education also had an income poverty level of 17.93 percent. And finally, the poverty level reached 9.48 percent for those who attained tertiary education. This supports the works of Adu-Ababio and Darko-Osei (2018); Molini and Paci (2015) that higher education attainment reduces poverty. This study confirms the government of Ghana education policy of ensuring that many people at least attained second cycle education. The result indicates that those who attained education level above basic education have their income poverty level below the national income poverty level of 26.25 percent.
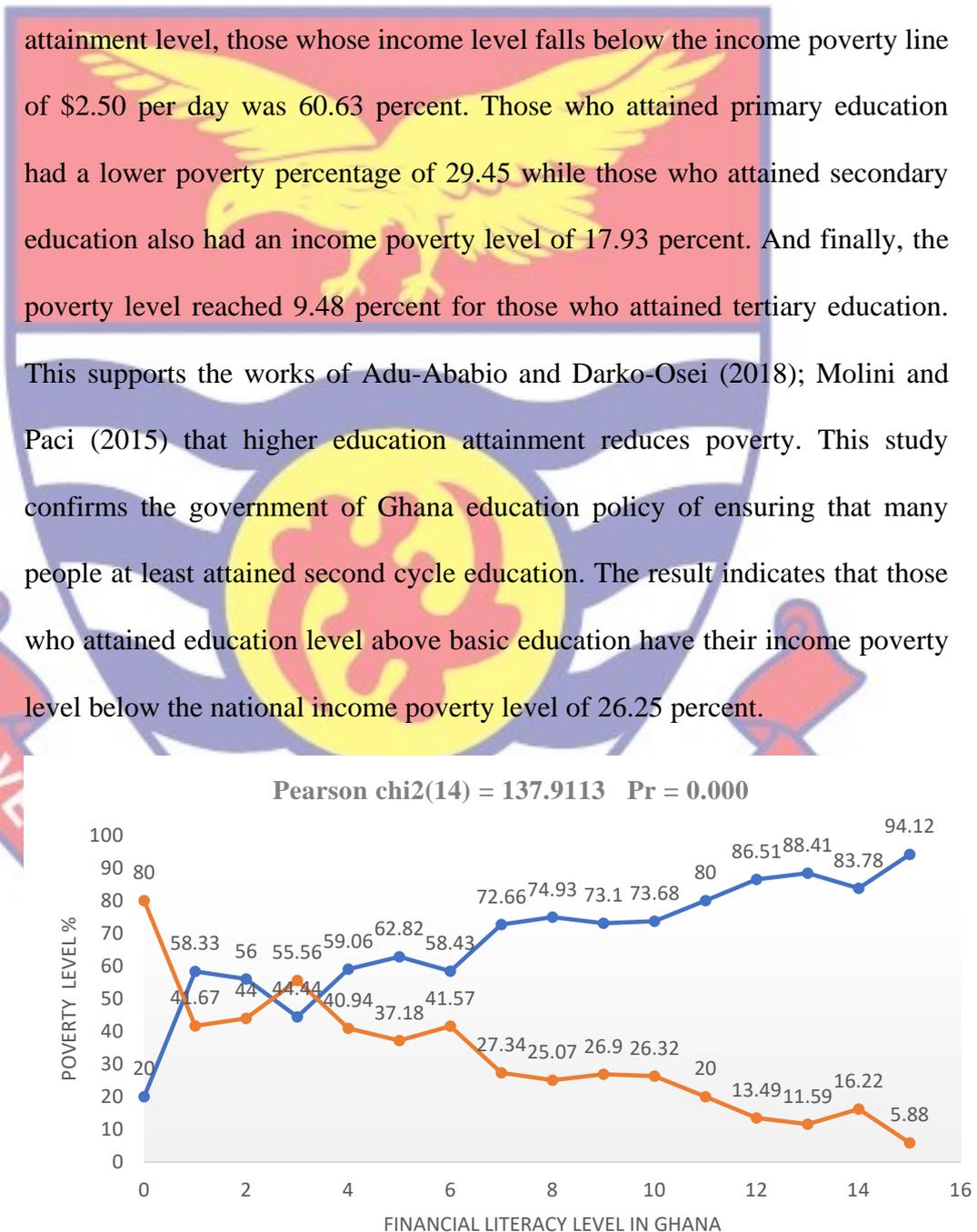
Figure 13: Poverty Financial Literacy in Ghana,
Source: Author's estimate (2020)

Figure 13 presents the relationship between financial literacy and income poverty. The result indicates that there is a strong negative relationship between the income poverty level and financial literacy, and it confirms studies of Berry, et al. (2018). As a household member becomes financially literate, he or she can make effective financial decisions and plan adequately. This improves financial management and the tendency of falling above the income poverty line of $2.50 becomes high.
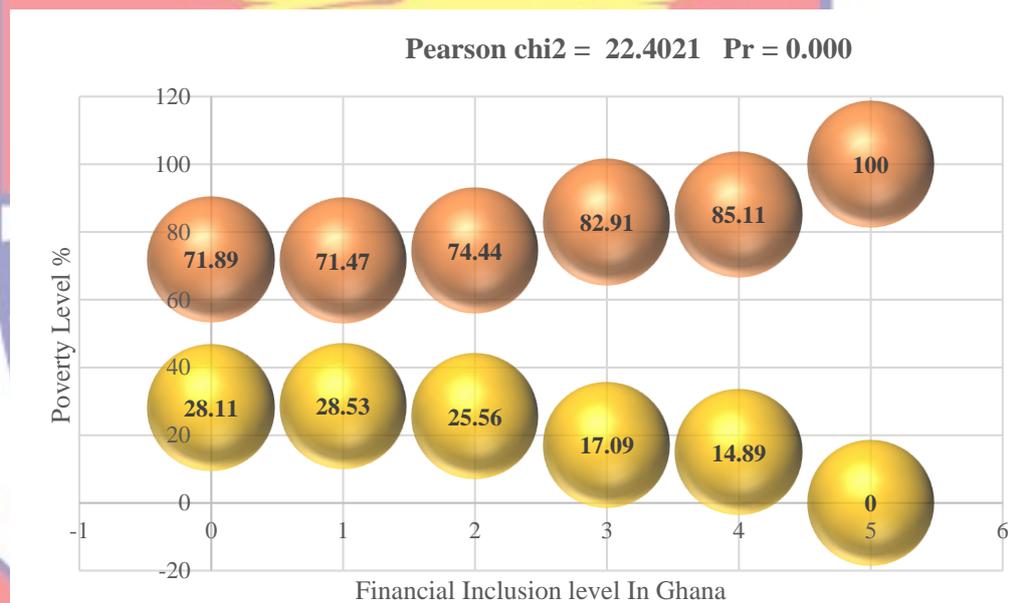
Figure 14: Poverty by financial inclusion in Ghana,
Source: Author's estimate (2020)

Figure 14 indicates the relationship between FI and income poverty levels in Ghana. The graph indicates a strong inverse relationship between income poverty and the FI level of households in Ghana, also echoed by Boateng (2018) and Agyemang-Badu, et al. (2018). A financially exclusive household has about 71.89 percent of its people falling below the income poverty line of $2.50, while only 28.11 percent of them fall above the poverty level. As they become financially inclusive, they can reduce their poverty

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level, and as they improve their FI level further, their poverty level also diminishes.

Effect of Financial Inclusion and Financial Literacy on Poverty

Table 10 presents results on financial inclusion and financial literacy on poverty. Table 10 gives the results on the effect of FI and FL on measure of poverty based on multidimensional. Income poverty was also used for robustness purpose. Under each poverty measure, the study gives results for both the OLS and probit estimation for multidimensional poverty and IV estimations for MPI and income poverty. This is done as the estimations' reliability varies for the study's main hypothesis. The results support the IV estimation in Table 10, where FI and FL are the main variables of interest. This provides the result for one of the study's main hypotheses: through financial inclusion and financial literacy individually reduce poverty, both jointly reduce poverty more is validated in Appendices 22 and 23.

From Table 10, the IV and IV Probit results are preferred to that of OLS estimation because the Wald Test of exogeneity and Hausman post-estimation result indicate that financial inclusion is endogenous. Therefore, the study fails to accept the case that FI is exogenous. Hence, using OLS estimation to examine financial inclusion and poverty will underestimate the effect financial inclusion has on poverty, as shown by the coefficients of FI and FL in Table 10.

To determine if the instruments are weak, the research used the F-statistic with the first stage regression (Staiger & Stock, 1994) and acquired an F-statistic of 11.972, which is significantly larger than 10, indicating that the null hypothesis of the weak instrument is rejected. Using the Cragg-Donald

Wald F-statistic of 11.972 results in a rejection of the null hypothesis of weak instruments at a 10% alpha level. The study used the Sargan statistic score test of over-identifying restrictions (p-value = 0.075) for the over-identification/valid instruments test because both Sargan's (1958) and Basmann's (1960) tests make the assumption that the errors are independent and identically distributed (IID). Based on the score test, we fail to reject the null hypothesis of valid instruments at a 5 percent level.

Appendices 10 and 11 provide the correlation analysis of the prospective endogenous constructs, poverty indicators, and the instruments utilised, as well as the first phase inference results, for further investigation of the appropriateness of the instruments utilised. In Appendix 10, for example, the study finds that the instruments utilised – proximity to the financial entity – are statistically significant across all first-phase estimates. After justifying the circumstances for utilising the instruments and the IV technique in general, the study goes ahead to estimate the results, analyses and discussion. Having justified the use of the IV and IV Probit, the study interprets and discusses the results of estimated coefficients of the stated models.

As indicated in Table 10, FI reduces MPI by 15.4 percent, significant at five percent. Using the unidimensional measure (income poverty), being financially included reduces one's probability of falling below the poverty line of $2.50 per day by 11.4 percent at a one percent level of significance. This finding implies that FI has a poverty reduction effect on the beneficiaries regardless of its measure. Similarly, FL also significantly reduces the poverty level of the individual regardless of the perspective from which it is being measured. For example, using the multidimensional measure, financial literacy

reduces multidimensional poverty by 0.9 percent but the probability of falling

below the poverty line of $2.50 per day reduces by 5.3 percent.

Table 10: Effect of Financial Inclusion and Financial Literacy on Poverty

Explanatory variables	Multidimensional poverty		Unidimensional poverty	Unidimensional poverty
	IV	OLS	Probit	IV
Financial inclusion (FI)	-0.154**	-0.0150***	-0.114***	-0.201***
	(0.0720)	(0.00209)	(0.0336)	(0.0258)
Financial Literacy (FL)	-0.00859*	-0.00561***	-0.0526*	-0.220***
	(0.00457)	(0.00200)	(0.0313)	(0.0189)
Both FI & FL	-0.189***	-0.0745***	-0.254***	-0.00729*
	(0.0547)	(0.00461)	(0.0708)	(0.00832)
Land ownership	-0.0249**	-0.0447***	0.0546	-0.0283
	(0.0119)	(0.00501)	(0.0753)	(0.0189)
Education (base=no formal educ.)				
Primary	0.0145*	-0.0190***	-0.415***	0.0350
	(0.0224)	(0.00672)	(0.0955)	(0.0341)
Secondary	-0.0154**	-0.0299***	-0.766***	-0.0231
	(0.0162)	(0.00698)	(0.101)	(0.0405)
Tertiary	-0.0400**	-0.0260***	-0.989***	-0.0916**
	(0.0223)	(0.00883)	(0.146)	(0.0425)
Household size	-0.00217**	-0.000482	0.00883***	0.0832***
	(0.00109)	(0.000381)	(0.0499)	(0.0184)
Male (base=female)	0.0197**	0.0134***	0.273***	0.0856***
	(0.00925)	(0.00419)	(0.0656)	(0.0318)
Urban (base=rural)	-0.0371***	-0.0464***	-0.624***	0.0575
	(0.00990)	(0.00411)	(0.0624)	(0.0413)

Table 30 continue ……

Age group (ref=below 33)				
53-34 years	0.116**	0.0206	-0.095	0.0896**
	(0.057)	(0.018)	(0.264)	(0.0508)
73-54 years	0.145*	0.0095	-0.056	0.0376
	(0.077)	(0.0179)	(0.255)	(0.0258)
74+years	0.147**	0.024	0.083	0.0512
	(0.068)	(0.0180)	(0.256)	(0.014)
Marital status (base= single)				
Married	0.0332*	-0.00131	-0.0613	0.201**
	(0.0201)	(0.00462)	(0.0727)	(0.0192)
Separated	0.0546**	0.0158*	0.0147	(0.0200)
	(0.0257)	(0.00831)	(0.127)	
Widowed	0.0376	0.00188	-0.178	-0.0745*
	(0.0258)	(0.00971)	(0.149)	(0.00461)
Cohabit	0.0286	-0.00327	0.0694	-0.0447*
	(0.0319)	(0.0108)	(0.163)	(0.00501)
Other	0.161	0.0517		0.0224
	(0.131)	(0.0528)		(0.0502)
Government welfare	-0.0661	-0.130***		0.0173
	(0.0402)	(0.0148)		(0.0355)
Employment (base= No Job)				
Employed	-0.0122**	-0.00594	0.653***	0.0265*
	(0.0249)	(0.0111)	(0.155)	(0.0345)
Yes, main job is in agriculture	0.00575	0.0148**	0.479***	0.0364**
	(0.0161)	(0.00669)	(0.0948)	0.0237
No, main job is not in agriculture	-0.0538***	-0.0625***	-0.448***	(0.0418)
	(0.0101)	(0.00487)	(0.0782)	(0.0418)

Table 30 continue …

Constant	0.347***	0.316***	-0.732***	0.065**
	(0.0263)	(0.00818)	(0.128)	(0.0012)
Observations	3002	3002	3002	3002
R-squared	0.884	0.303		
Wald test of Exogeneity	4.55 (0.033)			3.78 (0.011)
Hausman	7.40(0.00)			9.11(0.00)
Under identification test	5.992 (0.000)			
Weak identification test (Cragg-Donald Wald F statistic)	11.972			
Stock-Yogo weak ID test critical values: 10% maximal IV size	19.93			
Sargan statistic (over-identification test of all instruments)	15.67A			
Hatsq			**(p=0.456)**	

Instruments: distance to Financial Institution. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.001
Source: Author's estimate (2020)   A means greater than 5% and that is not significant
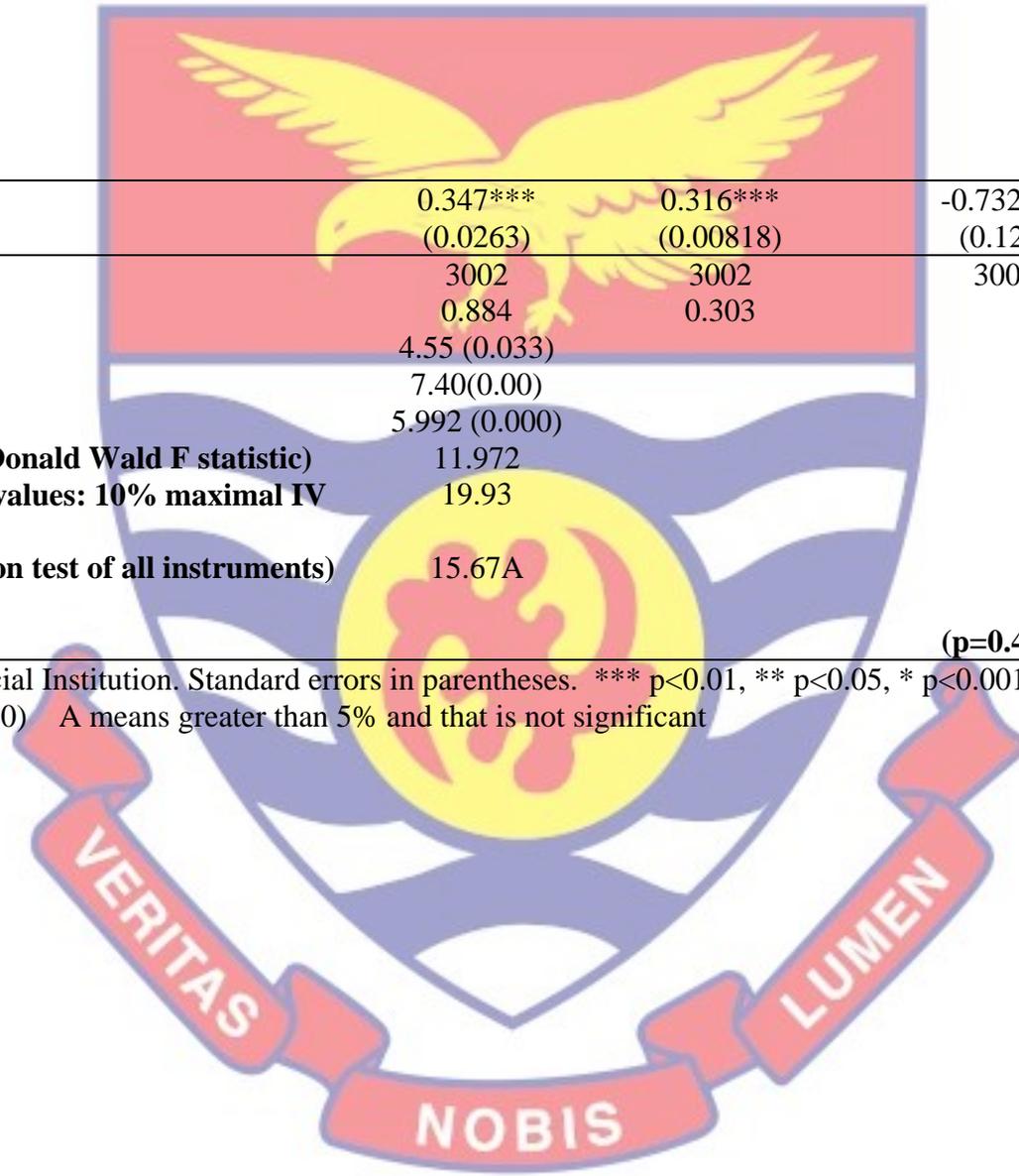
Remarkably, FI and FL jointly reduce multidimensional poverty by 18.9 percent. Besides, the probability of falling below the poverty line of $2.50 per day reduces by 25.4 percent. This finding implies that although FI and FL individually reduce poverty, their joint effect on poverty is greatest. Consistent with extant literature (Abor et al., 2018; Ramada-Sarasola, 2012) widening the scope of FI, individuals can easily access financial services like savings, credit, and micro-insurance, which diversely improve their livelihood and most importantly, protect them against idiosyncratic risk and sudden shocks (Duflo et al., 2013; Giordano & Ruiters, 2016). An individual who is financially literate can appreciate financial inclusion and can participate it better than individual who either just financial literate or inclusive.

Owning land reduces multidimensional poverty by 2.5 percent compared to someone without land. Compared to an individual without education, having primary education reduces poverty by 1.45 percent but reduces the probability of falling below the poverty line of $2.50 per day by 41.5 percent. These are all statistically significant indicating the relevance of this variation. Having secondary education reduces multidimensional poverty by 1.54 percent and it is significant at five percent. Relative to those without formal education, having tertiary education reduces multidimensional poverty by 40 percent and it is significant at five percent but reduces the chances of falling below the poverty line of $2.50 per day by 98.9 percent. Education has shown to improve family wellbeing (Mukherjee & Benson, 2003), Datt and Jolliffe (1999) are some of the researches that revealed education to be the key to reduce poverty. Higher-educated family leaders have been proven to reduce

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the low chances. As a result, enhancing the standard of education of leaders is viewed as a variable in determining livelihoods and rates of poverty.

The majority of individuals for whom a family lead is monetarily accountable is referred to as family size. This measure of poverty describes the relation between a family's poverty rate and its structure. Household size differs significantly between poor and non-poor families. Many studies have found that the increased household size increase poverty. Consistent with this study's finding, an additional member reduces the multidimensional poverty by 0.22 percent but increases below the poverty line of $2.50 per day by 0.88 percent. According to Biyase et al. (2017), adding an individual to a family rises poverty by lowering consumer spending. Everything else being equal, poverty is predicted to decrease with narrower families.

Studies such as Cooke et al. (2016) and Annim et al. (2012) have found that the sex of household heads influences poverty. Consistent with this study's finding, being a male household increases multidimensional poverty by 2.0 percent and increases the probability of falling below the poverty line of $2.50 per day by 27.3 percent. Geda et al. (2005) discovered that woman-lead households are more likely to be poor than man-lead households. However, Rajaram (2009) study found mixed findings regarding the connection between man-lead and woman-lead families and poverty.

Living in an urban area reduces multidimensional poverty by 3.71 percent while reducing the probability of falling below the poverty line of $2.50 per day by 62.4 percent compared to living in a rural setting. In Ghana, most rural dwellers are saddled with poor socioeconomic infrastructures, including low commercial activities, which makes them poor. This is

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consistent with the findings of Karbo and Agyare (1997); Tsibey et al. (2003); Codjoe (2010).

Employment status from Table 10 significantly reduces poverty regardless of poverty measurement. Similarly, Twerefou et al. (2014) discovered that full time work influences the poverty rate of people and family units. Mujherjee and Benson (2003) in the United States found that manufacturing full time work is a main predictor of poverty reduction via rising per capita expenditure or per capita food expenditure. In contrast, a study by Litchfield (2003) demonstrated that working in the "*white collar*" and agricultural production decreases the chance of becoming poor.

Calculating for the Net Effect of FI and FL

The interaction effect = .0067495

$$p_i = 0.347 - 0.154FI_i - 0.009FLp_i = 0.347 - 0.154FI_i - 0.009FL \qquad (42)$$

From equation (42), the net effect of FI is -0.154072. Thus, the effect of FI on poverty in a financially literate household is -0.154072. On the other hand, the net effect of FL is -0.010232. Thus, the effect of FL on poverty in a financially included household is –0.010233. This finding implies that FI is more favourable in reducing poverty in a financially literate household compared to the effect of FL on poverty in a financially included household

The Relative Importance of FI and FL on Poverty in Ghana

This section is based on dominance analysis and its rankings of socioeconomic variables, including FI and FL, that affect or determine poverty. After examining the combined effect of FI and FL on poverty in Ghana, the study proceeds by accessing the two (FI and FL) variables that have the biggest influence on poverty in Ghana. The section comprises three

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parts: multidimensional poverty, unidimensional (income poverty), and full model (multidimensional and unidimensional). These have been presented in Tables 11, 12, and 13 of the study.

Table 11 depicts the ranking and standardized dominance of variables that determine multidimensional poverty among urban-rural dwellers and across male-female. Focusing on dominance analysis at the locality level, urban and rural household dwellers have different rankings and standardized dominance of variables. Under the urban dwellers, FL is ranked the highest with the standardized dominance statistics of 0.403, followed by household size with a standardized dominance statistic of 0.167. The third highest ranked variable under urban dwellers is FI with a standardized dominance statistic of 0.141, while the fourth rank is the main job status with 0.129 as a standardized dominance statistic.

Under rural dwellers, multidimensional poverty determinants are ranked, and standardized dominance statistics are as follows. FL is ranked the highest (0.233), like urban dwellers. Though the Region factor is not highly rated under urban dwellers, the story differs from rural places. Under the rural perspective, region is ranked second with a standardized dominance statistic of 0.2123. FI (0.1933) maintained its third on the log. The fourth position education (0.153) is relatively ranked higher under multidimensional poverty than unidimensional poverty. Observing both rankings of urban and rural household variables that determine multidivisional poverty, it is evident that FL is superior to all the variables, including FI. FL involves financial knowledge, behaviour, and attitude that make people aware of financial issues and develop a strategy to deal with them. The essential aspect of FI is that it

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can make an effective and efficient financial decision. Financial products, including savings in all their forms, insurance, and mortgage may exist, but utilising them more efficiently and effectively is crucial. This agrees with Usman, et al. (2022) that FL is a very critical issue that needs to be addressed in the battle for poverty alleviation. Other variables such as educational attainment, region, and main job status also play an essential role in determining the multidimensional poverty level concerning the locality.

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Table 11: Relative importance of financial inclusion and financial literacy in Ghana using multidimensional poverty

	MULTIDIMENSIONAL POVERTY							
	LOCALITY				GENDER			
	URBAN		RURAL		MALE		FEMALE	
Variables	Standardized Domin. Stat.	Ranking	Standardized Domin. Stat.	Ranking	Standardized Domin. Stat.	Ranking	Standardized Domin. Stat.	Ranking
FI	0.1411	3	0.1933	3	0.1535	4	0.0849	4
FL	0.4028	1	0.233	1	0.1662	2	0.2348	2
Locality	0	0	0	0	0.2844	1	0.3527	1
Household Size	0.1667	2	0.0144	7	0.0182	8	0.044	8
Land Ownership	0.0039	9	0.0534	6	0.024	7	0.0503	6
Main Job	0.129	4	0.1266	5	0.0573	6	0.1082	3
Education	0.0416	6	0.153	4	0.1306	5	0.0335	8
Marital Status	0.0019	10	0.0021	9	0.0013	10	0.0015	10
Region	0.1032	5	0.2123	2	0.1628	3	0.0724	5
Govt welfare	0.0048	8	0.0011	10	0.0017	9	0.0045	9
Gender	0.0049	7	0.0108	8	0	0	0	0
No. Reg	1023		1023		1023		1023	
No.OBS	1645		1357		1271		1731	
Overall Fit test	0.095		0.1304		0.212		0.1531	

Source: Author's estimate (2020)

Table 11 again looked at the ranking and standardized dominance of variables of multidimensional poverty under gender (male and female) perspective. The ranking and Standardized Dominance of variables among males are as follows: locality (0.2844) and FL (0.1662). The fourth variable per the ranking is FI, with standardized dominance statistics of 0.1535. Regarding females, the ranking and Standardized Dominance statistics follow in descending order. The locality is the highest with Standardized Dominance (0.3527) statistics similar to the male counterpart. FL follows that with Standardized Dominance statistics (0.2348). The fourth highest-ranked variable is also FI, with a Standardized Dominance statistic of 0.0849.

Under the multidimensional poverty approach, locality (urban and rural dwelling place) is the most important variable from the gender perspective. This may result from the inadequate availability of socioeconomic amenities (Kumar, 2014) in a certain part of the country that hinders the socio-economic activities of people who live in such places. FI was ranked fourth for both males and female's category in the model. The result revealed that though FL is ranked higher than FI under both gender and locality levels, these variables of interest are more significant than under gender. FL is relatively important at both male and female household head levels than FI at both male and female household head levels. This confirms Fambon (2014) and GSS (2018) assertion that locality plays a vital role in achieving eradicating poverty in all its forms.

Table 12 focuses on the ranking and standardized dominance of variables that determine unidimensional (income) poverty among urban-rural household dwellers and across the male-female head of household. The

ranking and standardized dominance statistics for unidimensional poverty of urban dwellers variables are as follows. The household size is ranked the highest with the standard dominance statistics of 0.3789. This is followed by educational attainment level with a standard dominance statistic of 0.1896. FL is ranked third and standard dominance statistics of 0.1596. However, FI was ranked fourth among the variables affecting income poverty at the urban level.

In line with the ranking of unidimensional poverty variables, the rural household level provides another interesting result. It was observed that the household size is also ranked the highest with a standard dominance statistic of 0.5608, just like that of household heads who reside in urban centers. The third variable in the ranking order is FL and has a standard dominance statistic of 0.1357, while FI is ranked fifth. Land Ownership is ranked third with a standard dominance statistic of 0.1319. In Ghana, the main occupation in the rural area is farming (World Bank, 2017) which mostly requires land ownership. Hence, the size of the land household owners is vital in determining their income level (Osmani & Hossain 2015) and extending their poverty level.

The study further explores this relative analysis and the determinants of unidimensional poverty as captured in Table 12 under the gender perspective. Considering the male household head, the variable that scores highest in determining income poverty level is household size with a standard dominance statistic of 0.3436. This is followed by locality with a standard dominance statistic of 0.1884. FL is ranked third on the log with 0.1509 as its standard dominance statistics, while the FI is ranked fifth and had a standard dominance statistic of 0.1312.

Table 12: Relative importance of financial inclusion and financial literacy in Ghana using unidimensional poverty

	INCOME POVERTY							
	LOCALITY				GENDER			
	URBAN		RURAL		MALE		FEMALE	
Variables	Standardized Domin. Stat.	Ranking	Standardized Domin. Stat.	Ranking	Standardized Domin. Stat.	Ranking	Standardized Domin. Stat.	Ranking
FI	0.1343	4	0.0643	5	0.1312	4	0.1481	5
FL	0.1596	3	0.1357	2	0.1509	3	0.1438	3
Locality	0	0	0	0	0.1884	2	0.1728	2
Household Size	0.3789	1	0.5608	1	0.3436	1	0.3908	1
Land Ownership	0.0049	9	0.1319	3	0.0024	9	0.0016	9
Main Job	0.017	6	0.0055	8	0.0103	7	0.0122	7
Education	0.1896	2	0.0666	4	0.0347	6	0.1438	4
Marital Status	0.0053	8	0.0127	7	0.0091	8	0.0059	8
Region	0.089	5	0.002	9	0.1279	5	0.0416	6
Govt welfare	0.0012	10	0.0016	10	0.0015	10	0.0009	10
Gender	0.0089	7	0.0191	6	0	0	0	0
No. Reg	1023		1023		1023		1023	
No.OBS	1645		1357		1271		1731	
Overall Fit test	0.1624		0.3024		0.3804		0.309	

Source: Author's estimate (2020)

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Focusing on female household heads under unidimensional poverty, the household size is ranked highest with a standard dominance statistic of 0.3908. From Table 12, it is evident that household size has the greatest effect on unidimensional poverty. The size or the number of people a household is financially responsible for determining the dependency ratio of a household (Han & Cheng, 2017). A household with a higher dependency ratio stands a higher chance of becoming poor (Salvucci, & Santos 2020). The locality variable is also being ranked second on the female household heads unidimensional poverty determinate the log, and it has a standard dominance statistic of 0.1728. FL is ranked third with a standard dominance statistic of 0.1438, while FI is ranked fifth with 0.1481. This implies that in a country like Ghana, FL influences the poverty level more than FI.

Table 13 reveals the relative importance of various socioeconomic variables that influence poverty status from either unidimensional or multidimensional approaches. It ranks the variables and determines their standard dominance statistics as well. In Ghana, the area of residence (urban or rural) plays a vital role in determining poverty status, whether unidimensional or multidimensional (GSS, 2018; Cooke et al., 2016). This is due to the unequal distribution of resources within geographical space. People are poor in Ghana and other SSA by extension basically because of their location (Cooke et al., 2016). In most cases, the rural dwellers lack most of the socio-economic amenities such as proper education, health facility, transportation network, security, and safe water (Singh, 2016; Boadi, et al., 2005), which affect both households and individuals to be alleviated from poverty status irrespective of its dimension. Table 13, under the

multidimensional level, was ranked number one with a standard dominance statistic of 0.3307 and second under unidimensional with standard dominance statistics of 0.1841 concerning its influence on the poverty level.

The next most relatively dominant variable in the two models is the household size which is relatively the second most influential variable in the poverty model. Focusing on a unidimensional poverty perspective, it is ranked as the essential variable with a standard dominance statistic of 0.3673 though it is ranked under multidimensional poverty with a standard dominance statistic of 0.027. In Ghana, the average dependence ratio of 68.53% (World Bank, 2020) is still high, coupled with low-income levels. Hence any household head with a large household size is likely to face poverty issues. This implies that in Ghana, household size influences the household's poverty status (Meyer & Nishimwe-Niyimbanira, 2016). The higher ranking of the household size could be attributed to the large family size, which leads to a higher average birth rate in the country (Anyanwu, 2013).

The role of FL in the two-poverty model cannot be overemphasized. Table 13 reveals that both the unidimensional and multidimensional poverty approach recognized the influence of the FL variable in determining the poverty status of a household. Under a unidimensional level, FL is ranked third with a standard dominance statistic of 0.1427 and ranked as high as the second position on a multidimensional poverty log with a standard dominance statistic of 0.199. This implies that FL has a relatively more significant influence under multidimensional poverty measurement than unidimensional.

Table 13: Relative importance of FI and FL in Ghana using unidimensional and multidimensional poverty

| | Multi and Unidimensional of Poverty (FULL) | | | |
| | Unidimensional (Income) Poverty | | Multidimensional Poverty | |
Variables	Standardized Domin. Stat.	Ranking	Standardized Domin. Stat.	Ranking
F I	0.0801	5	0.1065	4
FL	0.1427	3	0.199	2
Locality	0.1841	2	0.3307	1
Household Size	0.3673	1	0.027	8
Land Ownership	0.0576	6	0.0375	7
Main Job	0.0068	8	0.084	6
Education	0.1409	4	0.0933	5
Marital Status	0.0061	9	0.0012	11
Region	0.0017	10	0.1148	3
Govt welfare	0.0011	11	0.0024	10
Gender	0.0117	7	0.0036	9
No. Reg	2047		2047	
No.OBS	3002		3002	
Overall Fit test	0.3362		0.175	

Source: Author's estimate (2020)

FL, which consists of the financial knowledge, behaviour, and household or individual's financial attitude (Stolper & Walter, 2017), informed their financial decision (Prasand & Nataraj, 2017) hence their ability to eradicate poverty. Only 32% of adults (Standard & poor, 2015) are financially literate in Ghana. This presupposes people participate in financial activities, but they have become worse off due to either lack of financial knowledge, poor financial behaviour, or attitude. This confirms the fourth Ghana economic update report (World Bank, 2018) that the Ghanaian economy currently needs more FI to be able to achieve its objectives. This may partially explain why some people suffered a great deal during the financial sector crisis in Ghana.

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FI is another essential variable that influences poverty from both unidimensional and multidimensional levels. This consists of ownership, access, and usage of financial products or services. For instance, Table 13 revealed that FI under unidimensional poverty is ranked fifth with a standard dominance statistic of 0.0801 while it is the fourth highest-ranked under the multidimensional approach with a standard dominance statistic of 0.1065.

FI has a relatively more substantial influence on multidimensional poverty ranking than that of a unidimensional aspect. The study also agrees with (Kavidayal &Kandpal, 2016; Park & Mercado, 2015) that FI has been identified as one of the key variables that influence the level of poverty at both household and individual levels. It provides an opportunity for the deprived to participate in financial activities. As people become financially inclusive, they can either save, receive remittance, or access credit (Ajefu & Ogebe 2019; Grandolini 2015), which improves their income and general consumption levels (Koomson, et al., 2020).

In sum, in Ghana, variables such as locality, household size, education, occupation, land ownership, region, FL, and FI are significant determinants of poverty (irrespective of the approach). However, locality (urban-rural) is the dominant poverty variable under both poverty dimensions. Concerning the relative importance of FI and FL, the study concludes that FL is relatively crucial in combating poverty in the country currently, as was echoed by Chaulagain (2015); Sabana (2014).

Chapter Summary

The third empirical chapter was based on relative and combined effects of FI and FL on poverty in Ghana using both multidimensional poverty and

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income (unidimensional) poverty. The study presented detailed results and analyses. On the combined effects of FI and FL on poverty in Ghana using instrumental variable (IV) since OLS would not provide the best linear estimates as there are downward biases with such results. FI reduces multidimensional poverty by 15.4 per cent while FL multidimensional poverty decreases by 0.9 per cent. However, combining both FI and FI reduce multidimensional poverty by 18.9 per cent. Using the dominance analysis approach, it also looked at the relative importance of financial inclusion and financial literacy in Ghana. The result indicated that variables such as locality, household size, education, land ownership, FL and FI are essential in eradicating poverty. In comparing the relative importance between FI and FL, the latter is more crucial with a standard dominance statistic of 0.199 while the formal also has a standard dominance statistic of 0.1065 under multidimensional poverty.
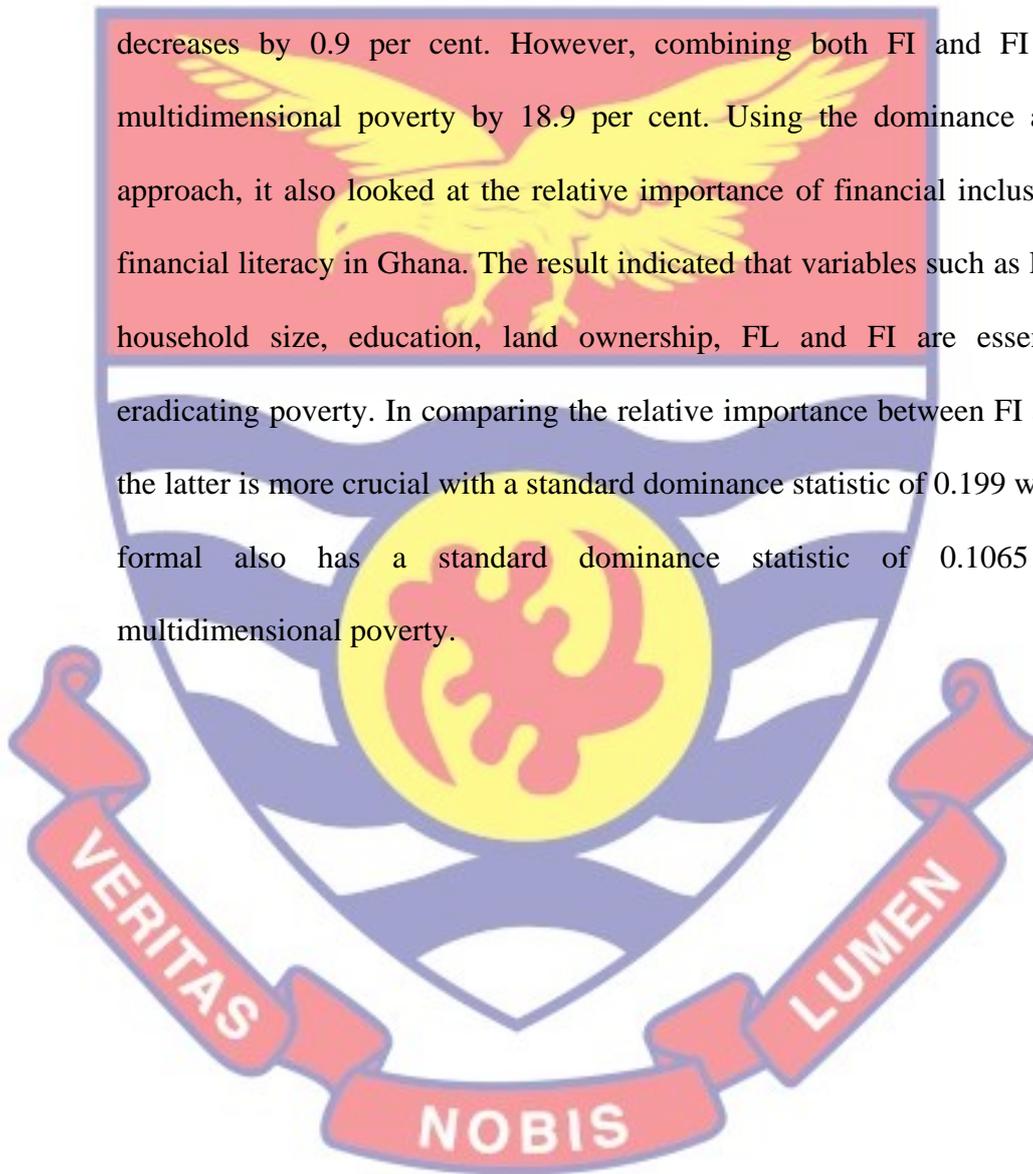
CHAPTER SIX

FINANCIAL INCLUSION INEQUALITY AND HOUSEHOLD

POVERTY IN GHANA

Introduction

This chapter presents the study's findings on the effect of Financial Inclusion Inequality on poverty at the district level in Ghana. The results are organised according to sections based on the sub-objectives of the chapter. The chapter begins with descriptive statistics and is followed by the trends of financial inclusion inequality at the various geographical levels (district, Rural/Urban, regional and ecological zone), while special analyses of both financial inclusion inequality at the district levels and poverty are also discussed. The next section focused on the OLS regression results for consumption poverty and financial inclusion inequality. The last section discusses ordered logit regression results on poverty status and District financial inclusion inequality.

Descriptive Statistics

Figure 15A presents a graphical distribution of financial inclusion inequality across the various levels of education for GLSS R6 (2005). Education had a negative correlation with financial inclusion inequality as the inequality was seen to be high for household heads with no level of education and relatively lower for household heads with some form of education. However, the rate of financial inclusion inequality was seen to be declining as the level of education for the household heads increased from basic to tertiary. This can be attributed to the fact that with education, people can understand the various

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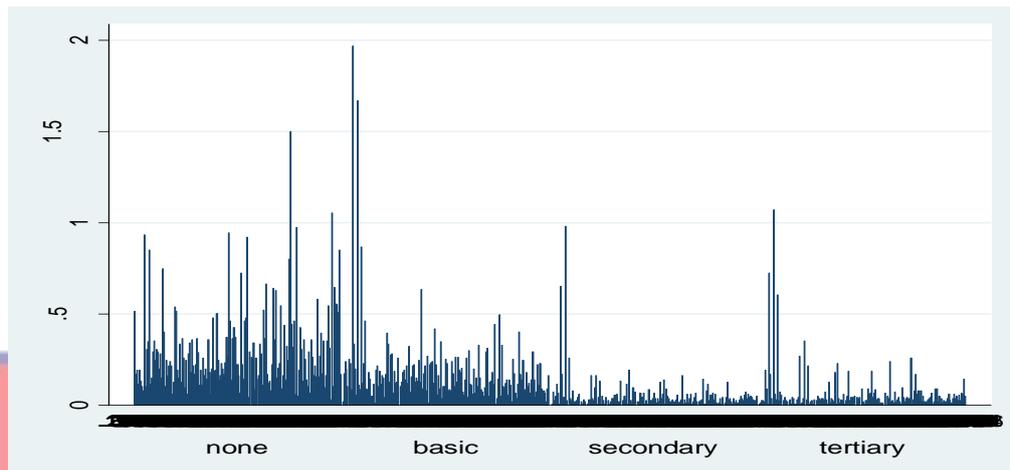
Figure 15A: District financial inclusion inequality and educational levels (R6)

Financial services available and patronise them, reducing the gap between the various levels of financial inclusion. However, most household heads with no level of education were seen to have less patronage of financial services, making them less included. This would widen the gap between those who would be included and those who were not included, increasing the financial inclusion inequality rate. This is consistent with ESCAP (2020) findings that conclude that education decreases financial inclusion inequality.
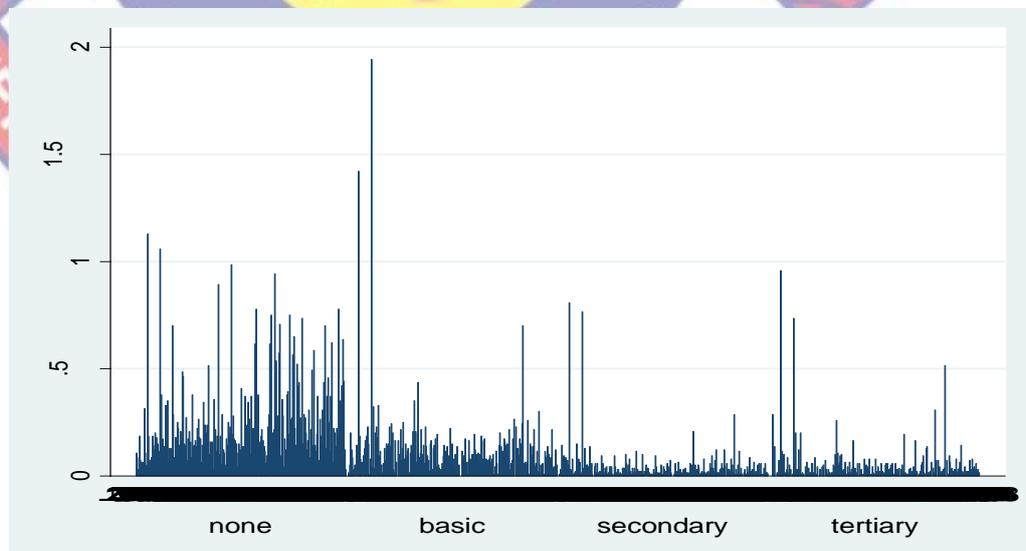
Figure 15B: District financial inclusion inequality and educational levels (R7)

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For the GLSS R7, Figure 15B presents financial inclusion inequality across the various levels of education. Household heads without education had higher financial inclusion inequality than household heads with education up to the tertiary level. As explained in the GLSS R6, education cannot be overlooked in explaining financial inclusion. As the rate was seen to be high among households without education, it was decreasing across the various levels of education. Comparing the GLSS R6 and R7, education is still significantly correlated to financial inclusion inequality in Ghana.

(R6)   (R7)
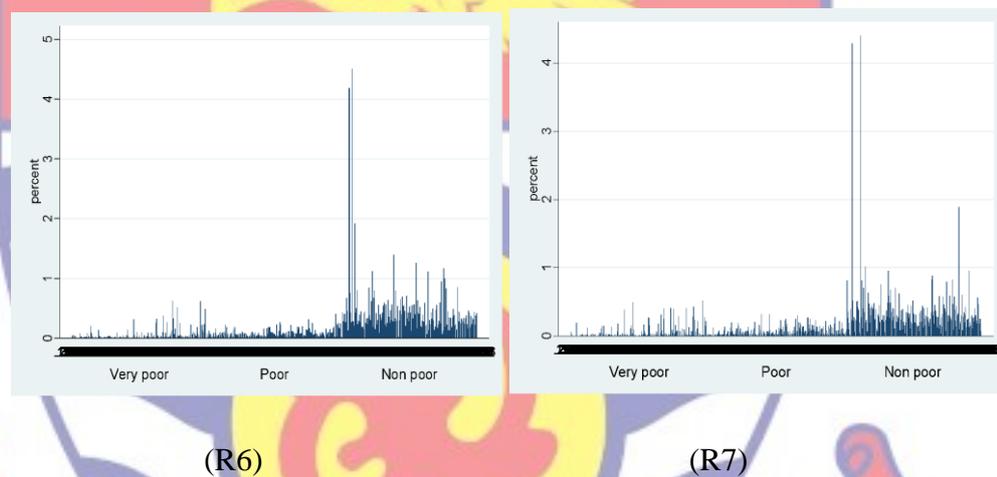
Figure 16 District: Financial inclusion inequality and poverty statuses (R6 &7)

Figure 16 present the distribution of financial inclusion inequality across the various poverty statuses in Ghana. From the graphs, financial inclusion inequality was seen to be high among household heads who were non-poor, relatively lower among the poor and very low among the very poor. This was a result of the fact that most non-poor can access and use financial services, which would widen the gap between those that are financially included and those excluded. This means that non-poor heads of the household should all patronise financial services and be included to reduce the financial

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inclusion inequality. As it is a known fact that all incomes earned among the poor are used for consumption, most of the poor households engage in activities in the informal sector; it will therefore be difficult for them to access and use financial services. Once most of them are included, the gap between those who are included and those who will not be included will be minimal, as seen in the figures.

Figure 17A shows how financial inclusion inequality differs across the various employment statuses of the heads of households for the GLSS R6. The financial inclusion inequality was seen to be high for heads of households that were employed compared to those who were unemployed, retired and inactive. This means that employed household heads can earn income either through bank accounts or invest these incomes into financial assets, which make up financial inclusion. Therefore, the gap between those who were included and those who were not included would be wider compared to those who were unemployed, retired and inactive.
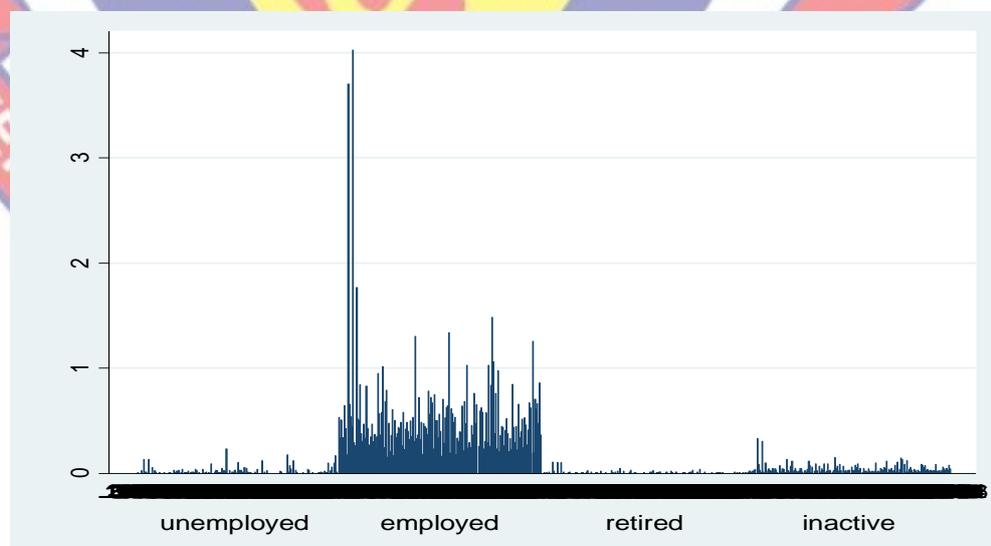
Figure 17A: District financial inclusion inequality and employment (R6)

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Again, between those inactive, unemployed and retired, the financial inclusion inequality was seen to be higher for those who were inactive because heads of households who were inactive may receive some remittances either from abroad or within the country through money transfer services which are a form of financial services thereby increasing the inequality for retired heads of households.

Figure 17B presents the distribution of financial inclusion inequality across the employment categories for the GLSS 7. As explained in R6, financial inclusion inequality was seen to be high for household heads who were employed compared to those who were unemployed, retired, and inactive. As indicated in the works of Sykes et al., (2016), households who were employed tend to have access to and use the available financial services compared to those who were not employed. This can be attributed to the fact that employed heads of households may receive their salaries and other payments through a financial institution or service. The gap between those included in this category would be high compared to other categories who were likely not to be included at all
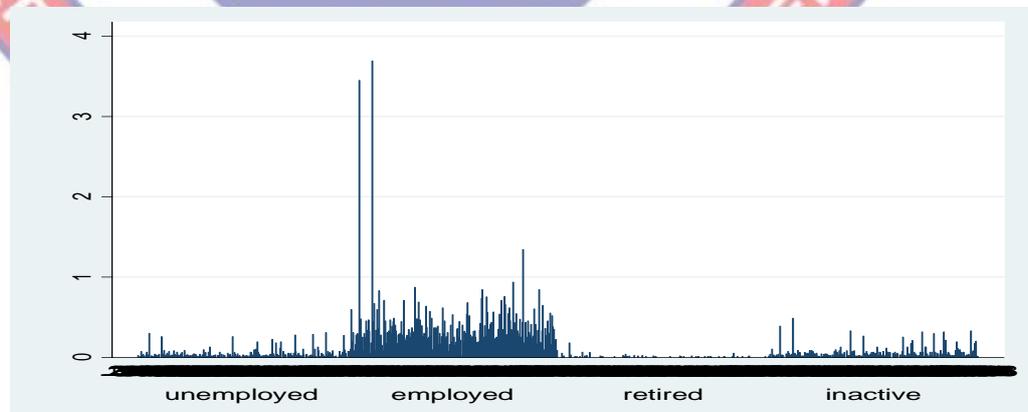
Figure 17B: District financial inclusion inequality and employment (R7)

As discussed in the literature, religion is one important variable that influences the level of financial inclusion among heads of households in Ghana. Figure18A, however, presents the distribution of financial inclusion inequality across the various religious groupings in Ghana for the GLSS R6. Heads of households who were Christians were seen to have a high financial inclusion inequality compared to Islam, traditionalist, and other religions. Christianity, according to literature, allows its members to be exposed to financial services. The financial inclusion rate for those who were included was very high, thereby increasing the gap between those who were included and those who were not included. This is evident in the higher rate of financial inclusion inequality as seen in Figure18A. Islamic religion, according to Galloway, 2014; Rahman, 2019 does not encourage females in financial inclusion, which is the reason why we can see a high financial inclusion inequality for the heads of households who belong to the Islamic religion.
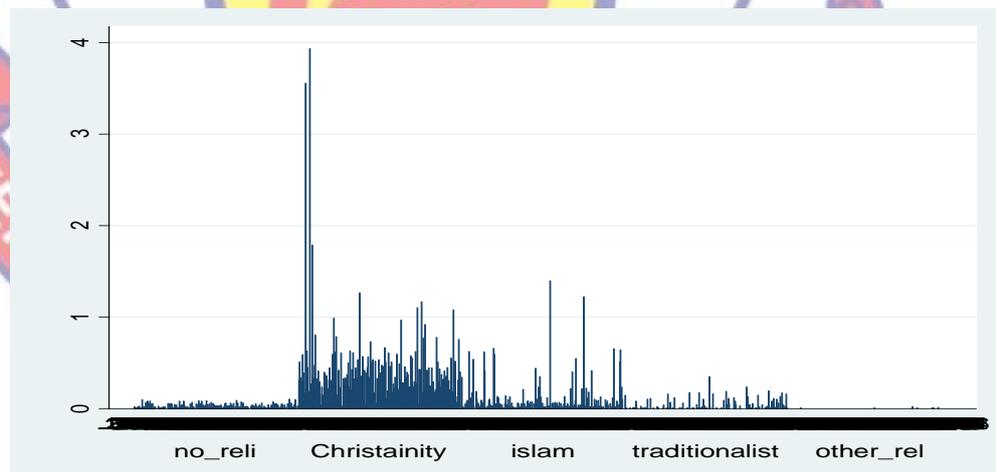
Figure 18A: District financial inclusion inequality and religion (R6)

For the GLSS R7, figure 18B also presents the distribution of the financial inclusion inequality and the religion of the head of household. Just as discussed in GLSS R, the financial inclusion inequality is seen to be relatively

higher for household heads who were Christians compared to any other religion. However, the inclusion inequality was seen to have reduced for household heads who belong to the Islamic religion comparing GLSS R6 and R7. This can be due to the increasing education on the need to be financially included over a period.
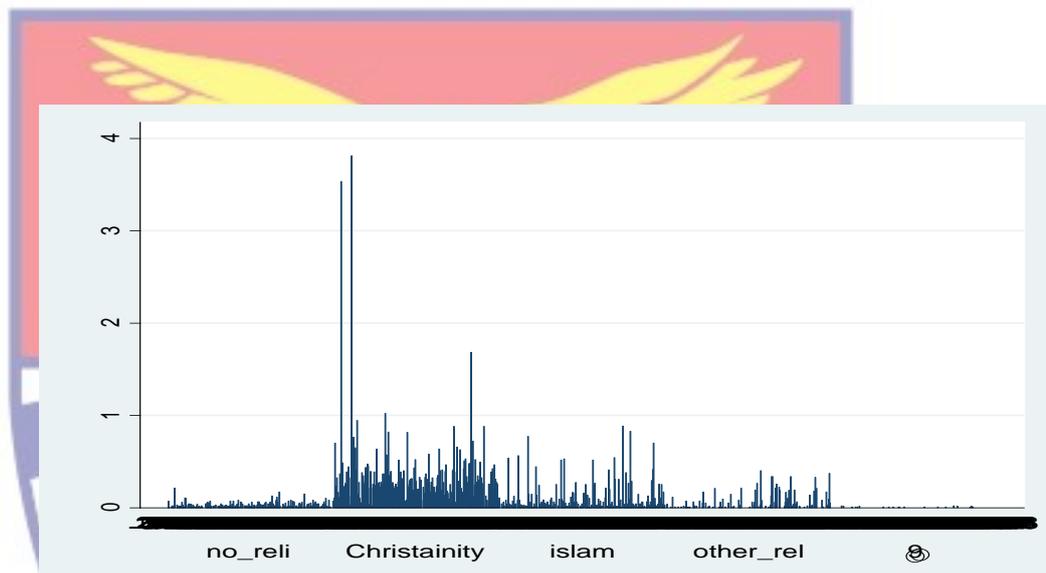
Figure 18B: District financial inclusion inequality and religion (R7)

There is the need to determine how financial inclusion inequality varies across various locations. Figure 19A presents the distribution of financial inclusion inequality for the GLSS R6 across the rural forest, rural savanna, rural coastal, urban savanna, and urban forest, urban coastal and Accra. Generally, financial inclusion inequality was seen to be high in urban areas compared to rural areas. This was since usage and access to financial services were seen to be high among a group of people who dwell in urban areas while it was also low within certain parts of urban areas. Therefore, the gap between the heads of households who were included and those who may not be included at all tend to be high, as can be seen in the figure 19A.

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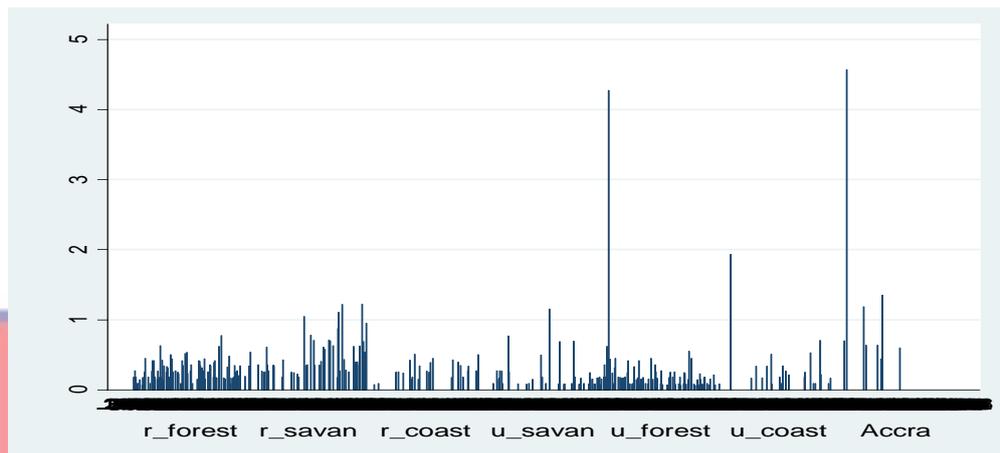
Figure 19 A: District financial inclusion inequality and Ecological zone (R6)

On the other hand, rural folks turn to use fewer financial services, making the level of inclusion low. This could be attributed to the fact that there was limited access to financial institutions in rural areas. Again, poverty was seen to be a rural phenomenon, and as a result, most of the household heads expend all the income directly on consumption as soon as they earn and not to be used on any financial asset. The gap between those included and those not included would be low since the level of financial inclusion for those included was low.
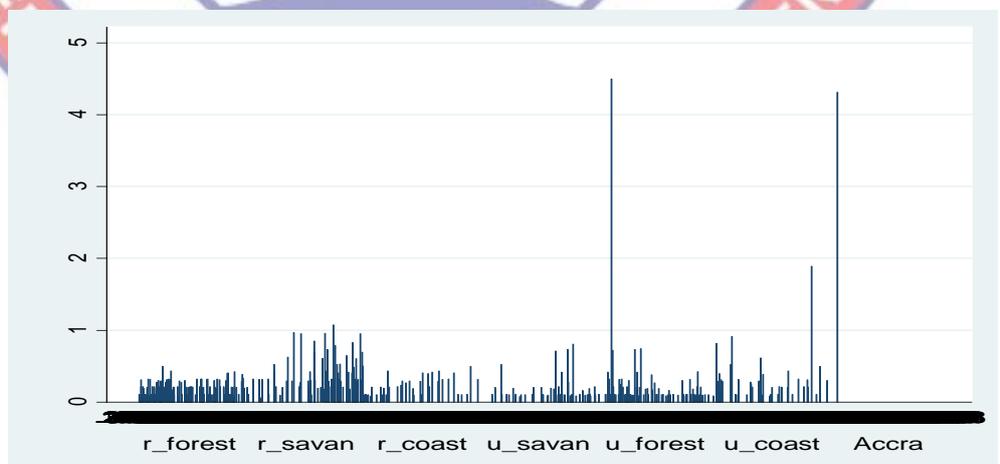
Figure 19 B: District financial inclusion inequality and Ecological zone (R7)

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Figure 19B again presents financial inclusion inequality distribution across the various locations for the GLSS R7. Just as it was explained, FI inequality was seen to be relatively high in the urban areas as compared to the rural areas. As Lopez and Winkler (2018) indicated, the level of financial inclusion was seen to be high in urban areas than in rural areas. The high levels of FI imply that the gap between those household heads who were included and those who were not included would be high, as seen in the figure 19B.

Analysis of Financial Inclusion Inequality in Ghana (2013-2017)

Part of the objective was to examine the trends and spatial distribution of financial inclusion Inequality and poverty headcount from 2013 to 2017 at different geographical clusters, specifically, district, Rural/Urban, regional and ecological zone. We further used the Theil's decomposition to examine whether the difference in spatial distribution is emanating from with variations or between variables. The results are presented in Table 14.

The discussions of the study are based on two key premises as was echoed by Haughton and Khandker (2009) and Annim, et al. (2012). The inequality rate within the area should be higher than that of the inequality rate between groups and within inequality should contribute to about 69.1 percent of total inequality. Secondly, the Theil index has additive power that makes the sum within and between inequalities equal to the sum of the national inequality.

From Table 14, it is evident that the financial inclusion inequality rate within an area was above 69.9 percent and is higher than the financial inclusion between inequality. The share of between inequality in all locational areas (columns 4 and 7) was less than 20 percent. Other facts from the results

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indicate that the sum of within and between financial inclusion inequality for each locational area are equal to the national financial inclusion inequality for a particular GLSS round (Annim et al, 2012).

The overall result from the study points out that the financial inclusion inequality in Ghana has gone up from 0.495 to 0.505 mainly due to an increase in the financial inclusion inequality within the groups, which confirms a study conducted by Haughton and Khandker (2009). During the period under review, FI inequality between reduced while within went up in all the four geographical areas, leading to an overall increase in financial inclusion inequality in Ghana from 2012 to 2017. As the economy within a geographical area improves, people become financially inclusive while others within the same area also remain excluded. This implies that financial inclusion differences "between" groups such as regions, urban/rural, districts and ecological zones were reduced; however, that of "within" subpopulation of the groups were rather increasing.

Table 14: Decomposition of topographical Financial Inclusion inequality into between and within the components-Theil index

			TREND			
		2012-2013			2016-2017	
GROUP	BETWEEN	WITHIN	A SHARE	BETWEEN	WITH	SHARE
Rural	0.05	0.445	0.1	0.032	0.473	0.063
Ecological zones	0.027	0.469	0.045	0.019	0.486	0.038
Region	0.037	0.458	0.076	0.028	0.476	0.056
District	0.084	0.411	0.169	0.067	0.437	0.134
Ghana		0.495			0.505	

Source: Author's Estimate (2020) [A]Share of between inequality across the different pattern in the given year.

From the above discussion, the decomposition aimed to identify which of spatial groups contribute most to the financial inclusion inequality in

Ghana. Comparing across different geographical areas, they follow the same trend by contributing to the rise in Ghana's financial inclusion inequality level. Among the four areas, the district geographical area contributes most within the period, increasing by 6.34 percent. An urban-rural area followed this with an increase from 0.445 in the period 2012 to 0.473 in 2017 giving us a percentage increase of 6.29 percent. Again, the regional levels also had a marginal increase from 0.458 to 0.476 giving us 3.93 percent increase. The ecological zone had the least percentage increase of 3.62 percent within the period under review.

However, in the context of the highest financial inclusion difference among the four geographical locations, the ecological zone had a 0.478 financial inequality level. This implies that Rural Forest, Rural Savanna, Rural Coastal, Urban and Accra have higher FI inequality within their subpopulation. This could result from higher FI inequalities in the urban centers compared to that of the rural areas as explained in Appendix 16. The next area with the highest financial inclusion difference within as of the year 2017 was the regional level and it was 0.476. Rural/Urban closely follows this with the value of 0.473 as of 2017 and lastly, district level had financial inclusion inequality of 0.437 even though it had the highest increase within the period of the study.

Spatial Distribution of District Financial Inclusion Inequality and Headcount Poverty from 2012 to 2017 in Ghana

As part of achieving objective one of the studies, the spatial distribution of both financial inclusion inequality at the District level and headcount poverty from 2012 to 2017 in Ghana was reviewed. The aim is to

explore the relationship between financial inclusion inequality and poverty headcount within the study period.

From Figures 15 and 16, we observed that both FI inequality and poverty head count in the three Northern parts of Ghana (Upper East, Upper West and Northern) are very high. The legend of the Ghana map displays Gini indexes. These indexes range from 62 percent to 77 percent in most of the districts considered in the study. Jirapa, Sissala East, Lawra, Kasena Nakana West and East, Wa West, West Gonja and Salwa/ Tiuna/Kalbo districts had higher financial inclusion inequality. Though there are some pockets of districts in the southern part of Ghana such as Abura/Asebu/Kwamankese, Kwabre, Yilo Krobo, Gomoa East, Upper Denkyira West and Nkwanta South, the prevalence rate in the three Northern regions is quite high. Some districts in the Brong Ahafo and Volta region were also characterised with relatively higher financial inclusion inequality ranging from 51 to 62 percent than other southern regions. This gives an average score for higher financial inclusion inequality of 0.738.

Figures 15 and 16 also describe the poverty   status of each district in Ghana as of 2012/13. The figures reveal that the poverty status of these districts ranges from zero to 98 percent. Most of the districts in the three Northern regions and some parts of the Brong Ahafo region had a higher headcount poverty value ranging from 44 percent to 98 percent. The districts in the southern sector of the country had relatively lower poverty headcount even though some districts that are in both Volta and other Coastal regions do experience quite high poverty headcount ratios during the period 2012-13.

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This alludes to the fact that most districts in these regions are predominantly rural households and are seen to have relatively high poverty rates in Ghana. A critical view of these maps reveals that there is a positive relationship between district-level financial inclusion inequality and poverty headcounts as most districts with high rates of financial inclusion inequality was also seen to have high rates of poverty headcount ratios in Ghana during a period.

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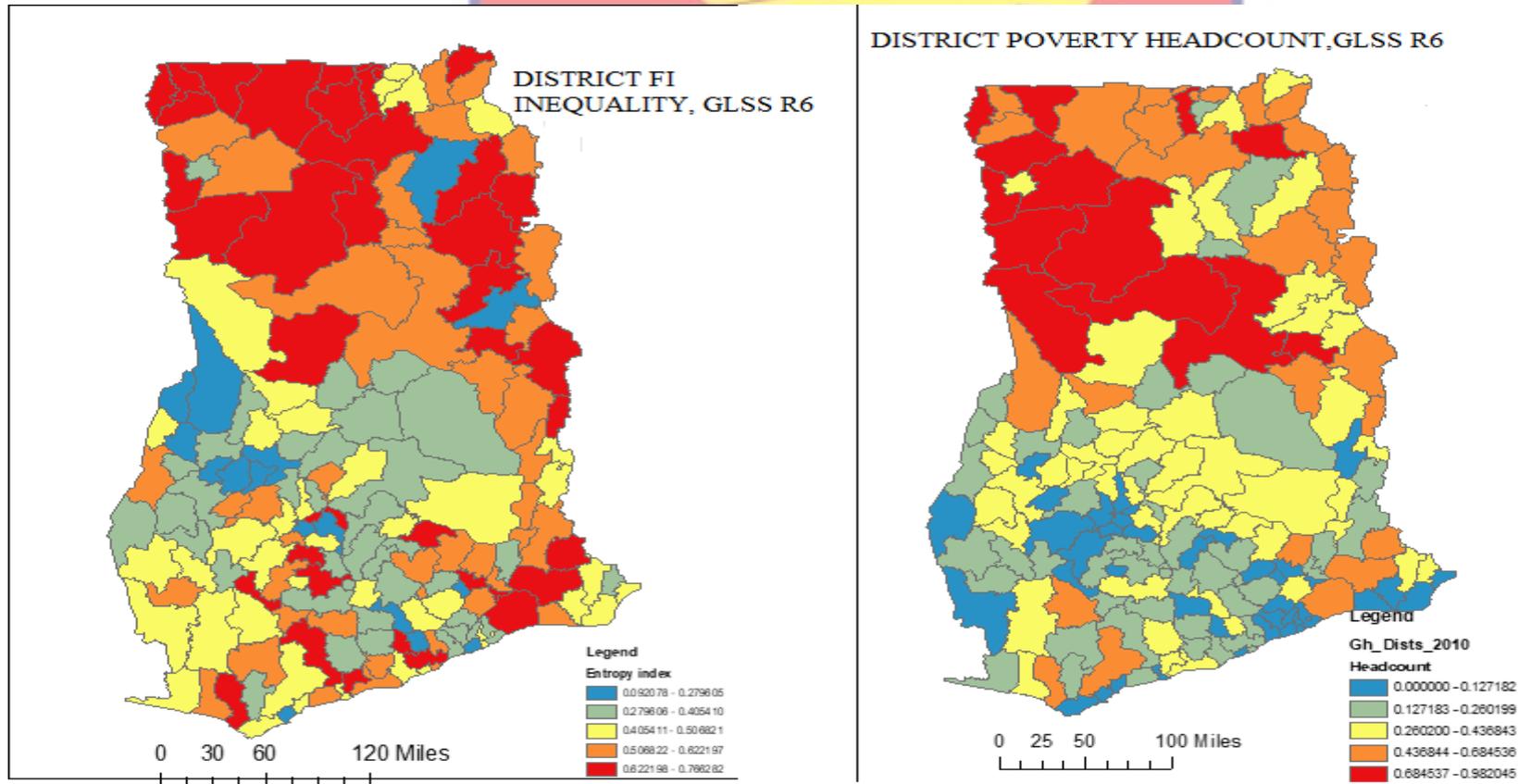
Figure 15 & Figure 16: Levels of financial inclusion inequality and poverty Headcount using GLSS R6
Source: Author's estimate (2020)

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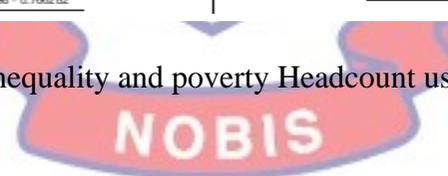
Figure 17 revealed that seven districts out of the 10 top-ranked districts with higher financial inclusion inequality are from the northern part of the country. They have higher financial inclusion inequality ranges between 0.77 and 0.68. This implies that within such districts whiles some groups of people have higher financial inclusion, other groups have very low financial inclusion, and the disparity is so high.
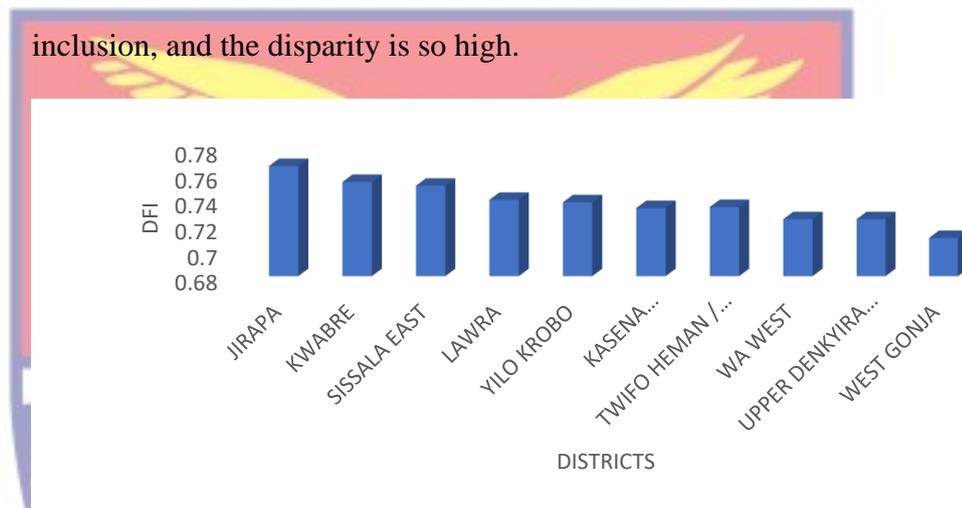
Figure 17: Top 10 ranked highest financial inclusion inequality using GLSS R6
Source: Author's own estimate (2020)

Figure 18 also indicated that nine out of the top 10 ranked districts in Ghana with the lowest financial inclusion inequality also came from the districts in the southern part of the country. Also, the top 10 ranked districts with the highest financial inclusion inequality had an average value of 73.75 percent while the top 10 ranked districts with the lowest financial inclusion inequality had an average value of 21.39 percent. Comparing the 10 top highest financial inclusion inequalities to that of the lowest 10, there was a difference of 48.7 percent, implying that the gap between the highest and lowest financial inclusion inequality levels is as high as 52.36 percent.

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Figure 18: Top ten ranked lowest financial inclusion inequality using GLSS R6

Source: Author's estimate (2020)
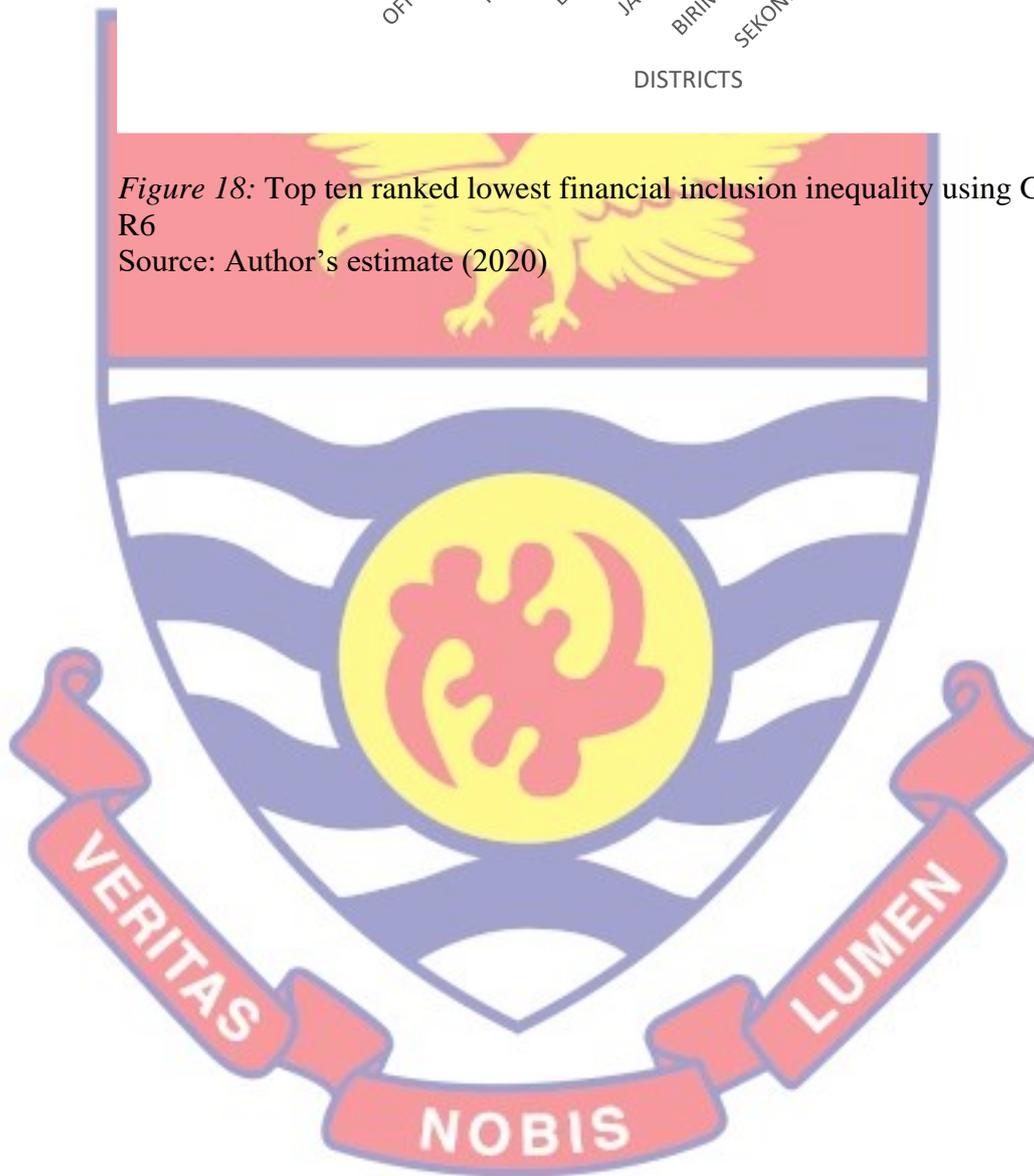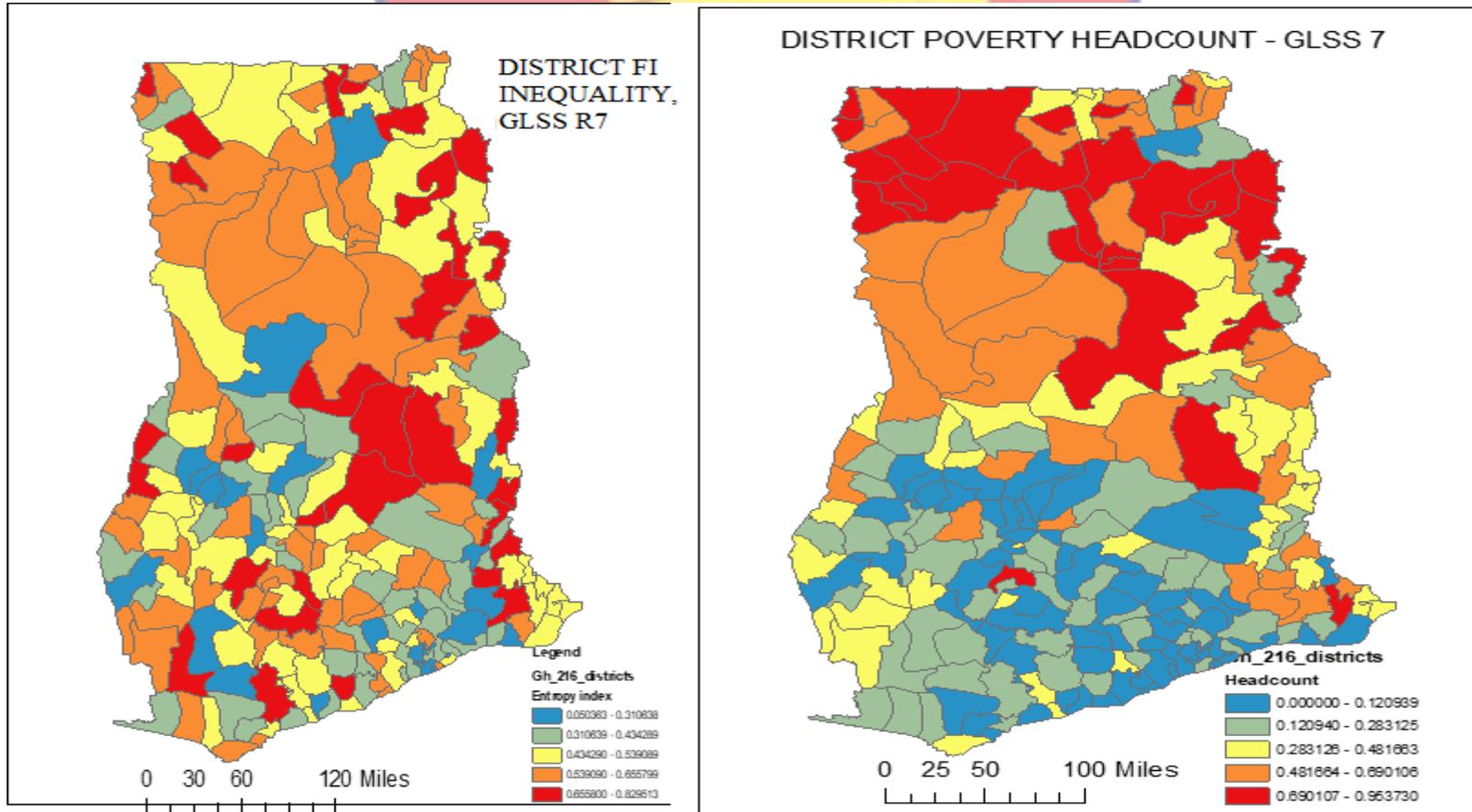
Figures 19 & 20: Levels of financial inclusion inequality and poverty Headcount using GLSS R7
Source: Author's estimate (2020)

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Figures 19 and 20 depict a similar trend to Figures 15 and 16 above as the northern sector (Northern region, Upper East and West regions) had higher financial inclusion inequality. It can be observed from the map that the sector had a lot of districts with relatively higher financial inclusion, which ranges from 0.43 to 0.83. However, the extreme higher financial inclusion inequality which ranges from 0.66 to 0.83 prevailed across the length and breadth of the country during the period 2016/17. The southern sector, contrary to the observation in GLSS R6 had its fair share of districts suffering from extreme higher financial inclusion inequality. For instance, districts such as Dorma East, Bosome Freho, Ajumako Enyan Essiam and Assian North recorded higher financial inclusion inequality during the period. The rest are Kumawu, Nkanta North, Sene East and Wassa Amenfi West.

Again, observing the top 10 higher financial inclusion inequality from Figure 21 provides an exciting result. Out of the 10 top highest financial inclusion inequalities in Ghana during 2017, only three can be located in the three northern regions in Ghana. This implies that financial inclusion inequality is reducing in the northern part of the country. However, the top 10 lowest financial inclusion inequality from Figure 22 are all in the southern part and the majority (five out of the 10 districts) were located in the Greater Accra.
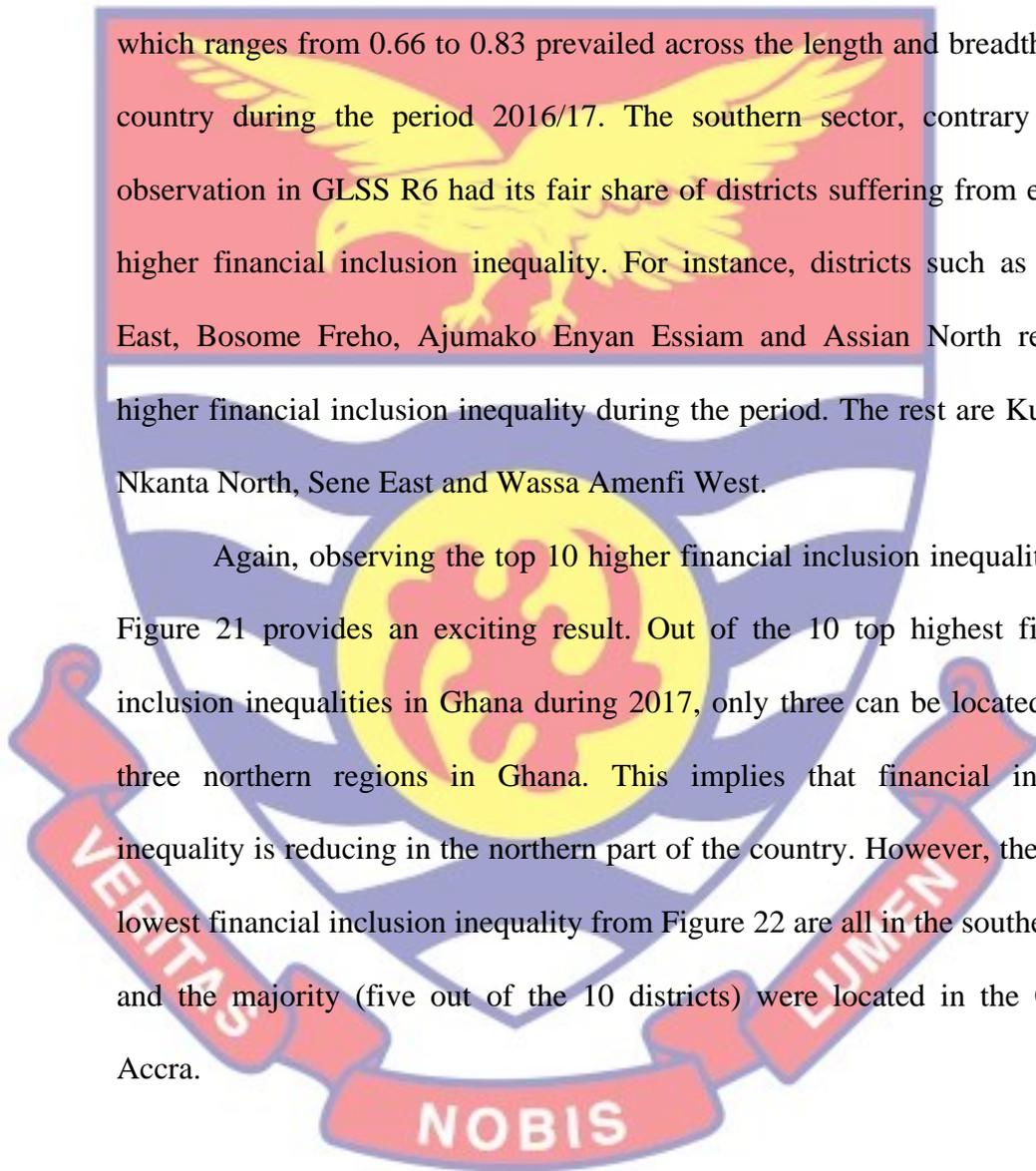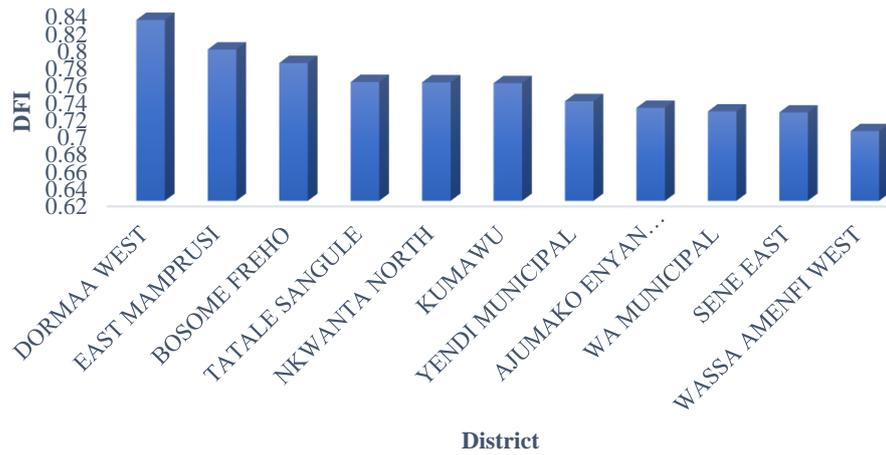
Figure 21. Top ten ranked highest financial inclusion inequality using GLSS R7 Source: Author's estimate (2020)
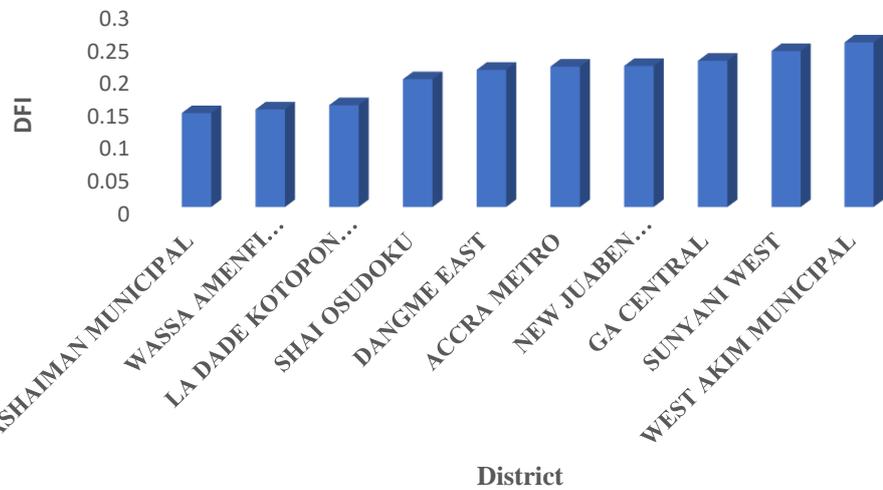
Figure 22: Top ten ranked lowest financial inclusion inequality using GLSS R7
Source: Author's estimate (2020)

Comparing the top 10 highest financial inclusion inequality in Figure 21 to that of the top 10 lowest financial inclusion inequality in Figure 22, it is evident that the average gap was 0.5547. The general comparison of the two spatial results from GLSS R6 (2012/13) and GLSS R7 (2016/17) revealed that the average score for FI inequality between GLSS R6 and R7 has increased by

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0.0311 (0.5547-0.5236). This confirmed the Table 14 results as indicated that during the same period financial inclusion inequality level in Ghana has gone up over the period (2012 to 2017).

It was observed that the poverty headcount in GLSS R6 and that of GLSS R7 also follow the same pattern. Headcount poverty was highly prevalent in Ghana's three northern regions (Northern, Upper East and Upper West regions) compared to other parts of the country. A positive relationship between financial inclusion inequalities that existed in the period 2012/13 can be observed again. Figures 19 and 20 (financial inclusion inequality and that of poverty headcount in GLSS R7) indicate that both financial inclusion inequality and poverty headcount were higher in the northern part of Ghana than in the southern. This adds up to the argument that there is a positive correlation between financial inclusion inequality and poverty.

The Relation between Financial Inclusion Inequality and Household Poverty

Another sub-objective of objective three of the study was to assess the relationship between District financial inclusion Inequality and poverty in Ghana. To achieve this, two different types of estimation techniques were used to run for both GLSS R6 and R7 data to estimate the sign direction and magnitude to assist in comparing coefficients.

OLS estimation technique was used since the dependent variable, the log of household consumption expenditure adult per equivalent (welfare). Household consumption expenditure adult per equivalent has a negative relation with poverty since when they improve the poverty level decline. The estimations were categorised into male, female, urban, rural and full.

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In all the estimations, the value of the district level financial inclusion inequality (DFI Ineq) varies even though they point to the same directional sign. The dependent variables were household consumption expenditure adult per equivalent (welfare) and poverty status perspectives. Variables that were not significant at 10 percent were not discussed. The findings of this objective are presented in Table 15.

In Table 15, the results support the study's hypothesis that states that District level financial inclusion inequality affects the household poverty level. The result shows that the main variable of interest (district level financial inclusion inequality) negatively relates to household consumption expenditure per equivalent adult (welfare) for both GLSS R6 and R7, and they are all significant. This indicates that higher financial inclusion inequality is associated with a lower level of household consumption expenditure per adult equivalent. The coefficient values for district financial inclusion inequality at household heads in the form of a male, female, urban and rural were all negative and significant at one percent. The coefficient for district financial inclusion inequality for the entire model GLSS R6 is -0.792 and that of GLSS R7 is -0.578. This implies that a unit increase in district-level financial inclusion inequality is associated with a reduction in the household's welfare by 79.2 percent for GLSS R6 and 57.8 percent for GLSS R7.

Table 15: Effect of Financial Inclusion inequality on poverty using household consumption expenditure per adult equivalent (welfare) GLSS R6 and R7

	MALE		FEMALE		URBAN		RURAL		POOLED	
	R6	R7	R6	R7	R6	R7	R6	R7	R6	R7
DFIineq	-0.867***	-0.527***	-0.584**	-0.710***	-0.772***	-0.365***	-0.803***	-0.844***	-0.792***	-0.578***
	(0.085)	(0.108)	(0.145)	(0.169)	(0.107)	(0.123)	(0.073)	(0.135)	(0.085)	(0.092)
Age	0.0^{05}	0.010***	0.006	0.004	0.000	0.013***	0.005*	0.006*	0.007***	0.008***
	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)	(0.002)	(0.002)
Agesq	-0.000*	-0.000***	-0.000	-0.000	-0.000***	-0.000***	-0.000	-0.000*	-0.000**	-0.000***
	(0.000)	(0.000)	(0.019)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
HHSize	-0.206***	-0.186***	-0.264***	-0.315***	-0.234***	-0.246***	-0.209***	-0.192***	-0.216***	-0.204***
	(0.007)	(0.009)	(0.016)	(0.013)	(0.011)	(0.011)	(0.007)	(0.009)	(0.006)	(0.008)
HHSizesq	0.008***	0.007***	0.013***	0.018***	0.012***	0.012***	0.007***	0.007***	0.009***	0.008***
	(0.000)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)
Employment (Base= Unemployed)										
Employed	0.021***	0.208***	0.098**	0.166***	0.129**	0.202***	-0.053***	0.161***	0.045***	0.190***
	(0.033)	(0.027)	(0.047)	(0.032)	(0.037)	(0.026)	(0.046)	(0.030)	(0.027)	(0.021)
Retied	0.020	0.265***	0.044	0.147	0.122	0.279***	-0.037	0.187	0.030	0.217***
	(0.062)	(0.065)	(0.125)	(0.097)	(0.071)	(0.056)	(0.107)	(0.180)	(0.055)	(0.054)
Inactive	-0.088	0.006	0.039	0.067	0.069	0.108**	-0.161**	-0.017	-0.028	0.033
	(0.046)	(0.036)	(0.055)	(0.041)	(0.045)	(0.035)	(0.052)	(0.039)	(0.035)	(0.027)
Education (Base= No Education)										
Basic	0.192***	0.219***	0.227***	0.223***	0.210***	0.193***	0.174***	0.220***	0.198***	0.223***
	(0.014)	(0.015)	(0.021)	(0.021)	(0.017)	(0.017)	(0.016)	(0.018)	(0.012)	(0.013)
Secondary	0.394***	0.343***	0.404***	0.353***	0.398***	0.290***	0.394***	0.392***	0.397***	0.345***
	(0.021)	(0.022)	(0.040)	(0.037)	(0.023)	(0.023)	(0.033)	(0.032)	(0.018)	(0.019)
Tertiary	0.648***	0.599***	0.674***	0.632***	0.632***	0.516***	0.684***	0.731***	0.655***	0.610***
	(0.021)	(0.022)	(0.037)	(0.036)	(0.022)	(0.022)	(0.035)	(0.033)	(0.018)	(0.018)

Table 6 continued………….

Married (Base= Single)

Widowed	0.089	-0.040	-0.042	0.046	-0.010	0.019	0.087*	-0.056	0.022	-0.015
	(0.048)	(0.049)	(0.040)	(0.038)	(0.035)	(0.034)	(0.041)	(0.041)	(0.026)	(0.027)
Divorced	-0.055	-0.013	0.005	0.061	0.044	-0.017	0.076	-0.023	0.051*	-0.002
	(0.040)	(0.027)	(0.039)	(0.034)	(0.034)	(0.026)	(0.042)	(0.033)	(0.027)	(0.028)
Separated	0.000	-0.061	-0.001	0.058	-0.052	-0.004	0.131**	-0.044	0.025	-0.015
	(0.050)	(0.045)	(0.041)	(0.041)	(0.039)	(0.036)	(0.047)	(0.047)	(0.030)	(0.030)
Consent Union	-0.096	-0.058	-0.0008	0.052	-0.012	-0.007	0.151***	-0.008	0.065	0.010
	(0.028)	(0.045)	(0.046)	(0.041)	(0.032)	(0.031)	(0.037)	(0.035)	(0.023)	(0.023)
Married	0.172**	0.090***	0.034***	0.101**	0.126***	0.160***	0.188***	0.047	0.141***	0.105***
	(0.025)	(0.027)	(0.037)	(0.036)	(0.027)	(0.027)	(0.034)	(0.036)	(0.021)	(0.021)
Region= (Base= Western)										
Central	-0.056*	0.156***	0.010	0.099**	-0.058	0.262***	-0.001	0.054	-0.031	0.137***
	(0.026)	(0.026)	(0.034)	(0.035)	(0.030)	(0.029)	(0.028)	(0.029)	(0.021)	(0.021)
Accra	0.074	0.293***	0.171***	0.329***	0.153***	0.455***	0.021	0.306***	0.105***	0.304***
	(0.024)	(0.030)	(0.035)	(0.041)	(0.024)	(0.032)	(0.050)	(0.049)	(0.020)	(0.025)
Volta	-0.074***	-0.157***	-0.171***	-0.202***	-0.153**	-0.091***	-0.059*	-0.233***	-0.077**	-0.176***
	(0.024)	(0.028)	(0.035)	(0.036)	(0.024)	(0.033)	(0.028)	(0.029)	(0.022)	(0.022)
Eastern	-0.130***	0.088***	-0.116***	0.054	-0.108***	0.185***	-0.140***	0.015	-0.128***	0.077***
	(0.023)	(0.026)	(0.033)	(0.034)	(0.027)	(0.030)	(0.026)	(0.028)	(0.019)	(0.021)
Ashanti	-0.041	0.139***	0.053	0.119***	0.078**	0.221***	0.028	0.132***	0.043*	0.133***
	(0.023)	(0.026)	(0.033)	(0.033)	(0.026)	(0.029)	(0.033)	(0.030)	(0.019)	(0.021)
Brong Ahafo	-0.137***	-0.058*	-0.149***	-0.093**	-0.133**	0.009	-151***	-0.111***	-0.144***	-0.071***
	(0.025)	(0.028)	(0.038)	(0.039)	(0.030)	(0.032)	(0.028)	(0.031)	(0.021)	(0.023)
Northern	-0.333***	-0.288***	-0.369***	-0.321***	-0.217***	-0.148***	-0.409***	-0.398***	-0.332***	-0.303***
	(0.024)	(0.028)	(0.055)	(0.053)	(0.033)	(0.036)	(0.028)	(0.032)	(0.022)	(0.024)

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Table 6 continued………….

Upper East	-0.268***	-0.341***	-0.274***	-0.421***	-0.174***	0.038	-0.336***	-0.512***	-0.274***	-0.368***
	(0.027)	(0.030)	(0.044)	(0.048)	(0.043)	(0.042)	(0.029)	(0.031)	(0.023)	(0.025)
Upper West	-0.503***	-0.649***	-0.700***	-0.641***	-0.049	-0.174***	-0.669***	-0.781***	-0.535***	-0.649***
	(0.029)	(0.031)	(0.058)	(0.048)	(0.021)	(0.048)	(0.031)	(0.032)	(0.025)	(0.026)
Locality (Base= Urban)										
Rural	-0.284***	-0.380***	-0.264***	-0.353***					-0.275***	-0.369***
	(0.013)	(0.014)	(0.020)	(0.019)					(0.011)	(0.011)
Sex (Base= Male)										
Female					0.086***	0.118***	0.027**	0.094***	0.055***	0.109***
					(0.017)	(0.017)	(0.021)	(0.021)	(0.013)	(0.014)
_cons	8.733***	8.592***	8.694***	9.253***	8.437***	8.477***	8.620***	8.655***	8.706***	8.732***
	(0.077)	(0.089)	(0.118)	(0.127)	(0.092)	(0.101)	(0.092)	(0.104)	(0.064)	(0.073)
N	12037	9643	4725	4366	7442	6018	9320	7991	16762	14009

Standard errors in parentheses * $p < 5\%$, ** $p < 1\%$ *** $p < 0.1\%$,
Source: Author's estimate (2020)
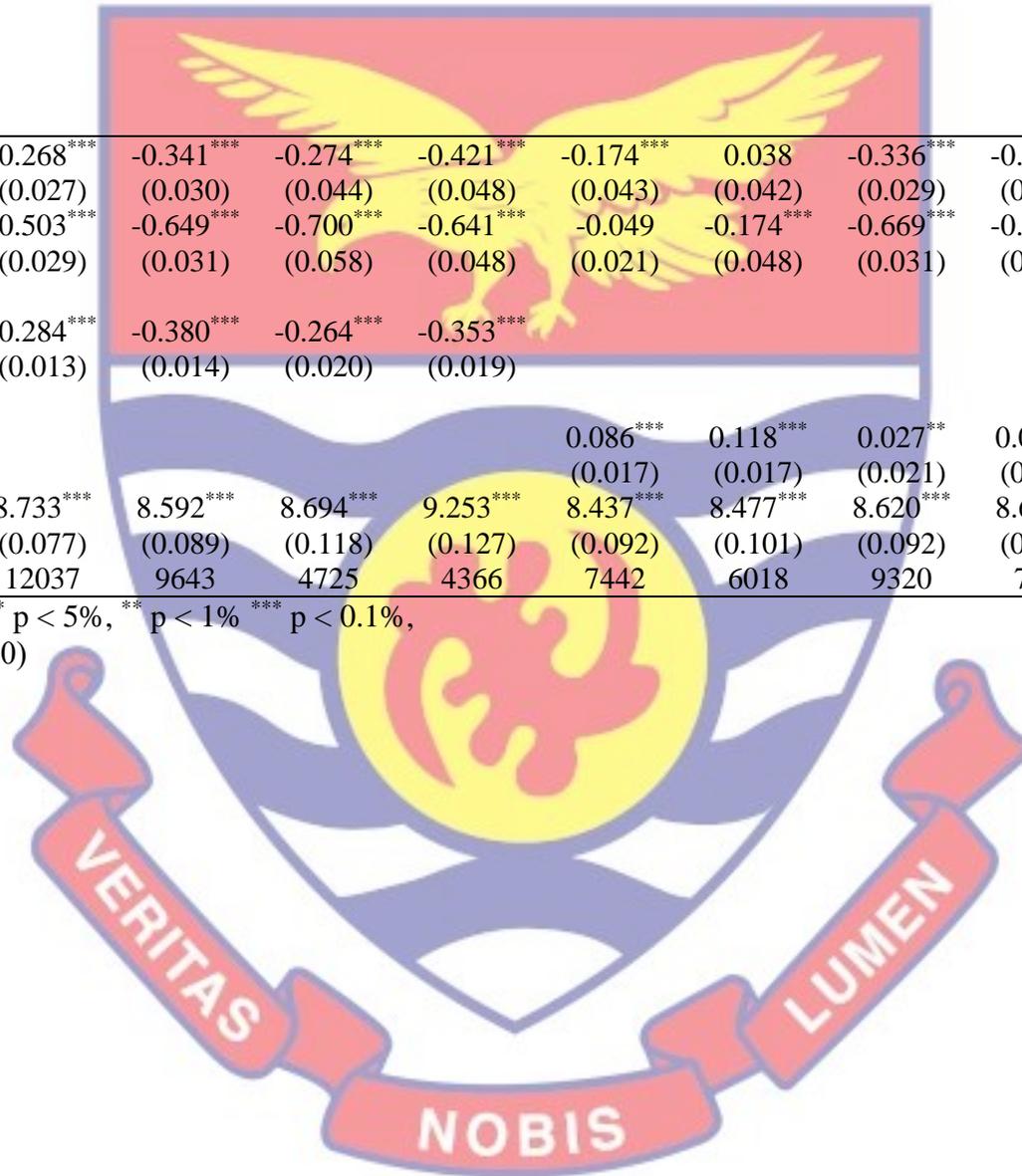
Drawing from financial inclusion inequality coefficients for the two periods, it is obvious that its impact on households in Ghana is high making a household worse off. From Table 15, it is evident that a male-headed household has higher (-0.867) household consumption expenditure as compared to its female counterparts (-0.584), for GLSS R6 while under GLSS R7 it was vice versa. This indicates that males were worse when financial inclusion inequality at the district level increased, but the opposite is true.

Again, looking at it from the geographical location perspective, the coefficient in the rural area was higher for both GLSS R6 (-0.803) and GLSS R7 (-0.844), supporting the earlier assertion that financial inclusion inequality is higher at the rural levels and has gone up. This may be due to the unstable income from their earnings. In rural areas, where the main occupation is agriculture, prices of their produce or output sometimes fall, making it impossible for household heads to save or attract credit to support their consumption.

Also, comparing the periods of data set 2012/13 and 2016/17, being male and located in the rural area was worse off during 2012/13 while rural females were worse off during 2016/17. However, rural households irrespective of the sex is always worse off whenever the financial inclusion inequality level increases hence an increase in district financial inclusion level will make rural males or females worse off compared to urban males and urban females.

Table 16 shows the results of the effect of district financial inclusion inequality and poverty using an ordered logit model. Household poverty was estimated in ordered form from low to high, in the very poor, poor and non-

poor categories. The outcome of the ordered logit estimation is presented in the form of a marginal effect. Table 16 was made up of two regression results from GLSS R6 and R7 depicting the effect of District FI inequality. The result indicates that a unit change in district-level financial inclusion inequality will increase the household head's chance of falling into a very poor category by 16.7 percent and that of poor by 30.15percent. However, the chance of household head becoming non-poor was reduced by 31.5 percent and they are significant at an alpha level of one percent for the GLSS R6 result. The GLSS R7 result also followd the same trend. This indicates that households were more likely to be poor or poor compared to non-poor when district-level financial inclusion increases.

This further explains that households are at a higher risk of being either extremely poor or poor whenever district-level financial inclusion inequality increases. Again, the result indicates that out of three categories of poverty the impact of FI inequality on the non-poor is about twice that of very poor and poor. This presupposes that a household head who is not poor hitherto is more likely to become one when financial inclusion inequality increases at the district level. For instance, as FI inequality at the district level increases more people become financially excluded from participating in financial activities. This is because it will deprive them of accessing services such as remittance, savings, and loans, reducing their consumption and purchasing power (Makoni, 2014). This confirms the results in Table 16 that indeed district-level financial inclusion inequality has a positive relation to poverty irrespective of its form.
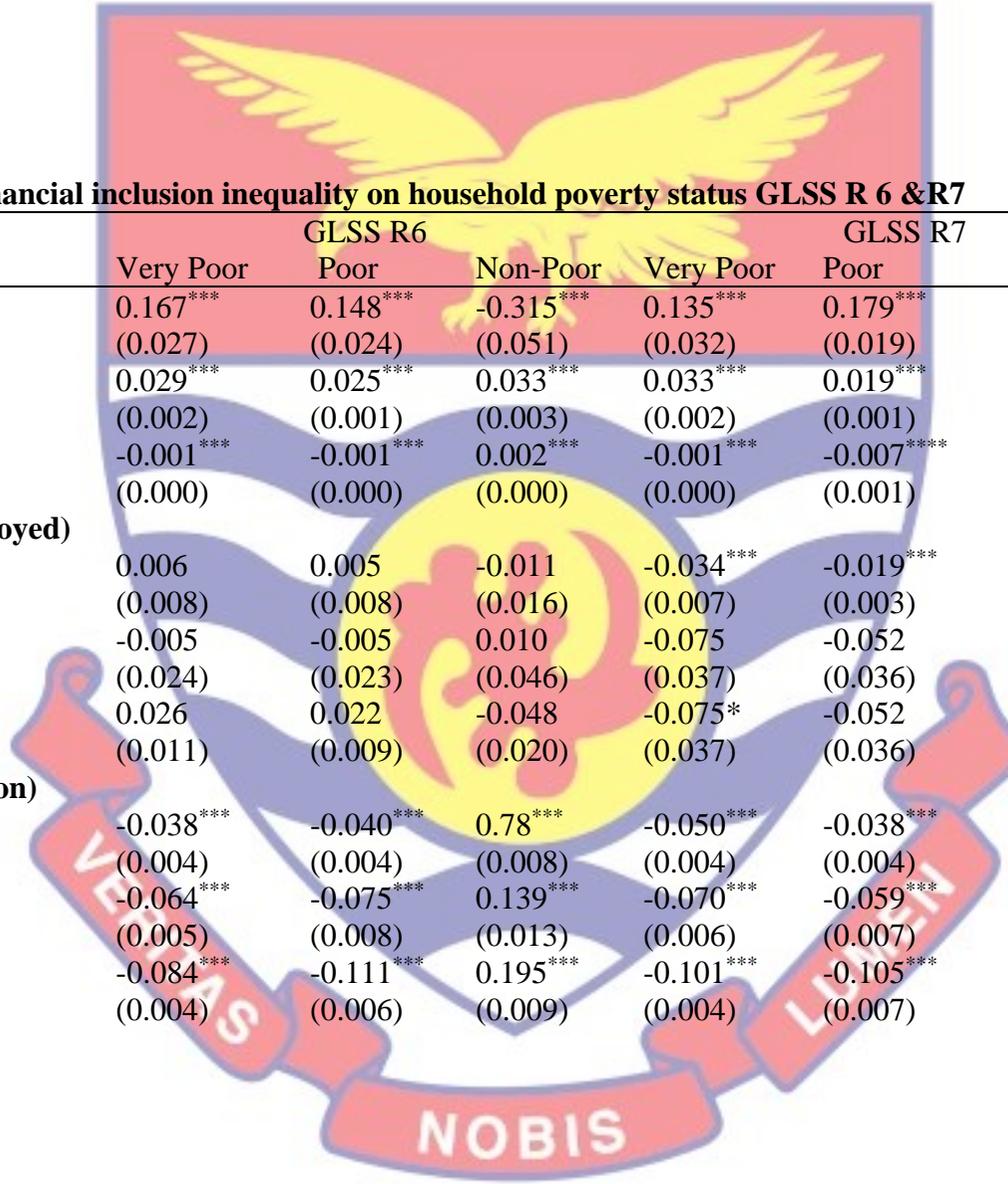
Table 16: Effect of district financial inclusion inequality on household poverty status GLSS R 6 &R7

	GLSS R6			GLSS R7		
	Very Poor	Poor	Non-Poor	Very Poor	Poor	Non-Poor
DFI Ineq	0.167***	0.148***	-0.315***	0.135***	0.179***	-0.214***
	(0.027)	(0.024)	(0.051)	(0.032)	(0.019)	(0.051)
Household size	0.029***	0.025***	0.033***	0.033***	0.019***	-0.052***
	(0.002)	(0.001)	(0.003)	(0.002)	(0.001)	(0.003)
Household sizesq	-0.001***	-0.001***	0.002***	-0.001***	-0.007****	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
Employment (Base=No Employed)						
Employed	0.006	0.005	-0.011	-0.034***	-0.019***	0.053***
	(0.008)	(0.008)	(0.016)	(0.007)	(0.003)	(0.010)
Retired	-0.005	-0.005	0.010	-0.075	-0.052	0.127*
	(0.024)	(0.023)	(0.046)	(0.037)	(0.036)	(0.073)
Inactive	0.026	0.022	-0.048	-0.075*	-0.052	-0.127
	(0.011)	(0.009)	(0.020)	(0.037)	(0.036)	(0.073)
Education (Base=No Education)						
Basic	-0.038***	-0.040***	0.78***	-0.050***	-0.038***	0.088***
	(0.004)	(0.004)	(0.008)	(0.004)	(0.004)	(0.008)
Secondary	-0.064***	-0.075***	0.139***	-0.070***	-0.059***	0.130***
	(0.005)	(0.008)	(0.013)	(0.006)	(0.007)	(0.0122)
Tertiary	-0.084***	-0.111***	0.195***	-0.101***	-0.105***	0.205***
	(0.004)	(0.006)	(0.009)	(0.004)	(0.007)	(0.011)

Table 7 continue …………..

Married (Base= Single)						
Widowed	0.002	0.001	-0.003	0.015	0.008	-0.023
	(0.007)	(0.005)	(0.012)	(0.013)	(0.007)	(0.070)
Divorced	-0.008	-0.007	0.015	0.001	0.001	-0.002
	(0.009)	(0.008)	(0.017)	(0.012)	(0.007)	(0.019)
Separated	0.000**	0.000*	-0.000**	0.013	0.010	-0.023
	(0.009)	(0.012)	(0.020)	(0.012)	(0.008)	(0.020)
Consent Union	-0.010	-0.008	0.018	0.004	0.002	-0.006
	(0.007)	(0.006)	(0.013)	(0.013)	(0.007)	(0.006)
Married	-0.116***	-0.014***	0.030***	-0.001	-0.001	0.002
	(0.004)	(0.003)	(0.007)	(0.009)	(0.006)	(0.015)
Locality (Base=Urban)						
Rural	0.056***	0.063***	-0.119***	0.092***	0.091***	-0.183***
	(0.003)	(0.004)	(0.007)	(0.003)	(0.004)	(0.007)
Gender (Base=Male)						
Female	0.003	0.002	0.005	-0.007	-0.004	0.011
	(0.004)	(0.004)	(0.008)	(0.005)	(0.003)	(0.008)
Region (Base= Western)						
Central	-0.001	-0.003	0.005	-0.016***	-0.024***	-0.040***
	(0.005)	(0.008)	(0.014)	(0.006)	(0.008)	(0.014)
Accra	-0.006	-0.009	0.015	-0.035***	-0.059***	0.094***
	(0.006)	(0.010)	(0.016)	(0.007)	(0.014)	(0.021)
Volta	0.019**	0.027**	-0.045**	0.043***	0.047***	-0.090***
	(0.005)	(0.008)	(0.013)	(0.007)	(0.007)	(0.014)

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Table 7 continue ………….

Eastern	0.009	0.014	-0.024	-0.010*	-0.008*	0.024*
	(0.005)	(0.008)	(0.013)	(0.056)	(0.0008)	(0.014)
Ashanti	-0.006	-0.010	0.016	-0.017***	-0.026***	0.043***
	(0.005)	(0.008)	(0.013)	(0.006)	(0.009)	(0.014)
Brong Ahafo	0.022***	0.032***	-0.054***	0.022***	0.0***	-0.054***
	(0.006)	(0.008)	(0.014)	(0.006)	(0.008)	(0.014)
Northern	0.071***	0.080***	-0.152***	0.095***	0.090****	-0.186***
	(0.007)	(0.008)	(0.015)	(0.007)	(0.007)	(0.014)
Upper East	0.053***	0.065***	-0.118***	0.097***	0.091***	-0.189***
	(0.007)	(0.008)	(0.015)	(0.007)	(0.007)	(0.014)
Upper West	0.149***	0.125***	-0.274***	0.165***	0.118***	-0.283***
	(0.010)	(0.008)	(0.017)	(0.008)	(0.007)	(0.014)

Standard errors in parentheses * $p < 5\%$, ** $p < 1\%$, *** $p < 0.1\%$
Source: Author's estimate (2020)

An effective financial inclusion policy reduces poverty. Financial inclusion provides easy and affordable financial services/products such as savings, credit, mobile money and remittance to people, especially the vulnerable adults who cannot access formal financial institutions. It allows one to save, consume, or invest in the form of capital. Once the investment is achieved, employment level is affected, providing income and ultimately leading to an improvement in general consumption. Hence poverty is reduced if not eradicated. However, when few people become financially inclusive, poverty levels in general remain high since access to affordable financial services is limited. This is in line with the structural poverty theory Schiller (2008), Islam (2005), who argued that people are poor due to discrimination from the system, which denied them the needed opportunity. It is against this background that Triki & Faye (2013); UNDP (2012) suggested the need for appropriate financial services products that reach the unbanked at all levels. This will ensure that financially excluded in the district have the opportunity to participate in financial activities

From Table 15, the age of the household head significantly affects the welfare of the household, and its effect is non-linear as expected. It is consistent with Anyanwu (2010) results who indicated that age had a positive relation with consumption poverty but divergent to that of Attanasso (2005). As the age of the household head increases, welfare increases at a decreasing rate reaches a maximum and declines at old age. Household heads at an early age mostly earn lower income, but as they grow, their income levels also increase, improving their welfare. This means that as the age of the house head increases by one year, is associated consumption expenditure level increases

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by 7 percent GLSS R6 and 8 percent for GLSS R7. As people grow older, their capacity to work reduces, affecting their income levels and welfare. This is in line with the life cycle hypothesis (Gounder, 2012; Datt & Jolliffe, 2005) cited by Lekobane, & Seleka (2014).

Household size has a negative coefficient whilst household size squared has positive coefficients for both periods and they are all highly significant at 1 percent. It can be observed from Table 15 that as the household size increases by one it is associated with a reduction in the welfare level by 0.216 percent for GLSS R6 and 0.204 percent for GLSS R7. However, an increase in household size squared will increase the welfare level by 0.008 percent for GLSS R6 and 0.006 percent for GLSS R7. This implies that the relationship between household size consumption expenditure per adult equivalent is non-linear. Hence increasing household size initially would decrease the welfare level faster than at a higher initial level of household size. Ultimately, increasing household size would increase the welfare level at very high levels. These findings are consistent with those of Meyer et al., (2016); Anyanwu, (2013) who found that household size reduces welfare.

Another variable worth discussing is the employment status with household consumption expenditure per adult equivalent. From Table 15 comparing household employment status of unemployed with employed the result is positively correlated and significant at five percent. For example, from GLSS R7 result, household heads who are employed and belong to a category such as male, female, the urban-rural and entire group are associated with reduction of consumption poverty levels by 20.8 percent, 16.6 percent, 20.2 percent, 16.1 percent and 19 percent respectively. The results indicate

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that male households and those heads who reside in the urban area stand a chance of improving their welfare better than the rest. Also, comparing unemployed household heads to retired household heads, the latter can improve its welfare by 21.7 percent, which is highly significant.

The effect of household head's employment on the poverty statue was again captured in Table 16. As the employment status of the household head changes from unemployed to employed, the chances that a household will fall into the very poor category have been reduced by 3.4 percent while that of the poor has also reduced by 1.9 percent. On the part of those who belong to the non-poor category, there is a 5.3 percent likelihood to remain above the poverty level. There is a 12.7 percent likelihood that those who belong to the non-poor household category will not be poor for the retired household. This indicates that a household head either employed or retired, can reduce poverty. One common but obvious characteristic of every poor person is the lack of purchasing power. In most cases, poor people have lower income, leading to all forms of deprivations such as food, clothing, shelter, health, and education. Employment permits both workers and their dependents to acquire goods and services which are essential to their survival (Page & Shimeles, 2015; Bergh & Zanker 2013).

From Table 15, education attainment level in all its forms project a positive relationship with consumption expenditure per adult equivalent. For instance, using GLSS R6, household heads with basic education and belong to men, women, urban, rural and entire group category can increase their consumption expenditure by 19.2 percent, 22.7 percent, 21 percent, 17.4 percent and 19.8 percent, respectively. However, a household head with

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tertiary education has relatively higher welfare as compared to those who have to attain either basic or secondary level and this pertains to both GLSS R6 and R7. Again, it is evident that among all the four categories of household groups, the urban male can reduce poverty faster than the urban -female, rural -male and rural- female.

It is also observed from Table 16 that education in all its attainment levels has a negative relationship with all the three poverty categories and they were significant at one percent for both GLSS R6 and R7. As the household changes, education attainment level moves from no education to basic, taken into consideration GLSS R6, those who already belonged to the very poor category had a 3.8 percent chance of leaving the extremely poor category while those into the poor category will also have 4 percent of becoming non-poor. It was observed that those who belonged to the non-poor group had a 7.8 percent chance to remain at that level.

An interesting observation concerning the educational attainment level in tertiary education. For example, using GLSS R6, as the educational status of household head changes from no education to secondary level, the chance of becoming extreme poor reduces by 6.4% while being poor reduces by 7.5% and being non-poor has a 13.9% chance of remaining in that status. However, when the educational status of household head changes from no education to tertiary education level, the chance of becoming extremely poor reduces by 8.4 percent while that of being poor category also decreases by 11.1 percent. With regard to the non-poor, as the educational status of household heads changes from no education to tertiary level, those who are not poor have a 19.5 percent chance of remaining in that category. This confirms the research

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findings of Annim et al., (2012) and Baugh, Vanderbilt and Baugh (2019) that though those who have basic education can fight poverty compared to no education however, those who have secondary education can reduce it more than those who completed basic education. More so, tertiary education graduates can reduce poverty levels far better than both basic and secondary school leavers. The results revealed further that among the three education categories, tertiary education has the highest impact on poverty, meaning as a household head improves his/her education attainment level from basic through to tertiary, there are higher chances that the person lives above the poverty level, and this confirms the study of Jabir (2015) that education reduces poverty level.

Higher educational attainment reduces poverty by improving labour market outcomes such as access to jobs and higher-paid jobs. However, Hershbien and Kearney (2015) opined that education does not necessarily increase income. Nevertheless, it provides returns closer to investment. For instance, in the full model under R7, as the education level of the entire household level improves from no education to basic educational level the consumption level improves by 22.3 percent while when educational level changes from no education to tertiary level the coefficient reaches as high as 61 percent. This implies that higher education is associated with reducing poverty more than lower education. The study confirms the research conducted by Wanka (2014) indicating that as the educational level improves the chances of reducing poverty increase. Structural theorists such as Bici and Çela, (2017) stated that education aids one to acquire requisite skills and

knowledge needed not only to participate in the job market but also financial services as well which reduce poverty.

Table 15 also presents the results of the regional location of the household head and welfare. In Ghana, the regions are not equally endowed with socioeconomic resources hence the occupant's ability to satisfy their welfare differ. For instance, using Western Region as a base, a household located at Gt. Accra can increase its welfare level by 10.5 percent and 30.4 percent, respectively. This is because higher commercial activities promote higher consumption expenditure per adult equivalent. However, the story is different, considering the three northern regions in Ghana. For example, focusing on GLSS R6 and R7, a household located in the Upper East Region of Ghana has its welfare level decrease by 53.5 percent and 64.9 percent, respectively compared with its counterpart in the Western Region and it is significant at one percent. Again, from Table 16, using GLSS R7 households located in the Upper West Region that are very poor have a 16.5 percent likelihood to remain very poor while those in a poor group have an 11.8 percent likelihood of remaining poor compared to a household located at the Western Region.

On the other hand, households which are non-poor located in the Upper West Region has a 28.3 percent likelihood of not remaining non-poor compared to those in the Western Region. This confirms findings of GSS (2018) and Cooke et al (2016) that in Ghana, poverty and welfare levels are bad in the Northern regions compared to the Western Region. This is due to low economic activities and poor socioeconomic infrastructure in the northern part of the country.

Other results worth discussing is the household who stay in a rural place and that of those who stay in urban centre relation to their welfare and highly significant. It was observed from Table 15 of the study that a rural household head has its welfare level reduced by 27.5 percent for GLSS R6 and 36.9 percent for GLSS R7. As a result of low- or unstable-income levels coupled with the socio-economic infrastructure characterized by rural places. This implies that as a household head relocates from urban place to rural place, the welfare situation worsens. This finding is consistent with Cooke et al. (2016) and GSS (2018) research works and that of appendix 16 which indicate that those who are located in the rural places such as Rural Forest, Rural Savanna, Rural Coastal, in Ghana have higher poverty status compared to their counterparts in an urban location.

Last but not least, the issue of sex and welfare is critical in this study as revealed by both available literatures and by intuition. The sex of the household head in table 15 shows the expected signs and are mostly statistically significant. For instance, using GLSS R6 and R7 female household heads have higher consumption expenditure per equivalent adult than a household headed by a male. The result is consistent with that of GSS (2018; Twerefour et al;(2014), Annim et al. (2012); Coulombe and Wodon (2007), which concluded that female-headed households have greater consumption per equivalent adult and are better off than household headed by male-headed household.

Chapter Summary

The third empirical chapter of the study centered on the financial inclusion inequality and poverty. The study showed that FI inequality has a

positive relation with poverty and is highly significant at one percent. Also, the study revealed that the level of FI inequality has gone up from 0.495 to 0.505 within the periods 2012 to 2017 and this was mainly caused by an increase in FI inequality level within a geographical location. Again, the result from the spatial analysis revealed that both FI inequality poverty levels are high in the three northern sectors (Upper East, Upper West and Northern Regions) compared to that of the southern sector of the country. Finally, the chapter of the study indicated that using GLSS R7 dataset, a unit increase in FI inequality is associated with a reduction in the household's welfare by 57.6%. This would also increase the chance of the poor household head remaining poor by 79% and reduce the non-poor not being poor by 21.4%.
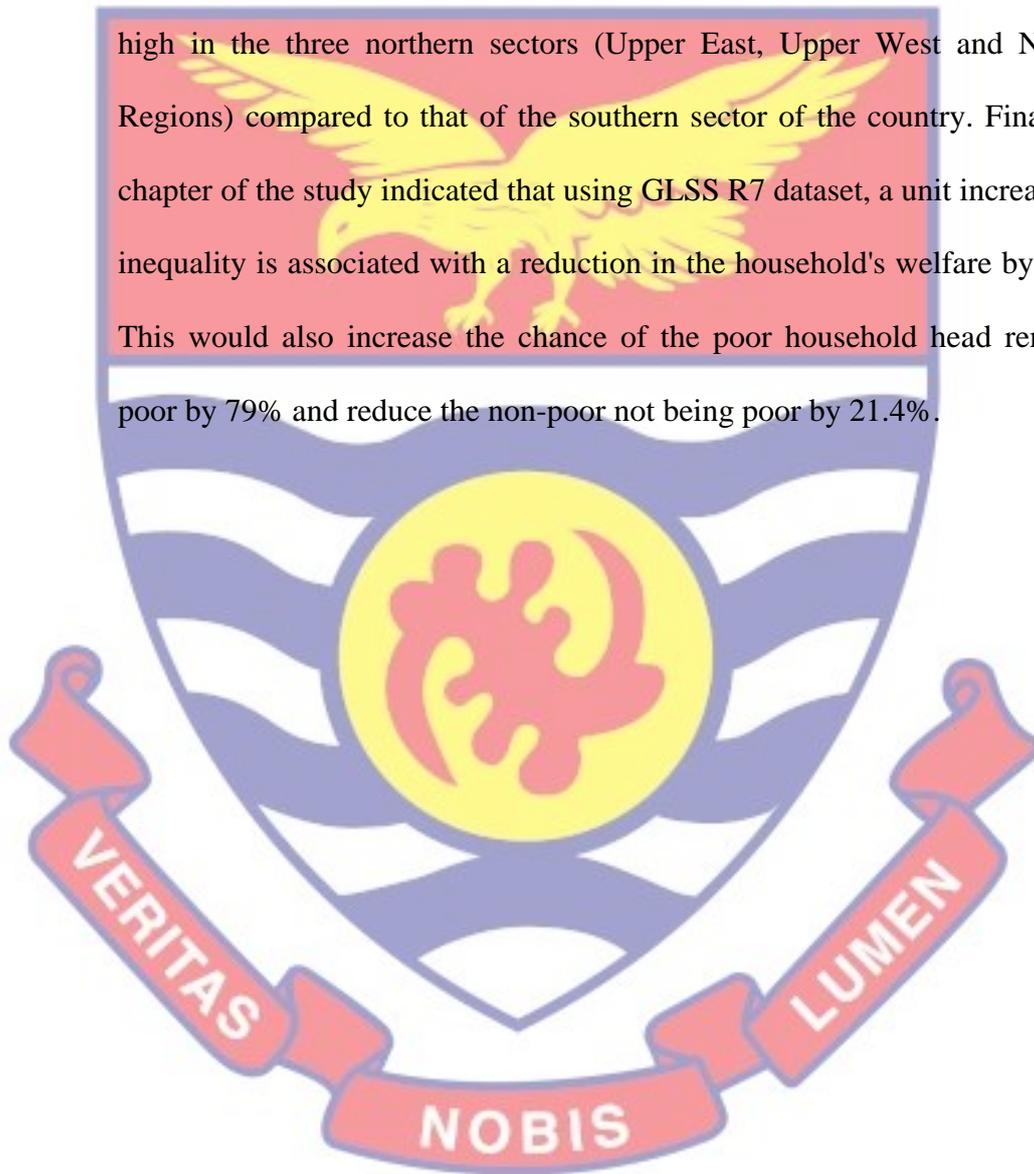
CHAPTER SEVEN

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter captures the summary of findings and provides conclusions based on the key findings. It also provides appropriate recommendations and policy direction to various stakeholders based on the three empirical chapters. It finally suggests study areas for further considerations.

Summary

The first objective determined the variations in FI between males and females, urban and rural areas and assessed whether these gaps, if any, have increased over time (2012-2017) using GLSS R6 and R7. MCA index of FI was constructed in the study. Counterfactual decomposition technique was used to decompose two key financial inclusion variables (gender and locality).

The study confirmed that indeed FI gaps exist and highly significant. In all, the differences in the mean value of explained component accounted for the greater portion of the gap and were also significant. The result disclosed that the FI gender gap using GLSS R6 is 22.8 percent and that of GLSS R7 is also 21.5 percent all in favour of men. The drivers of FI gender gap were income, education (secondary and tertiary), access to financial institutions, employment, and religion (Islam). The result indicated that the FI gender gap has reduced over the period (2012-2017) by 6.00 percent.

The study again decomposed FI by locality and determined its drivers using GLSS R6 and R7. The result indicated that the FI gap between urban and rural is 33.3 percent for GLSS R6 while that of GLSS R7 is 47.3 percent

in favour of men. The main drivers of FI by locality gap were income, access to financial institutions, employment, education (secondary and tertiary) and Islamic religion. The result revealed further that FI by locality gap has gone up over the period (2012-2017) by 42 percent.

The second objective examined the combined and relative effects of financial inclusion and financial literacy on household poverty in Ghana. Financial inclusion insight 2015 data was used to analyse both MPI and unidimensional poverty in Ghana. Analytical approaches employed include the OLS, IV, and the dominance analysis. FI reduced multidimensional poverty by 15.4 percent while FL decreased it by 0.9 percent. Combining both FI and FL, reduced multidimensional poverty by 18.9 percent. This implies that a person who is both financially inclusive and financially literate is better off compare to an individual who is either financially inclusive or financially literate.

Also, the study considered the relative importance of FI and FL in Ghana using the dominance analysis approach. The result indicated that certain variables such as locality, household size, education, land ownership, FL and FI are essential to eradicating poverty. In comparing the relative importance between FI and FL, the latter (FL) was more crucial with a standard dominance statistic of 0.199 while the former (FI) also had a standard dominance statistic of 0.1065 under multidimensional poverty.

The third and final objective of the study sought to investigate the effect of FI inequality on poverty at the district level. Generalized Entropy class of inequality measures were used to calculate FI inequality. The study adopted OLS and ordered logit estimation techniques to analyse the results

and these were selected based on different scales of measurement of household expenditures per adult equivalent and categorical (ordered), with relevant explanatory variables.

For objective three, the results indicated that FI inequality has a positive relationship with poverty, and it was highly significant. In addition, the study found that levels of FI inequality in the country have increased over the period (2012-2017). Specifically, the study found that financial inclusion inequality in Ghana has gone up from 0.495 to 0.505. However, financial inclusion inequality between geographical locations has rather reduced while that of within geographical locations has increased.

Evidence from the spatial analysis revealed that both FI inequality and poverty are high in the northern part (Northern, Upper East and West Region) of the country compared to that of the southern part. Taking both GLSS R6 and R7 into consideration, the majority of the top 10 poor districts came from the northern part of the country and the top worse financial inclusion inequality came from the same part of the country.

Again, the study revealed that all the two methods of measuring poverty (consumption expenditure per adult equivalent (welfare) and poverty status) concluded that FI inequality increases poverty level. The result indicated that using the GLSS R7 dataset, a unit increase in FI inequality is associated with a reduction in the welfare of the household by 57.8 percent. This would also increase the chance of the poor household head to remain poor by 17.9 percent and reduce the chance of non-poor not being poor by 21.4 percent.

Conclusions

Based on the findings of the study, the following conclusion are drawn:

Firstly, the study concludes that the decrease of 6.00 percent in the FI gender gap is triggered by socioeconomic variables such as income, employment, and education (secondary level). However, the increase of 42 percent in FI locality gap is influenced by the behaviour of variables such as access to financial institution, education attainments (secondary and tertiary) and Islamic religion.

Secondly, the study concludes that a person who is both financially inclusive and financially literate can reduce poverty by 18.9 percent which is more than a person who is only financially inclusive or only financially literate. Also, to tackle poverty reduction issues in Ghana, effort must be made to ensure that the developmental gap between urban and rural places in Ghana is minimised and household dependency level in the country has reduced.

Finally, the study concludes that indeed FI inequality exists in Ghana. It further concludes that financial inclusion differences in groups such as urban/rural and districts have gone up and accounts for the increase of 2.02 percent in FI inequality within the period. In addition to the above, when FI inequality increases, the likelihood that a poor household head will remain poor is 17.9 percent while the chance of a non-poor not being poor reduces by 21.4 percent. In Ghana, in areas where poverty is prevalent, financial inclusion inequality is also high.

Recommendations

Considering the conclusions of the study, the following recommendations have been prescribed to policymakers to enhance the potential of financial inclusion (FI) to reduce poverty in Ghana.

Firstly, to close the FI gender (male-female) gap, the Ministry of Education (MOE) and Ghana Education Services (GES) should institute financial and logistics support scheme for female students at the tertiary level. Again, GES and MOE should continue implementing the free SHS programme to promote access to education. This will encourage more females to enter tertiary school. Stakeholders should continue applying gender lens in other sectors of the economy since reducing gaps in other dimensions will also reduce gaps in financial inclusion further.

Secondly, concerning the closure of the financial inclusion locality (urban-rural) gap, the Ministry of Finance should introduce marketing boards for all products to ensure stable income. In rural areas, the main sources of income are from farming. However, prices of farm produce are not stable, which affect the stability of their income. Introducing a marketing board just like that of cocoa will enable them to use financial products such as savings, loans, and transfers. Also, the Bank of Ghana should revise the capital requirement downwards for financial institutions to encourage financial institutions to operate in rural areas.

Thirdly, to reduce poverty level, MOE, GES and National Commission for Civic Education should make financial literacy part of the education curriculum in Ghana to improve financial literacy level. This will make the combination of financial inclusion and financial literacy effective. Given the

constraint of low financial literacy among rural dwellers, a financial knowledge promotion programme for rural folks should be included in the national strategy to increase financial inclusion.

Lastly, to address the financial inclusion inequality and its effect on poverty, the study recommends that Management of the District Assembly liaise with the National Commission for Civic Education to promote financial inclusion at the district level. Again, the Ministry of Communication and Digitalisation should review the existing National Telecommunication policy to improve coverage in rural areas.

Suggestions for Further Research

To expand the frontiers of research on FI and poverty, research work could be done in the form of longitudinal or panel studies that will afford the researcher an opportunity to examine the phenomena over a longer period of time. Also, further studies can examine the gender and locality disparities in digital FI since digitalisation is currently impact FI in Ghana.

Lastly the current event in the financial space in Ghana requires more work to be done on FL as intuitive and available data suggest that more efforts must be put in with regard to FL.

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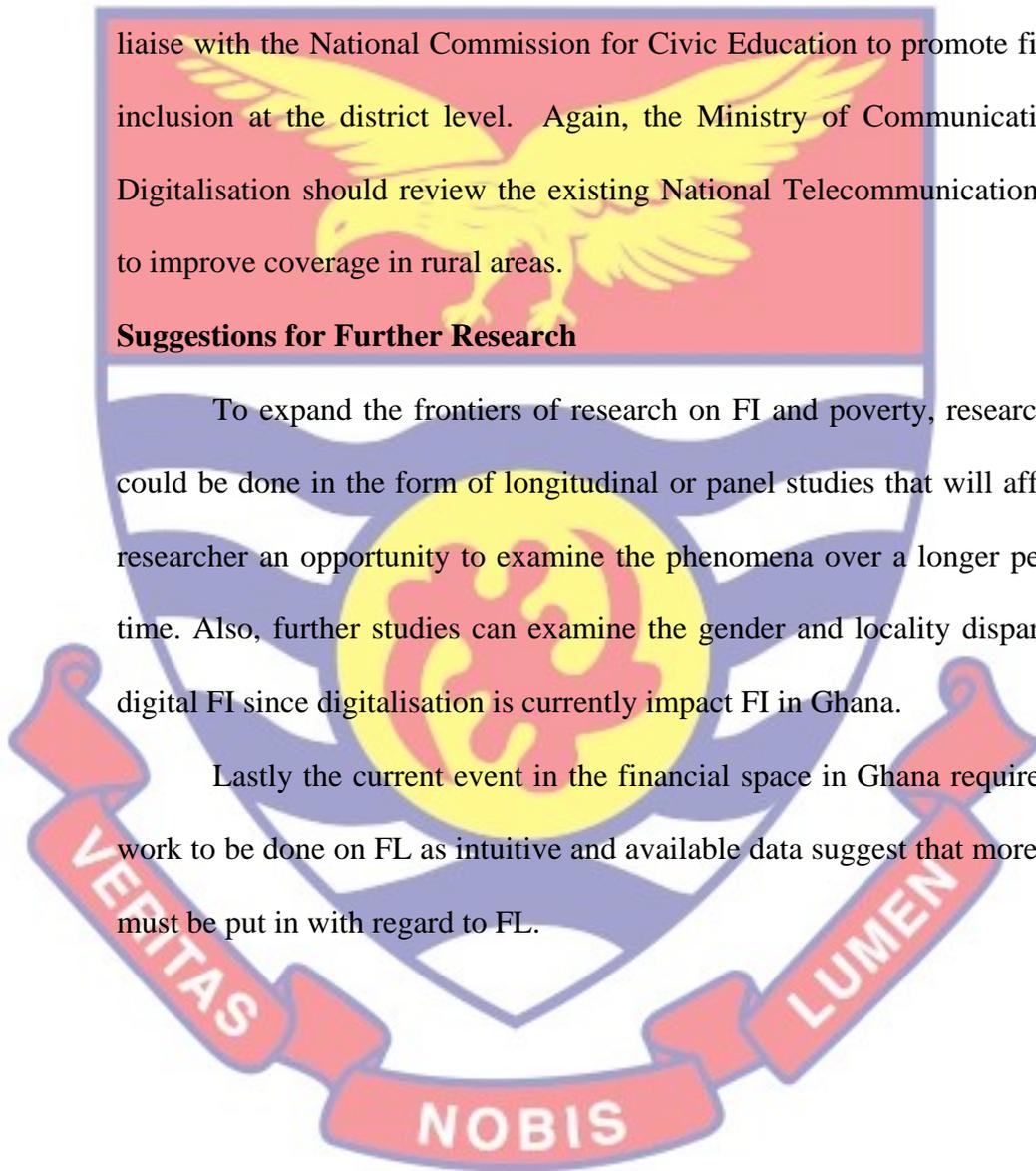
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APPENDICES

Appendix 1: Lintest and Ovtest

Lnwelfare	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
_hat	0.641459	0.2395277	2.68	0.007	0.1719289	1.110989
_hatsq	0.022699	0.0151487	1.50	0.134	-0.006996	0.052394
_cons	1.408883	0.9442062	1.49	0.136	-0.441981	3.259747

Ovtest

Ramsey RESET test using powers of the fitted values of lnwelfare

Ho: model has no omitted variables

$F(3, 8792) = 1.72$

Prob > F = 0.1603

Appendix 2: Link test

Pstatus	Coef.	Std. Err.	Z	P>z	[95% Conf.	Interval]
_hat	1.0138	.0287598	35.25	0.000	.957443	1.070179
_hatsq	0.0119	.0123537	0.97	0.334	-.0122678	.0361579
/cut1	-3.1224	.0617312			-3.2434	-3.001467
/cut2	-1.5758	.0408853			-1.6560	-1.495725

Appendix 3: Correlation between Poverty and Financial Inclusion

	MPI	Both	FL	FI	Dist_bank	Dist MFI	Gender
MPI	1.0000						
Both	-0.1705	1.0000					
FL	-0.2219	0.2273	1.0000				
FI	-0.2157	0.7620	0.2917	1.0000			
Dist_bank	0.2144	-0.4118	-0.2407	-0.5728	1.0000		
Dist MFI	-0.0938	0.0673	0.1080	0.0879	-0.0627	1.0000	
Gender	-0.0019	0.0482	0.0269	0.0833	-0.1085	-0.0703	1.0000
Gwelfare	-0.0349	0.0561	0.0710	0.0882	-0.0818	-0.0011	0.0171
Main_job	-0.1379	0.0537	0.0352	0.0654	-0.0380	0.0248	0.2422
Marital_status	0.0166	0.0158	-0.0136	-0.0035	0.0259	0.0441	-0.2192
Education	-0.1828	0.1541	0.2134	0.2308	-0.2688	-0.0192	0.2041
Gender	0.0019	-0.0482	-0.0269	-0.0833	0.1085	0.0703	-1.0000
Locality	-0.2752	0.0499	0.0693	0.0928	-0.1845	0.0284	-0.0047
Household_size	0.0034	0.0086	-0.1242	0.0154	0.0620	0.0051	-0.0196
Employed	0.1321	-0.1576	-0.2123	-0.1931	0.1417	-0.1175	0.0355

	Gwelfare	Main_job	Marital_S	Education	Gender	Locality	Househ_s	Employed
Gwelfare	1.0000							
Main_job	0.0063	1.0000						
Marital_S	0.0373	-0.0275	1.0000					
Education	0.0831	0.0735	-0.2484	1.0000				
Gender	-0.0171	-0.2422	0.2192	-0.2041	1.0000			
Locality	0.0361	0.0514	-0.0423	0.2308	0.0047	1.0000		
Household_~S	-0.0114	0.0872	0.0524	-0.1286	0.0196	-0.0875	1.0000	
Employed	-0.0606	-0.0390	-0.1678	0.1463	-0.0355	0.0520	0.0149	1.000

Appendix 4: DESCRIPTIVES GLSS 6

Collinearity	Diagnostics			
	SQRT		R-	
Variable	VIF	VIF	Tolerance	Squared
Income	1.16	1.08	0.8632	0.1368
Gender	1.18	1.08	0.8508	0.1492
Financial Inst	1.41	1.19	0.7099	0.2901
Marital Status	1.09	1.05	0.9143	0.0857
Employment	1.04	1.02	0.9625	0.0375
Education	1.41	1.19	0.7100	0.2900
Locality	1.22	1.10	0.8226	0.1774
Religion	1.05	1.02	0.9519	0.0481
Mean VIF	**1.19**			

Appendix 5: DESCRIPTIVES GLSS R 7

Collinearity	Diagnostics			
	SQRT		R-	
Variable	VIF	VIF	Tolerance	Squared
HHEXP_N	1.42	1.19	0.7032	0.2968
Financial Inst	1.34	1.16	0.7440	0.2560
Gender	1.30	1.14	0.7693	0.2307
Marital Status	1.36	1.17	0.7365	0.2635
Employment	1.02	1.01	0.9763	0.0237
Locality	1.29	1.14	0.7759	0.2241
Education	1.40	1.18	0.7159	0.2841
Religion	1.07	1.03	0.9342	0.0658
Mean VIF 1.28				

Appendix 6: Financial inclusion gender Blinder-Oaxaca decomposition GLSS R6

Financial inclusion Coef.		Std. Err.	P>z	[95% Conf.	Interval]
Differential					
Male	1.3946	0.0162	0.000	1.3627	1.4264
Female	1.1072	0.0215	0.000	1.0651	1.1493
Difference	0.2873	0.0269	0.000	0.2346	0.3401
Decomposition					
Endowments	0.2255	0.0266	0.000	0.1733	0.2778
Coefficients	0.0207	0.0234	0.375	-0.0251	0.0665
Interaction	0.0411	0.0241	0.088	-0.0061	0.0883

Standard errors in parentheses $^* p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$

Appendix 7: Financial inclusion locality Blinder-Oaxaca decomposition GLSS R6

Financial Inclusion Coef.		Std. Err.	P>z	[95% Conf.	Interval]
Differential					
Urban	1.8048	0.0268	0.000	1.7523	1.8573
Rural	0.9568	0.0196	0.000	0.9184	0.9953
Difference	0.8480	0.0332	0.000	0.7829	0.9130
Decomposition					
Endowments	0.6430	0.0283	0.000	0.5875	0.6985
Coefficients	0.1282	0.0217	0.000	0.0856	0.1708
Interaction	0.0767	0.0237	0.001	0.0302	0.1231

Standard errors in parentheses $^*\,p < 0.05$, $^{**}\,p < 0.01$, $^{***}\,p < 0.001$

Appendix 8: Financial inclusion Gender Blinder-Oaxaca decomposition GLSS R7

Financial inclusion	Coef.	Std. Err.	P>z	[95% Conf.	Interval]
Differential					
Male	1.6126	0.0221	0.000	1.5692	1.6560
Female	1.2546	0.0273	0.000	1.2012	1.3081
Gap	0.3580	0.0351	0.000	0.2891	0.4268
Decomposition					
Endowments 0.3319		0.0346	0.000	0.2641	0.3996
Coefficients 0.0668		0.0481	0.165	-0.0274	0.1610
Interaction -0.0407		0.0478	0.394	-0.1343	0.0529

Standard errors in parentheses * $p < 0.05$, $^{**}\,p < 0.01$, $^{***}\,p < 0.001$

Appendix 9: Financial inclusion Locality Blinder-Oaxaca decomposition GLSS R7

Financial inclusion	Coef.	Std. Err.	P>z	[95% Conf.	Interval]
Differential					
Urban	1.8165	0.0209	0.000	1.7756	1.8574
Rural	1.0266	0.0140	0.000	0.9991	1.0540
Gap	0.7899	0.0251	0.000	0.7407	0.8392
Decomposition					
Endowments	0.6779	0.0199	0.000	0.6389	0.7169
Coefficients	-0.0860	0.0276	0.002	-0.1402	-0.0317
Interaction	0.1980	0.0244	0.000	0.1502	0.2457

Standard errors in parentheses * $p < 0.05$, $^{**}\,p < 0.01$, $^{***}\,p < 0.001$

Appendix 10: Correlation between Poverty and Financial Inclusion

	Multidimensional poverty
Multidimensional poverty	1.0000
Financial inclusion	-0.0096**
Distance to Fin Inst	0.2438***
Financial literacy	-0.0941**
Both FI & FL	-0.3294**
Land ownership	-0.1247**
Education	-0.1798**
Household size	0.0039**
Marital status	0.0176**
Gwelfare	-0.1920**
Gender	-0.0025**
Main Job	-0.2812**
Locality	-0.2757**

Appendix 11   COLLINEARITY DIAGNOSTICS

Variable	SQRT VIF	VIF	R-Tolerance	R-Squared
Financial Inclusion	1.09	1.05	0.9153	0.0847
Financial Literacy	1.13	1.06	0.8872	0.1128
Household size	1.17	1.08	0.8525	0.1475
Education	1.28	1.13	0.7796	0.2204
Land Ownership	1.16	1.08	0.8603	0.1397
Marital Status	1.32	1.15	0.7548	0.2452
Government welfare	1.02	1.01	0.9830	0.0170
Main Job	1.10	1.05	0.9086	0.0914
Gender	1.16	1.08	0.8587	0.1413
Locality	1.11	1.05	0.9020	0.0980
Region	1.07	1.03	0.9364	0.0636
Age of the group	1.30	1.14	0.7663	0.2337
Mean VIF	1.16			

Appendix 12: The effect of Financial Inclusion on Multidimensional and Unidimensional Poverty in Ghana

	Multidimensional poverty	Unidimensional poverty
Explanatory Variables		
Financial Inclusion(FL)	-0.0213***	-0.0535
	(0.00207)	(0.0302)
House holdsize	-0.0135***	0.837***
	(0.00326)	(0.0583)
Age group (base=below 33 years)		
53-34 years	-0.0170**	-0.147
	(0.00579)	(0.0791)
73-54 years	-0.0103	-0.202
	(0.00925)	(0.119)
	(0.0202)	(0.264)
Education (base=no formal educ.)		
Primary	-0.0300***	-0.480***
	(0.00828)	(0.0935)
Secondary	-0.0398***	-0.813***
	(0.00853)	(0.101)
Tertiary	-0.0370***	-1.048***
	(0.0104)	(0.156)
Land ownership	0.0141*	0.339***
	(0.00578)	(0.0710)
Marital status (base= single)		
Married	-0.00685	-0.0680
	(0.00572)	(0.0781)
Div/Separated	0.0238*	0.108
	(0.0102)	(0.131)
Widowed	0.0166	-0.0333
	(0.0119)	(0.153)
Cohabit	-0.00985	0.0363
	(0.0118)	(0.158)
Other	0.0145	1.473*
	(0.0459)	(0.622)
Govt welfare	-0.0126	-0.418
	(0.0243)	(0.440)
Employment (base=unemployed)		
Yes, main job is in agriculture	0.0166	0.753***
	(0.0125)	(0.161)
No, main job is in agriculture	0.0329***	0.557***
	(0.00800)	(0.0950)
No male head	-0.0251***	-0.228**
	(0.00549)	(0.0783)
Male (base=female)	0.00555	0.243***
	(0.00470)	(0.0661)

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Urban (base=rural)	-0.0500***	-0.622***
	(0.00458)	(0.0622)
_cons	0.287***	-0.867***
	(0.0104)	(0.130)
N	3002	3002

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

Appendix 13: The Effect of Financial Literacy on Multidimensional and Unidimensional Poverty in Ghana

	Multidimensional poverty	Unidimensional poverty
Finance Literacy (FL)	-0.00822***	-0.0457***
	(0.000836)	(0.0118)
Household Size	-0.0172***	0.814***
	(0.00333)	(0.0583)
Primary	-0.0252**	-0.452***
	(0.00829)	(0.0942)
Secondary	-0.0375***	-0.782***
	(0.00855)	(0.101)
Tertiary	-0.0392***	-1.001***
	(0.0104)	(0.156)
Land ownership	0.00701	0.321***
	(0.00575)	(0.0706)
Marital status (base= single)		
Married	-0.00766	-0.0493
	(0.00569)	(0.0780)
Div/Separated	0.0206*	0.110
	(0.0103)	(0.130)
Widowed	0.0124	-0.0452
	(0.0118)	(0.155)
Cohabit	-0.00733	0.0646
	(0.0116)	(0.158)
Others	0.00529	1.473*
	(0.0514)	(0.641)
Govt welfare	-0.0135	-0.404
	(0.0232)	(0.441)
Employment (base=unemployed)		
Yes, main job is in agriculture	0.0134	0.734***
	(0.0125)	(0.159)
No, main job is in agriculture	0.0304***	0.540***
	(0.00803)	(0.0951)
No, male head	-0.0254***	-0.231**
	(0.00551)	(0.0782)
Male (base=female)	0.00331	0.235***
	(0.00469)	(0.0661)
Urban (base=rural)	-0.0530***	-0.631***
	(0.00459)	(0.0625)

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_cons	0.335***	-0.557***
	(0.0125)	(0.155)
N	3002	3002

Standard errors in parentheses $^*\ p < 0.05$, $^{**}\ p < 0.01$, $^{***}\ p < 0.001$

Appendix 14: Determinants of Financial Inclusion

Financial Inclusion	Coef.	Std. Err.	P>t
Distbank	-.020493	.0253849	0.020
Distmfi	-.059178	.0257877	0.022
Financial Literacy	-.0258352	.0244904	0.292
Land ownership	.0788139	.059953	0.189
Education			
Basic	.2238197	.0854075	0.009
Secondary	.0656682	.0872465	0.452
Tertiary	-.1769529	.1057477	0.094
Household size	-.0107447	.0044825	0.017
Age Groups			
1940-1959	.5063424	.2650186	0.056
1960-1979	.8726649	.2561956	0.001
1980-2000	.7303566	.2562723	0.004
Marital status			
Married	.2512657	.0545389	0.000
Divorced / Separated	.2445837	.1014736	0.016
Widowed	.1856199	.1242024	0.135
Cohabit	.2127314	.1609098	0.186
Other	.7127773	.6930067	0.304
Govt-welfare			
Yes	.3716507	.1678633	0.027
Gender			
Male	.0513165	.0497268	0.302
Main job			
Yes, Agric	-.0533741	.1391431	0.701
No_agric	-.0817516	.0836702	0.329
No male Head	.0061009	.0573099	0.915
Locality			
Urban	.0592773	.0496992	0.233
_cons	.3778141	.1202877	0.002

*** p<0.01, ** p<0.05, * p<0.001 Source: Author's estimate (2020)

Appendix 15: Multiple Correspondence Analysis (MCA) for FI index (GLSS R6)

Dimension	Principal Inertia	Cumulative Percent	Percent
Dimension 1	0.002832	63.05	63.05
Dimension 2	0.0001463	3.26	66.30
Dimension 3	0.0000418	0.93	67.24
Dimension 4	0.0000307	0.68	67.92
Total	0.0044918	100	

Appendix 16: Multiple Correspondence Analysis (MCA) for FI index (GLSS round Seven)

Dimension	Principal Inertia	Cumulative Percent	Percent
Dimension 1	.0145237	72.73	72.73
Dimension 2	.0004538	2.27	75.01
Dimension 3	.0000862	0.43	75.44
Dimension 4	5.60e-07	0.00	75.44
Total	.0199682	100.00	

Appendix 17: Multiple Correspondence Analysis (MCA) for FI index (Financial inclusion insight)

Dimension	Principal Inertia	Cumulative percent	Percent
Dimension 1	0.0084789	72.29	72.29
Dimension 2	0.0002528	2.16	74.45
Dimension 3	0.0000134	0.11	74.56
Total	0.011729	100.00	

Appendix 18: Multiple Correspondence Analysis (MCA) for FL index (Financial inclusion insight)

Dimension	Principal Inertia	Cumulative Percent	Percent
Dimension 1	0.0288046	43.88	43.88
Dimension 2	0.016696	25.43	69.31
Dimension 3	0.0101815	15.51	84.82
Dimension 4	0.0001473	0.22	85.05
Total	0.0656435	100	