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FINANCIAL LITERACY, FINANCIAL INCLUSION AND STOCK MARKET PARTICIPATION IN GHANA

BY

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DECLARATION

I, Agnes Akpene Akakpo, do hereby declare that this thesis is the result of my own research and has not been documented for presentation in this or any other University. All references in the work have been duly acknowledged. I also declare my full responsibility for any shortcomings in this document.

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September 10, 2020

DATE

CERTIFICATION

I hereby certify that this thesis was supervised in accordance with procedures laid down by the University.

September 10, 2020

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DEDICATION

I dedicate this thesis to the Almighty God for His grace to successfully complete this work. And to my supportive parents, Mr. Richard Akakpo and Madam Ivy Senoo.

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ABSTRACT

This thesis explores the impact of financial literacy and financial inclusion on stock market participation in Ghana. It employs a sample of 1,966 respondents sampled across the 10 regions of Ghana for the period 2018.This thesis employs biprobit models to estimate the influence of financial literacy on financial inclusion. To analyse the independent effect of financial literacy and financial inclusion on stock market participation as well as their joint effect, this thesis employs robust probit models. The following empirical findings emanate from this thesis: financial literacy positively and significantly affects financial inclusion. Second, the thesis does not support previous findings that financial literacy is not a significant determinant of stock market participation in Ghana. Third, the thesis finds that financial inclusion through using an account to save affects stock market participation significantly. Finally, the interaction of financial literacy and financial inclusion on stock market participation provides evidence of no significant impact.

The thesis makes appreciable contribution to literature: the analysis of the effect of financial inclusion on stock market participation is new in literature. Furthermore, the interaction of financial literacy and financial inclusion on stock market participation is novel in literature.

The thesis provides evidence of the need for financial inclusion policy initiatives to be backed by financial literacy in Ghana. Further, it provides evidence on the need to bridge the financial inclusion gender gap in Ghana for holistic financial development. This thesis also shows the need for creating awareness, protecting financial consumers' rights and also educating individuals on the securities traded on the Ghana Stock Exchange.

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CHAPTER ONE

INTRODUCTION

1.1Background

The role of financial markets in influencing the level of economic activity in developing and developed economies alike, cannot be overemphasized. One of the crucial functions financial markets perform is the mobilization of funds. Notwithstanding, modern financial markets are characterised by the emergence of new and highly sophisticated financial products. It has, therefore, become imperative for individuals to be financially knowledgeable owing to the increasing complexity of financial products and the need for individuals to participate in financial markets. Increased sophistication of financial products without the attendant improvement in the financial sophistication of financial consumers leads to an imbalance. According to Cohen & Nelson (2011a), financial education is, therefore, an important tool to deal with this discrepancy and also assist consumers to accept and use products that they increasingly have access to. Financial literacy is a necessary skill for ensuring the effective participation of individuals in today's ever-changing and increasingly sophisticated financial markets of which the stock market is inclusive.

Moreover, the general transfer in decision-making responsibility from government and employers and towards private individuals to plan for their retirement creates another need for people to take charge of their economic wellbeing (Thomas & Spataro, 2015). Individuals can only assume such responsibility when they possess the necessary financial literacy skills.

Financial literacy presents enormous potential benefits. For instance, when individuals are financially educated, they are often in the position to make better financial decisions which hitherto they would have. Some of the decisions they are likely to make bother on savings, borrowings, investing, insurance and planning for retirement. Furthermore, financial literacy gives one an advantageous edge as financially knowledgeable individuals turn out to be less financially fragile (Lusardi and Mitchell, 2017a). They are able to manage unexpected financial hardships better and come up with funds to make up for emergencies or unforeseen circumstances within shorter periods than their counterparts who are financial illiterates.

In spite of the benefits of being financially literate, widespread financial illiteracy is recorded across countries. This phenomenon makes it challenging to realize the full benefits of financial inclusion. Ensuing the global financial crisis, many studies have been advanced towards the financial literacy and financial inclusion discourse with an increased emphasis on the role of financial literacy in increasing access to, and the take-up of financial services (Xu & Zia 2012). For financial inclusion to have the intended best results, Menon (2019) suggests that financial inclusion must be reinforced by financial literacy. Given the importance of financial inclusion for promoting development in the financial sector and long-run growth outcomes in economies, financial inclusion is a policy priority in some jurisdictions. However, in developed countries like Switzerland, Spain, and the Netherlands, financial inclusion is not a policy priority (Russia Financial Literacy and Education Trust Fund, 2013).

The importance of financial inclusion as a matter of policy has led to financial innovations across the world. These include self-help groups, microfinance institutions, low-cost accounts, general credit cards and no-frills accounts (Gupte, Venkataramani, & Gupta, 2012; Sarma & Pais, 2011). Although financial innovative attempts have been made to ensure many people are financially included, a vast majority of people seem to be excluded financially. The adult population in developing countries form a greater proportion of the excluded (Morgan & Pontines, 2014). The 2017 Global Findex database puts the total number of adults who remain unbanked globally at 1.7 billion (Demirgüç-Kunt et. al, 2018).

Financial exclusion presents unfavourable conditions to the excluded population. In keeping with Demirguc-Kunt & Klapper (2012b), financial exclusion can lead to the emergence of poverty traps and stifle development. Further, financial exclusion can lead to the emergence of an unorganized and exploitative financial sector (Sharma, 2016). Given the consequences of exclusion, governments and key financial industry players often embark on initiatives like increasing account ownership to increase inclusion which often turns out not sustainable. Also, in the long run, governments' effort to broaden financial inclusion through access to bank accounts, without ensuring that people are financially educated to possess the necessary financial skills to take up such opportunities presented to them, can result in high debt, defaults in mortgage and insolvency (Klapper, Lusardi & van Oudheusden, 2017). These consequences are rather negative outcomes of inclusion which leave individuals worse off than intended.

Extant literature documents the importance of financial inclusion at the individual and macroeconomic levels. For instance, Chakrabarty (2012) opines that financial inclusion

is a more comprehensive instrument for growth whereby citizens in a country can use their earnings to improve their financial state and contribute to national growth (Chakrabarty, 2012). Sharma (2016) also suggests that economic growth and development is driven by financial inclusion. It plays this role through the building of a country's infrastructure. Klapper, El-Zoghbi, & Hess (2016) also view financial inclusion as an important masterpiece to achieve Sustainable Development Goals (SDGs). Abor et al., (2018) also make similar observations that financial inclusion is embedded in the SDGs as it features prominently as a target in 8 out of the 17 SDGs thus making financial inclusion an agenda worth pursuing.

Studies have taken diverse forms by establishing the nexus between financial literacy, stock market participation, financial inclusion and various dimensions of economic growth (Atkinson & Messy, 2013; Grohmann, Klühs, & Menkhoff, 2018; Van Rooij, Lusardi, & Alessie, 2008; Sharma, 2016; Basdas, 2020). The World Bank and OECD among notable international institutions have also been instrumental in championing inclusive finance by developing databases to aid research into the area. For instance, as part of the World Bank's quest of championing financial inclusion, it declared achieving financial access globally by 2020 (World Bank, 2013). This study, therefore, examines the joint effect of financial literacy and financial inclusion on stock market participation.

1.2 Research Problem

Development agencies have acknowledged the significance of financial literacy programs in stimulating access to financial services particularly among family units in developing countries (World Bank, 2014). Given the worth of financial literacy,

financial inclusion and stock market participation to economies, it has become crucial that much attention is given to this discourse to ensure that their potential is adequately tapped for financial development.

Previous studies have indicated that financial literacy is systematically linked to financial inclusion (Grohmann et al., 2018) and that lack of financial literacy particularly in stocks hinders households involvement in the stock market (Balloch, Nicolae, & Philip, 2015). More so, investigation into the contributing factors of financial inclusion in Sub-Saharan Africa by Chikalipah (2017) reveals that illiteracy is a major hindrance to financial inclusion. This suggests some kind of relationship between financial literacy and financial inclusion. Ozilli (2020), however, contends the school of thought which believes that financial literacy or education is a channel through which inclusive finance can be achieved. He argues that having appreciable level of knowledge in financial matters alone is not enough to eliminate the structural barriers which hinder people from having access to finance. Ozilli further concludes that financial literacy can increase financial inclusion if the leading and only cause of the obstruction to financial inclusion is inadequate knowledge of financial services. Although extant literature on financial inclusion also documents the positive economic outcomes of inclusion, Demirguc-kunt, Klapper & Singer (2017) recommend more research into the area to understand why financial inclusion may not be beneficial in all circumstances.

Several studies investigating the limited participation of individuals in the stock market have fixated on the determinants of stock market participation. One of the variables of interest which has gained attention and for that reason has been extensively studied is

the influence of financial literacy to the neglect of the impact of financial inclusion. For instance, Van Rooij et al., (2011) in their study, estimate financial literacy and analyse how it is related to stock market participation which is an economic outcome in the Netherlands by devising two distinct modules for the DNB household survey. They answer questions as to whether financial literacy has a bearing on the kind of financial decisions people make and also, whether participation in the stock market is affected by financial literacy. Further, they tackle the cause and effect direction between financial literacy and stock market participation and report that stock ownership improves at an increasing rate with literacy.

Financial literacy is of great importance as it manifests itself in sound investment decisions and increased investment levels. Although Adam, Frimpong, & Boadu, (2017) observe the persistence of adverse financial decisions in Ghana due to generally low levels of financial literacy, Banyen & Nkuah (2015) find that financial literacy is not a significant determinant of stock market participation in Ghana as majority of Ghanaians are financial illiterates in their endeavour to explore the low levels of active involvement of Ghanaians on the stock exchange from a behavioural perspective.

Also, Okello Bongomin, Ntayi, Munene, & Nabeta (2016) examined the role of social capital in the relationship between financial literacy and financial inclusion in rural Uganda. They find that financial literacy did not have a direct impact on financial inclusion but through the full mediation of social capital. They show that the introduction of social capital into the relationship serves as a boost thus without social capital, financial literacy may fail to improve financial inclusion.

Probing further into the components of financial literacy in emerging economies, by using a cross-sectional study design as well as data collected from 400 poor rural households in Uganda, Okello et al. (2017) observe that among the components of financial literacy, only attitude positively and significantly impacts financial inclusion. Knowledge, skills, and behaviour are observed to be insignificant predictors of financial inclusion.

Although various studies have analysed the variables of interest and have established relationships between them, these relationships have been examined independently in most cases (Atkinson & Messy, 2013; Birochi & Pozzebon, 2016; Bongomin et al,, 2020, Cohen & Nelson, 2011b; Kozak & Sosyura, 2015; Mishra, 2018; Thomas & Spataro, 2015; Van Rooij et al., 2008). These prior studies have failed to explore how the relationship between financial literacy and financial inclusion can jointly impact the participation of individuals and households in the stock market or stock market participation of individuals who are financially included through financial education. This study, therefore, seeks to answer these empirical questions. Do individuals who are financially included have financial education? Do individuals who are financial literates participate in financial markets? Do individuals who are financially included participate in the financial markets? If that is the case, then how do financial literacy and financial inclusion impact on their participation in the stock market? Empirically, the study fills the gap in the literature by analysing the interaction among financial literacy, financial inclusion, and stock market participation. The study is being conducted in Ghana where financial literacy and financial inclusion are relatively low (Kuffour & Adu, 2019; Baidoo et al., 2018; Abor et al., 2018). As a result, Ghana recently took steps to implement a National Financial Inclusion and Development

Strategy framework in partnership with the World Bank. The goal of the strategy implementation is to widen access to formal financial services among the excluded from the current 57percent to 85 percent by 2023. The implementation also forms part of government of Ghana broader objective of reforming Ghana's financial sector. The puzzling nature of participation in the stock market despite financial market innovation and progress also motivates this study. In Ghana for instance, low levels of direct stock market participation from both businesses and individual investors is observed (Kuffour&Adu 2019; Acquah-Sam& Salami 2013). A study by Kozak & Sosyura (2015) points to the positive impact of financial inclusion in terms of access to credit on improving financial market activity. They observe that the risk tolerance levels of persons who have access to credit increases as their need for precautionary saving reduces therefore increasing their chances of participating in the stock market. Their study is among the many studies that explore the impact of only a component of financial inclusion on stock market participation without considering financial inclusion variables in totality. Given that Ghana is implementing a financial inclusion strategy in the face of low levels of financial literacy and limited stock market participation, it is imperative to investigate the ramifications financial literacy and financial inclusion has on financial market activity in Ghana. The dominance of Ghana's financial sector by banks makes it even more imperative to investigative the impact bank enabled financial inclusion has on stock market participation. The study thus tests two main hypotheses. First, financial education increases the level of financial inclusion. Secondly, the interaction between financial education and financial inclusion has a positive impact on stock market participation.

Previous papers have tested the first hypothesis contributing to the discourse on financial literacy and financial inclusion (Atkinson & Messy, 2013; Berry et al., 2018; Grohmann et al., 2018; Vishvesh & Venkatraman, 2015), however, no previous study has simultaneously tested the hypothesis above.

1.3 Research Objectives

The main objective of this study is to investigate how financial literacy and financial inclusion affect stock market participation. Specifically, the study;

i. Examines the relation between financial literacy and financial inclusion
ii. Investigates the relationship between financial literacy and stock market participation
iii. Examines the effect of financial inclusion on stock market participation
iv. Analyses the effect of the interaction between financial literacy and financial inclusion on stock market participation.

1.4 Significance of the Study

This study presents potential significance along three strands. These are to practice, policy and future research. The study will add to the scope of knowledge on stock market participation through the lens of financial education and financial inclusion by documenting the level of involvement of individuals in the stock market who may be financially included but not educated financially.

Following Ghana's adoption of a policy on inclusive finance, the study will contribute to policy by providing useful insights to policy-makers responsible for financial market regulation so as to ensure that appropriate and effective policies based on country

characteristics are put in place to ensure adequate awareness and maximum participation from users of financial products. This is because the study specifically focuses on Ghana where financial inclusion and literacy levels are generally low.

Finally, the study contributes to practice by providing managers of banks and other financial institutions with information on their importance towards contributing to financial inclusion and thus help them in designing financial products that meet the needs of the banked and the unbanked population.

1.5 Organisation of the Study

The study is organised into five chapters. The first chapter of the study provides an overview of the research area. It comprises the background of the study, research problem, research objectives, significance of the study and the outline of the chapters by which the study is organised. Chapter two of the study focuses on the review of the literature. The literature review focuses on empirical and theoretical knowledge in the area of financial education, financial inclusion, and stock market participation. The methodology of the study is systematically presented in chapter three. It encapsulates the research design, population, data collection and model specification, selection of dependent and independent variables and the mode by which data is analysed. Chapter four of the study presents the results and discussions of the study. It gives an interpretation and supports findings in line with literature on financial education, financial inclusion and stock market participation. Chapter five of the study offers a conclusion of the study. In this chapter, recommendations are also presented. The chapter consists of the summary, conclusion, and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section reviews the literature on the subject area of research. It begins with the theories underpinning the study and goes on with a thorough examination of empirical literature addressing financial literacy, financial inclusion, and stock market participation together with the interactions between them.

2.2 Theoretical Overview

The nexus among financial literacy, financial inclusion, and participation in the stock market can be explained by the Finance-Growth Theory, Stakeholder and Legitimacy Theories (SLT).

2.2.1 Finance- Growth Theory

Financial systems distribute purchasing power, reduce transaction costs, information asymmetry, and improve resource allocation. The finance-growth theory posits that economic growth outcomes are observed when individuals and households are financially included. However, it can be argued that banks and other financial intermediaries cannot efficiently contribute to economic growth when a vast majority of individuals who are financially included are not educated financially. Financial literacy, therefore, performs a key role in the financial inclusion agenda by facilitating the role played by financial systems in the finance-growth nexus. Theoretically, financial inclusion can promote economic growth through the following medium: capital build-up, innovation, development of private enterprises, income and

employment. It also offers opportunities for diversification, productivity, promoting financial protection and safety (Abor et. al, 2018). There is a strand of literature that contends that economic growth drives the demand for financial services however Schumpeter argues for the reverse. According to Schumpeter (1911), services offered by financial intermediaries are key for technical innovation and economic growth. Beck and Levine (2004) and Levine and Zervos (1998) also show that banks and stock markets positively affect economic growth. Sharma (2016) provides evidence of a positive correlation between various magnitudes of bank enabled financial inclusion and economic growth. The dimensions are specific to banking penetration, availability of banking services and usage of banking services particularly deposits. Findings enumerating from studies carried out by Adomako et al., (2015) in Ghana suggest financial literacy is essential in transforming access to credit into much higher growth outcomes.

Financial inclusion will, therefore, lead to the intended finance-growth link when individuals are financially educated to take up the opportunities offered by inclusion given that financial intermediaries are not exploitative.

2.2.2 Stakeholder and Legitimacy Theories

Stakeholder theory explains the need for managers of organizations to maximize the interest of stakeholders in the remit of law and social values. A stakeholder is any group of individuals who can affect or are affected by the activities of the firm, in achieving the objectives of the firm (Freeman, Wicks, & Parmar, 2004). Legitimacy theory, on the other hand, is premised on the belief that a contractual relationship exists between businesses and society. Due to this social contract, society usually allows organizations

to exist and also have rights. In return for such rights and privileges, society expects organizations to operate within its bounds and norms.

In Ghana, financial organizations are controlled by the Central Bank to ensure that shareholders' interests are protected. The Bank of Ghana has complete supervisory and regulatory authority in all affairs concerning the bank and non-bank financial operation to foster a sound and efficient banking system to the benefit of depositors and other customers and the economy as a whole. The regulatory and legal structure within which banks, non-bank financial institutions including forex-bureaux function in Ghana are the Companies Act, 1963 (Act 179), Bank of Ghana Act 2002, Act 612, Bank of Ghana (Amendment) Act, 2016 Act (918), Non-Bank Financial Institutions Act, 2008 (Act 774), Banks and Specialised Deposit-Taking Institutions Act, 2016 (Act 930), and Bank of Ghana Notices/Directives /Circulars/Regulations (BoG, 2019). The Bank of Ghana also through the Investigation and Consumer Reporting Office (ICRO) protects users of financial products and educates them on their privileges and duties. The Securities Industry Act, 2016 (Act 929) and its Regulations (Securities Industries Act, 2016, Act 929, Foreign Exchange Act 2006 (Act 723), SEC Regulations 2003 and Unit Trust and Mutual Fund Regulations (LI1695)) govern the securities industry in Ghana. The securities industry law PNDCL 333 (1993), as amended, makes the Security and Exchange Commission (SEC) the highest regulatory body in the securities market (SEC, 2017). The Ghana Stock Exchange (GSE) also has provisions to protect investors in addition to what the SEC provides.

Financial markets around the world are regulated to ensure sanity in financial markets, maintain confidence, and contribute to financial stability and also to prevent adverse

economic situations. Individuals and society lose their trust in financial systems when financial institutions are not managed effectively and in the interest of stakeholders which in turn affects the legitimacy of the firm. To ensure financial inclusion of individuals, organisations are required to provide products that enhance the good of users rather than being exploitative. This also applies to the participation of individuals who may be financially included and not be financial literates in the stock markets. Stakeholder and legitimacy theories require firms to disclose adequately and also meet and maintain legal requirements for trading on the GSE and ensure maximum return on stock held by participants.

Stakeholder and legitimacy theories, therefore, indicate that financial intermediaries will only undertake financial education programs and also design financial products that will improve financial inclusion leading to positive economic outcomes and increase participation in stock markets only on the condition that such initiatives fall within the remit of the law, ethics and acceptable societal norms which bind their operation.

2.3 Empirical Review

2.3.1 Financial Literacy around the World

Even with the growth of financial markets, financial illiteracy is noted to be widespread around the world (Bucher-Koenen, 2014a; Lusardi & Mitchell, 2011). While exploring financial literacy around the world, Klapper, Lusardi and van Oudheusden (2017) document the Standard &Poor's Global FinLit survey findings that out of every three (3) adults, only one (1) is financially literate worldwide. Their study makes use of the documentation on financial literacy based on questions that were added to the Gallup

World Poll survey which interviewed about 150,000 nationally representative and randomly selected adults, aged 15 years and above, in over 140 economies in 2014. Further, they choose the definition of a financial literate to be an individual who answers correctly three out of the four questions that assessed financial knowledge on four fundamental concepts (knowledge of interest rate, interest compounding, inflation, and risk diversification). Based on their definition of who a financial literate is, they recorded Norway, Canada, Australia, Denmark, Israel, Sweden, Finland, United Kingdom, Germany, and the Netherlands to be the countries with the highest rate of financial literacy.

In the United Arab Emirates, Al-Tamimi & Kalli (2009) measure the financial literacy of UAE investors using 18 exam-type true-or-false questions covering main aspects of investment management. They report that the financial literacy of UAE investors was far below the required levels. They also find significant variations in the financial literacy of respondents based on gender although their investigation points to factors such as income, education and workplace activity to have an impact on financial literacy in the region.

Considerable number of studies exploring financial literacy have paid attention to issues related to gender with a particular focus on women (Almenberg& Dreber, 2015; Bucher-Koenen et al., 2017; Lusardi& Mitchell, 2008; Preston& Wright, 2019). Bucher-Koenen (2014a) tried to investigate the financial literacy of women and document the similar gender differences across countries by building on the work of Lusardi &Mitchell (2011b; 2014) which compares financial literacy in twelve countries. The study makes use of data from the survey of three out of the twelve

countries used by Lusardi and Mitchell which include Germany, America, and the Netherlands to ascertain the level of financial literacy through measures they deem to be both subjective and objective. Although Hasler & Lusardi (2017) are of the view that gender differences are hard to explain, the insights gained by the study into the gender gap differences show that even favourable economic conditions do not bridge the differences that exist between men and women. Even in favourable economic conditions, women tend to be less financially knowledgeable than their male counterparts. They find youthful and aged females to exhibit low levels of financial literacy. Also, women often indicated they did not know the answer to questions that measure their understanding of basic financial literacy and are less likely to answer correctly than men. However, in East Germany, Bucher-Koenen and Lusardi (2011), find no gender variances. Given the gender variations in financial literacy Bucher-Koenen et al. (2016) conclude that there is no single explanation that can adequately address the striking differences between men and women.

Previous studies have also paid attention to financial literacy with an emphasis on the youth and their determinants (Berry, Karlan, & Pradhan, 2018; Garg & Singh, 2018; Lusardi, Mitchell, & Curto, 2010). Garg & Singh (2018) for instance, set out to examine the extent to which the young in the world were financial literates based on previous studies carried out. The concentration of their inquiry was on how socio-economic and demographic factors impacted financial literacy among the youth. They report that the low level of financial literacy among the youth across most parts of the world was a great concern. Given that the youth are going to live for longer years ahead, the kind of financial choices they make will have repercussions on their future when the right ones are not made due to low financial literacy. Among the socio-economic and demographic

factors examined, they find gender, age, marital status, income, and level of education to influence financial literacy levels of the youth. They also find an interconnection between financial behaviour, financial attitude and financial knowledge in their study.

Xiao & Porto (2017) also document the relationship between financial satisfaction and financial education using financial literacy, financial behaviour, and financial capability as mediating factors. They employ cross-sectional statistics from the 2012 Financial Capability Study and observe that financial education affects financial satisfaction directly and indirectly through the mediating factor variables. The findings of their study also have practical implications for financial service professionals. They suggest that financial service professionals should take advantage of the numerous benefits presented by financial education.

Ansong & Gyensare (2012) explored the determinants of financial literacy among university-students in Ghana and further establish the relationship between financial literacy and demographic characteristics. The demographic characteristics their study considers aside age and gender include the type of study programme, level of study and workplace location of a respondent. Results from their study which adopts a correlation research design without testing for cause and effects show that work experience and age are positively related to financial literacy. The study employs data collected from 250 randomly selected undergraduate and graduate students. According to Xu & Zia (2012), understanding the determinants and effects of financial literacy are important for the effective targeting of financial education programs.

2.3.2 Financial Inclusion around the World

Financial inclusion has been studied in countries such as China (Fungáčová & Weill, 2014), Sub-Saharan Africa (Asuming, Osei-Agyei, & Mohammed, 2019; Chikalipah, 2017), Africa (Zins & Weill, 2016; Leon & Zins, 2020) and the MENAP region which comprises the Middle East, North Africa, Afghanistan and Pakistan (Shihadeh, 2018; Lyons &Kass-Hanna, 2018) among others.

Fungáčová & Weill (2014) use data from the 2011 World Bank Global Findex database to analyse financial inclusion in China. They observe that financial inclusion in China is high compared with other BRIC countries. In China, more prominent use of a formal account and formal credit are accounted for by high earnings, access to formal education, being a man, and belonging to the older age bracket. They show that financial inclusion defined in terms of the utilisation of regulated financial services is critical for economic development.

Financial inclusion in Africa is reported by the World Bank to be the lowest in the world with Burkina Faso and Chad being countries in the region recording the lowest bank account penetration. Also, in terms of access to formal banking services, more than half of the adult population lacked access (World Bank, 2014). Although financial inclusion is reported to be generally low in developing countries, financial inclusion saw significant improvement between the years 2011 and 2014. The level and rate of improvement among countries in Sub-Saharan Africa varied on a country-by-country basis. (Opoku Asuming, Gyamfuah Osei-Agyei, & Ibrahim Mohammed, 2019). Ghana was not excluded from the countries in Sub–Saharan Africa that experienced improvements. The CGAP notes the substantial progress made by Ghana within the five years between 2010 and 2015 by comparing the 2015 Financial Insights (FII)

survey it commissioned to the 2010 FinScope survey. The surveys show that the percentage of adult Ghanaians who are 15 years and above with access to formal financial services increased by not less than 41 percent with a corresponding fall in financial exclusion by nearly 50 percent within the five years under consideration. However, the increase in financial inclusion in the case of Ghana as the CGAP observes is mainly driven by mobile money which demonstrates the vital role mobile money plays in promoting financial inclusion in Ghana (CGAP, 2015).

2.3.3 Determinants of Financial Inclusion

In literature, there is a growing body of evidence which suggests that individual characteristics can influence financial inclusion. Extant literature shows individual attributes such as gender, age, education and income levels as key factors that influence financial inclusion. Shihadeh, (2018) examines how individual distinctive attributes influence financial inclusion in the MENAP region. The study explores 16 countries and 16,105 individuals in the region using statistics from the 2014 World Bank Global Findex database.

Using the World Bank's Global Index database, Zins & Weill (2016) examine the determinants of financial inclusion in Africa building on the work of Demirguc-Kunt and Klapper (2012) which seeks to investigate financial inclusion in Africa by providing statistics. They find that in Africa being a man, richer, more educated and older, favour financial inclusion with a higher influence of education and income.

Opoku Asuming et al., (2019) examine a wide range of financial inclusion indicators by considering both macro-level and micro-level indicators of financial inclusion. They

find that in Sub-Saharan Africa, age, education, gender and affluence are covariates on an individual-level that significantly contribute to financial inclusion in addition to macro-economic variables (presence of financial institutions and growth rate of GDP) and Business Freedom. Conversely, Chikalipah (2017) observes literacy, GDP growth and GNI to have a significant and positive relation to financial inclusion except for population density and infrastructure which show otherwise using country-level data generated by the World Bank on 20 Sub-Saharan countries.

Country specific studies on determinants of financial inclusion, also show different results. Akudugu (2013) investigates the determinants of financial inclusion in Ghana whiles Johnson et.al (2011) examine financial access and exclusion in Kenya and Uganda. The similarity between these studies is their use of household data however their empirical findings are mixed. Among the adult population in Ghana, Akudugu (2013) finds age, literacy, remoteness to financial institutions, dearth of records, wealth class, mis-trust for formal financial establishments, social networks and lack of money to be the determinants of financial inclusion. Moving further away from individual characteristics that influence financial inclusion, studies point to factors such as trust, good governance, quality of institutions, availability of information and the regulatory environment existing in a country (Chakrabarty, 2014; Park& Mercado, 2015; Xu, 2020).

2.3.4 Financial Literacy and Financial Inclusion

In establishing the nexus between financial literacy and financial inclusion considerable number of studies have been advanced in literature. For instance, Bongomin et al., (2020) make a case for financial intermediaries in the linkage between financial literacy

and financial inclusion. Using Partial Least Square, they analyse the data for the study and confirm the mediating role financial intermediaries play between financial literacy and financial inclusion. They find that financial intermediaries enhance financial literacy which then improves financial inclusion.

Grohmann, Klühs, & Menkhoff (2018) investigate the effect of financial literacy on financial inclusion and establish the stylized fact at the country level that financial literacy is systematically related to financial inclusion. Using cross country data, they provide evidence which suggests that both the demand for and supply of financial services are essential for financial inclusion. They employ the instrumental variable approach to test whether the relation between financial literacy and financial inclusion is causal. Financial inclusion is measured using four outcome variables in their study. The variables which capture access to financial services are the proportion of the population that has a simple bank account at a formal institution including mobile money accounts and proportion of the adult population that own a debit card. Using a bank account to save and also using a debit card during the past year form the additional two outcome variables which measure use of financial services.

Klapper, Lusardi, van Oudheusden (2017) also confirm that grown-ups who use formal financial services have higher financial knowledge and further posit that using financial services will improve financial skills of consumers which will also broaden financial inclusion. The results of the OECD/INFE project launched in 2010 also confirms the association between low levels of financial literacy and low levels of financial inclusion (Russia Financial Literacy and Education Trust Fund, 2013).

Baidoo, Boateng and Amponsah (2018) hypothesize that financial literacy plays a crucial role in increasing savings in Ghana. They advance the assertion that financial literacy is closely tied to savings which suggests that the more financial literate a person is, the higher the probability of saving since the individual knows when and how to save for uncertain future events. Using a binary probit regression estimation technique and sample of 800 respondents, they observe that as individuals' financial literacy scores increase their saving likelihood also increases. Also, the marginal effect of answering a financial literacy question correctly increases the probability of saving by 2.3%. The study highlights financial inclusion in the sense that 88.33 % of the sample respondents for the study save at a formal financial institution. They further observe that interventions in the form of saving promotions by banks enticed existing consumers to save more and also offered opportunities to new financial consumers to own accounts to save.

2.3.5 Stock Market Participation

The importance of stock markets to the growth of economies has influenced the establishment of exchanges in Africa. Africa like many other continents can boast of 30 organised exchanges that facilitate buying, selling and issuance of shares of publicly-held companies, thus providing a channel for companies to raise capital at a lower cost. They also encourage saving by providing individuals with financial instruments which satisfy their risk preferences and liquidity needs. African capital markets are however characterised by the dominance of very few large exchanges. Meanwhile, the majority of these markets according to international standards are small and underdeveloped (Schiereck et. al, 2018). Despite the importance of stock markets, participation is found

to be low across economies both developed and developing. In terms of developed economies, Favilukis, (2013) and Guiso, Haliassos, and Jappeli (2003) document low participation by individuals and households in the US and UK, Italy, France, Germany, and the Netherlands respectively.

Brown, Veld, & Veld-Merkoulova (2018) investigate why individuals did not participate in the stock market. Using the CentERpanel, a survey data which is representative of the population of the Netherlands, they study both economic and non-economic factors which affect stock market participation. They introduce the concept of the perceived equity risk premium (PERP) which they assert was related to the limited engagement of individuals in the stock market and also test the effects of trust, financial literacy and attitude on stock market participation. They report lower PERP and lower financial literacy on the part on non-investors who claim they will never invest in stocks.

In Ghana, the Ghana Stock Exchange makes it possible for individuals to participate in the stock market. The exchange started its operations in 1990 and is authorised to trade in bonds, stocks, and ETFs. Trading on the GSE takes place on an electronic platform known as the GSE Automated Trading System (GATS). There are 42 companies listed on the exchange with a total market capitalization of GHS 55,971.16 million as at August 2018 (GSE, 2018). The stock market in Ghana closed in a negative at the close of 2018 after reaching a peak of approximately 35% in April 2018. The GSE Composite Index posted losses of 0.29% whilst the GSE Financial Stock Index recorded losses of 6.79%. Nonetheless, the capital market in Ghana performed creditably well and was adjudged the world's best performing market at the end of 2004

(Databank Group, 2004; 2018). Despite the success chalked on the global front, Acquah-Sam & Salami (2013) observe a low level of participation from the public on the market where the level of participation was inadequate from both businesses and investors. Acquah-Sam's investigation into the state of Ghana's capital market reveals that inadequate knowledge of capital market activity is the major reason for the lack of participation of Ghanaians in the capital market. The lack of knowledge accounted for 35.1% of the total responses thus making it the major factor attributable to limited participation in Ghana's stock market. Other factors that came to light include preference of money market instruments, interest in real estate or landed properties, low incomes and information asymmetry. In a bid to increase Ghanaians awareness of capital market activities the study recommends increased public education (Acquah-Sam, 2014).

2.3.6 Determinants of Stock Market Participation

Participation in financial markets is more often than not, favoured by desirable financial instrument attributes, capable of meeting investors' risk and return preferences. For instance, participation on the part of an investor is more likely to be high in a financial market where an investor who is well informed and risk-averse has access to short-term and highly liquid instruments that meets the investor's risk and return preferences (Banyen & Nkuah, 2015). Although desirable characteristics of financial instruments elicit participation from investors, behavioural characteristics such as trust, level of risk aversion, intelligence quotient, transaction cost, gender and awareness of the stock market among others have been explained as factors that affect stock market participation.

Grinblatt, Keloharju, & Linnainmaa (2011) investigate cognitive ability as a driver of stock market participation and find stock market participation to be monotonically related to Intelligence Quotient (IQ). Even among the rich, they find a high correlation between IQ and participation. Similarly, Burks et al. (2009) argue that individuals with high cognitive ability are influenced to participate in the stock market because they have more patience and are exhibit less risk-averse behaviours.

Awareness of financial products has been argued to be an important pre-requisite for financial inclusion and a significant determinant of stock market participation. Guiso & Jappelli (2005) demonstrate the implications inadequate financial awareness has for understanding the lack of participation in stock markets usually referred to as the stockholding puzzle in literature and also in estimating the cost of participation. They observe that individuals will only invest in markets they are aware of and find a positive significant relationship between awareness and stock market participation.

Georgarakos & Pasini (2011) investigated the combined role of trust and sociability on stock market participation and show that they have a distinct and significant effect on stockholding. Sociability in the context of their study is a measure of interactions with information-rich and reliable acquaintances. In the study, sociability is found to decrease the fixed participation cost which Andersen & Nielsen (2010) assert to be the prominent justification for non-participation in the stock market.

Guiso, Sapienza, & Zingales (2008) also provide evidence of trust being a determinant of stock market participation. They assert that more trusting individuals are more likely

to hold stocks and that in the absence of any cost relevant to participation, trust explains a large variation in the limited participation of individuals in stock markets.

Another driver found to influence the participation of households or their willingness to hold stock was their motive for saving. Shum & Faig (2006) opine that a household's likelihood of holding stock increases when they save towards education bills, household needs and retirement however the vice versa is true when they save to invest in a private business. Kozak & Sosyura (2015) on the other hand assessed the influence access to credit has on household participation in the stock market. Findings from their study reveal that when households have access to credit, they tend to participate more in financial markets. This is because, access to credit reduces their need to save for precautionary measures and also enhances their risk tolerance levels. They bring to bare the implications that access to credit has on household finance by establishing the nexus between credit and active participation in the stock market and highlight the long-term financial benefits households can enjoy in the form of improvement in financial wealth.

Exploring the gender narrative, Kaur &Vohra (2012) and Almenberg & Dreber (2015) observe a wide gender gap in stock market participation which Almenberg & Dreber (2015) assert can be explained by basic financial literacy. Kaur & Vohra (2012) also in their study of women participation in stock markets recommend that financial education programs should be well designed to motivate women to invest in the stock market.

2.3.7 Financial Literacy and Stock Market Participation

Previous studies exploring the linkage between financial literacy and stock market participation have established a positive association between financial literacy and

stock market participation and have attributed the limited participation in the stock market to the lack of financial literacy even after controlling for demographic, socio-economic, psychological and financial behaviour variables (Arrondel, Debbich & Savignac, 2012; Thomas & Spataro, 2015; Kadoya, Khan & Rabbani, 2017; Hsiao & Tsai, 2018). Empirical findings from Van Rooij et al., (2011) demonstrate that individuals with low levels of financial literacy are more likely to shy away from the stock market. They show specifically that, families' inadequate awareness of stock, the workings of the stock market and the pricing of assets are the reasons why they shy away from the stock market. In the study, Van Rooij et al., (2011) again classify financial literacy into two that is basic and advanced literacy and modelled two distinct modules to measure and evaluate them. Basic financial literacy questions covered topics on interest rates, interest compounding, inflation, discount and the difference between nominal and real values whereas advanced financial knowledge questions covered topics on the difference between stocks and bonds, functions of the stock market, risk diversification and the relationship between bond prices and interest rates. Further, they employed OLS and GMM regressions in estimating how financial literacy affects stock market participation. Estimates from the OLS specifications and GMM regression did not show any significant differences. Even in GMM, the association between financial literacy and stock market participation from OLS estimates remained positive and statistically significant.

Bucher-Koenen (2014b) also shows that how financially literate an individual is can be related to the individual's financial behaviour in that individuals who show higher financial literacy are more likely to make preparations for their retirement and also

invest in the stock market which is consistent with Brown et al. (2018) findings that financial literacy and knowledge about stock market increases participation.

Kuffour & Adu (2019) also investigate the effect of financial literacy and trust on stock market participation in Ghana. The study uses survey data collected from 389 respondents sampled from the Kumasi Metropolis and employs a probit regression to estimate the impact of financial literacy on stock market participation. Two indexes of financial literacy was constructed by the study. The first index was arrived at by considering the total score of questions correctly answered by respondents whereas the second index was computed through Principal Component Analysis. Actual participation on the other hand was measured by the direct holding of stock therefore excluding ownership of shares through pensions and mutual funds. They find low levels of financial literacy in Ghana. Results from the probit regression also show that less financially literate investors are less likely to invest in stocks when socio-demographic and risk attitudes are taken into consideration. Consistent with Almenberg & Dreber (2015) who examine the link between the gender gap in stock market participation and financial literacy, Kuffour & Adu (2019) also conclude that there is a gender gap between financial literacy and stock ownership.

2.4 Summary

This chapter presents a theoretical overview of the subject matter of study. Discussions on empirical findings on widespread financial illiteracy, financial inclusion and limited participation in the stock markets are also presented. More so, empirical relationships that exist among financial literacy, financial inclusion, and stock market participation in scholarly journals are also discussed.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

In this section, the source of data, selection of sample and key variables under the study are discussed extensively and metrics by which variables are measured are presented. This section also highlights the estimation strategies and techniques used to execute the study.

3.2 Research Paradigm

Research Paradigms are used to describe researchers' worldview or perspective or school of thought. Khun (1962) first used the term paradigm to convey a philosophical pattern or way of thinking. Paradigm can be said to be a set of shared beliefs and principles that inform a researcher's understanding and interpretation of a phenomenon or research data. There are five paradigms in literature namely, positivism, relativism, realism, critical realism and interpretivism. Paradigms are made of four essential elements namely, epistemology, ontology, methodology, and axiology. The essential elements of a paradigm comprise the assumptions, beliefs, norms, and values a paradigm holds. Epistemology describes what is considered as knowledge, ontology refers to the assumptions made for a phenomenon to make sense or to be real. Methodology, on the other hand, refers to the research design, methods, approaches, and procedures used in the investigation of a phenomenon while axiology simply bothers on the ethical stance of research.

Interpretivists are of the view that reality is socially constructed and that there is no single truth. Researchers in this paradigm construct knowledge socially from their personal experiences. They assume knowledge and meaning are acts of interpretation. This paradigm assumes a subjectivist epistemology, a relativist ontology, a naturalist methodology, and balanced axiology. Relativists are of the view that there is no universal objective, truth. Reality as truth is not absolute, it is relative and dependent on something in existence. Realists share the view that entities exist independently of being perceived, or independently of theories about them. Critical realists hold the view that the assumption of reality is a social construct that is continually under internal influence. The assumption underlying the positivist paradigm is that reality is objectively given and is measurable using properties that are independent of the researcher and instruments; in other words, knowledge is objective and quantifiable. Positivists formulate hypotheses and employ a scientific way of testing hypotheses in their investigations. They share a worldview that the only legitimate means of extending knowledge and understanding human behaviour is through experimentation, observation and a reason based on the human experience as a basis of understanding human behaviour. In pursuance of an objective search for facts, the positivist paradigm has objectivist as its epistemology, naïve realism as its ontology, its methodology being experimental and beneficence as its axiology.

The research paradigm underlying this study is Positivism. This is because the paradigm encourages the use of quantitative research methods which allows that data gathered is analysed and interpreted to reflect the relationships contained in the data with precision.

3.3 Research Approach

The study employs a quantitative research approach. This method enables the measurement of the variables of the study, establish variations, and also identify relationships. It is the objective of the study to establish how financial literacy and financial inclusion affect stock market participation. Therefore employing a quantitative research method will help to achieve this objective. Moreover, this form of inquiry has assumptions about deductively testing theories, therefore, building in protections against bias and alternative forms of explanations enabling the generalization and replication of research outcomes. Given the nature of the study's data, employing quantitative tools and techniques are more helpful.

3.4 Data Sources

The area of study is Ghana located in the West African sub-region. As at December 2018, the country had 10 administrative regions with each region having several administrations. The number of regions in Ghana rose to 16 following the successful creation of 6 additional regions in 2019. As of February 2019, the number of districts stands at about 230 from 216. The Ghana Statistical Service puts the total population of the country at 27 million. The World Bank estimates the country's population as of 2018 at 29.6 million. Ghana has a robust financial system that comprises 23 universal banks, 144 rural and community banks, 23 savings and loans companies, 137 microfinance institutions and 11 finance houses. The sample frame used by the Ghana Statistical Services for the 2010 Population and the Ghana Demographic and Health Survey (GDHS) in 2014 is adopted by the study since it appears to be the most comprehensive and credible framework available in Ghana. A two-stage sampling procedure is used to ensure that indicators across the national level and along urban and

rural areas are appropriately captured. The data for the study was collected in 2018. Probability Proportional to Size (PPS) is employed in the first stage to select 60 districts across all the 10 regions of Ghana. In the second stage, 1,966 individual households are selected, administered and collated. The study takes a cue from the GDHS 2014 for the second stage sampling procedure.

3.5 Variable Measurement

In this study, the key variables under investigation are financial literacy, financial inclusion, and stock market participation. Financial literacy is measured in line with the use and application of seven financial literacy indexes in literature. Financial inclusion is measured using five main indicators of bank enabled inclusion. Stock market participation is also measured using three indicator variables which are investment in stocks, willingness to buy or sell shares when an agent visits and preparedness to buy or sell shares given the opportunity to convert shares to cash within the shortest possible time. Table 1 below provides a summary of variable measurement.

3.5.1 Financial Education/ Literacy

The OECD/ INFE defines financial education as the process by which financial consumers improve their understanding of financial products, concepts and risks to make informed choices to improve their financial well-being (OECD, 2005).

To improve financial literacy just like many policy interventions, the first crucial point is measurement. In literature, financial literacy has been measured using questions assessing basic knowledge of four fundamental concepts in financial decision-making. The questions specifically test knowledge of interest rates, interest compounding,

inflation, and risk diversification. Hasler & Lusardi (2017) opine that the Standard &Poor's Global FinLit survey provides the most comprehensive measure of financial literacy as it builds on other national survey initiatives. Following from this, the study, therefore, extends the four basic concepts as used in the Standard &Poor's Global FinLit Survey by adding three more variables. Therefore, this study assesses basic knowledge on seven concepts necessary for financial decision making. These are (i) understanding of interest rate, (ii) interest compounding, (iii) risk diversification, (iv) understanding of stock, (v) future value of a stock, (vi) inflation, (vii) risk and return. The question answered correctly is scored 1 and 0 otherwise. Questions come with possible answers. A total score of seven is an indication of high financial literacy whiles a score of 0 indicates low financial literacy. In this study, financial literacy is assumed to be positively related to inclusive finance.

3.5.2 Financial Inclusion

The definition and measurement of financial inclusion still remain unsettled in literature. Although some progress has been made towards a consensus of what financial inclusion means, the same cannot be said of its measurement. Financial inclusion in literature has been typically defined as the access and use of formal financial services. In line with the OECD, financial inclusion refers to the process of promoting affordable, timely and adequate access to a wide range of regulated financial products and services and broadening their use by all segments of society through the implementation of bespoke existing and innovative approaches including financial awareness and education with a view to promote financial wellbeing as well as economic and social inclusion (OECD, 2005). Based on the definitions of financial inclusion by Allen, Demirguc-Kunt, Klapper, and Peria (2016), the World Bank, the

African Development Bank and Diniz, Birochi and Pozzebon (2012), Abor et al., (2018) provide a broad definition of financial inclusion. They define financial inclusion as 'eliminating obstacles to financial products and services (such as credit, investment, savings, insurance, financial technology and payments) for everybody in the economy (rich or poor, male or female, rural or urban dweller, educated or uneducated) and establishing a platform, or framework, or a system which produces low cost, fair, convenient, safe, quality and sustainable financial services and products, and facilitates access to and usage of these products and services by all, at all times' (p7).

The study adopts the empirical strategy used by Allen, Demirguc-Kunt, Klapper & Martinez Peria (2016) to measure financial inclusion. In this study, five main indicators of bank enabled financial inclusion which captures access and use of financial services are empirically specified. The indicators are (i) bank account ownership, (ii) saving using a bank account, (iii) bank account usage frequency defined in terms of three or more withdrawals in a month, (iv) access to bank credit defined in terms of having secured a loan from a bank in the last year, (v) use of account to make payments. The indicator variables are dummies where one shows possession of financial inclusion characteristics and zero means otherwise.

3.5.3 Stock Market Participation

Although modelling of the determinants of stock market participation has taken the conventional form based on risk and return trade-offs, stock market participation in literature has also been measured by the direct and indirect holding of stock. In this study stock market participation is measured using three indicator variables. Investment

in stock which is a primary indicator of participation encapsulates the direct and indirect holding of stock traded on the Ghana Stock Exchange. The other two indicators capture stock market participation when an agent visits and when one is offered the opportunity to convert shares to cash within a short period of time.

3.5.4 Control Variables

Individual's socio-economic and demographic characteristics are included in the models to predict the relationship of interest. These control variables include age, gender, level of education, income, geographical location and employment status.

The *gender*, female is specifically controlled by the study. Previous studies indicate wide variations in financial literacy, financial inclusion and participation in stock markets among females than males. The variable is assumed to have a negative sign because it is less likely for women to work and independently make financial decisions. In line with previous studies, it is expected that women are less likely to be financial literates, hold bank accounts and participate in the stock market.

Age is also controlled for by the study because the use of bank accounts is expected to surge and decline with age. A hump-shape association between equity holdings and age has been observed in the literature. Therefore stock market participation is anticipated to increase over time with the age of a respondent. In terms of financial inclusion, studies investigating financial inclusion take particular consideration of the adult population aged 15 years and above because they stand a higher chance of being financially educated and included in the financial systems. Bank account usage is therefore expected to first increase with age and subsequently experience a decline.

Geographical location is controlled for by the study because where respondents are located often has a relationship with their levels of financial education, financial inclusion and active involvement in the stock market. It is assumed that individuals living in urban areas are more educated than those in rural areas. As a result, they are expected to have access to financial products and face fewer barriers to inclusion leading to their participation in the stock market. Also, the presence of financial institutions is more limited in rural areas than in urban centres. Therefore the location rural is expected to be negative.

Income is also controlled by the study because it is anticipated that as incomes of households increase, they are willing to acquire financial literacy skills and also make use of financial consultants in order to make healthier financial choices. Also, an increase in incomes motivates individuals to own accounts and use formal financial services. Individuals are also more likely to participate in the stock market as their earnings increase.

Educational level is documented to have a positive correlation with financial education, financial inclusion, and participation in the stock market. This positive correlation can be explained by the fact that when individuals are more educated they can understand basic financial concepts and are also able to use financial products offered by financial institutions and participate in the stock market.

Employment status is controlled for, specifically, the status employed. It is obvious and expected that individuals who are formally employed will more often than not use an

account since their employers are likely to require an account for the payment of their salaries.

Table 1. **Variables Measurement**

Variable	Definition	Measurement	Prior Literature
Personal/Household Characteristics			
Gender	Gender of respondent	1= if male; 0=otherwise	
Age	Age range of respondent	Years	
Marriage Status	Marital Status of respondents	1= if married; 0=otherwise	
Urban	Place of residence (Urban or Rural)	1= if urban; 0=otherwise	
Region	Residence in a particular region	1= if yes; 0=otherwise	
HHSize	Number of people in the respondent's household	Number of persons	
Education	Educational status of the respondent	1= if formally educated; 0=otherwise	
Religion	Religion of respondent	1= if Christian; 0=otherwise	
Employment	Employment status of the respondent	1= if formally educated; 0=otherwise	
MonthlyInc	Monthly household income range of respondent	Ghana Cedis	
MonthlyIncValue	Monthly household income range of respondent	Ghana Cedis	
Financial Inclusion			
ACCTO	Account ownership by the respondent	1= if yes; 0=otherwise	Allen et al., (2016), Abor et al., (2018), Demirguc-Kunt & Klapper,(2013), Fungáčová& Weill, (2016)
Saving	Usage of account for savings	1= if yes; 0=otherwise	Allen et al.,(2016), Abor et al., (2018), Demirguc-Kunt & Klapper,(2013), Fungáčová & Weill, (2016)

Upmt	Usage of account for payments	1= if yes; 0=otherwise	Amidu et al., (2018)
FreqWith	Withdraws money at least once a month	1= if yes; 0=otherwise	Amidu et al., (2018)
Credit	Access to credit by Respondents	1= if yes; 0=otherwise	Allen et al.,(2016), Abor et al., (2018), Demirguc-Kunt & Klapper (2013), Fungáčová & Weill (2016)
Financial Behaviour			
CreditD	Dummy variable for ownership of credit card	1= if yes; 0=otherwise	Amidu et al.,(2018)
SaIB	Good Savings and Investment behaviour of Respondent	1= if yes; 0=otherwise	Amidu et al.,(2018)
Risk	Respondent is risk-averse	1= if yes; 0=otherwise	Amidu et al.,(2018), Hong, Kubik & Stein (2004)
Financial Literacy (index score of how financial literate a respondent is)			
Stock valve	Understanding Value/price of stock/shares	Correct answer = 1; wrong = 0	Yoong (2010), Lusardi&Mitchell (2011), Van Rooij et al.,(2011)
Future stock	Understanding the future value of the stock/shares	Correct answer = 1; wrong = 0	Yoong (2010), Lusardi&Mitchell (2011),Van Rooij et al.,(2011)
Simple interest	Understanding the simple interest	Correct answer = 1; wrong = 0	Yoong (2010), Lusardi&Mitchell (2011), Klapper et. al, (2017),
Amount	Understanding interest plus the principal	Correct answer = 1; wrong = 0	Yoong (2010), Lusardi&Mitchell (2011), Klapper et. al, (2017), Van Rooij et al.,(2011)
Risk and return	Relationship between return and risk	Correct answer = 1; wrong = 0	Yoong (2010), Lusardi&Mitchell (2011), Klapper et. al, (2017)
Inflation and cost of living	Relationship between inflation and cost of living;	Correct answer = 1; wrong = 0	Yoong (2010), Lusardi&Mitchell (2011), Klapper et. al,

			(2017), Van Rooij et al.,(2011)
Risk diversification	Simple understanding of diversification and/or spreading of risk	Correct answer = 1; wrong = 0	Yoong (2010), Lusardi&Mitchell (2011), Klapper et. al, (2017), Van Rooij et al.,(2011)
	Financial Literacy index	**Total score = 7**	
Stock Market Participation			
InvStock	Having an investment in stocks	1= if yes; 0= otherwise	Kuffor & Adu(2019), Hong, Kubik& Stein (2001) , Cao& Wang (2005), Gardini& Magi(2006), Vestman (2010) Almenberg&Dreber (2011)
AgentTrade	Willing to buy or sell shares if agent visits	1= if yes,0=otherwise	By Author
StockConv	Prepared to buy or sell shares given the opportunity for conversion to cash	1=if yes, 0=otherwise	By Author

3.6 Model Development and Estimation Strategy

This study adopts the Probit Model, Biprobit Model, and Maximum Likelihood Estimation Procedure.

3.6.1 Analytical Models and Estimation Strategy

In this study the following model is used to estimate the nexus between banks enabled financial inclusion and financial literacy:

$$Y_{1j}^{*} = X_{1j}'\alpha + R_{1j}'\beta + \varepsilon_{1j} \quad (1)$$

$$Y_{1j} = 1 \;\; if \;\; Y_{1j}^{*} > 0$$

$$Y_{1j} = 0 \;\; if \;\; Y_{1j}^{*} \leq 0$$

Where, Y_{1j}^{*}, the dependent variable, represents account ownership. It is a binary variable which equals 1 if the individual owns an account and 0 if otherwise. The subscript j refers to the individual. X_j' is a vector of individual household level characteristics such as gender, age, marital status, level of education, household income level, geographical location, etc.; and financial characteristics including risk aversion and savings and investment behaviour. $R_j'\beta$ is an index score of how financial literate a respondent is. ε_j is a normally distributed random error term with zero mean and constant variance. All variables used in the models, their definitions and measurements are shown in Table 1. Using the maximum likelihood estimation procedure, Equation (1) is estimated as a probit model.

To estimate the determinants of the use of an account to save (Y_{2j}^{*}), the study employs the following model:

$$Y_{2j}^{*} = X_{2j}'\alpha + R_{2j}'\beta + \varepsilon_{2j} \qquad (2)$$

$$Y_{2j} = 1 \;\; if \;\; Y_{2j}^{*} > 0$$

$$Y_{2j} = 0 \;\; if \;\; Y_{2j}^{*} \leq 0$$

Y_{2j}^{*} is a binary dependent variable. It is assigned the value 1 if the individual uses the account to save and zero if otherwise. All other variables hold as defined under equation (1) above. However, a self-selection problem would be encountered if equation (2) alone is estimated. This is because the individual uses an account to save only when the individual owns an account. Therefore the study employs binary probit (biprobit) model to estimate equations (1) and (2) together, where equation (1) is the selection equation and equation (2) the decision equation, which is the decision to save after owning an

account. The leading benefit of using the biprobit estimation technique is that it can overcome the endogeneity problem that arises from sample selection bias.

Because the dependent variables in the two equations are binary, the traditional Heckman 2-step approach cannot be applied here. Following Allen et al. (2016), equations (1) and (2) are simultaneously estimated using the maximum likelihood estimation procedure. Equations similar to (2) are equally specified for the frequency of withdrawals, access to credit and usage of accounts for payments separately.

Each of the equations above is then also estimated simultaneously with equation (1). Again, it is worth considering that the individual is able to withdraw from an account, save or obtain bank credit, or use an account to make payments only when account ownership has been observed.

To analyse the influence of financial literacy on stock market participation, the study makes use of the model specified below.

$$P_j^* = X_{3j}'\alpha + R_{3j}'\beta + \varepsilon_{3j} \qquad (3)$$

$$P_j = 1 \;\; if \;\; P_j^* > 0$$

$$P_j = 0 \;\; if \;\; P_j^* \leq 0$$

The study estimates stock market participation using probit regression, controlling for both the wide range of potential drivers of stock market participation and dummies for individual participant demographics and socio-economic characteristics. P_j^* is the dependent variable that represents stock market participation. Stock market participation is a binary variable which equals 1 if the individual participates either by investing in stocks, is willing to buy or sell shares when an agent visits or is prepared

to buy or sell shares when given the opportunity to convert shares to cash and 0 if otherwise. $X'_{3j}\alpha$ is the vector of individual household characteristics whereas $R'_{3j}\beta$ is the index score of financial literacy of a respondent.

To investigate the effect of financial inclusion on stock market participation, the equation below is estimated.

$$P_j^* = X'_{4j}\alpha + Z'_{4j}\beta + \varepsilon_{4j} \quad (4)$$

$$P_j = 1 \ \ if \ \ P_j^* > 0$$

$$P_j = 0 \ \ if \ \ P_j^* \leq 0$$

$Z'_{4j}\beta$ is how financially included a respondent is, taking into consideration all five indicators of inclusion. All other variables hold as defined under equation (1) and equation (3) above.

The study specifies the model below to explore how financial education and financial inclusion impact stock market participation.

$$P_j^* = X'_{5j}\alpha + R'_{5j}\beta + Z'_{5j}\beta + (R'_{5j}\beta * Z'_{5j}\beta) + \varepsilon_{5j} \quad (5)$$

$$P_j = 1 \ \ if \ \ P_j^* > 0$$

$$P_j = 0 \ \ if \ \ P_j^* \leq 0$$

Again all variables hold as defined in equation (1), equation (3) and equation (4) above.

3.7 Summary

This chapter focuses on the discussion of the methodology used to execute the study. It comprises the research approach and design the study uses, the source of data, model

specification and the measurement of the variables under consideration by the study. It also states the empirical estimation techniques the study makes use of.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND INTERPRETATION OF RESULTS

4.1 Introduction

This section presents the empirical results on the analysis of financial literacy, financial inclusion and stock market participation. The three variables of interest are analysed for the entire dataset which consists of about 1,966 respondents sampled across all the ten regions of Ghana for the period 2018. A regional analysis is also carried out to compare and evaluate financial literacy, financial inclusion and stock market participation across the different regions. This section also shows the results from examining how financial literacy and financial inclusion influence stock market participation. Firstly, a biprobit model is employed to examine the effect of financial literacy on financial inclusion. Secondly, a robust probit model is used to determine the effect of financial inclusion on stock market participation. Finally, following from the estimation of the effect of financial literacy on financial inclusion and subsequently examining the influence of financial inclusion on stock market participation, a robust probit is again used to analyse the joint effect of financial literacy and financial inclusion on stock market participation in Ghana.

4.2 Summary Descriptive Statistics

Demographic statistics of respondents, as well as descriptive statistics of the major variables of interest of the study, are presented in tables 4.1, 4.2, 4.3 and 4.4 below.

4.2.1 Demographic Statistics

Table 4.1 presents summary statistics on the demographic characteristics of the sample for the study. In this table, the frequency distribution shows that out of the sampled respondents, about 63% are males. The age distribution reflects the youthful nature of Ghana's population. Out of the individuals sampled, the frequency distribution shows that about 58% of respondents fall within the age brackets of 19 and 35. Individuals within this age bracket record the highest frequency compared to the other age groupings in the study. Cumulatively, respondents who are less than 18yrs but not more than 45 years form about 88% of the sample.

In terms of the geographical location of the individuals sampled, the frequency distribution shows that about 40% of individuals live in urban areas which means that the majority live in the rural parts of Ghana. A regional segregation of respondents shows that most of the respondents were drawn from the Upper East Region.

The employed form about 73% of the sample. Although more people are employed than unemployed, monthly incomes of the majority of sampled individuals appear to be relatively low. The frequency distribution shows that about 81% of the sample earn incomes less than GHC 8,000 on a monthly basis. Despite recording low monthly incomes, about 33% of respondents find themselves in households with size ranging between 5 and 6.

The frequency distribution also demonstrates that respondents have acquired some form of formal education. The level of education of respondents spans from elementary through to the tertiary level. It is interesting to observe that only about 5% of individuals

sampled did not possess any form of formal education. Individuals with tertiary level education formed the greatest percentage followed by those with a secondary level of education. They form about 49% and 30% of respondents respectively. Respondents with an elementary level of education constitute about 14%. This striking feature of the sampled respondents makes them fit for analysing financial literacy, financial inclusion and stock market participation in Ghana since respondents are expected to exhibit an understanding of the survey for the study.

The frequency distribution also confirms that there are more Christians in Ghana. Out of the sample, 76% of respondents are Christians, 21% are Muslims and 2.7% are Traditionalists.

Table 4. 1 Summary of Demographic Statistics

	Freq.	Percent	Cum.
Gender			
Female	722	36.89	36.89
Male	1235	63.11	100
Age			
Less than 18years	164	8.37	8.37
Between 19 and 35years	1137	58.04	66.41
Between 36 and 45years	431	22	88.41
Between 46 and 60years	182	9.29	97.7
Above 60years	45	2.3	100
Marriage Status			
Single	1125	57.22	57.22
Married	841	42.78	100
Urban			
Rural	1165	59.56	59.56
Urban	791	40.44	100
Region			
Greater Accra	282	14.38	14.38
Western	218	11.12	25.5
Eastern	205	10.45	35.95
Volta	106	5.41	41.36
Ashanti	93	4.74	46.1
Northern	254	12.95	59.05
Upper West	263	13.41	72.46

Upper East	386	19.68	92.15
Central	66	3.37	95.51
Brong Ahafo	88	4.49	100
Household Size			
Less than 2	158	8.05	8.05
Between 3 and 4	607	30.94	38.99
Between 5 and 6	643	32.77	71.76
Between 7 and 8	284	14.48	86.24
Above 8	270	13.76	100
Education			
None	101	5.18	5.18
Elementary	268	13.75	18.93
Secondary	594	30.48	49.41
Tertiary	961	49.31	98.72
Other	25	1.28	100
Employment Status			
Unemployed	465	23.65	23.65
Employed	1501	76.35	100
Monthly Income			
Less than GHC 8000	1523	80.8	80.8
Between GHC 8,000 and GHC10,000	217	11.51	92.31
Between GHC 11,000 and GHC15,000	89	4.72	97.03
Above GHC 15,000	56	2.97	100
Religion			
Christianity	1363	75.55	75.55
Islam	387	21.45	97.01
Traditional	48	2.66	99.67
Other	6	0.33	100

4.2.2 Summary Statistics on Financial Literacy

Table 4.2 displays the frequency distribution of the index of financial literacy of the sampled population. The index ranges from 0-7 which demonstrates how financial literate a person is by answering questions on financial concepts which form the indicators of financial literacy employed by the study. The questions test respondents understanding of interest rate, interest compounding, risk diversification, understanding of stock, the future value of a stock, inflation and risk and return. A total score of seven is an indication of high financial literacy whiles a score of 0 indicates low financial literacy. It is evident that respondents demonstrate an appreciable understanding of financial concepts. The standard deviation of financial literacy is 1.65 which implies

that on an average, a respondent can score between 3 and 6. From the table, the majority of respondents score five on the financial literacy index. They form about 25% of the sampled population. Individuals who demonstrated the least knowledge of financial concepts and therefore score 0 on the index form about 3% of the sample.

Table 4. 2 Frequency Distribution of Financial Literacy Index

FinLit	Freq.	Percent	Cum.
0	33	3.11	3.11
1	45	4.24	7.35
2	97	9.14	16.49
3	163	15.36	31.86
4	221	20.83	52.69
5	263	24.79	77.47
6	201	18.94	96.42
7	38	3.58	100

4.2.3 Summary Statistics of Financial Inclusion

Table 4.3 presents the summary statistics of the five indicators of financial inclusion employed by this study. From the table, 74 % of respondents have an account either at a bank, credit union or other financial institutions. However, only about 30% of respondents who own accounts use it for the purposes of saving. This reflects the savings culture of Ghanaians who prefer to hold money rather than to keep them at financial institutions. All the other indicators of financial inclusion fall below the percentage of individuals who own accounts. In terms of withdrawal using an account at least once a month, only 21% of respondents indicate inclusion in that regard. Access to credit using an account and use of account for payment by respondents constitute 40% and 24% respectively. This also suggests that account ownership does not automatically translate into using of account to save, access to credit, frequency of withdrawal and payment using an account. It can also be inferred from the frequency

distribution that respondents encounter more barriers and have less incentive with regards to the usage of account than ownership.

Table 4. 3 Frequency Distribution of Financial Inclusion Variables

Variable	Freq.	Percent	Cum.
Account Ownership			
No	509	25.89	25.89
Yes	1457	74.11	100
Frequency of Withdrawal			
No	1546	78.64	78.64
Yes	420	21.36	100
Credit			
No	1200	61.04	61.04
Yes	766	38.96	100
Saving			
No	1384	70.4	70.4
Yes	582	29.6	100
Use of Account for Payment			
No	1495	76.04	76.04
Yes	471	23.96	100

4.2.4 Summary Statistics on Stock Market Participation

Summary statistics on the variables employed by the study to examine stock market participation in Ghana are presented in Table 4.4. The indicators of participation are investment in stocks, willingness to buy or sell one's shares if an agent visits and thirdly, a respondent's preparedness to buy or sell shares given the opportunity to convert shares to cash. The table shows that about 11% of respondents have actually invested in stocks. Also, 45% of respondents indicate a willingness to trade if an agent visits whiles 57% indicate their willingness to trade given that they can easily convert their shares to cash. This suggests that liquidity may be an important factor that influences stock market participation in Ghana.

More so, 33% of respondents indicate that they are aware of the Ghana Stock Exchange and what they engage in whereas 35% of them have knowledge that stocks are traded on the exchange. Respondents who agree that the securities traded on the exchange meet their risk and return preference comprise 36% compared to 64% who disagree. Out of the respondents sampled, 68% contribute less than 10 percent of their monthly incomes to finance investment which confirms the poor and fair saving and investment behaviour of respondents. About 98% indicate that they invest because it serves to them as a source of short-term funds rather than for future wealth and safety, family or for retirement. The sample included high, medium and low-risk averse respondents. The low and medium risk-averse respondents form about 87% of the sample population.

Table 4. 4 Frequency Distribution of Stock Market Participation Variables

	Freq.	Percent	Cum.
Investment in stocks			
No	1065	89.35	89.35
Yes	127	10.65	100
Agent Trade			
No	719	54.59	54.59
Yes	598	45.41	100
Stock Conversion			
No	531	42.89	42.89
Yes	707	57.11	100
Awareness of GSE			
No	1193	66.95	66.95
Yes	589	33.05	100
Knowledge of stocks			
No	746	65.21	65.21
Yes	398	34.79	100
Investment Objective			
Short-term source of funds	1626	98.13	98.13
Future Wealth and Safety	24	1.45	99.58
Retirement Funds	5	0.3	99.88
Family	2	0.12	100
Monthly Income Used to Finance Investment			
Below 10%	1097	67.55	67.55
10%-25%	375	23.09	90.64
26%-40%	91	5.6	96.24
41% and above	61	3.76	100
Saving and Investment Behaviour			
Poor	498	29.33	29.33

Fair	603	35.51	64.84
Good	524	30.86	95.7
Very Good	73	4.3	100
Risk Aversion			
High	211	12.91	12.91
Medium	731	44.71	57.61
Low	693	42.39	100

4.5 Pairwise Correlation Matrix

Table 4. 5 Pairwise Correlation Matrix

Table 4.5 presents inferential statistics between the key variables of interest of the study. It covers a sample of 1996 respondents. Stock market participation indicators are **Investment in stock (InvStock)**, **AgentTrade (AT)** and **Stockconv (SC)**. **Finlit** is the index of financial literacy. Financial Inclusion indicators are represented by **accto, saving, upmt, freqwith** and **credits**.* shows significance at 10%

VARIABLES	InvStock	AT	SC	ACCTO	SAVING	CREDIT	UPMT	FREQWITH	FINLIT
InvStock	1.000								
AgentTrade	0.029	1.000							
Stockconv	-0.007	0.447*	1.000						
Accto	0.087*	0.045	0.026	1.000					
saving	0.034	0.034	-0.019	0.340*	1.000				
Credits	0.087*	0.071*	0.045	0.286*	0.282*	1.000			
Upmt	0.112*	0.061*	0.064*	0.253*	0.176*	0.309*	1.000		
Freqwith	0.047	0.046*	0.064*	-0.023	0.067*	0.123*	0.080*	1.000	
Finlit	0.087*	0.093*	0.131*	0.195*	0.010	0.027	0.079*	-0.001	1.000

Table 4.5 presents inferential statistics on the coefficients on which examination is made on Stock Market Participation. The results of the pairwise correlation indicate that a positive linear correlation exists between stock market participation and financial literacy given all three indicators of participation. This means that stock market participation increases with financial literacy of respondents. As individuals become financial literate they tend to participate more in the stock market.

Using investment in stocks as a measure of stock market participation, the results show a significant positive linear correlation between investment in stocks and three indicators of financial inclusion which are account ownership, frequency of withdrawal and access to credit. This means that participation in the stock market is expected to rise as individuals become financial included through owning of accounts, having access to credits and also using their account frequently in terms of withdrawing at least once a month.

Concerning willingness to trade in stocks when an agent visits, the pairwise correlation matrix shows a significant positive linear correlation between willingness to buy or sell shares and three indicators of financial inclusion. These indicators are payment using an account, access to credit and withdrawal using an account at least once in a month.

Finally, on willingness to participate in the stock market given the opportunity to convert shares to cash, a significant positive linear correlation is also observed for two indicators of financial inclusion which are the usage of account for payment and withdrawal.

On the whole, the pairwise correlation matrix shows a positive linear correlation between stock market participation and financial literacy and also a positive linear correlation relationship between stock market participation and financial inclusion.

4.3 Regression Results

In this section, the empirical results of the study are presented. The presentation follows the objectives of the study thus it is in four parts. The first part examines the relationship between financial literacy and financial inclusion. The second part presents the relationship between financial literacy and stock market participation. In the third part, the effect on financial inclusion on stock market participation is presented. Finally, the fourth part presents the effect of the interaction between financial literacy and financial inclusion on stock market participation.

4.3.1 The Impact of Financial Literacy on Financial Inclusion

To examine the effect of financial literacy on financial inclusion, a biprobit regression is used. A probit model is often used to model outcome variables which are binary or dichotomous. A variable is said to be binary when it can take only two values (0/1). Although ordinary least squares have occasionally been used in the past, the assumptions underlying OLS regression significance tests are often disregarded owing to the dichotomous nature of the dependent variable. As a result, probit has been found by most researchers to be theoretically attractive as it does not face this limitation. (Aldrich, Nelson & Adler, 1984; Noreen, 1988; Spector&Mazzeo, 1980; Stone & Rasp, 1991). The single drawback of probit models is that they require normal distribution for all unobserved components of utility. The probit model is derived under the assumption of jointly normal unobserved or latent utility components. The observed dependent

variable in a dichotomous probit analysis consists of two mutually exclusive and exhaustive categories. In this study, the probit model allows for the estimation of the effect of financial literacy on financial inclusion given the binary nature of financial inclusion indicators across the 1,966 sample respondents. The purpose of the probit model is to estimate the probability that an observation with particular characteristics will fall into a specific category. For instance, in this study, the probit model helps to estimate the chances of a financial literate to be financially included through the maximum likelihood estimation procedure. The maximum likelihood technique selects values of the probit and biprobit model parameters that produce a distribution that gives the observed data the greatest probability. Table 4.6 presents the biprobit output of the influence of financial literacy on financial inclusion. The diagnostic tests reported are :(1) Observations (2) Chi-square (3) P-values. The Wald test is used to test for the fitness of the biprobit model employed by the study to estimate the effect of financial literacy on financial inclusion. The test shows that at 1% level the independent variables jointly predict financial inclusion significantly which also implies that the models have a good fit.

Table 4. 6 The Effect of Financial Literacy on Financial Inclusion

Financial inclusion indicators which are ownership of an account (*accto)*, saving using an account (*saving)*, access to bank credit *(credits)*, frequency of usage *(freqwith)* and usage of account to make payment (*upmt)* are regressed against financial literacy (*Finlit*), household characteristics (Age, Age2, Hhsize, Income, Urban, Employment status, Marriage status, and Religion), financial behaviour(Saving and Investment behaviour, Credit Card, Risk) and the region of residence (Greater Accra, Western, Eastern, Upper East, Upper West, Northern, Volta, Ashanti). Financial inclusion is the dependent variable whereas financial literacy, household characteristics and financial behaviour are independent variables. A biprobit is employed to examine the relationship between the variables specified below. This model also helps to overcome the problem of self-selection and the problem of endogeneity that is often associated with self-selection. Standard errors are displayed in parentheses. ***, **, and * indicate statistical significance at 1%, 5% and 10% level respectively. The diagnostic tests reported are: (1) Observations (2) Chi-square (3) P-values.

	Accto	Saving	Accto	Credit	Accto	Freqwith	Accto	Upmt
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Finlit	0.143***	-0.00825	0.138***	-0.0257	0.133***	-0.0305	0.133***	0.00424
	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)	(0.04)	(0.04)	(0.03)
Age	0.541	0.464	0.548	0.348	0.575	0.0880	0.617*	-0.234

	(0.36)	(0.31)	(0.36)	(0.29)	(0.36)	(0.32)	(0.36)	(0.30)
Age2	-0.0874	-0.0800	-0.0893	-0.0455	-0.0918	-0.00181	-0.0971	0.0262
	(0.06)	(0.05)	(0.06)	(0.04)	(0.063)	(0.05)	(0.06)	(0.05)
lnHHsize	-0.200	-0.0660	-0.151	-0.237*	-0.156	0.338**	-0.170	0.204
	(0.19)	(0.13)	(0.18)	(0.12)	(0.18)	(0.15)	(0.18)	(0.13)
Lnincome	0.124	0.108	0.0719	0.280	0.0586	0.283	0.0646	-0.0345
	(0.30)	(0.22)	(0.30)	(0.21)	(0.30)	(0.23)	(0.30)	(0.22)
Urban	0.00204	-0.257**	-0.0185	0.178	-0.00657	0.183	-0.00565	0.0651
	(0.15)	(0.113)	(0.15)	(0.11)	(0.15)	(0.12)	(0.15)	(0.12)
M. Status	0.0327	0.0828	0.0226	0.617***	0.00819	0.161	-0.0160	0.137
	(0.18)	(0.130)	(0.18)	(0.13)	(0.18)	(0.15)	(0.18)	(0.14)
E.Status	0.0895	0.328**	0.112	-0.197	0.117	-0.210	0.113	0.00134
	(0.19)	(0.15)	(0.19)	(0.14)	(0.19)	(0.16)	(0.19)	(0.15)
Gender	0.139	-0.113	0.157	0.331***	0.158	0.332***	0.154	0.189*
	(0.14)	(0.10)	(0.14)	(0.10)	(0.14)	(0.12)	(0.14)	(0.11)
Education	0.312	0.546	0.00818	0.546	0.0581	0.0611	0.0708	-0.168
	(0.57)	(0.554)	(0.66)	(0.58)	(0.65)	(0.63)	(0.65)	(0.60)
Christian	0.244	0.260	0.190	0.0134	0.202	0.153	0.200	0.245
	(0.22)	(0.176)	(0.23)	(0.17)	(0.23)	(0.20)	(0.23)	(0.18)
Saib		0.224***		0.211***		0.0753		0.217***
		(0.0577)		(0.0580)		(0.066)		(0.061)
Risk		0.0753		-0.142*		-0.0419		-0.137*
		(0.0765)		(0.075)		(0.087)		(0.080)
Credit Card						0.268**		0.550***
						(0.12)		(0.11)
GreaterAccra	0.114	0.195	0.107	0.218	0.116	0.353*	0.119	0.265
	(0.26)	(0.17)	(0.26)	(0.17)	(0.26)	(0.20)	(0.26)	(0.17)
Western	-0.0715	0.139	-0.0933	0.416**	-0.102	0.274	-0.109	-0.115
	(0.30)	(0.20)	(0.30)	(0.20)	(0.30)	(0.24)	(0.30)	(0.21)
Eastern	-0.510**	-0.153	-0.531**	0.581***	-0.531**	0.396*	-0.535**	-0.125
	(0.25)	(0.19)	(0.25)	(0.19)	(0.25)	(0.22)	(0.25)	(0.20)
Volta	-0.729***	0.193	-0.649**	0.458**	-0.664**	0.326	-0.657**	-0.243
	(0.28)	(0.21)	(0.28)	(0.21)	(0.28)	(0.25)	(0.28)	(0.23)
Ashanti	-0.242	0.180	-0.225	0.216	-0.242	-0.0710	-0.236	0.123
	(0.29)	(0.21)	(0.29)	(0.21)	(0.29)	(0.25)	(0.29)	(0.21)
Northern	4.532	1.041	3.908	0.249	3.677	-4.057	4.049	6.591
	(2080.0)	(0.84)	(559.3)	(0.79)	(327.2)	(517.5)	(834.3)	(844.3)
Upper West	-0.167	-0.180	-0.212	0.124	-0.178	0.288	-0.162	-0.0336
	(0.31)	(0.23)	(0.31)	(0.23)	(0.31)	(0.26)	(0.31)	(0.24)
Upper East	0.211	0.260	0.237	0.375	0.229	0.230	0.249	-0.327
	(0.408)	(0.25)	(0.409)	(0.25)	(0.406)	(0.29)	(0.407)	(0.27)
Constant	-1.390	-3.539*	-0.622	-4.339**	-0.589	-4.745**	-0.689	-0.784
	(2.87)	(2.13)	(2.86)	(2.13)	(2.87)	(2.30)	(2.87)	(2.17)
Observation	766	766	766	766	766	766	766	766
Chi2	82.64	82.64	125.11	125.11	74.81	74.81	101.51	101.51
P	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000

In table 4.6, results on the effect of financial literacy on financial inclusion are presented. The results show that there is a positive and significant relationship between financial literacy and account ownership. This implies that financial literacy increases financial inclusion in that when individuals are able to understand the basic concepts of finance, they do not shy away from owning accounts which happens to be the most basic form of financial inclusion.

The results further suggest a positive relationship between age and account ownership. Age squared, on the other hand, shows a negative relationship. The positive relation means that younger individuals have a higher probability of owning formal accounts whereas the negative relation denotes lower probability of account ownership. At a much younger age individuals are more inclined to own accounts. However, a reverse effect is observed when individuals get much older. This results in a non-linear relationship between age and financial inclusion. This outcome is expected because of the youthful nature of Ghana's population. Financial products like bank accounts are designed to encourage the youth to take up such products. Financial outreaches aimed at improving financial literacy are often targeted at the youth thereby making them aware of financial products and subsequently encouraging increased access and usage. The young are more likely to own formal accounts because of the opportunities they foresee account ownership bring to them. Among the opportunities include, but not limited to, the ability to plan and control one's finances and also have access to credit where account ownership is a requirement.

On the relationship between gender and financial inclusion, the results show that males are more likely to be financially included than their female counterparts. This may be attributed to the fact that males are usually responsible for financial decision making in households thus turn out to be more financially literate than females. Also females form a majority of the marginalised when it comes to owning, accessing and using productive resources. For instance, women often lack access to collateral which further makes it difficult for them to have access to financial services especially credit. Another factor which may explain why males are financially included than females is the patronage of informal financial services by women. Females usually form a majority of the informal

sector who are engaged in menial jobs which yield very low to no income. Some are also limited to the care giving of their young ones which does not earn them any income. Hence they do not see the need to own accounts. The coefficient of account ownership for males provides some evidence. From the results, this coefficient is positive. This outcome to some extent confirms Adegbite et al., (2020) observation that financial inclusion gender gap stems from gender gaps in account ownership. Further, a positive and significant relationship exists between males and financial inclusion indicators such as usage of account for payment, frequency of withdrawal and access to credit except for the usage of an account to save which shows a negative relationship. This is consistent with findings by Zins & Weill (2016) that in Africa financial inclusion is favoured by being a man.

In addition, married individuals are more likely to be financially included as shown by the positive relationship between the married and all financial inclusion indicators. Specifically, the positive relationship observed is only significant for access to credit. The significant positive relationship is expected because the married are seen to be more responsible and thus banks are more willing to offer them credit. Masiyandima, Mlambo & Nyarota (2017) however find no significant impact of marital status on financial inclusion.

The household size of individuals has an impact on their financial inclusion. Large households are expected to withdraw more frequently than smaller households. This is shown by the positive significant impact on the frequency of withdrawal. Given their large size it is clear that they have less incentive to save because of the needs of their large members. This makes it even worse for them to have access to credit. This is

shown by the negative significant influence on access to credit. Although a statistically significant relation is not observed between household size and savings, this study partly confirms Baidoo et al.; (2018) finding of a negative significant relationship between household size and savings.

The geographical location of individuals be it urban or rural has an influence on their financial inclusion. The location urban shows a positive influence on all indicators of financial inclusion except for saving. This relationship can be explained by the high cost of living in urban centres which makes it difficult to save coupled by the inordinate desire of urban dwellers to engage in fun-loving activities and leisure compared to rural dwellers. Another reason which may explain the positive relationship for four indicators of inclusion which are account ownership, use of account for payment, frequency of withdrawal and credit is the concentration of banks and other financial institutions which happens to be high in urban areas than in the rural areas. As a result, urban dwellers find banks closer to their places of settlement thus they do not have to walk long distances to use their account for whatever transaction they desire. Urban centres also have the needed resources that facilitate banking operations which cuts the cost of operation in urban areas. This serves as a motivation to site more banks in urban areas than in rural areas although rural dwellers may have some demand for financial services.

Formal education and income have a similar influence on financial inclusion. Both education and income show a positive relationship with all indicators of financial inclusion with the exception of the use of account for payment where both show a negative relationship. The poor are often excluded financially because they tend to lack

the resources required for owning and maintaining an account. Even when they get to own accounts at no cost, they lack the capacity to build savings. Formal education favours financial inclusion in the sense that it serves as a foundation which enables individuals to understand basic financial concepts which encourages them to use formal financial services. In literature, Zins & Weill (2016) find a higher influence of income and education on financial inclusion in Africa. A more recent study by Yangdol and Sarma (2019) also adds to the plethora of evidence that income improves the financial inclusion level of individuals after analysing financial inclusion form a demand perspective.

Finally, the results of financial behaviour on financial inclusion indicators show that individuals who possess good saving and investment behaviour are more likely to have access to credit, use their account to save, frequently withdraw using their accounts and also make payments using their account. This outcome is not surprising because individuals who have good saving and investment behaviour view account ownership as a means of deferring consumption to the future hence will use their account in furtherance of their saving and investment objectives. Saving and investment behaviour has a positive and significant relationship with payment using an account, use of an account to save and access to credit. Also, individuals with credit cards are more likely to withdraw using their account and also make payment using their account. The positive significant relationship between the variables of interest demonstrates that the ownership of credit cards contributes to financial inclusion.

4.3.2 The Relationship between Financial Literacy and Stock Market Participation

To estimate the effect of financial literacy on stock market participation, the study employs a robust probit model. The probit model is used because of the binary nature of the variables used by the study to measure stock market participation. For model fitness, similar to the estimation of the result in table 4.6, the Wald test is used again to test how well the probit models of financial literacy and stock market participation fit. The Wald test shows that the independent variables jointly predict stock market participation at the 1% significance level implying that the models used by the study have a good fit. The results on how financial literacy affects stock market participation are presented in three columns according to the indicators used by the study to measure participation in the stock market. The first column shows investment in stocks, whereas the second and third columns represent willingness to buy or sell shares when an agent visits and preparedness to buy or sell one's shares given the opportunity for conversion to cash respectively. The diagnostic tests reported are: (1) Observations (2) Chi-square and (3) P-values.

Table 4. 7 The Impact of Financial Literacy on Stock Market Participation

The table shows the results of the relationship between financial literacy and stock market participation using robust probit regression. The variables used to measure participation are Investment in stock (*InvStock*), willingness to buy sell shares when an agent visits (*AgentTrade*) and willingness to buy or sell share given the opportunity to convert shares to cash (*StockConv*). These variables are regressed against financial literacy (*Finlit*), household characteristics (Age, Age2, Hhsize, Income, Urban, Employment status, Marriage status, and Religion), region of residence (Greater Accra, Western, Eastern, Upper East, Upper West, Northern, Volta, Ashanti) and financial behaviour (Saving and Investment behaviour, Investment Objective, Percentage of Monthly income used for investment and Risk Aversion).The parentheses show robust standard errors resulting from the analysis. ***, **, and * show statistical significance at 1%, 5% and 10% level respectively. The diagnostic tests reported are (1) Observations (2) Chi-square and (3) P-values

	(1) InvStock	(2) AgentTrade	(3) StockConv
Finlit	0.196	-0.0849	-0.238*
	(0.182)	(0.128)	(0.136)
Age	0.0775	-0.560*	-0.527*
	(0.433)	(0.288)	(0.300)
age2	0.0172	0.0737	0.0650

	(0.0730)	(0.0501)	(0.0527)
lnHHsize	-0.0845	0.110	0.00913
	(0.177)	(0.122)	(0.123)
Lnincome	-0.326	0.554**	-0.472*
	(0.317)	(0.252)	(0.257)
Urban	-0.208	0.162	0.0320
	(0.164)	(0.107)	(0.109)
Marriage Status	-0.0248	0.206*	0.112
	(0.182)	(0.121)	(0.123)
Emp. Status	0.217	-0.0506	-0.146
	(0.222)	(0.132)	(0.134)
Gender	-0.0854	0.215**	-0.0646
	(0.164)	(0.104)	(0.107)
Education	-0.442	-0.370	-0.0616
	(0.451)	(0.409)	(0.401)
Christian	0.171	0.0318	0.133
	(0.216)	(0.127)	(0.125)
Greater Accra	0.453	-0.236	0.0855
	(0.334)	(0.205)	(0.229)
Western	0.826**	-0.235	-0.428*
	(0.349)	(0.242)	(0.238)
Eastern	0.324	-0.0690	0.0182
	(0.362)	(0.186)	(0.199)
Volta	0.445	0.198	0.527*
	(0.381)	(0.254)	(0.269)
Ashanti	-0.430	-0.116	0.685***
	(0.471)	(0.248)	(0.254)
Brong Ahafo	0.689	-0.278	0.233
	(0.462)	(0.306)	(0.294)
Central	0.742*	-0.113	-0.0269
	(0.408)	(0.270)	(0.300)
Upper West	0.616**	-0.0441	-0.117
	(0.285)	(0.174)	(0.173)
Risk and return	0.943***	0.838***	0.687***
	(0.171)	(0.113)	(0.113)
Knowledge of stock	1.178***	-0.351***	0.0345
	(0.171)	(0.125)	(0.127)
GSE Awareness	0.0178	0.414***	0.529***
	(0.199)	(0.125)	(0.127)
Inv. Financing	0.0977	0.0261	-0.0848
	(0.101)	(0.0762)	(0.0831)
Inv. Objective	0.0239	0.585	1.105**
	(0.483)	(0.590)	(0.490)
Saving and Inv.	0.0485	-0.0434	0.00171
	(0.0926)	(0.0592)	(0.0615)
Risk averse	0.454**	0.0542	-0.115
	(0.193)	(0.116)	(0.122)
Constant	-0.372	-5.067**	4.026*
	(2.967)	(2.399)	(2.410)
Observation	756	733	712
Chi2	133.075	110.330	92.432
P-values	0.000	0.000	0.000

The results on the relationship between financial literacy and stock market participation are presented in Table 4.7. From the table, although a positive relationship exists

between financial literacy and investment in stocks, a negative relationship is observed for the other two indicators of stock market participation which are the willingness to buy or sell shares when an agent visits and also preparedness to sell or buy shares given the opportunity to convert shares to cash. The relationship is only significant for participation given the opportunity for conversion to cash. The negative significant coefficient means that financial literacy is a significant determinant of stock market participation and that financial literates in Ghana are less likely to participate in the stock market even when they are offered stock conversion opportunities. This is contrary to findings by Banyen & Nkuah (2015) that stock market participation is not significantly determined by financial literacy because most Ghanaians are financial illiterates. Kuffour & Adu (2019) also find contrary evidence which suggests that less financially literate individuals are less likely to participate in the stock market. Kadoya et al., (2017) also find stock market participation to be significantly improved by financial literacy. The limited participation of financial literates in Ghana may be as a result of the poor performance of the local bourse. Financial literates in Ghana prefer setting up their own business which they deem more profitable than investing in stocks. The stock market is also seen as a complex venture where increased returns is not guaranteed unlike having investment in fixed term deposits, other government instruments like treasury bills and physical assets.

Although findings in the literature suggest that males are more financial literate than females (Al-Tamimi & Kalli, 2009; Atkinson & Messy, 2012; Klapper et al., 2015; Hasler & Lusardi, 2017) and thus are more likely to invest in stocks, the results show the contrary for investment in stocks and stock conversion as indicators of participation. The results show that financially literate males are less likely to invest in stocks and are

also less likely to buy or sell their shares given the opportunity to convert them into cash. However, they are more likely to buy or sell their shares when they are visited by an agent. This demonstrates the influence brokerage houses have in changing the participation narrative in Ghana. Although men are more likely to trust their financial knowledge prowess in financial decision making, agents have the ability to steer their investment decisions. Men may use agents as a means of validating their participation decisions. The relationship between males and participation in the stock market through an agent is positive and significant contrary to Banyen &Nkuah (2015) and Kuffour & Adu (2019) finding that gender is not a significant determinant of participation in the stock market. Although married individuals will rarely invest in stocks, they are expected to participate in the stock market given that their agent visits them or they are given the opportunity to convert their shares to cash. This outcome is expected because the married tend to have many commitments and responsibilities for which they may be time or financially constrained. Using an agent will ease their time constraints whereas an opportunity to convert their shares to cash gives them the assurance of having access to cash to cater for emergencies as and when they fall due. There is a positive significant relationship between married individuals and stock market participation through an agent.

On the relationship between age and stock market participation, the results reveal that as individuals get older, they are more likely to participate in the stock market. This is shown by the positive coefficient of age squared for all three indicators of participation. This phenomenon can be explained by the fact that as people age they tend to spend less and invest more in their retirement. The results also show a negative significant relationship between age and two indicators of participation which implies that the

young are less likely to participate in the stock market through an agent and even when they can easily convert their shares to cash.

When risk and return preferences of stock market participants are met by securities traded on the exchange, they tend to elicit more participation. This evidence is provided by the significant positive relationship between risk and return preferences and all three indicators of stock market participation. This finding confirms Banyen & Nkuah (2015) assertion that stock market participation is favoured by instruments that meet consumers' risk and return preference.

Also when individuals are employed they are more likely to participate in the stock market by investing in stocks. This is evidenced by the coefficient of employment which is positive but not significant. Conversely, a negative relationship is observed between employment and the other two indicators of stock market participation. Being employed serves as a source of income which is an incentive to invest. An employed person may like to have other streams of income like income from investment aside regular salary or wages and the stock market offers them such opportunities. The results also indicate that stock market participation is influenced by household incomes. In that, as households' monthly income increases, individuals are more likely to buy or sell their shares when an agent visits them. These individuals tend to shy away from buying or selling their shares when offered the opportunity to convert their shares to cash. In both cases, statistical significance is observed. When individuals' objective for investing is to have access to short-term funds, they are more likely to participate in the

stock market when presented with the opportunity to convert their shares into cash since their investment objective is met.

Finally, awareness and knowledge of stock contribute significantly to stock market participation in Ghana. This implies that financial literates who have knowledge that stocks are traded on the Ghana Stock Exchange and are aware of the GSE and what they engage in are more likely to participate in the stock market. Also, risk-averse financial literates are more likely to invest in stocks and participate through an agent than when presented with shares conversion opportunity. It can be inferred that their understanding of basic finance tends to moderate their level of aversion which enables them to invest in stocks. A positive significant relationship is seen between investment in stock and knowledge of stock whereas a positive significant relationship is observed for GSE awareness and willingness to trade when an agent visits and trading ones shares given that the individual has the opportunity to convert his shares to cash. This is in line with Acquah-Sam (2014) findings that lack of knowledge of the workings of the capital market is a major reason for the lack of participation of Ghanaians in the stock market. Guiso & Jappelli (2005) also document similar findings that awareness is a significant predictor of stock market participation. The relationship between knowledge of stock and buying or selling shares through an agent is negative and highly significant. This suggests that when individuals have knowledge of the securities traded on the stock market they are less likely to buy or sell their shares when an agent visits since they understand the workings of the stock market and would not want to bear the charges that come with using an agent to trade.

4.3.3 The effect of Financial Inclusion on Stock Market Participation

Having estimated the effect of financial literacy on financial inclusion, the study further examines the effects of financial inclusion on stock market participation. To test for the fitness of the model used by the study, a Wald test is employed. The result from the test shows that at 1% significance level, the independent variables jointly predict stock market participation. Stock market participation is measured using the same indicators as used in previous estimations. The study employs all the indicators of financial inclusion for each stock market participation indicator variable as presented in table 4.8, 4.9 and 4.10 below. The diagnostic tests reported are (1) Observations (2) Chi-square (3) P-values.

Table 4. 8 The Influence of Financial Inclusion on Stock Market Participation (Investment in Stocks)

Financial inclusion indicators which are ownership of an account (*accto)*, saving using an account (*saving)*, access to bank credit *(credits)*, frequency of usage *(freqwith)* and usage of account to make payment (*upmt)* together with household characteristics (Age, Age2, Hhsize, Income, Urban, Employment status, Marriage status, and Religion), financial behaviour(Saving and Investment behaviour, Credit Card, Risk) and the region of residence (Greater Accra, Western, Eastern, Central, Brong Ahafo, Upper West, Volta, Ashanti) are regressed against the stock market participation indicator; investment in stocks (InvStock). InvStock is the dependent variables whereas financial inclusion indicators, household characteristics and financial behaviour are independent variables. A robust probit is employed to examine the relationship between the specified variables. Standard errors which are robust are reported in parentheses. ***, **, and * represent statistical significance at 1%, 5% and 10% level respectively. The diagnostic tests reported are: (1) Observations (2) Chi-square (3) P-values

	(1) InvStock	(2) InvStock	(3) InvStock	(4) InvStock	(5) InvStock
Accto	-0.158				
	(0.290)				
Saving		-0.487***			
		(0.156)			
Freqwith			-0.113		
			(0.193)		
Upmt				0.0183	
				(0.151)	
Credits					-0.0143
					(0.161)
Age	0.0769	0.119	0.0905	0.0819	0.0805
	(0.434)	(0.442)	(0.433)	(0.435)	(0.436)
Age2	0.0170	0.0126	0.0156	0.0164	0.0167
	(0.0737)	(0.0741)	(0.0729)	(0.0736)	(0.0737)
lnHHsize	-0.0769	-0.0834	-0.0665	-0.0752	-0.0743
	(0.176)	(0.179)	(0.176)	(0.174)	(0.176)
lnincome	-0.344	-0.301	-0.331	-0.341	-0.341
	(0.315)	(0.319)	(0.316)	(0.314)	(0.314)

Urban	-0.217	-0.242	-0.218	-0.225	-0.223
	(0.166)	(0.163)	(0.165)	(0.167)	(0.165)
Marriage status	-0.0254	-0.00867	-0.0292	-0.0355	-0.0298
	(0.179)	(0.181)	(0.181)	(0.179)	(0.184)
Emp. status	0.248	0.311	0.218	0.240	0.239
	(0.223)	(0.223)	(0.219)	(0.219)	(0.220)
Gender	-0.0709	-0.0622	-0.0635	-0.0700	-0.0700
	(0.166)	(0.167)	(0.167)	(0.165)	(0.165)
Education	-0.369	-0.211	-0.391	-0.418	-0.409
	(0.451)	(0.452)	(0.460)	(0.458)	(0.455)
Christian	0.194	0.248	0.203	0.195	0.196
	(0.218)	(0.219)	(0.218)	(0.217)	(0.216)
Greater Accra	0.539*	0.482	0.505	0.519*	0.519*
	(0.316)	(0.316)	(0.313)	(0.309)	(0.311)
Western	0.899***	0.848**	0.874***	0.889***	0.887***
	(0.336)	(0.330)	(0.332)	(0.333)	(0.330)
Eastern	0.400	0.347	0.382	0.391	0.393
	(0.341)	(0.339)	(0.339)	(0.338)	(0.334)
Volta	0.540	0.443	0.508	0.528	0.528
	(0.358)	(0.358)	(0.356)	(0.354)	(0.352)
Ashanti	-0.340	-0.478	-0.364	-0.347	-0.348
	(0.455)	(0.456)	(0.460)	(0.451)	(0.456)
Brong Ahafo	0.803*	0.700	0.785*	0.798*	0.796*
	(0.432)	(0.446)	(0.431)	(0.432)	(0.436)
Central	0.753*	0.716*	0.695*	0.730*	0.726*
	(0.421)	(0.431)	(0.418)	(0.413)	(0.412)
Upper West	0.652**	0.595**	0.620**	0.632**	0.630**
	(0.291)	(0.283)	(0.282)	(0.281)	(0.282)
Risk and return	0.936***	0.968***	0.930***	0.930***	0.932***
	(0.172)	(0.171)	(0.172)	(0.172)	(0.172)
Knowledge of stock	1.199***	1.228***	1.199***	1.197***	1.197***
	(0.168)	(0.172)	(0.169)	(0.168)	(0.169)
GSE Aware	0.0927	0.0710	0.0905	0.0789	0.0780
	(0.209)	(0.213)	(0.212)	(0.211)	(0.210)
Inv. Financing	0.0923	0.0804	0.0930	0.0886	0.0892
	(0.0987)	(0.101)	(0.0993)	(0.0995)	(0.0997)
Inv. objective	0.0138	0.148	-0.0128	-0.0150	-0.0131
	(0.482)	(0.479)	(0.470)	(0.480)	(0.482)
Saving and Inv.	0.0508	0.106	0.0515	0.0485	0.0507
	(0.0935)	(0.0932)	(0.0929)	(0.0936)	(0.0936)
Risk Averse	0.461**	0.498**	0.466**	0.452**	0.455**
	(0.197)	(0.201)	(0.196)	(0.195)	(0.197)
Constant	-0.195	-1.127	-0.377	-0.247	-0.252
	(2.967)	(2.999)	(2.974)	(2.954)	(2.956)
Observation	756	756	756	756	756
Chi2	129.970	150.085	132.066	128.623	129.981
P-values	0.000	0.000	0.000	0.000	0.000

On the relationship between the stock market participation indicator ***Invstock*** and all five indicators of financial inclusion, the results show no statistical significance except for use of an account to save. The relationship is negative and highly significant. This suggests that when individuals are financially included by means of using their account to save, their chances of participating in the stock market is limited. This can be

attributed to the fact that saving using an account provides more incentives in terms of ease and flexibility of having access to one's funds as and when needed. Also, an individual is more likely to have access to packages offered by banks by virtue of saving using an account. A regional analysis reveals that stock market participation through financial inclusion is likely to be high in Greater Accra, Western, Central, Brong Ahafo, Central and Upper West Region. These regions demonstrate a positive significant relationship with investment in stocks.

Having knowledge of stocks and risk and return preference also show a positive and significant relationship with investment in stock. This implies that there is a high probability that financially included persons who have knowledge of the stocks traded on the Ghana Stock Exchange and have their risk and return preferences met will participate in the stock market. Risk-averse individuals who are financially included are more likely to participate in the stock market because their risk and return preferences have been met. Results on the control variables show no significant impact on stock market participation through financial inclusion. However, it can be observed that financially included Christians and the employed demonstrate a higher likelihood to participate in the stock market.

Using ***AgentTrade*** as an indicator of stock market participation in table 4.9, the results show no significant impact of all five financial inclusion indicators on stock market participation.

Table 4. 9 The Influence of Financial Inclusion on Stock Market Participation (Participation Motivated by Agent Visit).

Financial inclusion indicators which are ownership of an account (*accto)*, saving using an account (*saving)*, access to bank credit *(credits)*, frequency of usage *(freqwith)* and usage of account to make payment (*upmt)*, household characteristics (Age, Age2, Hhsize, Income, Urban, Employment status,

Marriage status, and Religion), financial behaviour(Saving and Investment behaviour, Credit Card, Risk) and the region of residence (Greater Accra, Western, Eastern, Central, Brong Ahafo, Upper West, Volta, Ashanti) are regressed against the stock market participation indicator; willingness to buy or sell shares when an agent visits (AgentTrade). AgentTrade is the dependent variables whereas financial inclusion indicators, household characteristics and financial behaviour are independent variables. A robust probit is employed to examine the relationship between the specified variables. Robust standard errors are displayed in parentheses. Statistical significance at 1%, 5% and 10% level are indicated by ***, **, and * respectively. The diagnostic tests reported are: (1) Observations (2) Chi-square (3) P-values

	(1) AgentTrade	(2) AgentTrade	(3) AgentTrade	(4) AgentTrade	(5) AgentTrade
Accto	0.0249				
	(0.149)				
Saving		0.0861			
		(0.108)			
Freqwith			0.141		
			(0.138)		
Upmt				0.0462	
				(0.110)	
Credits					0.0793
					(0.105)
Age	-0.564**	-0.575**	-0.573**	-0.563**	-0.563**
	(0.287)	(0.289)	(0.287)	(0.287)	(0.287)
Age2	0.0744	0.0758	0.0752	0.0742	0.0733
	(0.0501)	(0.0503)	(0.0501)	(0.0500)	(0.0500)
lnHHsize	0.101	0.0998	0.0919	0.101	0.104
	(0.121)	(0.121)	(0.121)	(0.121)	(0.121)
Lnincome	0.565**	0.570**	0.544**	0.572**	0.563**
	(0.250)	(0.251)	(0.253)	(0.251)	(0.251)
Urban	0.166	0.170	0.158	0.162	0.158
	(0.107)	(0.107)	(0.107)	(0.107)	(0.107)
Marriage status	0.205*	0.204*	0.208*	0.201*	0.191
	(0.121)	(0.121)	(0.121)	(0.121)	(0.122)
Emp. status	-0.0601	-0.0734	-0.0483	-0.0611	-0.0663
	(0.132)	(0.133)	(0.132)	(0.131)	(0.132)
Gender	0.208**	0.210**	0.200*	0.207**	0.202*
	(0.104)	(0.104)	(0.104)	(0.104)	(0.104)
Education	-0.385	-0.410	-0.389	-0.385	-0.379
	(0.407)	(0.412)	(0.408)	(0.408)	(0.410)
Christian	0.0258	0.0195	0.0138	0.0240	0.0241
	(0.127)	(0.127)	(0.127)	(0.127)	(0.127)
Greater Accra	-0.278	-0.270	-0.263	-0.278	-0.270
	(0.198)	(0.197)	(0.198)	(0.197)	(0.197)
Western	-0.268	-0.259	-0.258	-0.260	-0.268
	(0.237)	(0.238)	(0.238)	(0.238)	(0.237)
Eastern	-0.104	-0.0939	-0.0917	-0.105	-0.105
	(0.179)	(0.179)	(0.180)	(0.179)	(0.179)
Volta	0.157	0.165	0.178	0.161	0.166
	(0.245)	(0.244)	(0.245)	(0.245)	(0.246)
Ashanti	-0.162	-0.152	-0.138	-0.160	-0.153
	(0.236)	(0.237)	(0.237)	(0.236)	(0.236)
Brong Ahafo	-0.330	-0.315	-0.312	-0.329	-0.312
	(0.294)	(0.296)	(0.296)	(0.294)	(0.295)
Central	-0.125	-0.119	-0.0855	-0.118	-0.112
	(0.268)	(0.269)	(0.271)	(0.268)	(0.268)
Upper West	-0.0598	-0.0481	-0.0538	-0.0559	-0.0485
	(0.172)	(0.172)	(0.171)	(0.172)	(0.173)
Risk and return	0.841***	0.841***	0.841***	0.834***	0.838***
	(0.113)	(0.113)	(0.113)	(0.114)	(0.113)
Knowl. of stock	-0.357***	-0.360***	-0.357***	-0.361***	-0.356***

	(0.125)	(0.125)	(0.125)	(0.125)	(0.125)
GSE Awareness	0.395***	0.398***	0.386***	0.396***	0.398***
	(0.124)	(0.123)	(0.124)	(0.123)	(0.123)
Inv. Financing	0.0263	0.0263	0.0261	0.0266	0.0284
	(0.0761)	(0.0758)	(0.0762)	(0.0761)	(0.0760)
Inv. objective	0.590	0.581	0.569	0.596	0.593
	(0.596)	(0.588)	(0.595)	(0.588)	(0.584)
Saving and Inv.	-0.0418	-0.0502	-0.0429	-0.0431	-0.0475
	(0.0595)	(0.0605)	(0.0593)	(0.0592)	(0.0599)
Risk averse	0.0496	0.0459	0.0404	0.0485	0.0427
	(0.117)	(0.116)	(0.116)	(0.116)	(0.117)
Constant	-5.153**	-5.130**	-4.907**	-5.206**	-5.133**
	(2.388)	(2.391)	(2.411)	(2.389)	(2.390)
Observation	733	733	733	733	733
chi2	107.675	108.282	109.447	107.707	107.570
P-values	0.000	0.000	0.000	0.000	0.000

The results also indicate that as incomes of individuals who are included financially increase, they are more likely to participate in the stock market. The relationship between income and stock market participation through an agent is positive and significant. Also, males and married individuals are more likely to participate in the stock market. A positive and significant relationship is observed between males and stock market participation through an agent. However, the employed, individuals with formal education and persons with knowledge of stocks are less likely to participate in the stock market through an agent. The relationship is negative and significant for individuals with knowledge of stocks. Awareness, on the other hand, contributes significantly to stock market participation positively.

The indicator for stock market participation in Table 4.10 is willingness to buy or sell shares given the opportunity to convert shares to cash. This table also provides useful insight into stock market participation given stock conversion.

Table 4. 10 The Effect of Financial Inclusion on Stock Market Participation (Participation motivated by stock conversion to cash)

Financial inclusion indicators which are ownership of an account (*accto)*, saving using an account (*saving)*, access to bank credit *(credits)*, frequency of usage *(freqwith)* and usage of account to make payment (*upmt)*, household characteristics (Age, Age2, Hhsize, Income, Urban, Employment status, Marriage status, and Religion), financial behaviour(Saving and Investment behaviour, Credit Card, Risk) and the region of residence (Greater Accra, Western, Eastern, Central, Brong Ahafo, Upper West, Volta, Ashanti) are regressed against the stock market participation indicator; preparedness to buy or sell shares given the opportunity to convert shares to cash (StockConv).StockConv is the dependent variables whereas financial inclusion indicators, household characteristics and financial behaviour are independent variables. A robust probit is employed to examine the relationship between the specified variables. Robust standard errors are shown in parentheses. ***, **, and * indicate statistical significance at 1%, 5% and 10% level respectively. The diagnostic tests reported are: (1) Observations (2) Chi-square (3) P-values

	(1) StockConv	(2) StockConv	(3) StockConv	(4) StockConv	(5) StockConv
Accto	-0.0226				
	(0.155)				
Saving		-0.0187			
		(0.111)			
Freqwith			0.200		
			(0.143)		
Upmt				0.0980	
				(0.114)	
Credits					0.0406
					(0.109)
Age	-0.532*	-0.530*	-0.547*	-0.527*	-0.532*
	(0.297)	(0.297)	(0.297)	(0.296)	(0.297)
age2	0.0655	0.0655	0.0679	0.0650	0.0652
	(0.0519)	(0.0519)	(0.0519)	(0.0517)	(0.0519)
lnHHsize	-0.0161	-0.0152	-0.0289	-0.0128	-0.0133
	(0.122)	(0.122)	(0.122)	(0.122)	(0.122)
Lnincome	-0.432*	-0.433*	-0.474*	-0.421	-0.436*
	(0.256)	(0.256)	(0.258)	(0.256)	(0.256)
Urban	0.0450	0.0437	0.0340	0.0353	0.0420
	(0.108)	(0.109)	(0.108)	(0.109)	(0.109)
Marriage status	0.119	0.119	0.118	0.108	0.112
	(0.123)	(0.123)	(0.123)	(0.123)	(0.124)
Emp. Status	-0.168	-0.167	-0.156	-0.174	-0.175
	(0.135)	(0.135)	(0.134)	(0.134)	(0.135)
Gender	-0.0748	-0.0758	-0.0900	-0.0822	-0.0783
	(0.107)	(0.107)	(0.107)	(0.107)	(0.107)
Education	-0.0663	-0.0647	-0.0838	-0.0819	-0.0720
	(0.394)	(0.393)	(0.394)	(0.396)	(0.392)
Christian	0.112	0.114	0.0941	0.110	0.112
	(0.125)	(0.125)	(0.125)	(0.125)	(0.125)
Greater Accra	-0.00830	-0.0136	0.00610	-0.0152	-0.00872
	(0.214)	(0.214)	(0.215)	(0.214)	(0.214)
Western	-0.507**	-0.511**	-0.486**	-0.493**	-0.506**
	(0.233)	(0.234)	(0.235)	(0.234)	(0.233)
Eastern	-0.0762	-0.0794	-0.0633	-0.0816	-0.0770
	(0.189)	(0.190)	(0.191)	(0.189)	(0.189)
Volta	0.412	0.410	0.446*	0.418	0.418
	(0.261)	(0.261)	(0.262)	(0.262)	(0.262)
Ashanti	0.556**	0.553**	0.591**	0.556**	0.560**
	(0.241)	(0.241)	(0.242)	(0.239)	(0.240)
Brong Ahafo	0.0905	0.0858	0.116	0.0883	0.0964
	(0.282)	(0.282)	(0.279)	(0.280)	(0.282)
Central	-0.0542	-0.0580	-0.00132	-0.0458	-0.0517
	(0.291)	(0.291)	(0.294)	(0.291)	(0.293)

Upper West	-0.148	-0.153	-0.145	-0.148	-0.146
	(0.172)	(0.172)	(0.171)	(0.172)	(0.173)
Risk and return	0.697***	0.698***	0.697***	0.684***	0.695***
	(0.113)	(0.113)	(0.113)	(0.115)	(0.113)
Knowl. of stock	0.0125	0.0134	0.0124	0.00282	0.0125
	(0.126)	(0.126)	(0.126)	(0.126)	(0.126)
GSE Awareness	0.482***	0.482***	0.463***	0.480***	0.482***
	(0.124)	(0.124)	(0.124)	(0.124)	(0.124)
Inv. financing	-0.0823	-0.0828	-0.0856	-0.0837	-0.0829
	(0.0831)	(0.0828)	(0.0832)	(0.0830)	(0.0830)
Inv. Objective	1.154**	1.155**	1.133**	1.138**	1.142**
	(0.489)	(0.486)	(0.493)	(0.481)	(0.485)
Saving and Inv.	0.00851	0.00980	0.00515	0.00349	0.00457
	(0.0615)	(0.0622)	(0.0613)	(0.0617)	(0.0621)
Risk averse	-0.121	-0.121	-0.135	-0.129	-0.127
	(0.122)	(0.122)	(0.123)	(0.122)	(0.123)
Constant	3.671	3.661	4.104*	3.591	3.717
	(2.397)	(2.397)	(2.415)	(2.393)	(2.395)
Observation	712	712	712	712	712
Chi2	89.737	89.656	89.729	91.892	89.873
P-values	0.000	0.000	0.000	0.000	0.000

It can be observed from Table 4.10 that even when the indicator for participation is ***StockConv*** the impact of financial inclusion on stock market participation is not significant which is similar for previous estimates using ***InvStock*** and ***AgentTrade*** as indicators of participation.

With regards to risk and return preferences and awareness, they show a positive significant relationship with participation given conversion whereas knowledge of stock shows a positive relationship although not significant. This implies that individuals who have knowledge of stock are less likely to buy or sell their shares given stock conversion opportunity. More so, having an investment objective is significant to stock market participation when an individual is financially included. The aged are also more likely to participate in the stock market given the opportunity for conversion than the young. In contrast, the vice versa is observed for age and age squared for investment in stocks.

In conclusion, stock market participation improves when financially included individuals are visited by their agents. This evidence is provided by the positive coefficient of all five indicators of financial inclusion when they are regressed on ***AgentTrade*.**

4.3.4 The Interactive Effect of Financial Literacy and Financial Inclusion on Stock Market Participation.

The study goes on to analyse the effect of financial literacy and financial inclusion on stock market participation in Ghana. With the aid of a robust probit regression, the interactive effect is established. To test for the fitness of the model used by the study, a Wald test is employed. The result from the test shows that at 1% significance level, the independent variables jointly predict stock market participation. Stock market participation is measured using the same indicators as used in previous estimations. The results of the interaction are presented in Table 4.11, 4.12 and 4.13. In all these tables, the diagnostic test reported are (1) Observation (2) Chi-square (3) P-value

Table 4. 11 The Effect of Financial Literacy and Financial Inclusion on Stock Market Participation (Investment in Stock)

The table presents the interaction of financial literacy and financial inclusion on stock market participation. Financial inclusion indicators which are ownership of an account (*accto)*, saving using an account (*saving)*, access to bank credit *(credits)*, frequency of usage *(freqwith)* and usage of account to make payment (*upmt)*, financial literacy, household characteristics (Age, Age2, Hhsize, Income, Urban, Employment status, Marriage status, and Religion), financial behaviour(Saving and Investment behaviour, Risk aversion, Investment Objective, Investment Financing) and the region of residence (Greater Accra, Western, Eastern, Central, Brong Ahafo, Upper West, Volta, Ashanti) are regressed against the stock market participation indicator; Investment in stock (InvStock). InvStock is the dependent variables whereas financial literacy, financial inclusion indicators, household characteristics and financial behaviour are independent variables. InvStock is the dependent variables whereas financial literacy, financial inclusion indicators, household characteristics and financial behaviour are independent variables. A robust probit is employed to examine the relationship between the variables specified. Robust standard errors are reported in parentheses. ***, **, and * indicate statistical significance at 1%, 5% and 10% level respectively. The diagnostic tests reported are: (1) Observations (2) Chi-square (3) P-values

	(1) InvStock	(2) InvStock	(3) InvStock	(4) InvStock	(5) InvStock
Fld*Accto	0.173				
	(0.184)				
Fld*Saving		-0.247			

		(0.210)			
Fld*Freqwith			-0.0357		
			(0.240)		
Fld*Upmt				0.132	
				(0.190)	
Fld*Credits					0.00915
					(0.188)
Age	0.0814	0.0812	0.0832	0.0707	0.0806
	(0.433)	(0.440)	(0.435)	(0.434)	(0.436)
Age2	0.0165	0.0163	0.0161	0.0182	0.0165
	(0.0731)	(0.0743)	(0.0736)	(0.0736)	(0.0737)
LnHHsize	-0.0810	-0.0734	-0.0726	-0.0877	-0.0732
	(0.176)	(0.175)	(0.175)	(0.175)	(0.175)
LnIncome	-0.333	-0.324	-0.339	-0.345	-0.341
	(0.317)	(0.314)	(0.314)	(0.315)	(0.315)
Urban	-0.213	-0.243	-0.222	-0.221	-0.223
	(0.165)	(0.163)	(0.165)	(0.165)	(0.164)
Marriage status	-0.0307	-0.0219	-0.0315	-0.0409	-0.0341
	(0.182)	(0.179)	(0.180)	(0.179)	(0.181)
Emp. status	0.219	0.262	0.237	0.235	0.240
	(0.221)	(0.218)	(0.217)	(0.219)	(0.220)
Gender	-0.0819	-0.0523	-0.0669	-0.0781	-0.0710
	(0.165)	(0.164)	(0.165)	(0.165)	(0.163)
Education	-0.435	-0.391	-0.412	-0.426	-0.414
	(0.453)	(0.454)	(0.457)	(0.456)	(0.455)
Christian	0.177	0.218	0.198	0.189	0.196
	(0.215)	(0.218)	(0.217)	(0.216)	(0.217)
Greater Accra	0.462	0.566*	0.520*	0.490	0.519*
	(0.334)	(0.314)	(0.309)	(0.316)	(0.313)
Western	0.835**	0.918***	0.888***	0.879***	0.885***
	(0.348)	(0.331)	(0.331)	(0.333)	(0.335)
Eastern	0.340	0.427	0.396	0.377	0.389
	(0.355)	(0.341)	(0.339)	(0.337)	(0.343)
Volta	0.460	0.542	0.528	0.506	0.525
	(0.376)	(0.355)	(0.354)	(0.354)	(0.362)
Ashanti	-0.407	-0.354	-0.346	-0.380	-0.347
	(0.463)	(0.454)	(0.453)	(0.446)	(0.452)
Brong Ahafo	0.721	0.823*	0.800*	0.766*	0.795*
	(0.474)	(0.439)	(0.432)	(0.440)	(0.433)
Central	0.738*	0.728*	0.721*	0.733*	0.726*
	(0.409)	(0.412)	(0.412)	(0.412)	(0.412)
Upper West	0.621**	0.620**	0.630**	0.632**	0.631**
	(0.283)	(0.280)	(0.281)	(0.282)	(0.281)
Risk and return	0.940***	0.944***	0.930***	0.930***	0.932***
	(0.171)	(0.172)	(0.172)	(0.171)	(0.172)
Knowl. of stock	1.177***	1.208***	1.201***	1.181***	1.197***
	(0.171)	(0.171)	(0.169)	(0.170)	(0.172)
GSE Aware	0.0281	0.100	0.0807	0.0689	0.0777
	(0.204)	(0.212)	(0.211)	(0.212)	(0.210)
Inv. financing	0.0943	0.0837	0.0886	0.0876	0.0889
	(0.100)	(0.0993)	(0.0996)	(0.100)	(0.0996)
Inv. objective	0.00967	0.0483	-0.0169	-0.0124	-0.0119
	(0.485)	(0.480)	(0.479)	(0.472)	(0.480)
Saving and Inv.	0.0495	0.0609	0.0504	0.0418	0.0493
	(0.0927)	(0.0917)	(0.0933)	(0.0924)	(0.0925)
Risk averse	0.453**	0.454**	0.455**	0.444**	0.453**
	(0.192)	(0.195)	(0.193)	(0.193)	(0.194)
Constant	-0.306	-0.554	-0.276	-0.129	-0.253
	(2.963)	(2.944)	(2.957)	(2.957)	(2.958)
Observation	756	756	756	756	756

Chi2	131.918	131.493	129.060	129.338	129.165
P-values	0.000	0.000	0.000	0.000	0.000

Table 4.11 presents the results of the interactive effect of financial literacy and financial inclusion on stock market participation using ***InvStock*** as an indicator of participation. The results indicate that the interaction of financial literacy and financial inclusion indicators do not have a significant impact on stock market participation although the coefficient of financial literacy and indicators of inclusion such as account ownership, use of account for payment and access to credit are positive. The level of risk aversion, risk and return preferences and knowledge of stock tend to be significant predictors of stock market participation given that a person is financially literate and included financially. This is shown by the positive and statistically significant coefficients. On a regional level, financial literates who are also financially included in Greater Accra, Western, Brong Ahafo, Central and Upper West regions are more likely to participate in the stock market by investing in stocks.

Using ***AgentTrade*** as an indicator of stock market participation, Table 4.12 presents the results of interacting financial literacy and financial inclusion on stock market participation. The results show a similar effect on stock market participation when *InvStock* is used as an indicator of participation. The only distinguishing feature in the case of using *AgentTrade* is that although there is no significant impact of financial literacy and inclusion on stock market participation, the coefficient of interacting financial literacy and saving using an account is positive.

Table 4. 12 The Effect of Financial Literacy and Financial Inclusion on Stock Market Participation (Participation Motivated By Agent Visit)

The table presents the interaction of financial literacy and financial inclusion on stock market participation. Financial inclusion indicators which are ownership of an account (*accto)*, saving using an account (*saving)*, access to bank credit *(credits)*, frequency of usage *(freqwith)* and usage of account to make payment (*upmt)*, financial literacy, household characteristics (Age, Age2, Hhsize, Income, Urban, Employment status, Marriage status, and Religion), financial behaviour(Saving and Investment behaviour, Risk aversion, Investment Objective, Investment Financing) and the region of residence (Greater Accra, Western, Eastern, Central, Brong Ahafo, Upper West, Volta, Ashanti) are regressed against the stock market participation indicator; willingness to buy or sell shares when an agent visits (AgentTrade). AgentTrade is the dependent variables whereas financial literacy, financial inclusion indicators, household characteristics and financial behaviour are independent variables. InvStock is the dependent variables whereas financial literacy, financial inclusion indicators, household characteristics and financial behaviour are independent variables. A robust probit is employed to examine the relationship between the variables specified. Robust standard errors are reported in parentheses, ***, **, and * indicate statistical significance at 1%, 5% and 10% level respectively. The diagnostic tests reported are: (1) Observations (2) Chi-square (3) P-values

	(1) AgentTrade	(2) AgentTrade	(3) AgentTrade	(4) AgentTrade	(5) AgentTrade
Fld*Accto	-0.0824				
	(0.124)				
Fld*Saving		0.162			
		(0.161)			
Fld*Freqwith			-0.0309		
			(0.200)		
Fld*Upmt				0.00589	
				(0.158)	
Fld*Credits					0.221
					(0.150)
Age	-0.560*	-0.570**	-0.561*	-0.563**	-0.562*
	(0.287)	(0.288)	(0.287)	(0.287)	(0.288)
Age2	0.0739	0.0752	0.0738	0.0742	0.0726
	(0.0501)	(0.0502)	(0.0500)	(0.0500)	(0.0500)
LnHHsize	0.108	0.100	0.102	0.101	0.104
	(0.122)	(0.122)	(0.121)	(0.121)	(0.121)
LnIncome	0.555**	0.568**	0.567**	0.566**	0.577**
	(0.252)	(0.251)	(0.250)	(0.251)	(0.252)
Urban	0.162	0.177*	0.167	0.166	0.159
	(0.107)	(0.107)	(0.107)	(0.107)	(0.107)
Marriage status	0.206*	0.201*	0.207*	0.206*	0.179
	(0.121)	(0.121)	(0.121)	(0.121)	(0.121)
Emp. status	-0.0513	-0.0658	-0.0578	-0.0577	-0.0602
	(0.132)	(0.131)	(0.131)	(0.131)	(0.132)
Gender	0.214**	0.202*	0.211**	0.209**	0.186*
	(0.104)	(0.104)	(0.104)	(0.104)	(0.104)
Education	-0.371	-0.385	-0.376	-0.377	-0.379
	(0.409)	(0.408)	(0.407)	(0.408)	(0.406)
Christian	0.0300	0.0175	0.0267	0.0255	0.0214
	(0.127)	(0.127)	(0.127)	(0.127)	(0.127)
Greater Accra	-0.238	-0.308	-0.274	-0.276	-0.324
	(0.204)	(0.202)	(0.197)	(0.201)	(0.202)
Western	-0.238	-0.286	-0.263	-0.267	-0.321
	(0.240)	(0.240)	(0.235)	(0.237)	(0.240)
Eastern	-0.0764	-0.126	-0.100	-0.104	-0.167
	(0.184)	(0.182)	(0.180)	(0.180)	(0.184)
Volta	0.191	0.137	0.159	0.157	0.0955
	(0.250)	(0.247)	(0.246)	(0.246)	(0.252)
Ashanti	-0.122	-0.189	-0.160	-0.162	-0.214
	(0.246)	(0.239)	(0.236)	(0.238)	(0.238)
Brong Ahafo	-0.286	-0.362	-0.326	-0.330	-0.394
	(0.302)	(0.300)	(0.294)	(0.297)	(0.300)

Central	-0.113	-0.133	-0.124	-0.122	-0.137
	(0.270)	(0.270)	(0.268)	(0.268)	(0.268)
Upper West	-0.0459	-0.0572	-0.0572	-0.0568	-0.0599
	(0.173)	(0.172)	(0.171)	(0.171)	(0.172)
Risk and return	0.838***	0.839***	0.841***	0.841***	0.846***
	(0.113)	(0.113)	(0.113)	(0.113)	(0.114)
Knowl. of stock	-0.350***	-0.361***	-0.356***	-0.358***	-0.375***
	(0.125)	(0.125)	(0.126)	(0.126)	(0.126)
GSE Awareness	0.412***	0.383***	0.397***	0.396***	0.378***
	(0.124)	(0.124)	(0.123)	(0.123)	(0.123)
Inv. financing	0.0274	0.0262	0.0267	0.0270	0.0327
	(0.0762)	(0.0758)	(0.0760)	(0.0760)	(0.0759)
Inv. Objective	0.594	0.570	0.598	0.596	0.609
	(0.589)	(0.593)	(0.594)	(0.594)	(0.589)
Saving and Inv.	-0.0431	-0.0446	-0.0406	-0.0411	-0.0460
	(0.0591)	(0.0592)	(0.0591)	(0.0591)	(0.0593)
Risk Averse	0.0558	0.0513	0.0523	0.0514	0.0421
	(0.116)	(0.116)	(0.116)	(0.116)	(0.116)
Constant	-5.082**	-5.112**	-5.180**	-5.158**	-5.225**
	(2.397)	(2.389)	(2.389)	(2.389)	(2.400)
Observation	733	733	733	733	733
Chi2	110.345	106.991	108.029	108.085	105.518
P-values	0.000	0.000	0.000	0.000	0.000

On the control variables, gender, age, marital status, monthly household incomes and the location of respondents show a significant relationship with stock market participation when financial literacy and financial inclusion are interacted. The results show that even with financial literacy and inclusion the young are less likely to participate in the stock market. Also, males who are financial literates and included are more likely to participate than their female counterpart. Further, stock market involvement of financial literates and the included will rise as they experience an income in their monthly incomes. Urban dwellers are more likely to participate in the stock market when they are financially educated and included by means of using an account to save. Married individuals will lean towards active participation in the stock market when they are financial literates and included financially.

Table 4. 13 The Effect of Financial Literacy and Financial Inclusion on Stock Market Participation (Participation Motivated by Stock Conversion)

The table presents the interaction of financial literacy and financial inclusion on stock market participation. Financial inclusion indicators which are ownership of an account (*accto)*, saving using an account (*saving)*, access to bank credit *(credits)*, frequency of usage *(freqwith)* and usage of account

to make payment (*upmt)*, financial literacy, household characteristics (Age, Age2, Hhsize, Income, Urban, Employment status, Marriage status, and Religion), financial behaviour (Saving and Investment behaviour, Risk aversion, Investment Objective, Investment Financing) and the region of residence (Greater Accra, Western, Eastern, Central, Brong Ahafo, Upper West, Volta, Ashanti) are regressed against the stock market participation indicator; preparedness to buy or sell shares given the opportunity to convert shares to cash (StockConv). StockConv is the dependent variables whereas financial literacy, financial inclusion indicators, household characteristics and financial behaviour are independent variables. InvStock is the dependent variables whereas financial literacy, financial inclusion indicators, household characteristics and financial behaviour are independent variables. A robust probit is employed to examine the relationship between the variables specified. Robust standard errors are reported in parentheses, ***, **, and * indicate statistical significance at 1%, 5% and 10% level respectively. The diagnostic tests reported are: (1) Observations (2) Chi-square (3) P-values

	(1) StockConv	(2) StockConv	(3) StockConv	(4) StockConv	(5) StockConv
Fld*Accto	-0.185				
	(0.134)				
Fld*Saving		-0.155			
		(0.168)			
Fld*Freqwith			-0.0892		
			(0.205)		
Fld*Upmt				-0.0729	
				(0.167)	
Fld*Credits					0.213
					(0.156)
Age	-0.526*	-0.528*	-0.528*	-0.533*	-0.529*
	(0.298)	(0.297)	(0.297)	(0.297)	(0.296)
Age2	0.0650	0.0649	0.0649	0.0659	0.0632
	(0.0524)	(0.0520)	(0.0519)	(0.0520)	(0.0517)
LnHHsize	0.00130	-0.0143	-0.0133	-0.0133	-0.0112
	(0.123)	(0.122)	(0.122)	(0.122)	(0.122)
LnIncome	-0.462*	-0.440*	-0.431*	-0.435*	-0.425
	(0.258)	(0.256)	(0.256)	(0.256)	(0.259)
Urban	0.0369	0.0352	0.0489	0.0448	0.0410
	(0.109)	(0.109)	(0.108)	(0.108)	(0.109)
Marriage status	0.115	0.122	0.119	0.122	0.0999
	(0.123)	(0.123)	(0.122)	(0.123)	(0.123)
Emp. status	-0.153	-0.161	-0.171	-0.169	-0.178
	(0.134)	(0.133)	(0.133)	(0.133)	(0.133)
Gender	-0.0670	-0.0690	-0.0699	-0.0707	-0.0938
	(0.107)	(0.107)	(0.108)	(0.107)	(0.108)
Education	-0.0660	-0.0651	-0.0713	-0.0684	-0.0709
	(0.398)	(0.392)	(0.391)	(0.391)	(0.385)
Christian	0.125	0.121	0.116	0.115	0.109
	(0.124)	(0.125)	(0.125)	(0.125)	(0.125)
Greater Accra	0.0628	0.0163	-0.00792	0.00270	-0.0493
	(0.227)	(0.220)	(0.214)	(0.218)	(0.220)
Western	-0.450*	-0.494**	-0.503**	-0.507**	-0.546**
	(0.237)	(0.232)	(0.233)	(0.232)	(0.238)
Eastern	-0.0139	-0.0558	-0.0667	-0.0701	-0.134
	(0.195)	(0.191)	(0.190)	(0.190)	(0.198)
Volta	0.485*	0.431	0.415	0.418	0.365
	(0.268)	(0.265)	(0.262)	(0.261)	(0.266)
Ashanti	0.638**	0.586**	0.557**	0.565**	0.509**
	(0.255)	(0.242)	(0.240)	(0.244)	(0.244)
Brong Ahafo	0.186	0.117	0.0901	0.104	0.0255
	(0.292)	(0.285)	(0.282)	(0.286)	(0.289)
Central	-0.0331	-0.0466	-0.0654	-0.0571	-0.0682
	(0.297)	(0.292)	(0.291)	(0.291)	(0.292)
Upper West	-0.129	-0.152	-0.153	-0.153	-0.149
	(0.173)	(0.171)	(0.171)	(0.171)	(0.172)

Risk and return	0.688***	0.701***	0.696***	0.697***	0.704***
	(0.113)	(0.113)	(0.113)	(0.113)	(0.113)
Knowl. of Stock	0.0316	0.0183	0.0185	0.0205	-0.00938
	(0.127)	(0.126)	(0.127)	(0.127)	(0.126)
GSE Awareness	0.514***	0.494***	0.486***	0.486***	0.465***
	(0.126)	(0.124)	(0.124)	(0.124)	(0.125)
Inv. financing	-0.0812	-0.0812	-0.0840	-0.0817	-0.0805
	(0.0830)	(0.0827)	(0.0828)	(0.0828)	(0.0834)
Inv. Objective	1.138**	1.183**	1.150**	1.151**	1.151**
	(0.498)	(0.485)	(0.485)	(0.491)	(0.472)
Saving and Inv.	0.00357	0.0111	0.00931	0.00941	0.00197
	(0.0614)	(0.0613)	(0.0612)	(0.0615)	(0.0617)
Risk averse	-0.114	-0.122	-0.121	-0.120	-0.132
	(0.121)	(0.121)	(0.122)	(0.122)	(0.122)
Constant	3.912	3.669	3.641	3.682	3.655
	(2.410)	(2.393)	(2.397)	(2.397)	(2.414)
Observation	712	712	712	712	712
Chi2	90.750	90.616	91.483	89.549	90.246
P-values	0.000	0.000	0.000	0.000	0.000

When ***StockConv*** is used as an indicator of stock market participation, age, monthly incomes, investment objective, awareness and risk and return preferences of respondents tend to influence stock market participation significantly when financial literacy and financial inclusion variables are interacted. Table 4.13 presents the results to that effect.

4.4 Summary

This chapter presents the empirical results of the study in four parts. Firstly, it provides a confirmation of the impact of financial literacy on financial inclusion. Secondly, it reveals the influence of financial literacy on stock market participation. Thirdly, it presents the effect of financial inclusion on stock market participation. Finally, the results of analysing the joint effect of financial literacy and financial inclusion on stock market participation are also presented. The biprobit model, probit model and maximum likelihood estimation are used for the purpose of model development and estimation. On the effect of financial literacy on financial inclusion, a significant effect is observed by the study. However, a mixed effect is discovered for the impact of financial literacy on stock market participation in Ghana. More so, the interaction of

financial literacy and financial inclusion did not yield any significant impact on stock market participation in Ghana.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary and conclusions of the study. It begins with a summary of the results from the analysis in the previous chapter and then goes on to draw inferences centred on the summary of the results. The chapter concludes with recommendations which have practice, policy and research implications.

5.2 Summary of results

This study measured financial literacy as an index from 0-7 where a respondent scores 1 when he answers questions on financial concepts correctly and 0 otherwise. An index score of 1 means low financial literacy whiles an index score of 7 denotes high financial literacy. Financial inclusion, on the other hand, is measured using five indicator variables that is account ownership, use of an account to save, frequency of account usage, access to credit and making payment with an account. The first objective of the study is to examine the relationship between financial literacy and financial inclusion. A biprobit regression model is employed by the study to achieve this objective. The study identifies that financial literacy improves financial inclusion significantly. The analysis shows a highly significant and positive relationship between the most basic measure of financial inclusion (account ownership) and financial literacy. This affirms the first hypothesis of the study. This result supports evidence from Grohmann, Klühs, & Menkhoff (2018) that financial literacy improves financial inclusion.

Secondly, the study makes use of a robust probit model to examine the influence of financial literacy on stock market participation in Ghana. The outcome shows a variation depending on the indicator used to measure stock market participation.

For the relationship between financial inclusion and stock market participation, a robust probit model is again used by the study. The outcome shows that financial inclusion has no significant impact on stock market participation. The results for account ownership is negative for both investment in stocks and stock conversion however it is positive when an agent visits.

Finally, the study examines the effect of interacting financial literacy and financial inclusion on stock market participation using a robust probit regression model. The results show a positive but insignificant relationship when financial literacy and account ownership is interacted on stock market participation using investment in stocks as an indicator of participation. This implies that individuals who are financial literates and own accounts are more likely to participate in the stock market by investing in stocks.

5.3 Conclusion

This study examines financial literacy, financial inclusion and stock market participation across a sample of 1,966 respondents across the ten regions of Ghana for the period 2018. Financial literacy is measured as an index from 0-7. Financial inclusion is also measured using five indicators which capture access and usage of accounts. Stock market participation is measured in this study using three indicator variables. Biprobit regression model is used to examine the relationship between financial literacy

and financial inclusion. With regards to the effect of financial literacy on stock market participation and the influence of financial inclusion on stock market participation, a robust probit regression is used by the study. Having established the effect of financial literacy on stock market participation and the effect of financial inclusion on stock market participation separately, the interactive effect of these two key variables are subsequently examined on participation. The results suggest that financial literacy improves financial inclusion significantly. More so, the effect of financial literacy on stock market participation is mixed. Further, the impact of financial inclusion through using an account to save on stock market participation is negative and highly significant hence does not improve participation. Finally, the interaction of financial literacy and financial inclusion on stock market participation yields no significant impact.

5.4 Recommendations

The study gives rise to the following recommendations which are relevant to policy, practice and future research. Firstly, the study identifies a highly significant and positive relationship between account ownership and financial literacy. It is, therefore, recommended that financial inclusion policy initiatives should be backed by financial literacy in order for financial inclusion to yield the intended outcomes. It is also recommended that financial inclusion policymakers focus on the gender gap in financial inclusion so as to be able to come up with ways of bridging it for holistic financial development as females usually form a majority of the world's population.

Although the main variables of financial inclusion and financial literacy do not have a significant impact of stock market participation, other factors such as awareness of the

Ghana Stock Exchange, knowledge of stocks traded on the exchange, risk and return preferences, investment objective and level of risk aversion significantly affect stock market participation in Ghana. It is therefore recommended that the Ghana Stock Exchange should educate the general public about the securities traded on the exchange, what they engage in, their mandate and the importance of the exchange to economic development. This will go a long way to increase awareness among the public and thus elicit participation among the general public. The risk and return preferences, investment objectives and level of risk aversion of clients should be taken into consideration by agents who introduce new stocks to consumers with the intention of eliciting participation. Agents should not be fixated on their commissions but should rather seek the well-being of consumers and not be exploitative. They should fully disclose the risk and returns associated with stocks and not engage in insider trading.

Finally, is it also recommended that the rights of financial consumers should be adequately protected by existing laws so that even financial illiterates would find it safe to own and use their accounts and also participate in the stock market. Financial institutions can also take up the initiative of educating their clients on basic financial concepts and helping them to cultivate good saving and investment behaviour as they go a long way to elicit increased patronage of account ownership and subsequent usage.

Future studies can also probe into the reasons why financial literates in Ghana are less likely to participate in the stock market despite the evidence that financial literacy is a significant determinant of participation. Furthermore, an in-depth analysis of country

specific factors may provide valuable insights that will encourage participation of financial literates.

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