

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

COLLEGE OF HUMANITIES AND SOCIAL SCIENCES

DEPARTMENT OF ECONOMICS

**EFFECT OF FINANCIAL INNOVATION ON THE PERFORMANCE OF
UNIVERSAL BANKS IN GHANA**

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**A THESIS SUBMITTED TO THE DEPARTMENT OF ECONOMICS, KWAME
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DECLARATION

I hereby declare that this thesis is the result of my own original work towards the Master of Science Degree in Economics and that to the best of my knowledge, it contains no material previously published by another person or materials which has been accepted for the award of any other degree of the University, except where due acknowledgements have been made in the text.

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DEDICATION

This thesis is dedicated to the most cherished woman in my life, Miss Lydia Akaba for her stint of hard work and sacrifice as a single parent to take care of me to this level. As a single parent you have given me life lessons to become a better man. All my life you have been the angel in the sky. Your stint of hard work to take care of me to the master's level would be a motivation to all single parents in the world. Mum thanks a bunch for the prayers and sense of wisdom as they have propelled me to this level in life. Thanks again for being with me every step of the way, through the good and bad times. I know these words of appreciation are not enough nonetheless I vow to always make you proud.

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ABSTRACT

The banking sector in recent times is going through a period of transformation. This process of transformation in the sector is mainly driven by digital innovation steered by technological transformation. Ghana's banking sector is no exception to the wave of technological transformation as financial innovations have heralded discourses on Ghana's banking industry but as to it being the main determinant of growth in the banking sector remains insufficiently proven. The objective of the study was to specifically evaluate the effect of innovation in relation to management efficiency, liquidity management, interest rate and gross domestic product on number of account holders and profitability. The study employed an explanatory research design and used a multiple regression model with the aid of Statistical Package of Social Sciences (SPSS) to estimate the association of financial innovation to both customer volumes and profitability of banks relative to interest rate, gross domestic product, liquidity management and management efficiency. Data on financial innovation was mainly on expenditure on financial innovation of some selected banks with a market share of 39%. The regression model revealed that financial innovations additional to adopted internal and external factors (i.e. management efficiency, liquidity management, interest rate and gross domestic product) account for 50.4% and 81.0% variations in customer volumes and profitability of banks respectively. The model again estimated positive regression coefficients for financial innovation on both customer volumes and profitability. Consistently, the Pearson's correlation analysis revealed a positive and strong relationship between financial innovation and customer volumes as well as profitability of banks.

The study concludes that financial innovation unequivocally has a positive and a statistically significant influence on bank performance and therefore recommends that banks accelerate their innovation drive to meet the needs of consumers as well as match up with trend of global competition. Again, the study recommends that banks extensively draw out innovative strategies to meet the changing needs of financial consumers at lower service cost and higher levels of efficiency.

TABLE OF CONTENT

Contents	Page
DECLARATION	i
DEDICATION	ii
ACKNOWLEDGEMENT	iii
ABSTRACT	iv
TABLE OF CONTENT	v
LIST OF TABLES	viii
LIST OF FIGURES	x
ABBREVIATION	xi
CHAPTER ONE	
INTRODUCTION	
1.1 Background of Study.....	1
1.2 Problem Statement	4
1.3 Aims and Objectives	5
1.4 Research questions	6
1.5 Justification of Study.....	6
1.6 Organisation of Study.....	7
CHAPTER TWO	
LITERATURE REVIEW	
2.1 Introduction	8
2.2 Concept of Financial Innovation	8
2.2.1 Categorization of Financial Innovation.....	9
2.2.2 Moderators of Financial Innovations	10
2.2.3 Significance of Innovations.....	13

2.3 Synopsis of Ghana's Banking Industry	14
2.4 Measurement of Firm Performance.....	16
2.5 Determinants of Bank Performance	19
2.5.1 Management Efficiency	19
2.5.2 Liquidity Management	19
2.5.2 External Factors/Macroeconomic Factors.....	20
2.6 Theories on Financial Innovations	21
2.6.1 Schumpeter Innovation Theory	22
2.6.2 Innovation Diffusion Theory.....	23
2.6.3 Circumvention Innovation Theory	24
2.6.4 Task Technology Fit Theory	24
2.6.5 Regulation Innovation Theory	26
2.6.6 Transaction Cost Innovation Theory	26
2.6.7 Constraint- Induced Theory	27
2.7 Conceptual Framework	27
2.8 Empirical Literature Review	30
2.8.1 Financial Innovation and Profitability.....	30
2.8.2 Financial Innovation and Customer Volumes	33
2.9 Summary of Related Literature Review	35

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction	36
3.2 Research Design	36
3.3 Study Population and Sampling Technique	37
3.4 Data Sources and Collection Methods	37
3.5 Study Variables and Units of Analysis	38

3.6 Data Reliability and Validity.....	39
3.7 Analysis of Data	40
3.7.1 Analytical Model.....	40
3.8 Test of Significance.....	42
3.9 Ethical Consideration	42

CHAPTER FOUR

EMPIRICAL ESTIMATIONS, DATA ANALYSIS AND INTERPRETATION

4.1 Introduction	43
4.2 Descriptive Statistics	43
4.3 Trend Analysis Variables	44
4.3.1 Trend Analysis for Profit Before Tax (PBT)	44
4.3.2 Trend Analysis for Customer Volumes (CV)	45
4.3.3 Trend Analysis for Financial Innovation (FI)	46
4.3.4 Trend Analysis for Management Efficiency (ME)	47
4.3.5 Trend Analysis for Liquidity Management (LM)	47
4.3.6 Trend Analysis for Interest Rate (IR).....	49
4.3.7 Trend Analysis for Gross Domestic Product (GDP).....	50
4.4 Inferential Statistics.....	51
4.5 Correlation Analysis for Effect of Financial Innovation on Bank Performance.....	51
4.6 Effect of Financial Innovation on Bank Profitability (Profit before Tax).....	53
4.6.1 Regression Model Summary	53
4.6.2 Analysis of Variance (ANOVA)	53
4.6.3 Regression Coefficients.....	54
4.7 Effect of Financial Innovation on Customer Volumes.....	55
4.7.1 Regression Analysis	56
4.7.2 Analysis of Variance (ANOVA)	56

4.6.4 Regression Coefficient	57
4.7 Interpretation of Findings	58
CHAPTER FIVE	
SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION	
5.1 Introduction	60
5.2 Summary of Findings	60
5.3 Conclusions	60
5.4 Policy Implications and Recommendations	61
5.5 Limitations of Study	62
5.6 Suggestions for Further Research	63
REFERENCES	64
APPENDIX	71

LIST OF TABLES

Table 3.1: Study Variables and Unit of Measurement	39
Table 3.2: Reliability Statistics	39
Table 4.1: Descriptive Statistics	43
Table 4.2: Correlation between Bank Performance, FI, ME, LM, IR and GDP	52
Table 4.3: Regression Model Summary	53
Table 4.4: ANOVA Table	54
Table 4.5: Regression Coefficients	54
Table 4.6: Regression Model Summary	56
Table 4.7: ANOVA Table	56
Table 4.8: Regression Coefficients	57

LIST OF FIGURES

Figure 2.1: Conceptual Framework.....	29
Figure 4.1: Profit Before Tax (2011-2015)	45
Figure 4.2: Customer Volumes (2011-2015)	46
Figure 4.3: Expenditure on Financial Innovations (2011-2015)	47
Figure 4.4: Management Efficiency (2011-2015).....	48
Figure 4.5: Liquidity Management (2011-2015).....	48
Figure 4.6: Average Interest Rate (2011-2015)	50
Figure 4.7: Gross Domestic Product (2011-2015)	51

ABBREVIATION

ANOVA	Analysis of Variance
ATM	Automated Teller machine
CV	Customer Volumes
E-banking	Electronic banking
FI	Financial Innovation
GDP	Gross Domestic Product
IR	Interest Rate
LM	Liquidity management
ME	Management Efficiency
PBT	Profit before Tax

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Globally, the financial system is undergoing rapid transformation and transfiguration which is attributed to the immense processes of deregulation and globalization. According to Pilbeam (2010), deregulation and increased competition in the financial sector has ensured that traditional boundaries between financial institutions are becoming increasingly blurred. Consequently, liberalization has been concerned with less government intervention in the regulation of the financial services sector. Liberalization has led to the conception of a room for essentially consenting for innovations and the creation of a wide range of services in the financial industry thus deepening financial services. In effect deregulation is coupled with the view of tolerating the growth of the financial services sector without over-burdensome restrictions. Pinto and Sobreira (2010) observed that over the last two decades' technological improvement, financial innovation and liberalization have exerted intense transformational pressure on the financial system. As a result, banks nowadays significantly differ and do not resemble banks of the pasts.

Ghana's financial sector is currently experiencing rapid advancement in its structure which is instrumental in enhancing the significant prospective growth in investment and additional economic growth. The reforms in the financial sector have given rise to the rearrangement of Ghana's financial landscape as well as creating new policies and regulatory challenges. Evidential development in the financial sector includes the creation of two Discount Houses (consolidated Discount House Ltd and Securities Discount Company Ltd) and the emergence of an interbank market that has aided banks to redistribute or trade their surpluses and shortages of liquidity without having to affect or cause unwarranted volatility in interest rate. This transformation in the financial system has resulted in the effective allocation and efficient distribution of economic resources across all spheres of the economy as claimed by Merton (1992).

Ghana's banking sector has gone through tremendous transformation over the years, renovating from traditional ways of banking to meet the changing face of financial consumers' needs in spite of global and domestic economic challenges. The banking

sector landscape is seen to be evolving, competitive as well as boding well for the future in terms of development financing ,savings mobilization and delivering of quality services (Abor, 2005 and Hinson et al., 2006) cited in (Idun and Aboagye, 2013). Obuobi (2012) echoes that developmental changes in the banking industry is influenced by factors such as information technology advancement, deregulation of the financial sector at both national and regional level in relation to the effects of the globalization process. Accordingly, Frame and White (2009) stipulate that technological advancement in the fields of telecommunication and data processing have driven financial innovations that have led to the alteration of banking product and services globally.

Consequently, the development of the banking sector however cannot be isolated from innovations. The dynamism of technology is leading the trends of innovations in banking products. Innovation has become an imprint on the financial services industry and a catalyst for competition as banks compete for greater market share. This statement is buttressed by the observations made by Batiz-Lazo and Woldesenbet (2006) as cited in Muiruri and Ngari (2014, pp. 52) that;

“financial innovations are used by banks as formidable strategic variables to outstrip the competition and have become an essential means for the bank to improve its performance and to maintain its effectiveness on the market”.

In reference to the above, financial innovation is said to be a key tool and element for financial, economic and business growth which is bordered with several ideologies bringing to fore new ways of doing things such as new ideas, methods or devices and to a larger extent the establishment of institutions.

The prominence of the financial sector in modern economies coupled with innovations has culminated in augmenting research interest on issues bothering financial innovations. As noted earlier, global development of the banking industry cannot be disassociated from the emergence of innovations. Hence the global development of the banking sector with respect to competitiveness and financial performance of banks cannot be looked at without closely assessing the role financial innovations play. Financial innovations have stimulated growth and competitiveness in the industry as well as deepening banking

services. Consequently, issues on the global financial crisis of 2007 and 2009 have heralded debates on the merit and demerit of financial innovations. Two schools of thought have denoted their views on financial innovation as discussed by Beck (2013). These views according to the author are; ‘innovation growth view’ and ‘innovation-fragility view’. Proponents of the *innovation growth view* argue in favor of financial innovation in aiding to reduce transaction and improving efficiency and economic growth. The *innovation-fragility view*, however contrast the view point of the “innovation growth view” by stating precisely that the advent of the recent Global Financial Crisis is mainly attributed to the emergence growth and development of financial innovation. They further denoted that financial innovations led to an unparalleled credit expansion stimulating an upsurge in housing prices, renovation of perceived safe securities exposed to neglected risks and aiding banking institutions to design structured products to exploit investors in the financial market, overcome the effect of regulations and exploit tax loopholes

In the Ghanaian context, financial innovation has emerged as a result of the need to boost and improve the performances of the banking industry. Frimpong (2010) cited in Domeher et al. (2014) found that the adoption of financial innovations in Ghana and other developing countries have provided an avenue for banking institutions to mend their market performance by reducing inefficiencies habituated to the banking industry. Accordingly, the Ghana Banking Survey (2010) emphasizes that the technological development and keen competition in the Ghanaian banking industry has compelled the rapid adoption of innovative strategies to satisfy customers with range of products and services to clients while minimizing operational costs. In reference to the above, it can be established that application of financial innovation in Ghana’s banking industry has led to the introduction of additional delivery channels and new financial instruments such as ATMs, credit and debit cards, E-banking, agency and mobile banking and again promoting financial inclusion.

Notwithstanding the benefits associated with financial innovation in the banking industry, there are inherit demerits which affect banks in their efforts to embrace financial innovations in a rapidly changing and globalizing Ghanaian financial environment. It is

against this backdrop that this study seeks to assess the role financial innovation plays in enhancing the performance of banks and the development of the Ghanaian banking industry bringing to light the benefits and challenges.

1.2 Problem Statement

The role of the banking industry in the economic growth of a country cannot be overemphasized. Banks are symbolized as agents of financial growth and overall economy development. The sector is indubitably regarded as the most sensitive sector of every economy. In recent times, banks are adopting financial innovations to enhance their activities. Tufano (2003) cited in Abir and Chokri (2010 pp.97) denotes banks are using financial innovations as fearsome strategic variables to get ahead of competition. Apparently, banks and other financial institutions are denoted to be at the core of the recent global financial crisis. Muiruri and Ngari (2014) posit that the mainstay of the crisis is ascribed largely to the deterioration of their asset portfolios owed to distorted credit management attributed to financial innovations.

In Ghana, studies depict that financial innovation has had its own merits on the banking industry by improving the operations of banks and promoting efficiency as well as upholding financial inclusiveness. Nonetheless, financial innovations in the sector have fueled discourse on security and operational losses. The Bank of Ghana (2015) estimated that banks lost an amount of GH¢ 70 million to only ATM crimes (cloning of cards). Again, available data from the Consumer Reporting Unit of the Central Bank's Financial Stability Department revealed that electronic fraud constitutes more than 80 percent of all complaints and fraud cases the central bank receives. Moreover, the e-Crime Bureau estimate that the banking industry is losing about US\$250,000 weekly due to cyber-crime (electronic banking) and even with regulators (central bank) not been able to match up as stipulated by Yeboah (2016) in the editorial of the Business and Financial times online 19th July, 2016.

Invariably, the adoption of financial innovations in the banking industry has been cut short coupled with issues of system shut downs. There have been cases where customers are unable to access their account with reference to low broadband internet penetration

generating long queues and other discomfort to customers. Unvaryingly, “customers’ preference for traditional branches, fear of online threats/scams, lack of basic knowledge of computers and the high cost of internet accessibility are some of the problems threatening the growth of financial innovation in the Ghanaian banking system” (Akuffo-Twum, 2011: pp. 2). This according to Sum and Memba (2016) has a negative bearing on the perception of customers on the quality of services offered by banks and thus adversely affecting the credibility and performance of banks.

Regardless of the above, empirical study on the contribution of financial innovation on the banking industry is limited world over notwithstanding the myriad of extensive literature on the subject topic (financial innovations). Studies on financial innovation in the banking sector have over the years mainly focused on financial performance banks mainly with the adoption of profitability ratios as shown in the Appendix. The outcomes of these aforementioned studies on effect of financial innovation on performance have been empirically inconclusive (Bonn, 2000).

It is therefore imperative to conduct an extensive research into the subject in the wake of the central banks quest to promote financial inclusion through innovations (with recent activity including a three year agreement worth US\$15.3 million project grant with the Swiss government) and to create a cashless economy that will be driven by the banking industry through the Ghana inter-bank payment and Settlement Systems which has vowed for the establishment of Ghana Payment Council to move the country from a cash based economy to cash-lite economy.

1.3 Aims and Objectives

The study is concerned with assessing the role financial innovation plays in enhancing both financial and non-financial performance of banks in Ghana. To guide this study, the following are the specific objectives;

- To evaluate the effect of financial innovation on the profitability of banks;
- To examine the effect of financial innovation on customer volumes of banks;

1.4 Research Questions

The study is aimed at providing answers to the following questions. These questions provide the content of the study;

- How does financial innovation affect the profitability of banks?
- To what extent do financial innovations affect the customer volumes (customer base) of banks?

1.5 Justification of Study

According to Ghana Banking survey (2014), banks consider that financial innovations will steer the future of banking business. The inducement for financial innovation is to increase wealth, ensure convenience and cost-efficiency and finally to increase bank penetration. Consistently, investments in innovations have provided a means for existing customers to conduct financial transactions transversely and affording banks to raise stable transactional revenue. Moreover, financial innovations are aiding banks to establish peripheral markets as well as creating an avenue for banks to increase their deposits assumed to be locked in those market to strengthen their financials. The relevance of financial innovation in the banking sector necessitates this study as it contributes to the available store of knowledge and provides empirical evidence to the ongoing intellectual discourse given the fact that the substance of this research has enhanced the already existing literature in the area of bank innovation. Nevertheless, this study is set to provide reference and set the tone for further research on financial innovation.

Besides empirically analyzing the substantiality of financial innovations on the development and performance of the banking industry, the recommendations and conclusion of this study will be purposeful to policy makers with their initiatives to transform the economy into a cash-lite economy driven by bank innovations. Again, the study is aimed to imperatively aid banks in reducing operational losses in the wake of economic challenges faced by the banking industry at least judging from the recent report by Bloomberg Intelligence which orate the situation to government's fiscal and monetary tightening policies.

Lastly, this study will build the capacity of industry players in formulating solid and balanced policies in the wake of stiff competition from the emergence of Mobile Money banking services provided by the Telcos'. The findings will as well enable industry players and regulators to realign strategies to enhance stability, growth and performance in the banking sector in relation to recent event of bank proliferation in the economy which has risen as an upshot of liberalization of the financial system been accompanied with transferals in the market share of banks which cannot be sequestered from the trends of innovations in the industry.

1.6 Organisation of Study

The study is sectioned into five chapters. Chapter one of the study is comprised with the background of the study, problem statement, research questions and the justification for the study. The second chapter of the study focused mainly on the concept of financial innovation and the review of relevant theoretical and empirical literature on the relation between financial innovation on both customer volumes and profitability of banks. The third chapter of the study elaborated on the research methodology and the empirical design including model specification. The chapter four of the study was concerned with the empirical estimations and interpretation of data analysis result. The last chapter concludes the study and provides policy recommendations based on the study findings.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter elaborates on related researches concerning financial innovation and bank performance as well as defining various concepts emanating from related studies. This chapter is put in three sections; first category delves on the concept of financial innovation as well as investigates theories of innovations significant to the study while the second section provides a conceptual framework to guide the study. The third section reviews empirical literature relating to the effect of financial innovation on bank performance. Furthermore, the chapter reviews the evolution and development of banking in Ghana.

2.2 Concept of Financial Innovation

Financial innovations gained prominence in the 1980s which witnessed the development and proliferation of a wide range of financial products. The range of financial products includes new forms of financial derivatives such as new types of options, forwards and future contract and junk bonds. The myriad of financial product meant that firms and investors are better able to attain their risk-return investment objectives as well as attracting new investment.

Financial innovation is empirically established to have a nexus with economic growth through enhanced efficiency of financial institutions to provide eminent financial services and ensure productive allocation of wealth among economic agent. There exist diverse conceptualizations of financial innovation. That is to say literature has not agreed on the generic meaning of what financial innovation is as different authors, proponents and scholars have defined this concept differently. Pilbeam (2010) defines financial innovation as a means of designing new financial instrument or packaging together existing financial instrument. In the view of Idun and Aboagye (2013), financial innovation involves the use of new financial instrument, market or existing as well as technologically knowledge to offer new product services to economic agents. In other words, financial innovation embroils the formulation of ingenious solutions to problems in finance. In relation to this study, financial innovation is referred to as the act of

creating and popularizing new financial instruments or the packaging of existing financial instruments as well as new financial technologies, institutions and markets, processes, and business models. It again relate to the creation of new types of financial firms, internet banks such as online banking, phone banking and new ways of using information technology. In reference to the geographical context of the study, innovative financial instrument is seen to mainly include ATMs, debit and credit cards, e-banking, mobile banking, agency banking, and venture capital financing.

Pilbeam (2010) identifies two main views for the emergence of financial innovations which includes; designing instrument to astound the effect regulations and to exploit tax loopholes and moreover to design products to meet unlimited needs of economic agents to ensure efficiency. Additionally, Gorton and Metrick (2010) assert that the motives for the development of financial innovations include the following; tax compensations, reduction in moral hazard, reduction in bankruptcy costs, reduced regulatory costs, transparency and customization. Invariably, Ignazio (2007) depicts that financial innovations do not only create opportunities for sector participants but also provide an avenue to increase market players by means of creating new and innovative products in the financial market.

Regardless of the innumerable benefit attributed to innovations in the financial system, there is been further discussions discounting the merit of financial innovations. Kenyoru (2013) suggest a primitive and cautious approach to innovations and their approach in the financial system especially the banking system. In the view of the author, behavior and impetuous decisions steering the financial markets may end in causing a boom-bust nature of the financial market. The authors however argue that increased nexus between banks and the financial markets creates instability deeply felt in the banking and bank-based systems.

2.2.1 Categorization of Financial Innovation

There are several categorizations for financial innovations. Amongst the categorization includes those by Ignazio (2007) and Pilbeam (2010). Ignazio (2007) categorizes financial innovations as enumerated below;

- New products (examples includes adjustable rate mortgages and exchange-traded index funds);
- New services (examples include on-line securities trading and Internet banking);
- New “production” processes (examples includes electronic record-keeping for securities; credit scoring);
- New organizational forms (examples includes a new type of electronic exchange for trading securities; Internet-only banks).

Consistently, Pilbeam (2010) categorizes financial innovations into five categories as highlighted below;

- Arbitraging Innovation: it involves economic agents capitalizing on discrepancies between different markets or within market.
- Market-broadening innovations: these innovations aim at advancing the liquidity by enticing new economic agents and providing new avenues for borrowers. It is also concerned with innovative approaches to selling and distributing financial merchandise besides innovating financial instrument.
- Pricing innovation: Pilbeam (2010) cites that pricing innovations seek to moderate the cost associated with realizing specific investment objective.
- Risk-management innovations: this category of innovation is concerned with reallocating financial risk exposure from risk averse economic agents to other agents prepared to take on risk.

2.2.2 Moderators of Financial Innovations

Firms and individuals require financial services. Innovations facilitate the promotion of a more efficient economy through the promotion of varied financial services at competitive prices. The progression and development of financial innovation in the financial landscape over the years has been tremendous. White (2001) expounds that the conditions that spawn innovations are multifaceted and amongst them includes; the “nature of the technology underlying the industry and the rate of change of that technology, the structure (e.g., firm size) and competitiveness of the industry, the economic environment of the industry and the regulatory environment of the industry”.

Consistently, the study expels moderators of financial innovation (i.e motivators or factors influencing financial innovations) as follows;

- Competition in Financial Markets

Financial institutions strive to edge its market rivals to have market power. In order to be competitive in the market, financial institutions are compelled to be innovative by means of supplying new instrument or initiating new processes. Greenspan (2005) categories competition into two arrangement that is competition between different national financial systems and that between banks and non -banks financial institutions within national financial systems. Accordingly, both tendencies are supported by the global regulatory environment that has become increasingly sympathetic to deregulation and liberalization. The prime objective of firms is to make profit and therefore strive to offer new products to remain profitable. Financial innovation is said to be driven by the market and therefore the progression of financial innovation cannot be overemphasized judging from the existing structure of the financial industry, degree of concentration and competition in the banking sector, ease of entry, profitability, extent of development and of specialization among different types of financial instruments, available choice of portfolio assets, and interaction of market forces with regulations effects financial innovations. Again, the rapid transformation in the global financial industry and the cumulative integration of both domestic and international financial markets promulgate financial innovation.

- Legal & Regulatory Framework

Generically, the deregulation (less restrictiveness and less protectionism) of the financial system has enhanced technological advancement and heightened the level of competition. Invariably, heightened competition has aided incumbent to identify enhanced and cost efficient ways of providing financial services, and deregulation has limited restrictions to enable innovators penetrate these markets with ease (White, 2001). Mwangi (2006) explicates that there is an inherit nexus between regulation and innovation since regulation forms the basis of innovation whilst innovation in certain cases prompt the promulgation of regulations. He again recounts that strict regulations can compel or provide incentives for banks and firms to come out with innovations that will aid them to evade regulations that limit their ability profit making ability. The main proponent of the

regulation concept labels the process of circumventing as “loophole mining”. The economic analysis of innovation denotes that excessive restrictions and boundaries in the financial system burden banks and firms as such. Avoiding these restrictions, results in firms oversizing profits, and loophole mining hence creating a room for innovations. Innovations arises when regulatory authorities initiate moves aimed at making changes to the operational rules or regulations of the financial markets in the quest of barring previous regulations

- Technological Advancement

The role of technological advancement in enhancing financial innovation cannot be overemphasized. The advancement in telecommunication technology, computing and information processes are commonly regarded as the dominating factors driving the growth of financial innovations. Coopers (2002) explained that the improvements in technology stimulate innovations and thus, it is impossible to run highly liquid and competitive global markets in the absence of fast and efficient computer and telecommunications. The pace of financial innovation in the financial system and instrument is climaxed by technological advancement explaining the proliferation of complex securities and the substitution of trading arrangements that generate liquidity for institutional arrangements aimed at coping with a lack of liquidity.

- Price Volatility

Price volatility in macroeconomic variables is widely acknowledged to edge financial innovations in the financial system. Tufano (1995) asserts that increased variations in commodity prices, exchange rates, interest rates as well as increased riskiness stimulate financial innovations. Price fluctuations and the improbability associated with the global financial environment have resulted in several economic complexities and disruptions necessitating innovations. The trends of inflation and exchange rate which proceeds unevenly, both overtime and among countries accounts for the progression of innovations in the financial system. Tufano (1995) further stipulated that invention of new financial instrument such as forward and future contracts, options and swaps afford market actors

with more appropriate means of dealing with exchange rate and price risk hence contemporary financial innovations are predominately of price risk transferring nature.

2.2.3 Significance of Innovations

Frame and White (2002) mentioned that innovation is definitive in all facets of a modern economy. Although Standard microeconomic theory has been responsive to issues of static resource allocation and economic efficiency, there is however general appreciation that performance is regularly impelled by a range of dynamic factors which includes innovation. Finance is observed to play a central role in an economy and prominent for economic growth. This notion naturally prompts the prominence of financial innovation.

Innovations are said to have profound impact on financial inclusion in markets where they have taken root and appear to leapfrog traditional banking and micro-finance as a means of delivering financial services to the poor as acknowledged by International Finance Corporation in the editorial of BiztechAfrica (June 3, 2014). Thus, the importance of financial innovations is enormous as studies suggest. The following enlisted benefits of financial innovations are amongst the few welfares of financial innovation relative to banking;

- Reduction in transaction cost and contribution to greater efficiency. The World Economic Forum (2015) stipulated that financial innovations promote cashless transactions and reduces the cost associated cash transactions. Financial innovations also allow for price flexibility and moderates opportunity cost.
- Households are able to keep most of their wealth in financial instruments and reduce their household real money balances.
- Investing in technologies increase banking population and lower the overall cost of innovations, cost of use of banks services and increase banks' income. Innovation aims at protecting customers and merchants from risk of fraud and theft by keeping records of transactions for future references and to minimize the need to hold cash (World Economic Forum, 2015).
- Financial innovation promotes traceability which ensures that there are high levels of visibility into the flow of money for financial institutions and regulators,

facilitating taxation, transparency, and information gathering (World Economic Forum, 2015)

2.3 Synopsis of Ghana's Banking Industry

Ghana's banking sector has over the years gone through periods of evolution. The banking sector is playing a vital role in the channeling of funds from agents with surpluses to agents with deficits and thus regarded as an environment where all economic agents interact through dependency relationship, where the savings of an agent is an investment to another. Traditionally, the sector was sectioned into commercial, development and merchant banks. Commercial or retail banks was inclined to mobilize their deposits from the public and advance these funds out to individuals and companies in the form of loans while development banks were set up to grant medium and long-term loans to specific sectors of the economy. Merchant banks on the contrary were set up to finance trade. Their activities varied from counseling on mergers and acquisitions, private banking especially wholesale banking for merchants and fund management among others and with their clientele base mainly limited to corporate bodies and high net worth enterprises. However, the changing face of the banking system has conceptualized a system for banks to be able to play diverse roles. The idea of Universal Banking has shifted specialization and compartmentalization in the domestic banking system. Universal banking has ensured there are limited barriers and provided equal market opportunities and maintained fair competition for banks (Hinson, 2004). The fruition of the universal banking law resulted in the conduction of all types of banking under a single corporate entity deepening competitiveness in the banking services sector.

The banking system is presently comprised with 32 class I banks and 6 representatives' banks (as at June, 2016) licensed and statutorized to engage in the business of banking under the banking laws of Ghana. Bank of Ghana is the central bank entrusted with the responsibility of regulating the activities of banks in the country. Among some of the roles of the central bank includes; the implementation of exchange rate policy and monetary policy, the management of the national debt, supervision of the banking sector, acting as the banker to the central government and the commercial banks and further

acting as the lender of last resort. These activities of the central bank are however guided by regulatory and legal frameworks enumerated as follows;

- Bank of Ghana Act 2002, Act 616
- Banking Act, 2004 (Act 673)
- Companies Code Act 179, 1963
- Bank of Ghana Notices /Directives / Circulars / Regulations

Historically, Ghana's banking sector dates back to the 1890s that saw the establishment of the first bank known to be Bank of the British West Africa (which later became standard chartered bank in 1985). Ghana then had 12 banks from independence up to the year 1983. During these period banks that were set up were either wholly or majority owned by the public sector. These banks included Agricultural Development Bank, Bank of Credit and Commerce (BCC), Bank for Housing and Construction (BHC), Barclays Bank of Ghana Limited (BBG), Cal Merchant Bank (CAL), Ecobank Ghana Limited, Ghana Commercial Bank (GCB), Ghana Corporative Bank (Co-op), Merchants Bank of Ghana Limited, Ghana Commercial Bank (GCB), National Investment Bank, Social Security Bank (now SG-SSB). Nonetheless, the 1992 liberalization of the country's financial landscape brought to fruition the entry of a number of foreign banks into banking industry as well as an increase in the number of domestic banks. These banks included Amalgamated Bank (AMALBANK), First Atlantic Merchant Bank (FAMB), Metropolitan Allied Bank (METRO), Prudential Bank Ltd (PBL), The Trust Bank (TTB), International Commercial Bank (ICB), HFC Bank, Unibank, Prestige Bank, Stanbic Bank and Standard Trust Bank.

In recent times, there has been significant growth and performance improvement in the banking industry credited to instituted reform programmes such as the Financial Sector Adjustment Programme (FINSAP II and I), Non-Performing Assets Recovery Trust (NPART) and the Foreign Exchange Bureau legislation. Consistently, promulgation of the New Banking Law has further aided in enhancing the capacity of the central bank to play its regulatory role. These reforms have resulted in the following as cited by Hinson et al. (2006);

- Strengthening the banks in terms of their capital base and managerial competence;
- Enhancing supervisory capabilities of Bank of Ghana;
- improving the quality of assets being held by banks;
- Increasing profitability of the banks

Accordingly, the introduction of the new banking act in 2004 permitted banks to provide various forms of banking services and led to the elimination of secondary reserves as well as adjustments in the minimum capital. The minimum capital which was increased initially to GHS 60 million in 2006 was further increased to GHS 100 million in 2013 and presently perked at GHS 120 million with moves to raise it to GHS 500 million by 2017. The adjustment in the minimum capital however led to mergers and acquisitions of some banks which have created larger banks with huge capital base or balance sheet to finance major deals with implications of increasing GDP growth. Recognizable among these mergers and acquisitions includes Access Bank and intercontinental Bank, Ecobank and TTB Bank, and HFC Bank and Republic Bank of Trinidad and Tobago. Presently, there are 29 universal banks operating in the country sparsely 17 foreign owned and 12 Ghanaian owned, with 7 (tier one) banks holding more than half (51%) of the total assets of the sector.

Regardless of the aforementioned evolution in the domestic banking sector, there is been immense competition in the banking sector which is occasioned to the high presence of Nigerian banks (representing about 26% of the total number of banks) in the economy being prompted by the ECOWAS protocol and favourable economic conditions. Again, competition in the sector is ascribed to new product development and technological innovations with the introduction of Automated Teller Machines (ATMs), e-banking mobile banking which has contributed largely to the deepening of banking services.

2.4 Measurement of Firm Performance

Consistency in organisational performance is the sole aim of any organisation since it is only through performance that organisations are able to grow and progress. It is therefore essential to identify the determinants of organisational performance as it particularly enables the identification of those factors that should be treated with an increased interest

in order to improve the organizational performance (Gavrea, Ilies & Stegorean, 2011). In explaining the authors' view, defining organisational performance is the prerequisite of measuring or managing it. Performance measure is becoming a key feature in assessing the accomplishment of an organisation.

Key performance indicators (KPIs) have become dominant tools for providing intelligent information that concerns the performance of public and private agencies (Williams, 2003). Key Performance Indicators means factors by reference to which the development, performance or position of the business of the company can be measured effectively as defined by Price Water Coopers (2007). Performance in an organisation is looked at as the level of achievement or success in commerce or profitability. Bonn (2000) states external parties are normally seen to evaluate the ability of a firm. Nevertheless, Lin, Peng, and Kao (2008) expounds that a firm's performance is an outcome that is achieved in meeting its internal and external goals. The predominant measure of performance mostly relate to export revenues, productivity, profits and sales nevertheless emphasis is occasionally placed on financial indicators such as returns on assets (Korir, 2014 citing Loof, et al., 2002). In effect the performance of a firm is measured in relation to its financial and non-financial capabilities. Lebens and Euske (2006) assert that Performance denote a set of financial and non-financial indicators which provide some of data and material information on the degree of achievement of organizational objectives and results.

A firm's performance is observed as multi-faceted as it can be viewed as growth, success and competitiveness of the firm. Business growth is traced to Gibrat's proportionate growth rule developed in the 1930s. The rule emphasised that a firm's growth rate does not depend on the size of a firm. Consistently, Alam, Raza and Akram (2011) defines a firm's performance as being multidimensional consisting of four element detailed as follows;

- Customer-focused performance, including customer satisfaction, and product or service performance;

- Financial and market performance, including revenue, profits, market position, cash-to-cash cycle time, and earnings per share;
- Human resource performance, including employee satisfaction; and
- Organizational effectiveness, including time to market, level of innovation, and production and supply chain flexibility.

Performance of an organisation is one of the most important variables in the management and arguably the most important indicator of the organizational performance. Price Water Coopers (2011) measures the performance of banks by adopting the following indicators; customer retention, customer penetration, asset quality, capital adequacy, assets under management and loan loss. In relation to the aforementioned indicators the study however sought to be identified with performance indicators that are largely used in market share determination of banks in relation to the banking industry. Market share is deemed a powerful performance metric as it is a strong predictor of cash flow and profitability (Ambler and Putoni, 2003). Additionally, market share is again regarded as a more appropriate and accurate measure as it reflects adaptation to a changing environment (Mavondo, Chimhanzi and Stewart, 2005). The indicators adopted for the study are enlisted below;

- Profitability: the state or condition of yielding a financial profit or gain and often measured by price to earnings ratio (Business Dictionary, 2016). Profit is the ultimate goal of commercial banks. All the strategies designed and activities performed thereof are meant to realize this grand objective (Ongore and Kuse, 2013).
- Customer volumes or base: refers to the number client that a bank has to deal with (number of account holders). In other words, it refers to the clients to whom a business sells products and services and again as a relatively broad number of customers, with a smaller section of the base being comprised of repeat customers (Business Dictionary, 2016). Customer volume edges mainly on customer retention and customer penetration.

2.5 Determinants of Bank Performance

Al-Tamimi and Hassan (2010) averred that the contributing factors affecting banks' performance can be classified into two, namely; bank specific (internal) and macroeconomic (external) factors. Internal factors are denoted to be bank-specific characteristics mainly concerned with management decisions that affect the performance of banks whereas external factors refer to those macroeconomic variables that affect the performance of banks. These variables are stochastic variables as indicated by Ongore and Kusa (2013). The CAMEL framework is the most predominant proxy used to assess the performance of banks (Dang, 2011). CAMEL is an abbreviation that denotes Capital Adequacy, Asset Quality, Management Efficiency, Earnings Ability and Liquidity. In relation to the study, Management efficiency and interest rate are the variables adopted in relation to financial innovations as the proxy to assess the performance of banks.

2.5.1 Management Efficiency

Management efficiency is one of the most predominant parameter that determines the performance of banks. The performance of management is mostly articulated qualitatively through subjective appraisal of management systems, organizational discipline, control systems, and quality of staff. Ongore and Kusa (2013) denote that management efficiency is observed to be complicated subject to quantify with financial ratios but can however be represented by different financial ratios which include total asset growth, loan growth rate and earnings growth rate. Thus some financial ratios drawn from financial statements can be used as proxy for management efficiency. Nonetheless, operational efficiency in managing the operating expenses can be used as another dimension for management quality. Management efficiency has to do with the optimum use of organisational resources to ensure income maximization and reduction in operating costs. Moreover, there are several financial ratios that can be adapted to measure management efficiency which ranges from operating profit to income ratio to the ratio of operating expenses to total asset. This study sought to adopt the ratio of operating expenses to total profit (Athanasoglou, Sophocles and Matthaios, 2005). A high management efficiency ratio is estimated to impact negatively on the performance of banks as efficient banks are expected to operate at lower costs (Hassan & Bashir, 2003). Management efficiency is adopted as an internal measure of bank performance justified

on the basis that the role of management in organisational performance is central in combining and using organisational resources towards attaining organisational goals.

2.5.2 Liquidity Management

Liquidity is regarded as one of the internal factors that affect bank performance. It is often referred to as the ability of a bank to meet the liquid needs of a depositor. Dang (2011) stipulate that adequate level of liquidity correlate positively to bank profitability. Liquidity as a factor can be measured by financial ratios drawn from financial statements. Liquidity is calculated by computing total loans to total asset or total loan to customer deposit. In regards to this study, liquidity of banks will be calculated using the ratio of customer deposit to total asset. A high ratio implies banks may not have enough liquidity to cover unforeseen fund requirement. Contrariwise, a low liquidity ratio may not be earning as much as it could.

2.5.3 External Factors/Macroeconomic Factors

Bank performance cannot be isolated from the various macroeconomic variables. Macroeconomic variables such Gross Domestic Product, Inflation, Interest Rate macroeconomic policy stability and Political instability are amongst the macroeconomic variables that directly affect bank performance. Regarding this study, interest rate and Gross Domestic product will be used as the macroeconomic variable to assess the performance of banks. Analyzing the responses of bankers revealed 70% of bankers acquiescing that the performance of the monetary economy (with interest rate being the dominant component) as the prime economic factor expected to impact the banking industry's future (Ghana Banking Survey, 2014).

Interest rate in simple terms is regarded as the price of money. Handa (2009) posits that interest rates is comprised with the cost of investment regarded as an appreciation in an economy's capital stock and a primary requirement for the growth of an economy's output capacity. Hence, it can be argued that relatively low interest rates will lead to higher investment and therefore higher growth rates for the economy. Interest rate is also seen as the yield accrued on savings lent through the financial markets. The neo-classical theory suggests a positive relationship between interest rate and savings such that higher rates of interest imply higher saving. Banks' profitability is said to be significantly

affected by interest margin. Interest margin represent the gap between lending rate and the interest with which banks fund their lending. Consistently, both the lending rate and the interest rate on funding generally follow the policy rate which implies that interest margin ought not to be affected by the level of interest rates. The Bank of Ghana Policy rate is the price or rate of interest at which the central bank lends funds to commercial banks and denotes the marginal cost of the funds to the banks. Banks are therefore compelled to adjust their base rate to reflect the fluctuations in the policy rate of the central bank (Adoah, 2015).

Gross domestic product represents the monetary value of all finished goods and services in a country at a specified period. GDP is estimated to affect significantly affect the performance of banks. During periods of declining GDP growth demand for credit declines which impact negatively on the profitability of banks. However, a positive GDP growth results in high demand for credit owing to the nature of business cycle. In other words, GDP as regarded as the value of a country when positive improves the asset quality of banks and leads to increased lending by which enhances profitability. Athanasoglou et al. (2005) stipulate that during boom periods the demand for credit is high compared to recession.

2.6 Theories on Financial Innovations

According to Chambers 21st Century dictionary a theory is defined as a series of ideas and general principles which seek to explain some aspect of the world. It is also regarded as an idea or explanation which has not yet been proved; a conjecture; a general and usually abstract principles or ideas of a subject.

A theoretical framework on the other hand comprises of concepts and, together with their definitions and reference to relevant scholarly literature, existing theory that is applied to a particular study. This framework provides a guide for further studies in a particular study, in this case financial innovation. There are several theories that have characterized the history of finance as a “chronicle of innovations”. Hence this section of the chapter is engrossed on some of the theories bordering on financial innovations. Theories to be reviewed include the following; Schumpeter innovation theory, Regulation Innovation

Theory, Circumvention Innovation Theory, Task Technology Fit Theory, Innovation diffusion theory, Transaction cost Innovation Theory and Constraint- induced theory

2.6.1 Schumpeter Innovation Theory

The Schumpeter Innovation Theory was propounded in 1928. The theory enabled independent entrepreneurs were able to create an avenue to innovatively raise additional profit (Schumpeter, 1939). In simple terms, the pursuit of entrepreneurs to maximize profit as they continuously developed new products. These innovations permitted entrepreneurs to enjoy temporary monopoly profit. These attracted imitators into the use of the new innovation which eventually reduced the profit margin for the innovation.

Schumpeter (1939) provided an explanation of how economic growth occurs through innovations. Schumpeter (1934) further attributed the significant role in economic growth to the disruptive activities of entrepreneurs and then to large corporations which led to the process of creative destruction by causing continuous disturbances in the economic system. The theory made emphasis to the significance of entrepreneurship and their effort to innovative ventures to roll out activities to renovate and expand their flow of income. This is motivated by distinctively drawing out the peculiarity between invention and innovation as well as commercialization and entrepreneurship. The distinction of innovation and invention characterized the nineteenth century institutional model of innovation where independent inventors came out with new ideas and products that served as input for entrepreneurial firms. Again, Schumpeter (1939) sought to draw a distinction between the entrepreneurs with innovations that create favourable conditions to ensure the profitability among new enterprises and the bankers who provide the finances for the construction of new ventures.

Notwithstanding the enormous contributions of the theory, the limitations associated with the theory include the perpetual gales of creative destruction that were essential forces driving growth rates in a capitalist system. Besides pointing out the merit of innovations and its fringe benefit, the theory failed to highlights the font of innovations.

2.6.2 Innovation Diffusion Theory

The Innovation Diffusion Theory was amongst the initial theories adapted by researchers to model technology acceptance among customers. The theory attempts to explain the process with which innovations are introduced and made known through certain channels over time among the members of a social system as postulated by Rambocas and Arjoon (2012). Rogers (1983 and 2003) is identified with the innovation diffusion theory which is prominent in the study of financial adoption theory. The theory sets out four basic elements that influence the adoption of innovation which includes; social systems, innovation, communication channels and time. Dillon and Morris (1996) buttressed by Rogers (2003) highlights some factors that affect the diffusion of innovation which includes compatibility, complexity, Observability, relative advantage and trialability. The factors influencing the diffusion of innovations are elaborated below;

- Compatibility: depict the association or consistency with which perceived innovations fall in line with the prerequisites, values and perspectives of the adopter. This facet of the diffusion theory relates to the extent to which the innovation is deemed to be aligned with customer values, past and potential wants and needs.
- Complexity: it elaborates the complications and intricacies associated with the use and adoption of innovation. This dimension recounts the amount of mental and physical efforts required in order understand innovations.
- Observability: illustrate the extent to which outcome or consequence of innovation are visible to others.
- Relative advantage: illustrates the extent to which an innovation is perceived to be superior in relation to others. According to Taylor and Todd (1995) new technologies are considered to possess a relative advantage over existing technology based on its perceived usefulness or its ability to enhance the user's state of well-being defined either economically, financially, physically or socially (Taylor & Todd, 1995).
- Trialability: relates to the level to which innovation is experienced before its actual adoption (Hernandez and Mazzon, 2006). Trialability provides the adopter

with the prospect to make an initial assessment of the innovation on a limited time scale prior to full adoption. Rogers (1983) contended that trial of innovation reassures the adopter and minimizes the risks and uncertainty associated with adopting the technology.

The probability of adopting innovative technology corresponds positively to the opportunity given to customers to tryout with the technology preceding the adoption.

2.6.3 Circumvention Innovation Theory

The circumvention Innovation theory was proposed by Kane (1981). The theory was propounded on the basis that regulations and controls of government with the similar characteristics in terms of implicit taxation mortify the profitable activity engaged by the company and the opportunity of earning profit. Subsequently, market innovation and regulation innovation is considered as a constant fighting process between independent economic force and political force. Since the financial industry is distinctive and constrained by firmer and effective regulations they sought to deal with issues relating to reduction in profit and management failures prompted by government regulations in order to minimize or overcome potential losses. This culminates in the adoption of financial innovations to maximize profit and circumvent government regulations.

The theory is however being distinct from reality. The regulation innovation promulgated by Kane's has always been directed towards the reinforcing of regulations. On the contrary, the regulation innovation in reality is directed towards the liberal markets innovation, the outcome is inclined to the release of financial regulation which tends to make the market more liberal. This theory is seen to be the origin of innovation in the market as well as comprehensively providing an explanation to the process of regulation and their dynamic relation.

2.6.4 Task Technology Fit Theory

Goodhue and Thompson (1995) are proponents of the Task Technology Fit Theory. The theory asserts that there is an affirmative bearing on individual performance with the application of Information communication and technology in the performance of a particular task. Goodhue and Thompson (1995) identified the under-listed factors as a

measure of the task-technology fit; authorization, compatibility, eases of use/training, quality, locatability, production timeliness, systems reliability and relationship with users. Ngumi (2014) cites that the theory of task-technology is essential in analyzing a range of information systems including electronic commerce systems and collectively used as an extension of other models related to information systems outcomes.

Consistently, the theory stipulates that the practicality of an information system ought be in line with the fit between task and technology, in circumstances where success has been linked to individual performance as indicated by Goodhue and Thompson (1995) and to group performance promulgated by Ziguers and Buckland (1998) scrutinized by Ziguers, Buckland, Connolly and Wilson (1999). Ziguers et al. (1999) comprehensively enacted the requirement of the group support system to fit group tasks. Consequently, Gebauer and shaw (2004) realized the general relevance of the mobile information systems and task-technology fit nonetheless more specific questions relating to the applicability of task-technology fit to mobile information systems remain unanswered (Gebauer and Shaw, 2004).

The theory affirms that the link between business tasks and information technology is imperative in explaining and predicting the success of information systems (Goodhue and Thompson, 1995; Ziguers and Buckland, 1998). The task-technology fit theory enables the identification of key features that are critical in supporting a given business task as well as contributing significantly to the success of technological innovations (Junglas and Watson, 2006). Notable of amongst such innovations include the introduction of mobile technology to support an increasingly mobile workforce as noted by Barnes (2003). Upon application of the theory to mobile information systems, it has become apparent that initial studies were mainly engrossed on the functionality provided by the technology and thus paid less attention to the context in which the technology is being used (Perry, Brown, Harper, O'Hara and Sellen, 2001). In other related studies, the usability studies suggested that the use-context may have a non-trivial influence on the conditions of task-technology fit (Perry et al., 2001). Nevertheless, the theory is identified with functional and non-functional features. Thus, functional requirements are seen to shift as business tasks are often performed differently in mobile versus non-mobile use

contexts (Perry et al., 2001; Gebauer and Shaw 2004; Zheng and Yuan, 2007) while non-functional features play a more predominant role in mobile relative to non-mobile use contexts (Gebauer and Ginsburg, 2006; Turel, 2006).

In reference to apparent modifications of business tasks and related technology requirement associated with the theory, Junglas and Watson (2006) mentions that it becomes imperious to make an assessment as to the applicability of the theory in the context of mobile technologies and mobile use, and carefully make justifications for theory adjustment and extensions.

2.6.5 Regulation Innovation Theory

The regulation Innovation theory is accustomed to Scylla (1982). The theory views financial innovations from a perspective of economic development history. The main proponent of the theory is that financial innovation is closely linked to social regulations and government activities. Regulation transformation is conceived of mutual influence and a mutual causality with economic regulation. The theory reputes that rules and regulations are used to control financial innovation which is an obstructive force of financial innovations and therefore ought to be directed towards financial reforms and innovations.

Scylla (1982) cited in Korir (2014) stipulates there is limited space for financial innovation in a planned economy with strict control and in the pure free-market economy, so any change brought about by regulation reform in financial system can be regarded as financial innovation. Thus innovative ventures are said to be progressive in a market economy controlled by government. Government interventions and management of the economy sometimes hamper financial activities which intend leads to financial innovations to get around government controls.

2.6.6 Transaction Cost Innovation Theory

The transaction cost Innovation theory was built on the foundation of financial innovations leading to a reduction in the transaction cost. The theory was promulgated by Hicks and Niehans (1983). They argued that the prime motivation for financial innovation was to cause a reduction in the cost of transactions and also for financial

innovations to respond to the advancement in technology which leads to the reduction in cost. The reduction in transaction cost in turn induces financial innovations and leads to an enhancement in the provision of financial services. Again, the theory is engineered on comprehensive motive that financial innovation is basically purposed at enabling financial institutions to earn financial benefits.

2.6.7 Constraint- Induced Theory

The constraint-induced theory was instituted by Silber (1983). The main proponent of the theory is profit maximization in relation to financial innovations in financial institutions. Thus, firms accustom to innovations mainly to increase profitability. The theory points out to some restrictions which bother on external handicaps and internal handicaps with a firm's pursuit to maximize profit. Makur (2014) explains that regardless of some inherent external and internal environmental obstacles which limit the apprehension of profit maximization. These inherent limitations undermine the efficiency of financial institutions. Constraint-induced theory in relation to financial innovations is built on the foundations of microeconomics hence originitive and representative. Again, the theory is engrossed in innovation of adversity making it a challenge when expressing a phenomenon of financial innovation increasing in the trend of liberal finance commendably.

2.7 Conceptual Framework

The wordweb dictionary (2015) defines a concept as an abstract or a general ideal inferred or derived from specific instances. In other words, a concept is understood to be instantiated or materialized by all of its definite and prospective instances thus whether manifested in the real world or other ideas. Miles and Huberman (1994:p18) defines a conceptual framework as a written or graphical presentation that "explains either graphically, or in narrative form, the main things to be studied the key factors, concepts or variables and the presumed relationship among them". A conceptual framework constitutes concepts that are explained within a logical and sequential design to provide clarity and proposed relationship among the concepts in a study.

The conceptual framework of this framework sought to depicts the nexus between financial innovation and the performance of banks in Ghana. The conceptual framework of the study is graphically presented in figure 2.1 below;

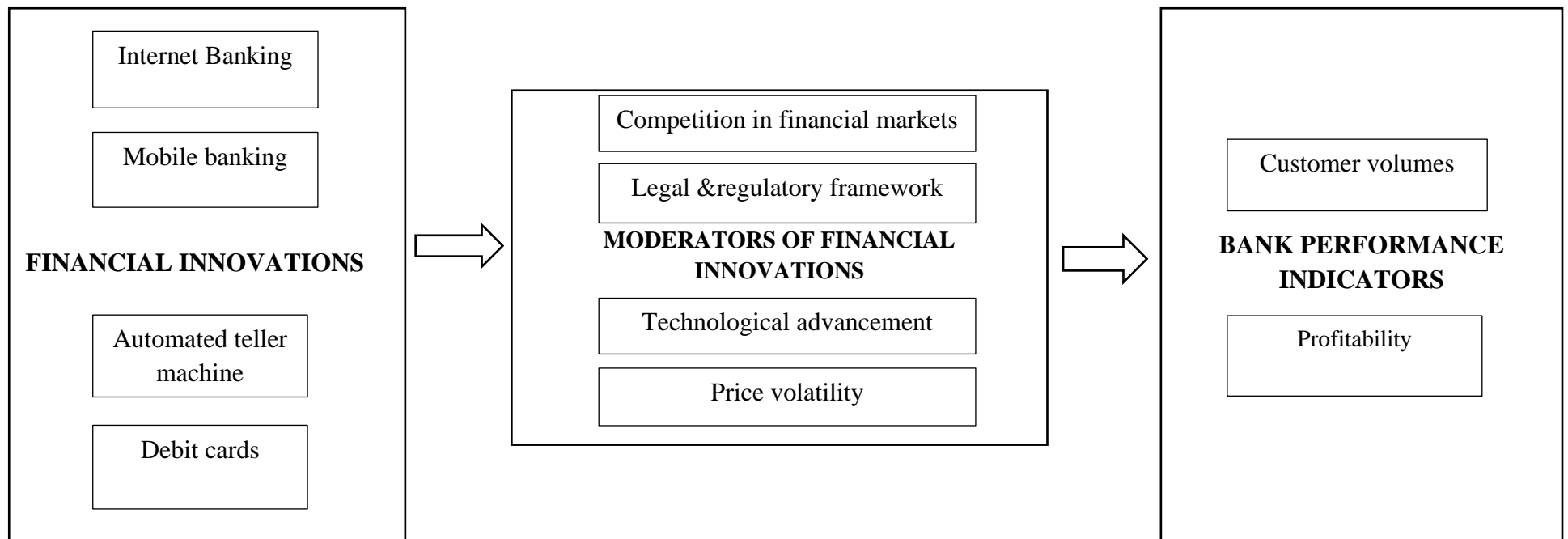


Figure 2.1: Conceptual Framework

(Source: Author's Construct, 2016)

Figure 2.1 depicts a graphical representation of the study which sought to comprehensively provide the linkage of financial innovations and how it affects the performance and growth of banks with reference to adopted bank performance indicators mainly customer volumes and profitability.

2.8 Empirical Literature Review

This section of the study provides an insight on related works that provides some form of empirics relevant to the study. Thus, review of literature in this section cover a range of scientific literature in the field of financial innovation related to the study as well as placing the study into an intellectual perspective.

Ghana Banking Survey (2014) noted that bankers regard technological factors to have a significant impact on the future performance of banks. The industry's uptake and deployment of technology in the delivery of banking services is driven by the pursuit to meet customers demand for convenience, increase wealth, ensure cost-efficiency and increased banking penetration. It is against this background that empirical review on the study is sectioned into market and financial performance as presented below;

2.8.1 Financial Innovation and Profitability

The aim of any profit-seeking enterprises is to seek continual development of innovative and improved products, processes and organisational structures that will ensure a reduction in their cost of production, satisfaction of consumer demands and increase profitability. In order to achieve the latter induces the adoption of innovations that are achieved either through formal research and development programs or through informal mending or trial and error effort (Frame and White, 2002).

In a study to establish the influence of information technology on the banking industry, Shirley and Sushanta (2009) concluded that regardless of information technology leading to cost. Increased expenditure on IT can create network effects of lowering the profit of banks. The study comprehensively utilized a panel data covering 68 banks over a period of 20 years in establishing the effect of IT on profitability. The study sought to establish that the link between IT expenditures and financial performance of banks is conditional to the extent of system or network effect. The study establishes that there is restrictive relationship between network effect and IT expenditures. Thus, if the network effect is too low it is likely to result in incremental effect in market share and increase revenue and profit.

Githikwa (2009) study on the effect of financial innovation on the profitability of banks in Kenya resolved that banks adoption of financial innovations enables them to moderate costs of operations, reduce cost per transaction as well as guaranteeing customer satisfaction. The study established that banks conceptualize financial innovations as a means of impacting on the profit performance. The study again stipulated that commercial banks become supplier in its operations and further leads to its expansion either through implementation of product, process or institutional innovation.

Ngumi (2013) study on bank innovations and financial performance of commercial banks in Kenya depicted that bank innovations have a statistical significant impact on customer deposits, income, profitability and return on asset amongst commercial banks in Kenya. The study findings revealed that bank innovations via mobile phones had higher moderating effect relative to internet services in relation to impact on financial performance of commercial banks in Kenya. The study however emphasized that there is a positive association between bank innovation and profitability of banks in Kenya.

Additionally, Iftekhar, Schmiedel and Song (2009) revealed that innovations of retail payment services contribute significantly to improving the performance of banks in countries with relatively higher adoption of retail payment transaction technologies. The study stated that banks connecting to a wider ATM network enable banks to be on a path of generating additional revenue from other banks' customers that use its ATM machines or from third parties that cooperate with it. Thus, banks are able to generate additional fee-based income with more third party transactions, enforcing the bank to enrich the features of e-banking transactions, such as payment of utility bills, mobile telephone top-ups, ticketing, etc. similarly, banks connecting to a certain ATM network create customer awareness and influence the market share of banks. The study again revealed that in addition to the impact of innovations on bank performance, retail payment transaction technologies impact immensely on the relationship between retail payment services and bank performance. The study denotes advanced retail payment transaction technologies enhance innovation and growth in the retail banking sector which intends to create a more value associated with retail payment services for banks. Nonetheless, the study concluded that retail payment transactions conducted through ATMs or POS instead of retail payments

offices provides avenue to generate be more cost efficient and an increased regular income hence improving profitability.

Mabrouk and Mamoghli (2010) embarked on a study themed the dynamics of financial and the performance of banking firms: context of an emerging banking industry. The study sought to investigate the consequence of product and process innovation on the performance of banks. The study was concerned with an analysis on two adoption behaviours mainly first mover adoption of financial innovation and imitator of the first movers. The study revealed that first mover adoption of product innovation improves profitability of banking firms whereas process innovation adoption positively both profitability and efficiency of banks. Invariably, the study depicted imitation of innovations is less profitable and less efficient relative to first mover adoption of innovation. Accordingly, Sana, Mohammed, Hassan and Momina (2011) in a study to establish the impact of E-banking on the profitability of banks noted that banks are making appreciable gains from innovation led services by way of commission and service charge as well as annual deductions. The banks apply certain amount of charges or percentage charge on products and service such electronic money transfers, ATMs etc. Comparing the era of traditional banking to modern era of E- banking revealed that banks are making excessive profit implying that there is a positive correlation between e-banking and profitability. Apparently, banks are gradually transitioning from manual banking process to the electronic process rather than directly hopping into electronic means of banking. Efficiency associated with the electronic banking system has ensured reduction in labour cost, accuracy, reliability and improved service quality.

Notwithstanding the above, Korir (2014) carried out a study to evaluate the effect of financial innovation on the financial performance of commercial banks in Kenya. The study focused on 44 commercial banks in Kenya. The study solely adopted secondary data to carry out a regression and correlational analysis that sought to establish the link between financial innovation and financial performance of banks. Consistently, the study revealed a positive relationship between financial innovation and the financial performance of banks. The study was carried out taking into account the value of checks cleared, the value electronic funds transfer and the value of real time gross settlement transfers which explained 92.8% of the variability in the financial performance of the commercial.

On the contrary, Pinto and Sobreira argue that the widely accepted advantages of electronic payments reduce the desirability of holding bank deposits for long times as was required when using checks. In other words, electronic payments increased speed and efficiency of the system while reducing the need to hold deposits for longer terms. This view is also supported by chami et al. (2003) who claims reduction of time for holding deposit puts dramatic pressure on loan agents in effect reducing profitability of banks.

2.8.2 Financial Innovation and Customer Volumes

There is a great deal with regards to the development of new forms of existing products offered to customers. Technology-based applications such as ATM, mobile banking, POS network, telephone banking and internet banking bring significant advantages to customers in the delivery of existing products which significantly contribute to customers increasing day by day (Akhisar et. al 2015). Invariably, Mbutor and Uba (2013) argue that banks are gradually moving away from manual means of banking to electronic means to entice, retain and win more customers and secure their loyalty. This is the essence for various modes of incentives to encourage loyalty, entice and stimulate customers' interest, via steady and improved adoption by customers.

Kombe and Wafula (2015) sought to establish the effect of internet banking on financial performance of banks in Kenya revealed that internet banking through traditional banks enabled customers to complete all routine transactions, such as account transfers, balance inquiries, bill payments, and stop-payment requests, and some even offer online loan applications. The study revealed online banking enabled customers' easy access to account information and thereby improving banking efficiency in rendering services to customers. The study findings revealed financial institutions in Kenya cannot disregard information systems since they play a vital role in their operations since customers are cognizant of technological advancements and demand higher quality services. On whether cheaper internet leads to extended client base, 18 respondents representing 58.1% agree with the statement, while 8 respondents representing 25.8% extremely agree and only 4 respondents representing 12.9% are indifferent to the statement. The study again emphasized that effective use of ICT creates distinctive competence that enhance market share and mostly importantly denoted that cheaper internet costs can lead to extended client base as many potential customers seek value for their money.

Domeher et al. (2014) in their study on the adoption of financial innovation in the Ghanaian banking industry assert that both perceived usefulness and perceived risk significantly affect the adoption of e-banking innovation. The study denoted perceived usefulness as having more influence on the adoption of innovation and therefore emphasized that banking firms focused on designing useful and easy-to-use e-banking products to entice prospective and existing customers. It again emerged from the study that the compatibility of the innovation with customers' needs, the ease with which customers can use the innovation, the perceived usefulness thereof, the amount of information provided on the innovation and the level of customers' education all have a substantial positive impression on the adoption of e-banking innovations in the Ghanaian banking industry. Conversely, perceived risk was identified to influence the adoption of e-banking innovations negatively. Therefore, the above enumerated factors must be taken into consideration during the design and implementation stages as the banking industry continues to expand and realize the introduction of an array of innovative products to gain competitive advantage. This study makes suggestions for banks to assess the potential success of new products they plan to introduce to attract prospective client or to reduce customer attrition.

Unvaryingly, the popularization and widespread availability of internet banking within the banking system is estimated to affect the range of financial services produced by banks as well as the mode with which services are produced and the consequential financial performance of these banks. Hence, the adoption of internet banking as a better means to serve its wide and ever growing customer base with quality service, fast, efficient and convenient manner. Regardless of the widening customer base of banks, it is believed that widespread availability of internet banking provides banks with regularly income thus leading to profitability and a potential impact of cost savings and risk profile of banks (Berger, 2003). This supports Akuffo-Twum (2011) assertion that customers and officials have become enthused about internet banking facilities because of its innumerable benefits. Thus, he revealed in a study that Internet banking would ensure greater customer loyalty and a desirable customer-banker relationship.

Consistently, Muiruri and Ngari (2014) in their research findings indicated agent banking have had the effect of increasing the number of transactions which the banks conduct in a day hence transaction charges. The agent banks outlets have increased competition among the banks and

have been within the reach of the customers especially those at rural areas. The study concludes financial innovations through agent banking; use of credit cards, internet banking and mobile banking in Kenya has greatly influenced the performance of banks. Again, Kenyoru (2011) established that there has been a stable rise in the number of financial users since 2007 from 217.2 to 700.3 depositors with commercial banks and other financial institutions per 1000 adults in 2012 in a study of to discover the effect of financial of financial innovation on financial deepening.

2.9 Summary of Related Literature Review

In relation to the review of relevant literature, it is established there is a statistically significant effect of financial innovation on the financial performance of banks. This view is supported by studies conducted by the following authors; korir (2013), Ngumi (2013), Muiruri and Ngari (2014) Iftekhar, Schmiedel and Song (2009), Mabrouk and Mamoghli (2010), and Githikwa (2009). The studies conducted by these authors acknowledge the efficiency and transformational effect with regards to enhancing banking operations. In relation to the contribution of financial innovation to non-financial performance of banks, authors like Akhisar et. Al, (2015), Mbutor and Uba (2013) and Kombe and Wafula (2015) depicts a strong correlation of financial innovation to performance of banks.

On the contrary, Pinto and sobreira (2010) and chami et al (2003) disputes that financial innovations impact negatively on bank performance in relation to bank deposit as an indicator for measuring financial performance. They argue financial innovations reduce the holding time for deposit relative to traditional way of banking with the use of checking means of withdrawal.

Regardless of the research works conducted on the financial innovations and it bearing on the performance of banks, it is evident there is much concentration on financial performance and particularly with the adoption of profitability ratio (mainly ROA and ROE) as a means of verification with the neglect of other financial and non-financial indicators. This study therefore sought to address the shortfall with the adoption of other financial and non-financial indicators as means of verifying the significance of financial innovation on bank performance.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter examines the research methodology employed in the study. The section primarily outlines the approach to eliciting responses to address the research questions. The section elaborates on the scope of the study and data sources required to inform analysis that will ultimately aid in achieving the objective of the study. The chapter again presents the conceptual econometric model to be adopted for the study. Specifically, the chapter seeks to justify the econometric model, the economic variables, and sources of data to be adopted in the study and finally discusses the validity and reliability of data sources.

3.2 Research Design

Research design can be defined as the overall strategy that is chosen to integrate the different components of a study in a coherent and logical way. A research design constitutes the blueprint for the collection, measurement, and analysis of data (De Vaus, 2001; Trochim, 2006). Research design is seen as the approach or method employed in the design of a study or carried out in a research to ensure that a research problem is effectively addressed. This study utilized an analytical method to examine the contribution or the role financial innovation plays in the development of the banking industry.

According to Bhattacharjee (2012), explanatory research is designed to seek descriptions of behaviours, observed phenomena and problems. It is suitable for seeking answers to ‘how and why’ types of questions as well as pinpointing causal factors and consequences of the target occurrence (Bhattacharjee, 2012). In effect explanatory research design aids in enhancing the understanding of characters and mechanisms of relationship that exist between dependent and independent variables. In this case the explanatory research design was used for an effective analysis of the study since it aided the researcher to gain a deeper theoretical and empirical understanding on why and how financial innovations improves or affects the performance of banks in Ghana.

3.3 Study Population and Sampling Technique

Bhattacharjee (2012) outlined a population to include people or items (i.e. unit of analysis) with the characteristics or features that one intends to study. The unit of analysis is comprised of a person, group, organization, country, object, or any other entity that one intends to draw scientific inferences about. In other words, the research population is regarded as the collection of individuals or objects with a common or binding characteristic or trait that is considered for the main focus of a scientific query. The target population for the study is 34 class 1 licensed banks in Ghana which is comprised with all registered universal banks in addition to the APEX bank which is the mother bank for rural and communities banks. The sampling frame was chosen to be the 29 operating licensed universal banks (as at March 2016). The sample chosen for the study covers 5 tier one banks in the country that has a total market share of 39% of the industry's operating asset according to Ghana Banking survey (2015) which is representative enough as Mugenda and Mugenda (2003) stipulates a sample frame of 10% is sufficient to represent a research population. This study adopts purposive sampling technique to identify the sample units. The selected banks which include Stanbic, GCB, Barclays, Stanchart and Ecobank remain the pioneers and frontliners so far as Ghana's banking industry are concerned as well as representing the banks that have heavily invested in innovations.

3.4 Data Sources and Collection Methods

In an economic research diverse data types can be used to make statistical analysis. The data type includes cross section data and time series data. A panel data set was employed for this study. This is because panel data as a method aids in the estimation of economic relationship with cross section series which has time dimension. Data for the study was obtained mainly from secondary data sources. Secondary data was retrieved from both published and unpublished documents on the subject of financial innovation and the banking industry subsector development. The sources of data included those from journals, reports, thesis among others. Other secondary data were gathered from the Finance, Consumer Banking and Product Development Department of the various banks using semi-structured questionnaires and interview guides. The questionnaires were designed to mainly gather data on expenditure on financial innovations. Data on financial performance and total number of bank customers were obtained from the banking performance report of the Bank of Ghana and bank's published annual financial reports covering a period of 5 years (2011 to 2015) which is appreciable to

empirically determine the nexus between financial innovation and bank performance in relation to internal and external factors. The heads of finance, consumer banking and product development of these banks were selected to be respondent of questions since they were in positions to provide accurate and sufficient knowledge about bank innovations than other employees.

Justifiably, the period between 2011 and 2015 is chosen as the period for observation because the global financial crisis which was attributed to financial innovations was postulated to have ended in 2011 which appeared to have impeded profitability in the Ghanaian banking industry because of the slowdown in the global economy. Moreover, the same period witnessed a boom in the economy arising from commercial production of oil which crowned the proliferation of universal banks which sparked the immense competition in the industry.

3.5 Study Variables and Units of Analysis

The main variables of the study are three, namely; customer volumes, financial innovation and profit before tax. Meanwhile, interest rate, gross domestic product, management efficiency and liquidity management were employed as control variables to neutralize the effect of financial innovation on customer volumes and profitability of banks. Table 3.1 depicts the variables to be subject of analysis and the means of measurement for these variables.

Table 3.1: Study Variables and Unit of Measurement

Variables		Notation	Measurement	Approximated Impact
Dependent variables	Profitability	y_1	Ghana cedi value of profit before tax at the end of each year	
	Customer volumes	y_2	Total number of account holders	
Independent variable	Financial innovations (ATMs, credit cards, mobile banking and internet banking)	x_1	Expenditure on innovations	+
	Internal factor	x_2	Operating expense to total profit	+
	Management efficiency	x_3	Customer deposit to Total Asset	
	Liquidity			
	External factor			
	Interest rate	x_4	Regulatory policy rate	-/+
	Gross Domestic Product	x_5	Annual gross domestic product	+

Source: Author's construct, 2016

3.6 Data Reliability and Validity

Reliability is defined as the extent to which the measure of a construct is consistent or dependable (Bhattacharjee, 2012). The reliability of a research instrument is concerned with degree to which a research instruments (questionnaire) produces the same results upon repetitive trials. Reliability implies consistency but not accuracy (Bhattacharjee, 2012). Hence, there is always some form of unreliability present to a certain extent but however there will generally be a good deal of consistency in the results of a quality instrument gathered at different times. The reliability of the study was tested using the internal consistency reliability specifically by use of cronbach's alpha formula which produced a statistical figure of 0.761.

Table 3.2: Reliability Statistics

Cronbach's Alpha	N of Items
0.761	7

Source: Author's construct, 2016

Validity defines to the degree to which measures adequately represent an underlying construct that it is supposed to measure (Bhattacharjee, 2012). Validity can be evaluated using theoretical

or empirical methodologies, and should ideally be measured using both approaches. Theoretical evaluation of validity makes emphasis on how well the idea of a theoretical construct is translated into or represented in an operational measure. Empirical assessment of validity on the other hand examines how well a given measure relates to one or more external criterion, based on empirical observations. The questionnaire for the study was designed in a careful manner and was tested on industry players for further improvements. This was carried out in order to augment the rationality and accuracy of data collected for the study.

3.7 Analysis of Data

This section of the study sought to comprehensively explain the analytical method employed to collate data to address specified objectives. Data analysis was piloted using both descriptive and inferential statistics. The Statistical Package for Social Sciences (SPSS) was used to generate output from the data gathered and output presented in the form of frequencies and percentages. Descriptive statistics were used as measures of central tendencies. Discussions were made out of the output and related to findings from previous works in literature to ascertain consistencies or divergence. Regression analysis was carried out to determine if there were a relationship between the financial innovations and bank performance

3.7.1 Analytical Model

A regression is found to be useful in establishing the relationship between two variables. That is, a regression model is used to explain one variable in terms of the other. In this study, a multiple regression model was employed to estimate the relationship between financial innovation and the performance of banks. The reason for the adoption was founded on the basis that multiple regression analysis is more acquiescent to *ceteris paribus* analysis since it allows us to explicitly control for many other factors that concurrently affect the dependent variable. The multiple regression models can also be used to build better models for forecasting the dependent variable (Wooldridge, 2012). In reference to the study, the independent variables refer to those explanatory variables while dependent variable refers to the explained variable. The independent variables denote financial innovations, management efficiency, liquidity management, interest rate and gross domestic product with the dependent variable signifying bank performance (profit before tax and customer volumes). The main variable of concern was financial innovation but in order to neutralize the effect of innovation on bank performance,

some control variables were adopted to conduct the estimation. Equation (3.1) addresses the issue of the functional relationship between *bank performance* and *financial innovations*.

Bank Performance = f (factors affecting bank performance)

$$y = f(X_1, X_2, X_3, X_4, X_5)$$

$$y_0 = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon \quad [3.1]$$

Where: y_0 = Bank Performance Indicators (dependent variable);

X_1 - X_5 = Independent Variables

β_0 = Constant (intercept) the value of bank performance when determinant values are 0.

β_{1-5} = measures the variation in *bank performance* with respect to *factors affecting performance* (X_1 - X_5), holding other factors fixed (regression coefficient).

X_1 =Financial innovations X_2 =Management efficiency X_3 =Liquidity management

X_4 =Interest rate

X_5 =Gross Domestic product

ε = **Error term** or **disturbance** in the relationship, represents factors other than *financial innovation and observed factors* that affect *performance of banks*.

Model specification for objective 1: In order to examine the correlation between profitability and financial innovation relative to other factors affecting bank performance, the multiple linear regression model specified in equation [3.2] was adopted.

$$PBT_{it} = \beta_0 + \beta_1[FI_{it}] + \beta_2[ME_{it}] + \beta_3[LM_{it}] + \beta_4[IR] + \beta_5[GDP] + \varepsilon$$

$$Y_1 = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon \quad [3.2]$$

Model specification for objective 2: The multiple linear regression specified in equation [3.3] sought to depict the influence of financial innovation on customer volumes in the midst of both internal and external factors which influence customer volumes. The

functional relationship sought to estimate the effect of innovation on customer base or account holders or clientele a bank has to deal with.

$$CV_{it} = \beta_0 + \beta_1[FI_{it}] + \beta_2[ME_{it}] + \beta_3[LM_{it}] + \beta_4[IR_{it}] + \beta_5[GDP_{it}] + \epsilon$$

$$Y_2 = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \epsilon \quad [3.3]$$

3.8 Test of Significance

The essence of carrying out the test of significance is that it allows in deciding as to whether the null hypothesis can be rejected (Mugenda and Mugenda, 2003). The significance of the relationship between the variables was tested at a 5% confidence interval.

3.9 Ethical Consideration

This section of the chapter outlines the measures that was undertaken to ensure that the study was carried out in accordance with the ethical dictates of conducting a research. The measures that were adopted include the following;

A letter, introducing the study, was obtained from the Department of Economics of the Kwame Nkrumah University of Science and Technology. Duplicate copies of the introductory letter were made and handed to the head of department of the consumer banking and product development of the banks covered in the study. This was done to ensure that the institutions were adequately informed about the purpose of the study before commencement of data collection.

In addition, the informed consent of subjects of the research was obtained before they were allowed to participate in the study as units of inquiry. This was done through the use of informed consent forms as shown in the appendix. The form was either read out or given to prospective participants to read and a section provided for them to sign to indicate their written consent before they were allow to participate as research subjects.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter presents a comprehensive analysis and discussion of study results. The chapter mainly sought to achieve the stated objectives through a presentation of both descriptive and inferential statistics. The chapter is sectioned into two with both sections exhausting the objectives of the study. To investigate the effect of financial innovations on performance of banks, a multiple linear regression analysis was carried to identify the effect of financial innovation relative to other factors on both profits before tax and customer volumes. Data for the analysis covered a period of 5 years (2011-2015) justified on the basis of data availability for these period. Additionally, the section presents a trend analysis of the variables in consideration.

4.2 Descriptive Statistics

This section provides the descriptive statistics that illustrates brief descriptive coefficients that summarizes the data set which is representative of the population. Table 4.1 presents the mean values, minimum and maximum and standard deviation values of the study variables over the entire period of the study.

Table 4.1: Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation
Profit Before Tax	17.206	19.949	18.961	0.704
Customer Volumes	10.779	14.346	12.743	1.097
Financial Innovation	14.751	19.953	16.655	1.027
Management Efficiency	0.474	8.387	1.365	1.521
Interest Rate	12.917	23.000	16.942	3.642
Liquidity Management	0.595	0.840	0.710	0.052
Gross Domestic Product	24.357	24.590	24.437	0.086

Source: Author's Construct, 2016

Table 4.1 depicts mean values of customer volume and profitability of banks in Ghana for the period between 2011 and 2015 as 12.743 and GHc18.961million respectively. The standard

deviation values of customer volumes and Profit before Tax were given as 1.097 and 0.704 respectively. The table also presents the minimum value of customer volumes and Profit before Tax as 10.779 and GH¢17.206 million and, maximum values of 14.346 and GH¢19.949million respectively. The standard deviation value for Profit before Tax indicates a 70.4% deviation from its mean value representing a relatively limited variation on a yearly basis. Varyingly, standard deviation figure for customer volumes indicate a relatively large variation of profit values from its mean values.

Invariably, the table indicates mean values of GH¢16.655million, 1.365, 16.942, 0.710 and 24.437 for financial innovation, management efficiency, interest rates, Liquidity management and Gross domestic product respectively. The standard deviations for the independent variables other financial innovation specify relatively limited yearly fluctuations of the individual values for the independent variables from their mean value. The standard deviation values of financial innovations, management efficiency, liquidity management, interest rate and GDP were recorded as 102.7%, 152.1%, 364.2%, 5.2% and 85.7% respectively.

4.3 Trend Analysis of study variables

This section of the chapter carries out a technical analysis that tries to predict the future movement of the study variables. Figures 4.1, 4.2, 4.3, 4.4 and 4.5 provide the trend movement of both dependent and independent variables adopted for the research study.

4.3.1 Trend Analysis for Profit before Tax (PBT)

Figure 4.1 presents the trend analysis for profit before tax of banks between the periods of 2011 to 2015. Profit from the beginning of the period was seen to be increasing thus from GH¢ 403,055,000 to a peak of GH¢ 1,560,258,000 mainly attributed to favourable economic conditions and macroeconomic stability within the economy that boosted the operations of banks culminating in the general rise in profit. The sustained profitability of banks over period between 2011-2014 cannot be isolated from factors such as high interest rate environment that resulted in high interest rate spread, better operating efficiency, especially in the last four years, improved asset quality in the midst of loan book expansion, a favourable funding structure that relies heavily on deposits and equity to fund balance sheet growth, and finally regulator-drive

recapitalization programs, which prompted some mergers (Ecobank/TTB and Access/Intercontinental) to form well capitalized and profitable banks (Ecobank research, 2014). However, there was downward turn after 2014 when banks reached a saturation point. The witnessed downward turn was attributed to the instability with macroeconomic variables coupled with energy costs due to the reoccurring energy crisis which affected banking operations adversely.

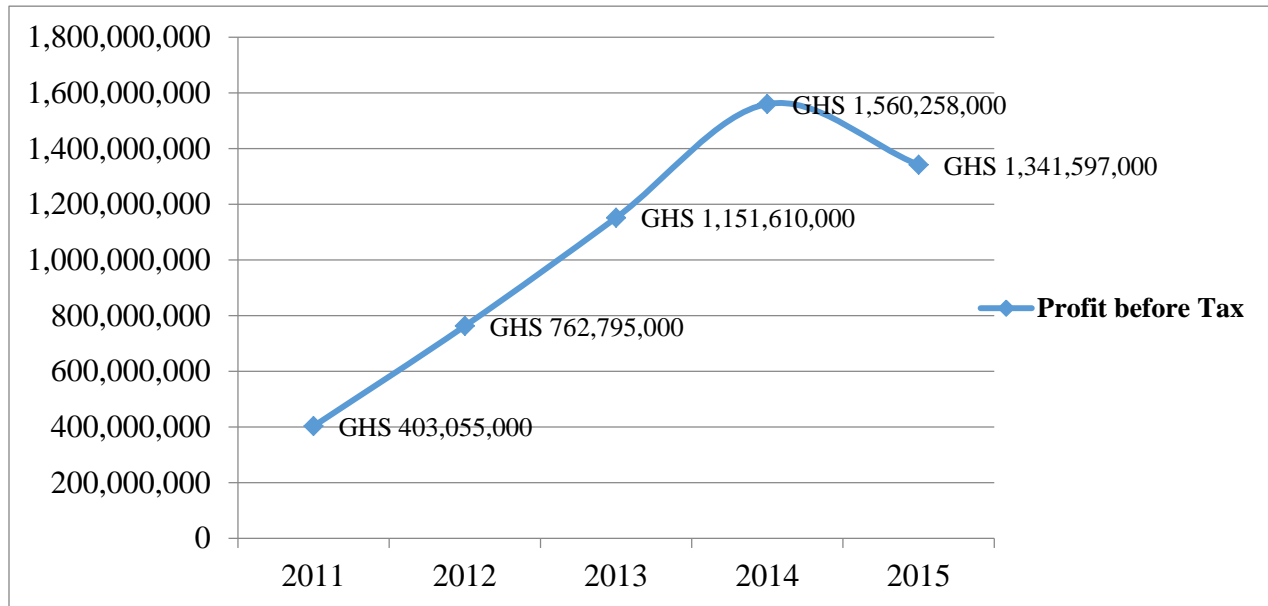


Figure 4.1: Profit Before Tax (2011-2015)

(Source: Author's Construct, 2016)

4.3.2 Trend Analysis for Customer Volumes (CV)

Figure 4.2 presents the customer volumes of banks over the study period. Records from figure 4.2 depict a significant growth in the number of bank client. The study period covering 2011-2015 witnessed about 48% growth in the customer base of the banks. The increase in the client base of banks cannot be isolated from the fact that banks in recent times are offering a spectrum of banking services to reach the financial needs of consumers as well as developing long-term relationships with clients. This development has therefore seen the reduction of customer attrition and ensured that banks reach a wider clientele base.

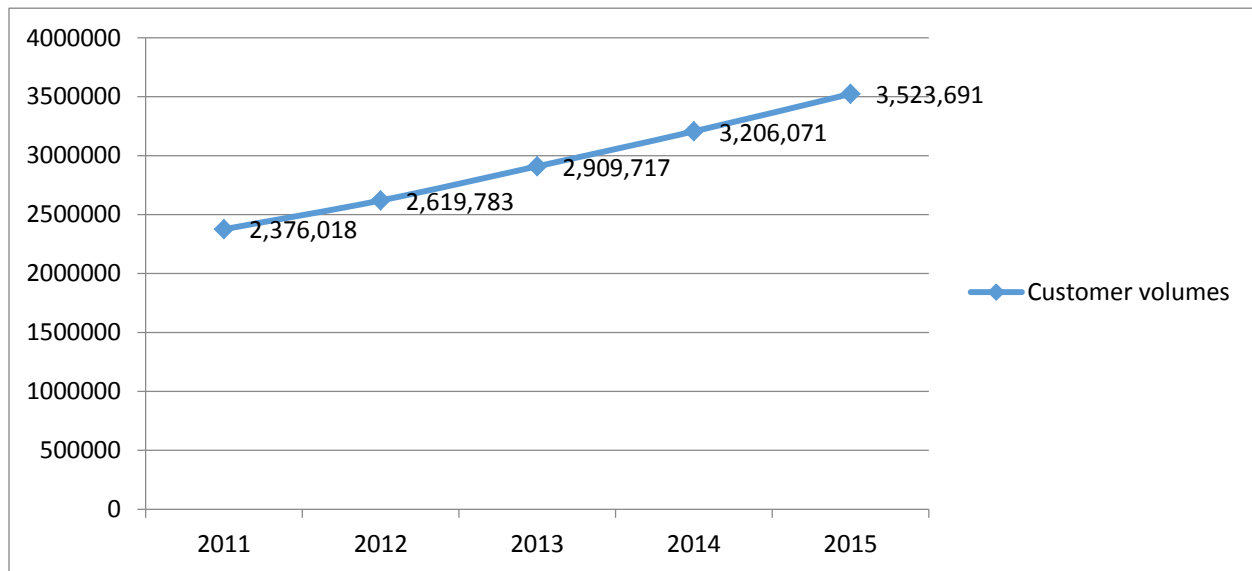


Figure 4.2: Customer Volumes (2011-2015)

(Source: Author's Construct, 2016)

4.3.3 Trend Analysis for Financial Innovation (FI)

Figure 4.3 depicts surges in the volume of expenditure dedicated to financial innovations. The steady increase in expenditure on innovations over the years can be ascribed to the motivation of banks to ensure improved and differentiating customer experience. It is an undeniable fact that over the period of 2011-2015, bank consumers are demanding for more convenient and easy ways of banking. Banks in a responds to the demand of customers are expanding channels and offering differentiated services that meet the unlimited demands of its customers. Regularly, Banks are also on the side are increasing expenditure in technologies and developing new product to strengthen clients' relationships and grow its profits as well as its customer base. The labeled justifications accounts for the increased investment in innovation from GH¢46,148,000 in 2011 to GH¢159, 588,000 in 2015

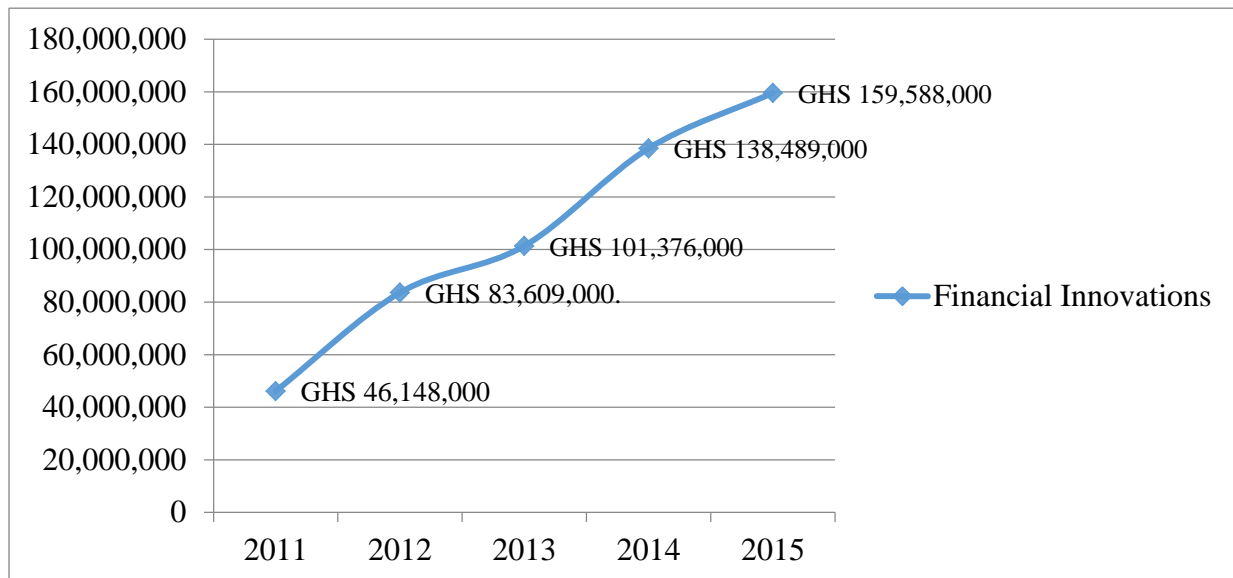


Figure 4.3: Expenditure on Financial Innovations (2011-2015)

(Source: Author's Construct, 2016)

4.3.4 Trend Analysis for Management Efficiency (ME)

Management efficiency as presented in figure 4.3 represents the mean value trends of management efficiency for the periods of 2011 to 2015. Management efficiency is represented by the ratios of operating expenses to total profit. From figure 4.4 it is realized 2011 recorded the highest figure of 2.59 followed by 2015 mean value of 1.426 which portray a predictable operating inefficiency thus with operating expenses excessively overriding profits. This inefficiency is accounted for by the uncomplimentary economic conditions relating to those periods. The ascendancy of the operating expenses is credited to the cost associated with development of new products and the provision of the necessary technological base to meet and support the needs of customers. Conversely, mean values of management efficiency for periods between 2012 and 2014 were found to be appreciable attributed to booms in the economy mainly ascribed to the commercialization of oil production and again with banks reducing their operational expenses due to the good economic climate in those periods.

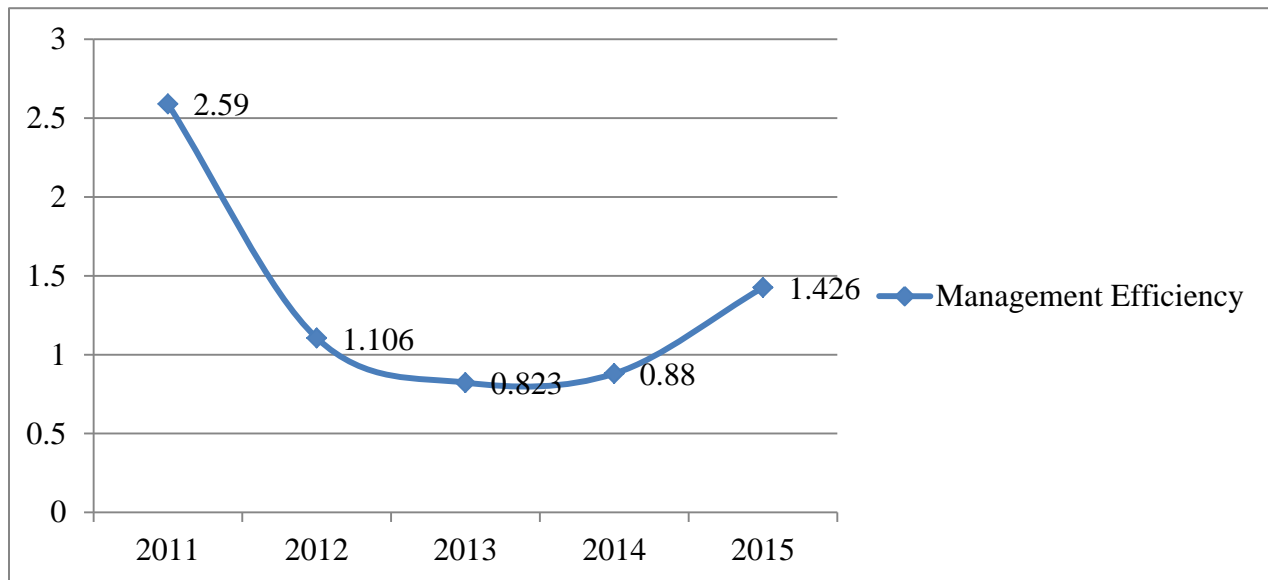


Figure 4.4: Management Efficiency (2011-2015)

(Source: Author's Construct, 2016)

4.3.5 Trend Analysis for Liquidity Management (LM)

Figure 4.5 present a trend analysis for liquidity covering periods of 2011 to 2015. Liquidity management was mainly measured using ratio of customer deposit to total asset. The figure depict years of variations in the liquidity management of banks. In relation to the diagram presented below 2013 and 2014 recorded a higher level of liquidity management. However, 2011 witnessed a lower level of liquidity management attributed to deteriorated total asset relative to customer deposit which could be attributed to the global financial crisis in that period. From the graph below it can be realized that banks have been working to reducing the ratio of customer deposit to total asset until 2015 where there was surge in the ratio which could be attributed to economic hardship in that period.

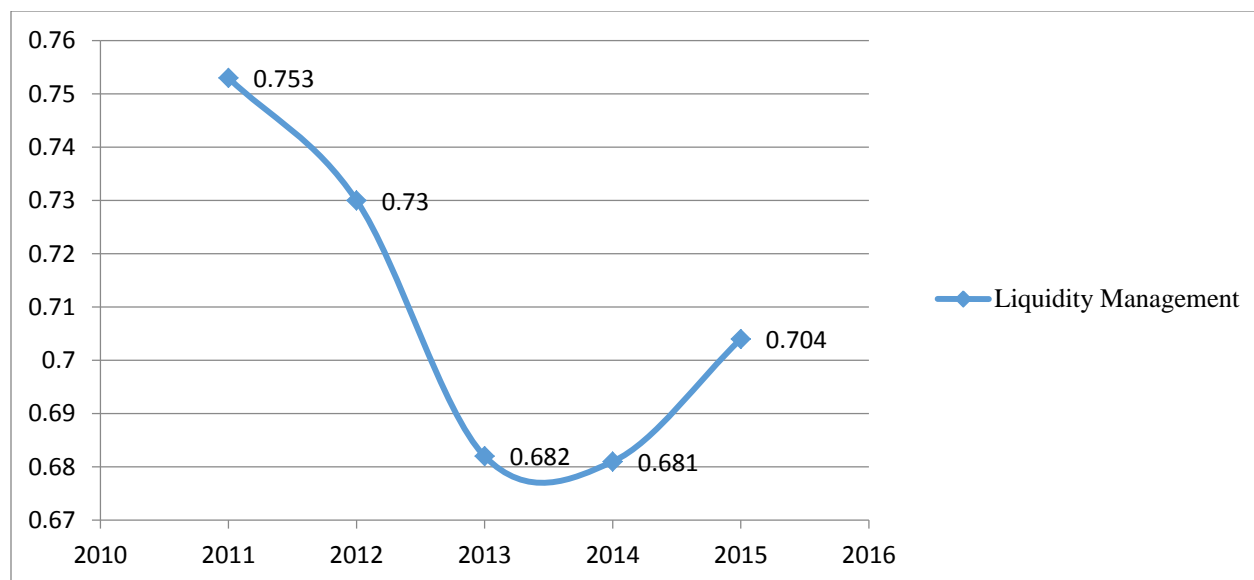


Figure 4.5: Average Liquidity management (2011-2015)

(Source: Author's Construct, 2016)

4.3.6 Trend Analysis for Interest Rate (IR)

Figure 4.6 describes the trends of interest rate as set by the Monetary Policy Committee (MPC) of the central Bank of Ghana over the last 5 years (2011-2015). As mentioned earlier, the central bank Policy Rate is the rate of interest at which banks in Ghana borrow funds from the central bank and also serves as the marginal cost of funds to commercial banks. From figure 4.5 it can be seen that Ghana's interest rate has been on the ascendency thus averaging from 12.917 to 23 between 2011 and 2015 years. This increasing interest rate is considered to be stifling investment, economic growth and the development of the private sector in general. The rapid increase in the average interest over the period can be attributed partly to high inflation rate. Additionally, the high cost in the banking industry covering operational costs, energy costs due to the reoccurring energy crisis, as well as structural inefficiencies, high borrower risks originating from inadequate collateral, lack of credit referencing, un-bankable projects and general macro-economic instability have culminated in the rising interest rates (The Finder, 2015). Again the adoption of inflation-targeting monetary policy regimes has culminated in the rising interest rate thus interest rate is adjusted upward when inflation rises enabling banks to maintain good real interest rates and spread (Ecobank Research, 2014).

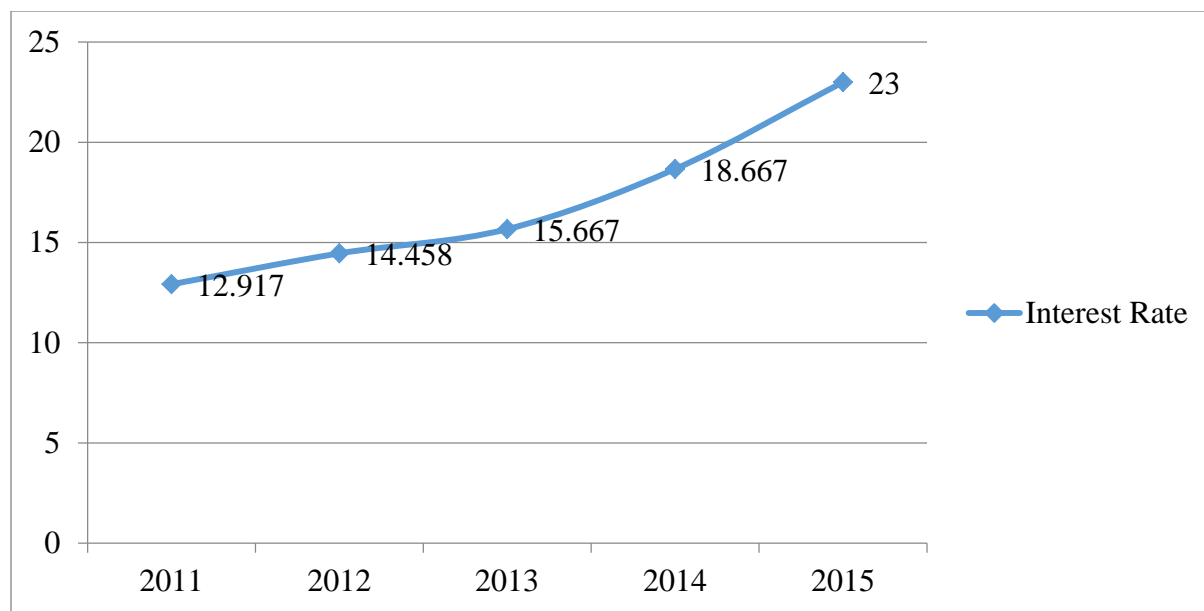


Figure 4.6: Average Interest Rate (2011-2015)

(Source: Author's Construct, 2016)

4.3.7 Trend Analysis for Gross Domestic Product (GDP)

Figure 4.7 present the trend analysis for gross domestic product covering the study. GDP figure for the study period witnessed an average growth of 20.80% from 2011 to 2013 which saw the highest growth of GDP. The growth of GDP over the period cannot be isolated from the boom in the economy as result of the commercial production of oil. Contrariwise, 2014 GDP saw decline thus to a value of \$38.61 billion. The decline in GDP was attributed economic distortions that characterised that period. The same argument is also advance for the 2015 fall of GDP growth.

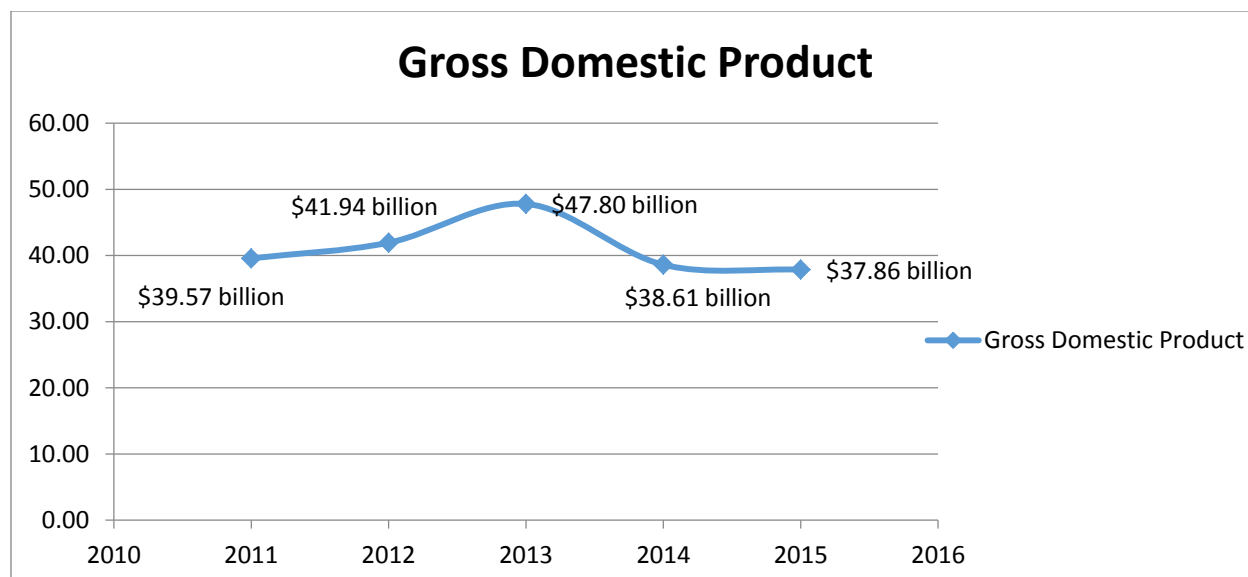


Figure 4.7: Gross Domestic Product (2011-2015)

(Source: Author's Construct, 2016)

4.4 Inferential Statistics

This section of the chapter makes inferences and predictions about the population based on the collated sample data from the population. In other words, the section adopts techniques that allow the use of samples to make probability judgments and generalizations about the populations from which the samples are drawn. The methods employed in the section include the estimation of parameters and testing of statistical hypothesis. Specifically, the section presents the correlation and regression analysis results that widely represent statistical procedures that are used to reach conclusions about the nexus between variables.

4.5 Correlation Analysis for Effect of Financial Innovation on Bank Performance

Correlation analysis for the effect of financial innovation on bank performance involved the adoption of the Karl Pearson's correlational method to evaluate the strength of association between financial innovations, management efficiency, liquidity management, interest rate, GDP and bank performance indicators (Profit before Tax and Customer volumes). Table 4.2 presents the Pearson bivariate correlation coefficients with their levels of significance between the dependent variables and financial innovations relative to other pressing factors that influence bank performance.

Table 4.2: Correlation between Bank Performance FI, ME, LM, IR and GDP

		PBT	CV	FI	ME	IR	LM	GDP
Profit Before Tax	Pearson Correlation	1	.424*	.653**	-.624**	.542**	-.404*	.016
	Sig. (2-tailed)		.034	.000	.001	.005	.045	.939
	N	25	25	25	25	25	25	25
Customer Volumes	Pearson Correlation	.424*	1	.571**	.190	.103	.423*	-.016
	Sig. (2-tailed)	.034		.003	.363	.625	.035	.940
	N	25	25	25	25	25	25	25
Financial Innovation	Pearson Correlation	.653**	.571**	1	-.066	.468*	.032	-.111
	Sig. (2-tailed)	.000	.003		.754	.018	.879	.597
	N	25	25	25	25	25	25	25
Management Efficiency	Pearson Correlation	-.624**	.190	-.066	1	-.153	.586**	-.174
	Sig. (2-tailed)	.001	.363	.754		.466	.002	.406
	N	25	25	25	25	25	25	25
Interest Rate	Pearson Correlation	.542**	.103	.468*	-.153	1	-.301	-.464*
	Sig. (2-tailed)	.005	.625	.018	.466		.144	.019
	N	25	25	25	25	25	25	25
Liquidity Management	Pearson Correlation	-.404*	.423*	.032	.586**	-.301	1	-.159
	Sig. (2-tailed)	.045	.035	.879	.002	.144		.449
	N	25	25	25	25	25	25	25
Gross Domestic Product	Pearson Correlation	.016	-.016	-.111	-.174	-.464*	-.159	1
	Sig. (2-tailed)	.939	.940	.597	.406	.019	.449	
	N	25	25	25	25	25	25	25
*. Correlation is significant at the 0.05 level (2-tailed).								
**. Correlation is significant at the 0.01 level (2-tailed).								

Source: Author's construct, 2016

The study result indicates that there is a positive correlation between bank performance indicators and financial innovation. The Pearson's correlation scale depicts a positive correlation between profit before tax and financial innovation as well as positive correlation between customer volumes and financial innovation. The significance values of correlation were recorded as 0.000 and 0.001 at 0.003 and 0.01 significant levels respectively. In relation to the other independent variables, the correlation analysis revealed a negative correlation between management efficiency and Profitability while interest rate on the contrary depicted a positive statistical significant correlation to profitability. In summary, financial innovation as the variable of concern exhibited a strong and a positive correlation with the dependent variables.

4.6 Effect of Financial Innovation on Bank Profitability (Profit before Tax)

This section of analysis is focused on the effect of financial innovation in relation to management efficiency, liquidity management, interest rate and GDP on bank profitability. The section presents the regression analysis as well as the ANOVA for Profit before tax and the independent variables

4.6.1 Regression Model Summary

The regression model summary presents the R square value (coefficient of determination) as a measure to indicate how close the data is to the fitted regression line. The table constructed below gives an insight to figure recorded for the R-squared.

Table 4.3: Regression Model Summary

Model	R	R square	Adjusted R square	Std. Error of the Estimate
1	0.900 ^a	0.810	0.760	0.345

a. Predictors: (Constant), Interest Rate, Management Efficiency, Financial Innovation, Gross Domestic Product, Liquidity Management

The regression model summary as presented in Table 4.3 indicates a coefficient of determination score of 0.810 which explains that 81.0% variation in profit before tax is explained by the variations in independent variables. This explains that 19.0% variations in profit before tax is explained by other variables other than those employed in the model. The 81.0% figure for the R-square specifies that the model is adequately reliable to explain the variability of the response around its mean. In other words, the model is regarded as sufficient to address the variations in the profitability of banks.

4.6.2 Analysis of Variance (ANOVA)

In order to statistically test the degree of variability among variables, analysis of variance is generated to explain the variation among variables. The result of the ANOVA is presented in Table 4.4 which depicts the reliability of the relationship that exists between the study variables as developed in the model.

Table 4.4: ANOVA Table

Model		Sum of squares	DF	Mean Square	F	Sig.
	Regression	9.636	5	1.927	16.162	0.000 ^b
1	Residual	2.266	19	0.119		
	Total	11.901	24			
a. Dependent Variable: Profit Before Tax						
b. Predictors: (Constant), Interest Rate, Management Efficiency, Financial Innovation, GDP, Liquidity Management						

The ANOVA table indicates that the sum of squares of the regression of the regression is 9.636 at degree of freedom 5 with a mean square value of 1.927. The sum of square value of the residual is given as 2.266 at a degree of freedom value of 19 with a mean square value of 0.119. The F-statistic given as 16.162 in the ANOVA table is largely significant when $P < 0.05$. This outcome suggests that the adopted model is significant in jointly explaining the association between the independent variables (financial innovation, interest rate management efficiency, Liquidity management and gross domestic product) and profitability.

4.6.3 Regression Coefficients

In order to remedy the proposed model for the relationship between financial performance (Profit before Tax) and the independent variables a regression analysis is conducted to generate an equation to describe the statistical relationship between the explanatory variables and the explained variable. Table 4.3 present the regression results which indicates the recorded figures for the regression coefficients.

Table 4.5: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-8.181	25.400		-0.322	0.751
Financial Innovation	0.346	0.082	0.504	4.211	0.000
Management Efficiency	-0.242	0.058	-0.522	-4.176	0.001
Interest Rate	0.052	0.029	0.271	1.833	0.082
Liquidity Management	-0.212	1.882	-0.016	-0.113	0.911
Gross Domestic Product	0.859	1.022	0.104	0.840	0.411

a. Dependent Variable: Profit before Tax

The coefficient result ascertained in the table above specifies the linear equation adopted to estimate the relationship between financial innovation and profitability relative to the other internal and external factors that affects bank performance. The equation labeled above illustrates positive coefficient figures of 0.346, 0.052, and 0.859 for financial innovation, interest rate and GDP which portrays a positive relationship with profitability. The coefficient estimate for financial innovation depicts a statistically strong and positive relation with profit before Tax in. On the contrary, Liquidity management and management efficiency depict a negative and a statistically significant relation with bank profitability.

In relation to the main thrust of the study, the positive and statistically significant relationship between financial innovation and profitability suggests that increasing expenditure on financial innovation will lead to a resultant increase in the profitability of banks.

4.7 Effect of Financial Innovation on Customer Volumes

The second objective of the study sought to establish the influence of financial innovation on customer volumes relative to management efficiency and interest rate which are representative of internal and external factors that influence bank performance so far as the banking sector is concerned. This part of the study presents the regression analysis as well as the ANOVA to estimate the relationship that exists between customer volumes as a dependent variable and the independent variables such as financial innovation, management efficiency and interest rate.

4.7.1 Regression Analysis

The regression model summary table below presents information about the regression line's ability to justify for the total variation in customer volumes. The result for table 4.7 indicates an R square value of 0.504 which reveals that 50.4% of the total variation in customer volumes is explained by the model which is impressive in that only 49.6% variation in customer volumes is unaccounted for by the variables employed in the model. The regression model summary indicates a standard error of the estimate to be 86.9% which indicates relatively less average distance data points from the fitted line which is descriptive of some high level of precision.

Table 4.6: Regression Model Summary

Model	R	R square	Adjusted R square	Std. Error of the Estimate
1	0.710 ^a	0.504	0.373	0.869

a. Predictors: (Constant), Interest Rate, Management Efficiency, Financial Innovation, GDP, Liquidity management

4.7.2 Analysis of Variance (ANOVA)

As means of showing the statistics used to test the hypothesis about the population, an Analysis of Variation was conducted to reveal the variation between the variables. Table 4.7 below present the analysis of variance of financial innovations, management efficiency, liquidity management, interest rate and gross domestic product that are comprised to explain the variations associated with customer volumes.

Table 4.7: ANOVA Table

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.547	5	2.909	3.855	0.014 ^b
	Residual	14.340	19	0.755		
	Total	28.887	24			
a. Dependent Variable: Customer Volumes						
b. Predictors: (Constant), Interest Rate, Management Efficiency, Financial Innovation, GDP, Liquidity management						

The ANOVA result shown above indicates a 14.547 sum of squares value for the regression at degree of freedom 5 and a mean square value of 2.909. The residual on the other hand indicated a sum of squares value of 14.340 at degree of freedom 19 with a mean square value of 0.755. The F-statistic of 3.855 illustrate that the joint effect of the independent variables is significant to explain the association with customer volumes ($P < 0.05$). As $p < 0.05$ our predictors are significantly better than would be expected by chance.

4.6.4 Regression Coefficient

In order to statistically estimate the relationships between customer volumes and financial innovations in particular, there was the need to adopt a technique to model and analyze the variables. This was however achieved by conducting a regression analysis. Table 4.8 provides the outcome of the regression analysis between the dependent and independent variables.

Table 4.8: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-45.088	63.904		-0.706	0.489
Financial Innovation	0.593	0.206	0.555	2.873	0.010
Management Efficiency	-0.001	0.146	-0.001	-0.007	0.994
Interest Rate	0.011	0.072	0.036	0.150	0.882
Liquidity Management	9.291	4.736	0.438	1.962	0.065
Gross Domestic Product	1.685	2.572	0.132	0.655	0.520

a. Dependent Variable: Customer Volumes

The result of the regression indicates a positive coefficient for financial innovation, interest rate, liquidity management and GDP. The coefficients of financial innovation is 0.593 thus for every unit increase in financial innovation, 0.539 unit increase in customer volumes is predicted, holding all other variables constant. This depict a positive and a statistically strong influence of financial innovation on customer volumes as $p < 0.05$. In relation to management efficiency, for every percentage of management efficiency there is an expected decrease of 0.1% in customer volumes, holding all other variables constant. Invariably, customer volumes increase by 1.1%, 929.1% and 168.5% for a percentage increase in interest rate, liquidity management and gross domestic product.

Again, holding financial innovation, management efficiency, liquidity management, interest rate and gross domestic product fixed, the customer volumes decreases by 450.8% in relation to the constant. This provides a description that without the predictor variables the customer volumes of banks stand at -45.088.

4.7 Interpretation of Findings

The trend analysis presented in the study indicated appreciable growth in values for the variables engaged. Figures from the analysis depicted an appreciable 48.3% and 232.9% growth for customer volumes and profitability over the study period. Consistently, the trend analysis indicated a remarkable increase in expenditure for financial innovation. Expenditure on financial innovation over the period realized a 245.8% appreciation. Management efficiency and interest rate also saw an appreciation in figures. Management efficiency over the study period improved from 2.59 to 1.426 while interest rate realized a percentage increase of 78.1 covering the periods of 2011 to 2015. On the contrary, Gross domestic product and Liquid management over the study period was accustomed with extreme variations. Comparing the GDP figure of 2011 to that of 2015 saw a decline of 4.32%.

Further outcomes indicated a negative association of management efficiency and liquidity management to profitability but a positive association with customer volumes of banks while interest rate and GDP depicted a positive correlation with profitability of banks. In relation to the main thrust of the study, collective result for the correlation analysis and trend analysis presentation revealed a consistent growth in the expenditure of financial innovation and a positive and significant association of innovations to both profitability and customer volumes of banks. The study depicted a positive and significant relationship between financial innovation and bank performance judging from figures obtained from Pearson's correlation method. The positive correlation gives an indication that increasing expenditure on innovation would lead to an appreciation in customer volumes and profitability.

Findings from the regression model revealed that financial innovations additional to both internal external factors account for 50.4% and 81.0% variations in customer volumes and profitability respectively. The model estimated coefficient figures of 0.593, -0.001, 0.011, 9.291 and 1.685 for financial innovation, management efficiency, Liquidity management, Interest rate and gross domestic product respectively in relation to customer volumes. 0.346,-0.242,0.052,-0.212 and

0.859 were estimated coefficient figures for financial innovation, management efficiency, Liquidity management, interest rate and gross domestic product in relation to profitability of banks. The main findings of the regression model indicated that financial innovation has a positive and a significant effect on customer volumes and profitability of banks.

The current study supports the study findings of Githikwa (2009), Mabrouk and Mamoghli (2010), Ngumi (2013) and Korir (2014) that bank innovations significantly influence the profitability of banks. Their findings support the claim that investment in innovations culminate in ensuring operational efficiency and financial deepening. Invariably, the study findings that innovations significantly affect the customer volumes of banks is sustained by study findings by Kenyuru (2011), Mbutor and Uba (2013), Akhisar et al (2015), kombe and Wafula (2015). The findings of the study by the authors on the significance of innovations on customer volumes support the generalization that innovations entice customers and therefore promote financial inclusion. However, the study refutes the study findings of Shirley and sushanta (2009) that concluded that regardless of the expenditure on information technology which is the main driver innovation can create network effects that can lower the profit of banks.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The study was aimed at establishing the relationship between financial innovation and the financial and non-financial performance of banks in Ghana. The study sought to analyze the effect of financial innovation on the performance of banks in relation to other dominating internal and external factors. This chapter elaborates on the findings from the previous chapter. The chapter also provides concluding remarks and policy recommendations for the study.

5.2 Summary

The study examined the relationship between financial innovation and bank performance in Ghana. The study estimated the effect of innovation on bank performance by adopting other internal and external factors relative to expenditure on innovation to determine the influence of innovations on customer volumes and profitability. Approximation of the influence of financial innovation bank performance was conducted based on a multiple linear regression model. Financial innovations together with the other independent variables were supported by the coefficient of determination which indicated that the independent variables adequately explained the variations in customer volumes and profitability. The expenditure on innovation mainly centered on the operations of ATMs, mobile banking, electronic bank and debit cards. The expenditure data covered a period of 5 years which saw an expenditure increase of 245.8%. The regression results accentuated that innovation had positive and statistically significant influence on the customer volumes and profitability of banks and not fortuitous. This assertion supports the claim that banks are embracing innovations to improve on customer satisfactions, loyalty and increase as well as profitability in Ghana.

5.3 Conclusions

The objective of the study was to estimate the relationship between financial innovation and bank performance using a multiple linear regression technique. Theoretically and empirically, it emerged from the study that financial innovation positively and significantly influences profitability and customer volumes of banks in Ghana. The study revealed that regardless of the penetrating competition in the industry and the trailing economy as a result of adverse economic

conditions, banks are required to be innovative to meet the changing needs of customers and sustain the profitability of banks. The upsurge in innovations was seen to facilitate payment and provide convenience to customers as well as edging to reduce the unbanked population. It is therefore imperative that banks extensively draw out innovative strategies to meet the changing needs of financial consumers at lower service cost and higher levels of efficiency.

5.4 Policy Implications and Recommendations

The findings of the study have become instrumental in providing invaluable information for policy formulation and implementation. First and foremost, innovations as estimated to positively affect the performance of banks should be considered as imperative by banks as it aid banks to be competitive in the market since it impact on the industry is tremendous. Banks as corporate entities should strive to be innovative to meet the needs of its clientele through cost effective means and focus on innovation embedded with process efficiency.

Again, as investment in innovations in the banking industry surges it is recommended that equal or more resources should be committed to combat the operational risk and fraudulent initiatives associated with innovations to reduce the spade of losses that has been recorded for the adoption of innovations in the industry. Similarly, there is undeniable fact that innovation is culminated with challenges particularly related to threat of security which often lead to reputational risk among banks and loss of confidence by customers and therefore recommended for banks to be rigorous in their sophistication to mitigate this effect.

It is recommended for the regulators of the industry to channel resources to motivate studies to advance innovations in the industry as innovations is seen to be catalyst to ensure sustainable growth in the sector as well as the economy. Furthermore, government through it regulators should ensure proper supervision of the activities of banks to prevent industry players from using innovations to exploit customers as it is on record that banks in recent times are unwarrantedly exploiting customers. Correspondingly, the activities of industry players should be effectively monitored to avoid the use of innovations that will negatively impact the financial sector which happens to be the mainstay of the economy.

Lastly, the study recommends that the banks should be innovative by accepting to work in conjunction with Telco's to enable their services reach a wider audience thus serving as a move

to bank the unbanked. Banks should avoid regarding Telco's as competitors as this will enhance the performance of banks hence enriching profitability and increasing customer volumes.

5.5 Limitations of Study

The thrust of the study was to assess the effect of financial innovation on the financial and non-financial performance of banks in Ghana. In order to make the study more comprehensive, financial innovations as a factor influencing bank performance was assessed relative to management efficiency and interest rates which is a limitation of the study in the sense that there were equally important variables that affect the performance of banks that could have been selected to make predictions on how financial innovation affect bank performance. This however limits the generalization of the result that the independent variables are the key determinant of financial and non-financial performance.

Again, the bureaucratic nature associated with assessing information from banks in Ghana coupled with the seemingly busy schedules of respondent of the questionnaires posed a great deal of challenge in the accomplishment of the study as scheduled. Nonetheless, the sensitive nature of information that the study sought for saw some respondents reluctant to relay essential information to enhance the quality of work and advance broader understanding of the relationship between financial innovation and bank performance in Ghana.

The study is limited with its coverage since the study only focused on universal banks which happens to be a component of the financial sector and therefore outcomes of study may not reflect the disposition of the whole financial sector. Invariably, the study focused on only two determinants of bank performance relative to financial innovation thus management efficiency and interest rate as function of Profit before Tax and Customer Volumes.

Furthermore, the study is limited in the use of secondary data. The use of secondary data is subject to misinterpretation as data collected might have meant for other purpose that would not fit the thrust of the study. Besides the seldom fit of data, accuracy of secondary data was a major bone of contention as data might not have been systematically collected. Additionally, issues associated with the internal validity were problematic since the temporal precedence between cause and effect was unclear.

Moreover, there was inadequate literature relative to the substance of the study which limited the knack of assessment of existing knowledge in relation to the study. Specifically, there was inadequate literature relating to financial innovations and customer volumes. This however compelled research to mainly focus literature review from foreign articles, journals and working papers.

5.6 Suggestions for Further Research

The study was limited in its coverage as it only concentrated on financial innovation and its effect on the performance of universal banks in Ghana. In relation to this limitation, it is however recommended that further studies are extended to other institutions in the financial sector as well as other sectors of the economy conducted and further conducted to cover a longer time span to clarify the impact of financial innovations on institutions. Similarly, other studies can be conducted in other jurisdictions with the adoption of financial innovation relative to other factors that affect bank performance.

Lastly, the study suggests that further studies are undertaken in the area of financial innovation and its effect on the performance of institutions with the utilization of primary data to ensure accuracy in data collection. Moreover, the utilization of primary data could be long-drawn-out to make an evaluation of the before and after effect of innovations on the performance of institutions both in the short and long-run periods.

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APPENDIX

SUBJECT'S SIGNED CONSENT OR ORAL CONSENT IF SUBJECT CANNOT WRITE

I have been informed about the objectives of this study, its possible benefits, risks, and discomforts. I hereby agree to take part in this research as a subject. I recognize that my participation is voluntary and that I am free to withdraw this consent and quit this study at any time, and that doing so will not cause me any penalty or loss of benefits that I would otherwise be entitled to enjoy. I may also skip any question that I do not wish to answer. I may choose not to provide consent, in which case I am not eligible to participate in the research.

I understand that, the information collected is going to be used and disclosed, (while keeping my identity confidential), between the researcher and to agencies responsible for the safety, effectiveness, and conduct of the research; and that the researcher may use and share my information for scientific purposes related to this and other associated studies. This information may be used for the duration of the research.

Subject's

Signature.....Date.....

Witness to Oral Consent (If subject cannot
write).....Date.....

Number:.....

This questionnaire is designed to establish the effect of financial innovations on the performance of banks in Ghana. Information collected will be exclusively used for academic purposes and treated as confidential. It would be highly appreciated if additional information or documents deemed relevant to the study are provided. Thanks for the consideration in completing this questionnaire.

- What is the bank's position on financial/bank innovations?

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- How many innovative products and services has the bank churned out and the total amount dedicated to the research and development of these innovations over the last years?

Years	2011	2012	2013	2014	2015
Number of innovations					
Expenditure on the development of these innovations					

- What is the approximate expenditure amount dedicated to the development of the following bank innovations over the years?

Financial innovation Type	2011	2012	2013	2014	2015
ATMs					
Debit cards					
Internet Banking					
Mobile Banking					

- What are the recorded figures for the following financial indicators?

Performance Indicators	Unit of measurement	2011	2012	2013	2014	2015
Profit before Tax	GHS					
Customer Volumes	No. of customers					
Operating expenses	GHS					

- Highlight the challenges associated with the adoption of innovations?

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Author	Central Theme	Country	Main findings
Idun A.A and Aboagye A Q.Q (2013)	Bank Competition, Financial Innovations and Economic Growth in Ghana	Ghana	<ul style="list-style-type: none"> Article sought to establish the nexus between bank competition, financial innovation and economic growth The study aimed at establishing the effect of financial innovation on both the long run and short economic growth (positive correlation in the SR and negative correlation in the LR) Bank competition in the study focused on the proliferation of banks as a result of the deregulation of the financial system (positive correlation with economic growth in the LR and a negative correlation in the SR attributable to market power ie government actively participated in the credit market)
Marfo-Yiadom E and Ansong A. (2012)	Customers' Perception of Innovative Banking Products in Cape Coast Metropolis, Ghana	Ghana	<ul style="list-style-type: none"> The aimed at discovering the opinions as well as perceptions of customers on innovative banking product. The study explored the relationship between demographic characteristics, usage and preference for financial innovative products
Domeher D, Frimpong J.M and Appiah T. (2014)	Adoption of financial innovation in the Ghanaian banking industry	Ghana	<ul style="list-style-type: none"> Study investigates the perceptions on innovations and factors inducing the adoption of innovation in the banking industry. Key indicators for adoption were identified as ease with which customers can use the innovation, the compatibility of the innovation with customers' needs, the perceived usefulness thereof, the amount of information provided on the innovation and the level of customers' education. Study provides a basis for banks to evaluate the potential success of new products which they plan to launch
Akuffo-Twum ,E.(2011)	The effect of internet banking on the Ghanaian banking	Ghana	<ul style="list-style-type: none"> Adopted an element of financial innovation (Internet banking) to examine its impact on the banking industry. The study focused on factors influencing the adoption and

	industry – A case of Cal bank, Unibank and Prudential bank		<p>customer perception of internet banking, services that can be utilized through internet banking and the challenges associated with the adoption of internet banking.</p> <ul style="list-style-type: none"> • The study established that few banks in Ghana that have implemented internet banking are chalking up some successes even with the problems that come with it. • The study identified challenges include the problems of internet connectivity, high cost of implementation, Security concerns for customers, perceived customer readiness and other problems they encounter.
Muiruri J.K and Ngari J.M (2014)	Effects of Financial Innovations on the Financial Performance of Commercial Banks in Kenya	Kenya	<ul style="list-style-type: none"> • The study aimed at finding the effect of some selected element of financial innovation on the financial performance of banks. • The measurement of financial performance was based on profitability ratio mainly net profit margin and gross profit as efficiency ratio.
Tsuma R.S., Musiega M.G., Odhiambo A., Musiega D (2015)	Effects of financial innovations on financial performance of savings and credit co-operative societies in Kenya. A case of Kakamega Teachers Co-operative Society Limited	Kenya	<ul style="list-style-type: none"> • The study focused on identifying the correlation between financial innovation and financial performance relative to savings and credit co-operative. • The study established a positive relation between financial innovation and financial performance • The indicator for the measurement of financial performance was dividends per share
Ngumi P.M (2013)	Effect of Bank Innovations on Financial	Kenya	<ul style="list-style-type: none"> • The focus of the study was to establish the effect of financial innovation on the profitability of banks. • Measure of financial performance used were income, profit

	Performance of Commercial Banks in Kenya		<p>before tax, return on assets and customer deposits.</p> <ul style="list-style-type: none"> • Unlike other studies, this study considers a whole range of innovations (automated teller machines, debit and credit cards, point of sale terminals, mobile banking, internet banking and electronic funds transfer) to discover the financial bearing on banks. • Study established a positive correlation between bank innovation and financial performance of banks
Adhiambo J. A (2013)	The effects of product innovation on financial performance of commercial banks in Kenya	Kenya	<ul style="list-style-type: none"> • The adopted regression analysis to estimate the impact of Core Product Innovation, Formal Product Innovation and Augmented Product Innovation on Financial Performance of the commercial banks in Kenya. • The regression analysis shown a negative relationship between Formal Product Innovation and Financial performance of commercial banks. • The regression analysis revealed that there is no relationship between augmented products innovation and financial performance of commercial banks
Kenyoru J.O (2011)	Effect of financial innovations on financial deepening in Kenya	Kenya	<ul style="list-style-type: none"> • The finding of the study shown that there has been a steady rise in the number of financial users since 2007 from 217.2 to 700.3 depositors with commercial banks and other financial institutions per 1000 adults in 2012. • The study's Correlation results indicated that financial inclusion had a perfect correlation with agency banking and a very high correlation with both mobile money innovations and m-banking
Tsuma R.S, Musiega G.M, Odhiambo A. and Musiega D (2015)	Effects of Financial Innovations on Financial Performance of Savings and Credit Co-operative Societies in Kenya: A	Kenya	<ul style="list-style-type: none"> • Regression analysis on data from a sample of 42 members of staff of Kateco was conducted to examine the financial innovations and financial performance variables. A suitable multiple regression model was designed in order to capture all the relevant variables of the study • A positive relationship between financial performance and process innovations was established.

	case of Kakamega Teachers Co-operative Society Limited		<ul style="list-style-type: none"> The study sought to establish that for SACCO to be effective and successful, it requires embracing of effective financial innovations strategies.
Kombe S.K and Wafula M.K (2015)	Effects of Internet Banking on the Financial Performance of Commercial Banks in Kenya a Case of Kenya Commercial Bank	Kenya	<ul style="list-style-type: none"> Study was aimed at establishing the effect of cheaper internet connectivity on performance of banks, the effects of 24-hour e-banking to the overall financial performance of commercial banks and the effects of the ICT competence of the customers on the financial performance of banks. The study revealed that reduced internet costs lowers transaction costs which attracts potential customers to the bank.
Berger A.N (2003)	The Economic Effects of Technological Progress: Evidence from the Banking Industry	United State of America	<ul style="list-style-type: none"> A desk study focused on examining the effect of technological progress with respect to the banking industry. The study touched on areas of geographic expansion of banking organizations, consolidation process, banking organization size
Akhisar I, Tunay K.B, Tunay N. (2015)	The Effects of Innovations on Bank Performance: The Case of Electronic Banking Services (Journal)	23 developed and developing countries	<ul style="list-style-type: none"> Research focused on the effect of electronic banking products on the performance of 23 developed and developing countries banking data. Performances of banks were based on profitability (ROE and ROA) The novelty of the study is it methodology. The adoption of a dynamic panel data method. Technology-based applications bring significant advantages to customers in the delivery of existing products which significantly contribute to customers increasing day by day

Source: Author's Construct, 2016