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IMPACT OF TECHNOLOGY INTEGRATION ON THE PERFORMANCE OF COMMERCIAL BANKS IN GHANA

By

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DECLARATION

I, Catherine Willie-Doe, hereby declare that this submission is my own work towards the Master of Science in Finance and that to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any degree of the University, except where due acknowledgement has been made in the text.

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ABSTRACT

The rapid growth of the internet and smartphone penetration in Ghana has occasioned a new era of banking and financial services across the globe and in Ghana. These trends have pushed commercial banks in Ghana into a race to develop and in some cases partner with telecom service providers and FinTech companies to serve the new and evolving market of clients. The purpose of this research is to evaluate the impact of the growth of novel internet-powered financial service delivery on the performance of universal banks in Ghana. Within this context, the researcher specifically sought to examine the use of digital innovations in the Ghanaian banking industry; to examine the effect of digital innovations on bank performance in Ghana; and to assess the challenges of digital innovations to Bank customers. 150 respondents were sampled for data collection purposes; fifty (50) employees and one hundred (100) customers of the selected banks were surveyed for the study. There are nine universal banks currently in good standing. Six (6) employees each from the nine (9) banks, and ten customers each from the banks. The data was collected through interviews and a standardized questionnaire. Secondary data from the published financial statements of the banks were also used. The data analysis revealed that there are major variations in the universal banking model of traditional banks in recent times as opposed to how things were years ago. It was learned that technology-based products give opportunities and significant cost advantages to universal banks in Ghana thus, increasing performance and facilitating lower risk than traditional banking products. The interview responses also indicate that if there is ample consumer demand for technology-based goods, the banks surveyed would receive a strong return on investment in the short term. High cost of implementation, lack of solid technological

infrastructure in the country and security issues as challenges severely hampers digital banking initiatives of the sampled banks.

DEDICATION

I dedicate this work to my family, course mates, friends and my sweetheart, Abraham Marshall.

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Words cannot express how grateful I am to the Almighty God for His abundant grace and mercies he showered upon me from the beginning of this course to the end of it, culminating into the writing of this project work.

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LIST OF ABBREVIATIONS

ABSA	ABSA Bank Ghana Limited
ADB	Agricultural Development Bank Limited
BBGL	Barclays Bank Ghana Limited
FABL	First Atlantic Bank Limited
FBL	Fidelity Bank Ghana Limited
FBN	FBN Bank Ghana limited.
FinTech	Financial Technology
FNB	First National Bank
GCB	GCB Bank Limited
KYC	Know Your Client
NIB	National Investment Bank Limited
NIM	Net Interest Margin
NPL	Non-Performing Loans
OBL	OmniBank Ghana Limited
PBL	Prudential Bank Limited

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

The value of digital technology is recognized by banks as a powerful lever for improving their efficiency, improving compliance with regulations and transforming their customer experience. In the COVID-19 crisis, the above necessity has taken on increased significance, as remote and mobile access for many millions of customers has changed from conveniences to necessities. As banks find new ways to service their customers during the recession, digitisation is expected to play an even more central role in the future. Globally, developments in information technology (IT) have led to the rapid expansion of new and creative financial services; locally, too the rapid growth of information and communication technologies is changing the entire landscape of the financial services industry, heralding a new age of convergence services (Baba and Nasieku, 2016). The use of internet banking technology allows customers more control over their financial details and makes it much easier to access and monitor their finances. Of course, commercial banks have worked for years in a controlled environment in which there has been a certain amount of competition (Gul. et al, 2011). Researchers accept that the ambitious move to use digital technology to improve the delivery of banking services allows consumers, for example, to access all their bank accounts through the interface of one provider or make payments directly from their account to online retailers as a bank transfer (Camere et al., 2016; Arifovic et al., 2017). While the move has provided clients with more seamless banking experience, conventional banks have been forced to invest more in their IT infrastructures to keep pace with their competitors and maintain relevance in the face of disruption. Electronic banking includes payment system authentication, network

environment, software and hardware for computers, electronic hardware, legal bindings, and so on. The security and authentication of the modern banking systems are greatly assured by cryptography and its applications. These could be costly and hard to manage, with the potential to impact banks' bottom line. Following Ramakrishnan (2001), due to internet banking, which has undermined other banking-specific threats, it can be said that information security risks are rising continually.

Just like the rest of the world, Ghana's financial sector is witnessing an unparalleled degree of convergence between finance and technology. Global investment in technologically advanced banking solutions has risen significantly from $4.05 billion (USD) in 2013 to $12.2 billion (USD) in 2014, according to the Accenture Study (Skan et al., 2014). Financial technology offers new possibilities for empowering people by increasing openness, reducing prices, removing intermediaries and making financial information available (Zavolokina et al., 2016). Financial institutions' conventional online banking platforms are now being converted into creative and differentiated financial services provided by non-financial providers. With mobile apps that allow users to enjoy internet banking services, commercial and investment banks in Ghana are embarking on major innovation drives. This is the main force behind the current growth of financial technology in the world. Through the efforts of Ghana Interbank Payment and Settlement Systems Limited (GhIPSS), customer demand, the use of point-of-sale equipment by shopping malls and supermarkets, telcos have undeniably leapfrogged and are now leading the pack in terms of payment solutions (Awuni, 2019). Using online channels, the growth in popularity of smartphones and the internet has made consumers rely on technology and demand faster services, either locally or cross-border. Many Ghanaians are able to make

mobile payments and money transfers, access loans and collect funds, as well as handle financial assets from mobile devices without entering banking halls, as a result of an increase in the general level of education of the Ghanaian population. The growing use of technology by financial services companies to drive efficiency is the key force behind this development and this research seeks to survey the impact of technology integration on the financial performance of the banking sector in Ghana.

1.2 Statement of the Problem

At both local and global levels, research has shown the effect of technology on conventional banking. In an article published in the American Banking Association Journal (ABAJ), Meinert (2017) believed that bank software applications specializing in robo-advisory have been growing at a phenomenal rate since 2014, the author further indicated that research by Black Rock, the world's largest asset management firm, showed that as of 2017, 60 and of digital advisory companies in the US were founded in 2014. Digital banking solutions have also been found to allow conventional banks to increase service quality and reduce transaction costs, operating on a strategic need rather than a competitive advantage (Goh and Kauffman, 2013). Holotiuk, et al. (2018) assume that by using online platforms, the growth in popularity of smartphones and the internet has made clients dependent on technology and demand faster services, either locally or cross-border. Internet-powered financial products give their customers an open space to freely switch between various providers, which contributes to an increase in the volatility of consumer deposits so that customers are not loyal to a single bank in this case. Buchak et al. (2017) suggest that the growth of internet banking has been triggered by strong bank regulations, including the rise in capital requirements and legal scrutiny. Puschmann (2017) also

analyzed the research position of businesses but concentrated on the qualitative characteristics of the industry. The reasons for partnerships between banks and FinTech companies have also been identified by some authors (Holotiuk, et al., 2018). Few research papers, however, has been done to address the effect on banks' financial performance of the in-house digital banking infrastructure. This study, therefore, seeks to contribute to the research on banking solutions carried out in the field of financial technologies and their effect on the financial output of the banking sector in Ghana.

Specifically, this research focuses on digital banking solutions built by the banks themselves instead of third-party entities. This is in the midst of the recognition that banks have provided an impetus for optional customer services and goods by introducing new technologies (Ayo et al., 2016; Mishra, 2014; Kamakodi and Khan, 2008). Bank customers are currently seeking quicker and more reliable services to meet and fulfil their needs (Ladeira et al., 2016; Malinconico and Fuccio, 2016). Technological progress has changed the market environment of commercial banks completely (Amin, 2016; Wonglimpiyarat, 2017). The introduction of revolutionary services and products such as internet banking, e-Wallet, Automated Teller Machines (ATMs), mobile banking and many others has changed the way commercial banks attract, accommodate and maintain their customers (Mishra, 2014; Thakur, 2014). Consumers now have a number of choices for making financial transactions that they can use. Technologies, competition and customer loyalty have all powered these services and goods (Amin, 2016; Wu et al., 2006). Other studies have empirically strengthened this claim (Khan, 2010; Musiime and Bayaki, 2010). Innovation, therefore, reduces transaction time and increases customer convenience by

eliminating queues and providing quick transfers of money. It should be noted that the way clients do their banking has been changed by commercial banking innovation. Customers can now perform banking transactions without a physical presence at bank counters at anytime and anywhere in the world (Vyas and Raitani, 2014). These revolutionary approaches have made banking services more effective and convenient than ever before for customers. Contradictory views on the potential of technology-powered banking services and largely descriptive prior studies allow the researcher to use a quantitative approach to reassess the role of digital banking solutions in the traditional banking industry.

1.3 Objective of the study

The objective of this study is to evaluate the impact of the growth of novel internet-powered financial service delivery on the performance of universal banks in Ghana. Within this context, the researcher specifically desires:

1. To examine the use of digital innovations in the Ghanaian banking industry.
2. To examine the effect of digital innovations on bank performance in Ghana.
3. To assess the challenges of digital innovations to Bank customers.

1.4 Research questions

1. What are the innovations using digital technologies in the banking industry in Ghana?
2. What are the effects of banking innovativeness on the financial performance of universal banks in Ghana?
3. What are the challenges facing universal banking in using digital technologies?

1.5 Significance of the study

The findings and conclusions of this study would be beneficial on three fronts. By focusing on the banking sector, the study will allow other researchers to appreciate the impact digital innovations have on banks' financial performance. In policymaking, the study would throw more light on the regulatory framework, and policy support needed to spur financial technology growth in Ghana. Finally, this study will also benefit the banking sector in understanding the impact technological innovations have on their financial performance and how to liaise with them in order to increase their profit margins as well as increase their market share.

1.6 Scope of the study

The scope of this research covered the nine listed banks on the Ghana stock exchange namely Access Bank, Agricultural Development Bank, Cal Bank, Ecobank Ghana Limited, GCB bank Limited, Republic bank, Société General, Standard Chartered Bank, and The Trust Bank. The data used and the literature drawn for the study is deliberately limited to banks which dominate the Ghanaian market by their sheer capital size and branch network. That is, the author believes all characteristics of the entire industry will be captured. All nine listed banks are covered to provide a comprehensive picture of the technology integration among industry leaders in the Ghanaian banking ecosystem.

1.7 Limitations of the study

Limitations are those circumstances outside the reach of the researcher, according to Best and Khan (1989), which will impose limitations on the study's results and their application to other situations. The main restriction of this study is that it is difficult to

access timely data on the financial results of the selected banks. The study's results are also informed by the failure of the author to consider non-banking financial institutions that could provide an alternate narrative on the financial effect of emerging technologies. However, the investigator is optimistic that these problems would not have a negative effect on the results of this report. Other considerations that presented a challenge to the investigator are financial resources and time constraints, but all these challenges are handled to ensure that the study's goals are achieved.

1.8 Organization of the study

Five chapters outline this project work: Chapter one looks at the introduction, context of the research, the problem statement, the intent and goal of the study, and ends with the study's importance and scope. Chapter two begins with an introduction and reviews applicable to this analysis of theoretical and empirical literature and ends with an overview of what other studies have concluded and their importance to this study. The research methodology adopted for this study is outlined in chapter three, while chapter four is a presentation and review of the data gathered for the study. The overview and conclusion summarizing the entire analysis are found in chapter five, which provides recommendations for setting a forum for further study on the subject and the list of sources and appendices used for the analysis ends with it.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter contains a review of the theoretical and empirical literature on financial intermediation and the growth of digital financial services. The relationship between technological innovations in finance and the emerging paradigms in investments is explored within the framework of the research objectives outlined earlier in chapter one.

2.2 Theoretical and Conceptual Review

Advances in information technology (IT) have contributed to the rapid growth of new and creative financial services, also referred to as the emerging field of financial technology, which is gaining considerable attention. Items, crucial success factors and market attributes shift as technology advances (Afuah and Utterback, 1997). Researchers use market theory to analyze whether conventional retail banks are still adversely impacted by digital banking start-ups. This principle notes that when used simultaneously with an old service, a new service will act as a supplement and will serve as a replacement if it can replace the old service by meeting the same needs (Aaker and Keller, 1990; Frank, 2009). Thus the offer of digital banking services in the former case will benefit conventional retail banks (Li et al., 2017) and impact the performance of the incumbents in the latter case (Kaul, 2012). When analyzing stock returns, it could also be possible to find no effect, which may mean that the complementary and replacement effects balance each other. Financial intermediation is the theoretical framework which captures the role of technology in modern finance.

The theories and ideas that serve as the basis for the rise of these new space additions are currently being explored.

2.2.1 Financial Intermediation theory

A financial intermediary (FI) is an entity such as a bank, insurer or other providers of financial services that by allowing or facilitating economic transactions between market participants, adds value (Allen and Santomero 1998, 2001; Brealey et al. 1977; Diamond 1984; Hasman et al. 2014; Holmstrom and Tirole 1997; Scholtens and van Wensveen 2000). The root cause of the existence of intermediaries lies in the absence of full and perfect markets, as described in the classic Arrow-Debreu resource allocation model, according to conventional financial intermediation theory (Allen and Santomero 1998; Diamond and Dybvig 1983). Asymmetries of information cause business imperfections or deviations from the neoclassical system. Specific types of transaction costs arise from each of these imperfections. Such costs tend to be overcome by financial intermediaries, at least partially. For instance, Diamond and Dybvig (1983) view banks as depositor coalitions that provide protection to households against idiosyncratic shocks that adversely affect their liquidity position. Leland and Pyle are the foundation of another strategy (1977). Financial intermediaries are involved, according to the modern theory of financial intermediation, because market imperfections prohibit savers and investors from trading directly with one another in an optimal way. The informational asymmetries between savers and investors are the most significant market imperfections. In particular, banks, financial intermediaries, act as agents and as delegated monitors, filling knowledge gaps between ultimate savers and investors. This is because they have a competitive advantage over the ultimate savers and investors in details. This is

their essential purpose, which justifies the expense of the transaction paid to the parties.

Financial intermediaries, by offering a payment, settlement and clearing mechanism, often bridge the maturity mismatch between savers and investors and promote payments between economic parties. Consequently, they participate in practices to turn qualitative properties. Security and soundness regulations must be placed in place to ensure the sustainability of financial intermediation. The law also lays the groundwork for intermediaries to take part in the development of their monetary services. Although finance technology applications are often said to reduce the degree of intermediation by separating intermediaries from processes, such as removing traditional banks as a critical intermediary to link capital seekers and providers, such statements usually refer to specific FinTech business models such as P2P payments and crowdfunding (Emmerson 2015; Lamacraft 2016; McWaters et al. 2016; Riasanow et al. 2018). However, while FinTechs sometimes eliminate existing FIs, they also often act as a new type of intermediary that is consistent with previous studies (Domowitz 2002); they may offer more competitive pricing, better user experience, or otherwise superior offering, but they act as intermediaries themselves on a regular basis and therefore do not eliminate intermediaries as a whole. It should be noted that FinTechs theoretically and the degree of intermediation with business cases focused on distributed ledgers such as blockchain. Researchers and practitioners speculate that one day they will be able to cut intermediaries out of some use cases, but at present, it is still practically impossible to participate in such networks without services such as exchanges, which again serve as FIs (Moore and Christin 2013). Prior work has also shown that these networks serve as financial intermediaries in

better-researched FinTech areas such as peer-to-peer lending or crowdfunding (Bachmann et al. 2011; Belleflamme et al. 2012; Lin et al. 2013).

2.2.2 Technology Acceptance/adaption Model (TAM)

TAM was originally intended to make up for the flaws of the rational action theory (TRA). It was proposed from the viewpoint of behavioural science, combining the theory of expectation and the theory of self-efficacy, and is primarily used to research people's behavioural intentions to use technology (Davis, 1986). The TAM model divides the variables that influence individual behavioural attitudes into perceived utility and perceived ease of use, which have a major effect on new technology adoption (Venkatesh and Bala, 2010). Since the TAM does a good job of explaining the difference in the willingness of customers to embrace information technology and can be improved and specified according to the study issue, it has become one of the most frequently used models for the adoption of information technology in the field of research (Zhang and Kizildag, 2018). The purpose of Fintech services is to apply the latest generation of IT tools to financial innovation, so the TAM has great adaptability in this article. Although the TAM is commonly used for technological implementation in fields such as mobile e-commerce payment, the novelty of Fintech services (e.g., privacy and security concerns, government funding, etc.) results in a major gap in the application process between the TAM and the adoption of conventional e-commerce information technology (Stewart and Jürjen, 2018). Since the TAM does a good job of explaining the difference in customer willingness to accept information technology and can be enhanced and defined according to the problem of study, it has become one of the most commonly used models in the field of research on the adoption of information technology (Zhang and Kizildag, 2018). Applying the latest generation of

IT tools to financial innovation is the core of Fintech services, so the TAM has great adaptability in this article. Although the TAM is commonly used for the implementation of technology in areas such as mobile e-commerce payment, there is a major gap in the application process between the TAM and the adoption of conventional e-commerce information technology. (Zhang and Kizildag, 2018).

2.2.3 Theory of Reasoned Action (TRA)

The research was also driven by the reasoned action theory, founded by Fishbein to explain the connections between employee attitudes, employee intentions and their actions (1967). The theory of reasoned action (TRA) posits that an organization's individual behaviour is pressured by employee behavioural intentions. The theory of rational movement gets is of notable significance within the field of customer behaviour because it affords a trustworthy method to apprehend possibilities to trade with regards to clients' behaviour during the use of an invention. In addition, the actual application of an invention is determined by utilizing the behavioral intent of the character to utilize it. The model resulting from their research is visualized in the following components and consists of: Starting from the intentions of actions. The actual use of an invention is thus determined by the behavioral intentions of the use of an entity. Attitudes to an act or action are the feelings of the person about performing a positive or negative behavior, determined by analyzing one's beliefs. Subjective norm is defined as an individual's interpretation of whether the behaviors should be carried out according to what the people who are more important to him think. To clearly describe in simple terms: the voluntary behavior of a person is predicted by the attitude of an individual toward a behavior or behavior and how an employee feels that if they performed better than them, their peers will perceive them. This theory is

applicable to the study since it is used in organizations to describe human activities in relation to the introduction of new technologies (Pedersen, 2005). The behavioural intent to implement new technologies is clarified by the attitudes of employees towards behaviour and subjective expectations. Increased competition and deregulation have driven many services and banks to adopt cost-effective practices to distinguish between operational technologies; providing reliable and efficient service quality is the approach that has been connected to organizational performance.

Due to high sales, improved market ratios, greater consumer retention, customer buying habits and expanded market share, customer satisfaction has become an important feature. The relevance of the Rational Action Principle to technology and consumer satisfaction is becoming more prevalent, so the level of delivery of customer service is also changing the scenario of the technical climate, so the level of customer satisfaction and loyalty is changing. In order to deliver quality services at lower prices and improve customer loyalty, technology adoption in the form of e-banking plays an important role.

2.3 Digitization in Banking

Digital technology is commonly used in the financial industry, with blockchain, big data, and smart investment consulting at its heart. By helping to solve data asymmetries (using big data and AI/ML techniques and blockchain technologies), offering a user-friendly customer interface and a higher quality of service, and eventually replacing obsolete technology, the digital disruption in banking promises to lead to a general improvement in productivity and service. Most of the advantages of traditional financial institutions are BigTech platforms; they have a proven, loyal

customer base and vast volumes of customer data; a strong reputation and lobbying capacity; strong brand names; the ability to take advantage of network effects; and the ability to finance their operations at low capital cost. BigTech platforms, in particular, have access to valuable market data and can benefit from their size to deliver high-volume financial services at a lower cost. BigTech platforms focused on internet search; gathering consumer information from search activities; those focusing on social media have direct personal data about users and their connections, and those focusing on e-commerce have information and habits about both sellers and buyers. The digitization process of commercial banks has also resulted in improved banking services being provided. The quality of banking services provided to clients is more reliable and competitive with the use of information and communication technologies. The information and transactions of customers are easily generated, saved and retrieved on a database. This helps to regulate the amount of paperwork that business banks need to manage. As a result of the digital transition, the process of opening accounts for new customers, the evaluation process of prospective customers for new accounts and the loan process has been made very clear, competitive and successful (Gonzalez-Paramo, 2017). In the process of financial transactions derived as a result of digitization, the degree of comfort and convenience is indisputable. Commercial banks tend to do well in the digitisation process. They make use of ICT devices and gadgets that provide them with greater comfort and convenience without compromising the quality of service rendered (Harigaya, 2016).

The BigTech business's complementarity with financial services depends on the form of data obtained. Data will assist with distributing and pricing financial services for social media and search firms, while data will promote credit evaluation for e-

commerce sites. For example, Freedman and Jin (2017) show that social media data should not replace the information found in credit scores. BigTech platforms also have a captive ecosystem, with high consumer switching costs, and can harness economies of scale and provide financial services with efficient technologies. Therefore, the conventional banking sector burdened by legacy structures is potentially even more disruptive to BigTech firms. BigTech companies will leverage the information gathered on their networks by non-financial activities in order to design new banking services, as opposed to incumbents that face tighter regulatory restrictions on activities and user data. In less established banking markets in particular those with high mobile penetration) with payment services and money market mutual funds and insurance offerings, BigTech platforms have penetrated further. With regard to lending, BigTech platforms tend to lend more in countries with a less competitive banking sector and less rigorous regulation. BigTech platforms already have a captive ecosystem with high consumer switching costs and can take advantage of economies of scale and efficient financial services innovations. BigTech platforms have penetrated more less-developed banking markets with payment services and money market mutual funds and insurance offerings, in particular, those with high mobile penetration.

Banking could switch from the conventional oligopoly to a modern type in which there are a few dominant platforms. The financial sector will become more competitive and have greater financial inclusion, as long as productivity benefits such as superior information and screening technology, leaner activity, and less leverage are what drive BigTech's entry into banking. This effect would be particularly pronounced if as a response to the entry of BigTech companies, by restructuring and

introducing more advanced technology, incumbents become more competitive. Nevertheless, if market influence, taking advantage of regulatory loopholes, and bandwagon effects of network externalities for exclusionary purposes are the forces behind BigTech entry, then the effectiveness of the banking system could suffer in the long run.

Legacy architecture in banks, based on enterprise architecture approaches, is usually heavy and transaction-oriented. Digital business models include the fast implementation of technology and shorter marketing time for fresh goods and services. Banks are increasingly looking at adopting new architectural approaches such as Two-speed IT architecture which help in balancing between the long release cycles of backend implementation with faster customer-facing capabilities. In order to build a shared data model and reusable services and microservices, banks should utilize technology as an Enterprise Integration strategy. For digital services to create an agile customer-centric infrastructure, banks will easily implement mobile, big data and analytics. APIs assembled on top of services\micro services are the mediation between faster customer-centred architecture and slower enterprise architecture.

Digital technologies act as a key enabler for digital services in the banking sector. From cloud computing to digital security to new communication technologies, innovations in ICT sector form the backbone of disruptive business models in the banking sector.

Figure 2.1 Digitization in Banking

2.4 Fintech Firms

Financial technology, also known as fintech, is a sub-sector of the financial services sector consisting of companies that render financial services more effective through the use of technology. Fintech is a portmanteau combining the terms "financial" and "technology." Sweeney (2015) and Kuo-Chuen and Teo (2015) described Fintech as products or services in non-financial institutions created on highly innovative and disruptive service technologies. Fintech was defined by Freedman (2006) as building systems which model, value and process financial products (examples include bonds, stocks, contracts, money). Ernst and Young described Fintech in a 2011 report as an advancement in financial services with technology as the key enabler. In particular, they clarified the differences between conventional electronic banking and FinTech, highlighting the new position of IT in finance. The role of IT in financial services is

not as a facilitator or enabler to effectively deliver financial services, but as an innovator that disrupts the existing value chain by bypassing the existing channels.

The role of IT in financial services is not to promote or encourage the successful delivery of financial services, but to disrupt the current value chain by circumventing existing channels as an innovator. By disrupting and replacing the current channel, Fintechs will directly provide its clients with streamlined or personalized financial services in the front office.

Although the relationship between financial and IT services is not novel, Fintech differs in terms of opportunities, risks and legal implications from existing electronic financial services. Fintech analysts and regulators are worried about who is using financial technology and supplying consumers with financial services (Arner et al., 2015). IT's rising and strengthening position is also an essential feature of digital finance, so fintech is increasingly seen as a facilitator for conventional electronic financial services which have resulted in the emergent Fintech as an advanced strategy to provide financial services (Arner et al., 2015).

Lee and Kim (2015) have argued that the technical mechanism arising from the creation and development of modern financial software that could impact the whole conventional structure is Fintech. Lee defined Fintech as a category of business that provides financial services using hardware and software technologies. Banking is thus transitioning to a platform-based model that is customer-centric. All of these developments present enormous challenges for incumbents as they will have to upgrade their technical systems (moving from relatively rigid mainframes to a more versatile cloud), reduce branch overcapacity in the current low-profit environment

especially in Europe and Japan, where legacy assets are still available), and attempt to meet the new service level through the current low-profit environment. The incumbents will have to restructure, and there will be restructuring. Incumbents will also face intense regulatory oversight and enforcement obligations and will have to address the immense harm caused by the financial crisis of 2007-2009 to their image. In corporate lending to medium-large and large businesses, FinTech firms have not yet made major inroads.

Despite its continuous growth, FinTech credit still accounts for a limited proportion of total lending, including in China (where it accounts for the largest share of total lending activity), where it accounted for only 3 of the total non-bank sector loans outstanding in 2017. In countries with higher per capita revenue and a less competitive banking system, FinTech credit tends to be more relevant. In the United Kingdom, the United States, South Korea and China, total FinTech loans per capita are high. BigTech firms have most FinTech credit in South Korea and Argentina (Claessens et al. 2018, Frost et al. 2019). While they initially aimed to replace conventional banks as market leaders, when faced with difficulties of growing size and customer numbers, many FinTech companies have focused on establishing alliances with incumbents. While FinTechs have successfully led innovation efforts and raised customer expectations through innovations such as rapid credit adjudication, the willingness of consumers to move away from incumbents has not met expectations, as switching costs and market inertia are high and incumbents have adapted to the innovations of FinTech companies (McWaters and Galaski 2017).

In line with their distinctive business models, Dorfleitner et al. (2017) split companies in the FinTech industry into four main divisions. FinTechs can be differentiated on the basis of their participation in finance, wealth management and payments, as well as other FinTechs, by a loose variety of companies performing other roles, when opposed to conventional value-adding areas of a universal bank. The FinTech subsector was classified by the Basel Committee on Banking Supervision into three product sectors, as well as market support services, representing the enabling technologies that support these innovative products. These three sectors are specifically related to core banking services, while market support services are related to innovations and emerging technologies which are not unique to the financial sector, but still play an important role in financial developments (BCBS, 2017).

2.5 Empirical Review

The use of emerging technologies has major consequences for the well-being of market participants, which may lead to lower costs of financial intermediation in credit, payment systems, financial advice and insurance, as well as better consumer goods (Philippon, 2018). Vives (2017) stresses that, amid technological advancement, the unit cost of financial intermediation has not decreased until recently. Empirical analyses of fintech start-ups and the economic success of retail banks are currently being investigated. There is no question that the digitization of the services provided by commercial banks has had a substantial positive effect on the success of their respective customers or clients, including the performance of the banks. Some of these influences include the following the process of inculcation of digital technologies into service provision in commercial banks has brought about a drastic reduction in the level of poverty (Mukherjee, 2017) (Naseem, 2017) (Maxima & Kim,

2018). Bank accounts can be opened without the prospective customer being physically in the bank simply because the process of digitization has allowed for mobile communication in the financial system (Nyangosi, Nyangau, Nyariki, and Nyangau, 2014; Happiest Mind, 2014; Piirainen, 2016; Ortstad and Sonono, 2017). Customers are encouraged to open bank accounts because they are conscious that they can carry out bank transfers with the click of a mouse or the use of mobile devices; rather than having to go through the banks and other financial institutions' time consuming and frustrating experiences. In a Harigaya (2016) survey, it was revealed that approximately 30 percent of the time was saved during financial deposits and approximately 70 percent of the time was saved during withdrawal as a result of the digital transformation in financial institutions." As a result of digitization, the ease of access to commercial banks has in turn increased the amount of savings made and in the lonely (Gonzalez-Paramo, 2017). Abbasi and Weigand (2017) further corroborated this argument, observing that there was a substantial increase (700 million) in the number of individuals who had accounts between 2011 and 2014.

2.5.1 Challenges and Opportunities for Banks in the Digital Era

Innovation in financial services powered by technology is rapidly reshaping the African financial and banking environment like never before (Sy et al., 2019).

There is a clear consensus that digital banking services favour financially excluded individuals and underserved customers worldwide and that this trend will continue in all key financial aspects such as deposits, credits and investments over the next decade (Jagtiani and John, 2018; IMF, 2018). Although the most active players are mobile network providers, banks play a crucial role in the provision of mobile money. Specifically, mobile network operators must establish relationships with banks or

other financial institutions with a banking license to launch mobile money services (Aron, 2017; UNCTAD, 2012). In this case, by keeping a "trust" account or "escrow" account deposits that fit the full scope of electronic money in the name of mobile network operators, banks play the role of custodians for mobile money users (Aron, 2017; Greenacre and Buckley, 2014). These additional funds can be used by banks to raise their lending and this is not different from the way banks use ordinary deposits. Bank participation in the mobile money scheme therefore entails simply keeping a (passive) trust/escrow account, establishing a relationship to launch mobile money services (active), or both.

Some banks, for example, create alliances with MNOs to increase the number of bank ATM users for cash-out functions in order to take advantage of other possible benefits associated with mobile money. Such interest and fee-generating operations are new sources of income that could theoretically increase the profitability of banks. In addition, many MNOs have recognizable brands that have been generated through comprehensive marketing and service provision, so banks can exploit mobile money platforms at a much lower cost to reach more customers in historically underserved areas.

The productivity gains of FinTech companies are primarily attributed to the personalization of loans and disintermediation of processes by removing intermediaries, which greatly decreases transaction costs for customers (KPMG, 2016; Lines, 2016). New technologies such as BlockChain" also increase competitiveness (Peters and Panayi, 2016; Wood, 2015). Since banks are typically less likely due to the regulatory climate to implement new technology quickly

(Hannan and McDowell, 1984) and instead rely on decades-old IT infrastructure, these developments are expected to benefit FinTech companies more. The reduction of counterparty and settlement risks in shortening the settlement time from 3 days to 2 days would help many markets in reducing counterparty and settlement risks, according to Peters and Panayi (2016), and BlockChain technologies have the potential to lead to a near-instant settlement. A contrary look at FinTech argues that advancement in financial technology has not the the cost of intermediation (Philippon, 2015). FinTech lenders offer higher interest rates than non-FinTech lenders, according to Buchak, Matvos, Piskorski, and Seru (2017), while their potential effect on banks and financial institutions has been expanding very rapidly in financial markets, it is yet to be definitively identified. European Economy deals particularly with the relationship between FinTechs and banks.

Table 2.1: Risks and Opportunities in incorporating technology into finance

	Risks	**Opportunities**
Impact on consumer sector	A. Data privacy B. Data security C. Discontinuity of banking services D. Inappropriate marketing practices	A. Financial inclusion B. Better and more tailored banking services C. Lower transaction costs and faster banking services
Impact on banks and banking system	A. Strategic and profitability risks B. Increased interconnectedness between financial parties C. High operational risk – systemic D. High operational risk – idiosyncratic E. Third-party/vendor management risk F. Compliance risk including failure to protect consumers and data protection regulation G. Money laundering – terrorism financing risk H. Liquidity risk and volatility of bank funding sources	A. Improved and more efficient banking processes B. Innovative use of data for marketing and risk management purposes c. Potential positive impact on financial stability due to increased competition15 D. Regtech

Source: Al-Ajloun, Al-Hakim, and Suliaman, 2018

2.5.2 Measures of Bank Performance

Bank profitability determinants can be divided into bank-specific and macro-economic variables (Aburime, 2005). Stochastic variables that decide the output are

these. Internal factors are individual bank characteristics that influence the bank's efficiency. The internal decisions of management and the board are essentially informed by these variables. The external variables are sector-wide or country-wide variables that are outside the company's control and influence banks' profitability. The ultimate purpose of commercial banks is profit. This grand goal is expected to be realized through all the tactics planned and activities carried out thereof. This doesn't mean, however that commercial banks have no other priorities. Commercial banks may have additional social and economic priorities as well.

2.5.2.1 Return on Equity (ROE)

ROE is a financial ratio that refers to how much profit a corporation receives relative to the total amount of equity spent or discovered on the balance sheet by the shareholder. In exchange for their investment, ROE is what shareholders want. A company with a high return on equity is more likely to be one that is internally capable of producing cash. Thus, in terms of profit production, the greater the ROE, the better the business is. Khrawish (2011) further states that the ratio of Net Profits after Taxes divided by Total Equity Capital is ROE. It reflects the return rate received by its stockholders on the funds invested in the bank. ROE explains how bank management uses the funds of shareholders efficiently.

2.5.2.2 Return on Asset (ROA)

ROA is also another important ratio that shows a bank's profitability. It is an income ratio to its total wealth (Wen, 2010). It tests bank management's ability to produce revenue through the use of corporate assets at their disposal. In other words, it illustrates how effectively the resources of the corporation are used to produce

revenue. It also shows the efficacy of a company's management in producing net profits from all the institution's capital (Wen, 2010). Wen (2010) notes that a higher ROA indicates that the organization uses its capital more efficiently.

2.5.2.3 Net Interest Margin (NIM)

NIM is a calculation of the difference between the interest income generated by banks and the amount of interest paid out to their lenders (such as deposits) in relation to the amount of their assets (such as interest earned). It is normally calculated as a percentage of what the financial institution receives on loans for a particular period of time and other assets minus interest paid on borrowed funds, separated by the average amount of assets on which it received profits over that period (the average earning assets). Net interest income divided by total earnings assets is known as the NIM variable (Gul et al., 2011). A higher net interest margin, however may represent riskier lending practices linked to significant loan loss provisions (Khrawish, 2011).

2.6 Technology adoption and Finance Performance of Traditional Banks

According to Joseph and Stone (2003), the introduction of technology raises the question whether account transfers, service delivery and new product creation in banks reflect positive progress and thus boost the quality of service by providing increased customer loyalty. Although the implementation of technology can save time and money and eradicate mistakes, among other functions, it can also minimize any associated service value and direct consumer engagement to be obtained by addressing different issues related to cultural changes and social trends (Bitner, 2001). Frenzel (1996) defines technology adoption as the capacity, through the application of information, processes and skills, to perform a given task. In addition, it can be

defined as a combination of computer and communication technologies that contribute to the processing, handling, storage and communication of information and/or the dissemination of information. In addition, Dick and Basu (2004). It claimed that the adoption of information technology by businesses has further extended from the traditional personal computer and network technologies by introducing other technologies such as mobile phones, TV use, etc (Laudon and Laudon, 2000). The introduction of technology in these banks has been used conveniently as a new physical banking service to reach more potential customers and encourage customer loyalty and moreover, as it enables bankers to offer banking services through technological innovations to a broader segment of customers (Goi, 2006). Seyed et al (2013) conducted a study to evaluate the effects of internet technology, the effects of customer relationship management, and the impacts on customer retention and satisfaction of customer loyalty. Their results showed that the use of internet technologies would provide consumers with value, which increases the bank's customer loyalty and financial efficiency. For example, Oppong, Adjei and Poku (2014) conducted a study on the role of information technology in fostering customer loyalty with reference to Agricultural Development Bank Ltd Ghana and the results showed that the standard of customer service is still low despite the implementation of technology in service delivery by Agricultural Development. On the other hand, the introduction of technology has played a role in improving consumer loyalty by making banking services more convenient, time-saving, and personalized. Xavier (2017) further observes that financial technology has a large and potentially welfare-enhancing disruptive capability. However, in order for the new technology to deliver the benefits for consumers and firms without endangering financial stability, regulation needs to rise to the challenge.

2.7 Banking Innovation and Customer Performance

It is well known that when it comes to making informed decisions about potential buying preferences, consumer loyalty is considered to be the key driving factor (Liébana-Cabanillas et al., 2013; Malinconico, 2016; Tan et al., 2016; Taylor and Baker, 1994). A happy consumer is more likely to repeat the product purchase. Similarly, Musiime and Bayaki (2010) indicate that banking creativity is directly linked to the degree to which the clients of a bank are pleased. For example, Fornell. (1992) and Amin (2016) point out that customer loyalty works as an exit obstacle to help a business maintain its customers and reduce its switching rate. Similarly, (Kaura et al., 2015; Lam et al., 2004; Thakur, 2014) argue that the impact of a happy customer on a service provider could encourage the customer to again patronize the provider and recommend it to other customers. In comparison, the supplier would most likely not be recommended to other clients by a disgruntled client. Good customer loyalty would also inevitably influence customers to stay loyal to the bank (Alsaaggaf and Althonayan, 2018; Jan and Abdullah, 2014; Parawansa, 2018). Many commercial banks have launched many technologically improved services and products with the primary objective of attracting, pleasing and maintaining clients in order to remain competitive and stay ahead of the competition (Jan and Abdullah, 2014).

In developing countries, the lack of electronic banking infrastructure decreases expected cost-effectiveness and profitability. In certain developing countries (Alam et al., 2007, Gutu 2014). Internet banking, on the other hand, has traditionally been triggered by large banks in some developed countries (Malhotra and Singh, 2006, 2009). Large-scale private-owned banks are found to have very high deposit volumes,

with low branches and fewer fixed assets tending towards internet banking. These are typically targeted at growing the low market share of the market. As a consequence, banks prefer to exploit internet banking, rivals are accelerating the competitive activity orientation in this sector (Malhotra and Singh, 2007).

On the other hand, many recent studies on the effectiveness of electronic banking activities on the performance of the banks in African countries that relatively lower level of development. For example, Abaenew et al. (2013), Hassan et al. (2013), Oyewole et al. (2013), Okiro and Ndung (2013) made studies on Nigeria and Adua and Kingoo (2012) and Nguyen Gakur Connection (2013) made studies on Kenya. The electronic banking activities increase profitability on banks wherein the majority of countries handled by the researchers.

On the basis of a positive impact on the performance of the role of providing the cost-effectiveness of the Internet, banking is great. The cost of a transaction performed at the branch can be reduced by 40 to 80 and when the same transaction is conducted on the website or ATM. The costs of the internet and other electronic banking systems decrease the overall operating costs and the overhead physical costs of the banks (DeYoung, 2001). Banks are rated as "innovative" using electronic banking services as intensive and their distribution networks are more than and their costs are below the industry average (Pigna, 2002). Therefore, the value of the electronic infrastructure used by banks is that the cost per transaction decreases dramatically along with the infrastructure created. However, factors such as the degree of customer knowledge, and the functionality of the bank's website, contribute to the performance of internet banking services. According to ordinary bank consumers, customers with

high levels of education demand internet banking services too much (Sullivan, 2000). The number of bank customers using the internet and other electronic banking services has not increased, as long as the profitability of the banks is affected by the cost of those services.

Some studies have been done on clients who use electronic banking to demonstrate that clients build expertise in the use of such services. The use of clients' electronic banking facilities, on the other hand, often affects the bank's expense and revenue structure. The profitability of all banks in the sector did not improve as the banks used similar electronic services and did not take sales capability into account. By comparison, as banks provide banks with complementary services, operating expenses decrease and profits rise (Dubois et al. 2011, Brush et al., 2012).

A significant problem is how to improve the productivity used by outsourcing companies in the promotion process of technical innovation. When event-related concerns are very complex, an optimal governance strategy should be pursued. Some research based on a survey has shown that the efficiency of online banking is improved by offering services from outside the bank. On the other hand, in a trade-off between them, a high degree of technology-induced performance adaptability.

2.8 Conceptual Framework

The diagram below shows the conceptual thinking deriving this study. The authors explore the impact of technology integration and banking innovativeness on the performance of traditional banking institutions.

The diagram below summarises the conceptual lenses through which the researcher seeks to analyse the research problem outlined in chapter one. The dependent variable is the financial performance of Banks and the independent variable is technology integration. Since the relationship between these variables can be affected by numerous factors, the author identifies two critical control variables which may influence the impact of technology integration and bank performance. The control variables are bank size (measured by stated capital) and bank age (measured by the number of years in operation).

Figure 2.2: Conceptual framework

2.9 Summary

This section of the literature review indicates that the short-term effect of digital disruption would be the erosion of banks' margins and increased competition in the banking and financial markets. The long-term effect would largely depend on what market structure is involved. The advancement of financial technology has also been shown to impact the viability and operations of conventional financial institutions in a way that calls for more empirical studies.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter includes in-depth the study's analysis methodology. The researcher explains the research strategy, research methodology, research technique, data collection techniques, sample selection, type of data analysis, and ethical requirements for data collection and analysis.

3.2 Research Design

To investigate and analyze the relationships between different variables, the research adopts a descriptive and causal approach. A descriptive survey offers a vivid summary of a study's reality, according to Arvind and Vijay (2013), whereas a causal design investigates how a variable or a combination of variables influences the values of other variables. For this review, the design was deemed suitable because it will include the most detailed approach to tackling the problem of analysis. This form of research design allows for a thorough examination of the variables to be carried out under review, as supported by Saunders et al. (2009).

3.3 Research Approach

The research uses a quantitative research approach to achieve the aims of the study. A quantitative analysis technique is a type of research method that involves classifying characteristics, counting and using statistical, mathematical or numerical models to analyze data, describe an outcome, and forecast future results as well. The key feature of quantitative research is that the findings are focused on a wider sample size that is representative of the entire population, so it is possible to construct general principles

and accurately analyze causal relationships. Its fundamental advantage lies in the fact that the findings are accurate because they do not rely solely on the researcher's judgments and can be applied to the broader population, which also constitutes its fundamental distinction from qualitative studies (Cengage, 2010). A study on the subject matter, therefore, offers itself to the tenets of quantitative research technique to objectively examine the relationship between digital innovation and financial performance as defined by their return on assets, return on equity, and net interest margin.

3.4 Sample selection

A sample is defined by Kothari (2004) as the selected respondent representing the population. A sample is a set of elements taken from a population to approximate population characteristics (Crammer and Howitt, 2004). Kothari (2004) believes that for certain research, at least 10 per cent of a broad sample is sufficient. The analysis, therefore, used a sample size of all the banks listed on the Ghana stock exchange in Ghana. Using the snowball sampling method, the findings were picked. Data collection refers to the collection of raw and unprocessed information to be converted into reasonable and usable information from known sources (Gall and Borg, 2007).

3.5 Population and Sample Size

The population of the study is estimated to be 10, 000, made up of customers and employees of all the universal banks in Ghana. Out of this population, 150 respondents are sampled; fifty (50) employees and one hundred (100) customers of the selected banks were surveyed for the study. There are nine universal banks

currently in good standing. Six (6) employees each from the nine (9) banks, and ten customers each from the banks.

3.5 Data Collection

For the research, both secondary and primary information was collected. The secondary data was derived from the annual reports of the selected banks for the study duration of three years. Using the basis of the literature, a questionnaire was built on the basis of the study's objectives and was tested on a sample of a few respondents before the full survey was performed. This pilot test was conducted to screen for inappropriate and ambiguous questions and to assess the suitability and adequacy of the data collection instrument. Using online survey forms, accessible historical data with employees and interviews with the top management staff of the selected banks, the actual data collection was conducted. In plain and easy English, the questionnaires were. The questionnaires were sent through email and WhatsApp to respondents. The responses were then extracted from the google sheet and used for the analysis.

3.5 Data Analysis

Data analysis refers to the process of data review, transformation and modelling to generate results that require interpretations to achieve research goals (Burns and Grooves, 2003). As a method of computing summaries on a data set, Berthold and Hand (2003) describe data analysis as a crucial part of any systematic study. Before the actual data analysis, the data collected was audited to ensure accuracy and to remove any outliers and obvious wrong data to ensure that the findings were not skewed by the wrong input data. In this thesis, the quantitative data was analyzed using descriptive statistical tools like mean scores, percentages and other measures of central tendency to access the characteristics of the data. The statistical package for

social sciences (SPSS) was used to obtain the summary statistics while the data collected through interviews were analyzed using content analysis. This research applies data analysis methods to the data collected from the companies listed.

3.6 Ethical Considerations

Ethics is characterized as the study of moral principles that regulate the conduct of our acts (Dudovskiy, 2018). Given the essential essence of ethics in the conduct of the study, the privacy and wellbeing of participants must be safeguarded (Silverman, 2009). In view of this during the conduct of this report, many ethical issues were taken into account in the sense that cross-checks were carried out to ensure that the data used was accurate and that the information transmitted would also be truthful. The researcher would ensure that the collected data is used purposefully for academic purposes in order to ensure that the analysis is ethical and confidential. The respondents were told that the data they supplied was strictly for academic purposes and would not be released to any third party. The tools are also built in such a way that they do not provide any personal information such as address or name, that could be used to monitor participants. This is done in order to avoid breaking the confidentiality laws of the university while conducting research. It was plain and quick to answer the questionnaire, so as not to cause any discomfort to the participants. In addition, the respondents were given their free will to participate and withdraw from the research on the basis of their convenience at any point in time.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, AND DISCUSSION

4.1 Introduction

In this chapter, the author synthesizes the data collected through questionnaires and interviews to achieve the research objectives outlined earlier in the first chapter of this thesis. The demographic characteristics of respondents are discussed followed by uses of digital innovations in the banking industry, the effect of digital innovations on bank performance, and challenges of digital innovations to bank customers. A discussion of the research findings and implications for extant literature are discussed in this chapter.

4.2 Background of Respondents

As explained in the methodology, one hundred and fifty (150) respondents are sampled; fifty (50) employees and one hundred (100) customers of the selected banks were surveyed. The table below gives a breakdown of the demographic characteristics of respondents.

Table 4.1: Demographic Characteristics of respondents

Variables	Categories	Frequency	Per cent
Gender	Male	72	48.0
	Female	78	52.0
Level of Education	High School	8	9.9
	Diploma/HND	14	17.3
	Bachelor's Degree	84	42.0

	Master's Degree	43	28.4
	PhD	2	2.5
Position	Customer	100	66.7
	Branch Manager	25	17.9
	Marketing Manager	19	13.5
	Relationship Manager	2	0.07
	Treasury Staff	4	0.02

A larger proportion of the respondents are customers of the banks who either answered the questionnaire virtually or completed printed versions of the data collection instrument. The remaining respondents were distributed among various roles in the banks ranging from branch managers, to marketing managers, relationship managers and people working in the treasury division of their respective banks

4.3 Uses of digital Innovations in the banking industry

The study sought answers from bank employees on the extent of the incorporation of technology with their core banking services. The answers suggest that for a long time, the use of technology has always been at the heart of banking services. However, the use of technology initially concentrated on the activities of the backend instead of the front end. However, the recent proliferation of digital technology is reinvigorating the over-regulated yet growing banking sector. With the launch of revolutionary products and services, the development of new business models, the rapid implementation of new technology and continuous changes in the regulatory climate, the banking sector is trying to find an unparalleled nimbleness. The introduction of new and creative

products and services in the banking industry has enabled the adoption of digital strategies.

Furthermore, the answers show that digitization blurs the distinctions between digital and other services and opens up higher competition for the banking industry. In recent times, there have been major differences in the universal banking model of conventional banks compared to how things were years earlier. Banks are now working to launch the Mobile Money Bank2Wallet Service and other services with telecommunications organizations. The service enables mobile phone users to connect their conventional bank accounts to their mobile money wallets on a 24/7 basis to make payments for products and services, carry out transfers of funds, etc.

This opens up access for the unbanked to conventional banking items.

One respondent pointed out that

> *"We continue to use cell phones, the internet and point-of-sale devices to provide consumers with quicker and more convenient basic financial services while promoting financial inclusion"*

With the launch of the Ghana Interbank Payment and Settlement Systems (GhIPSS) interoperability scheme, bank accounts can be connected to mobile money accounts to allow users to easily move funds from one mobile money platform to the other.

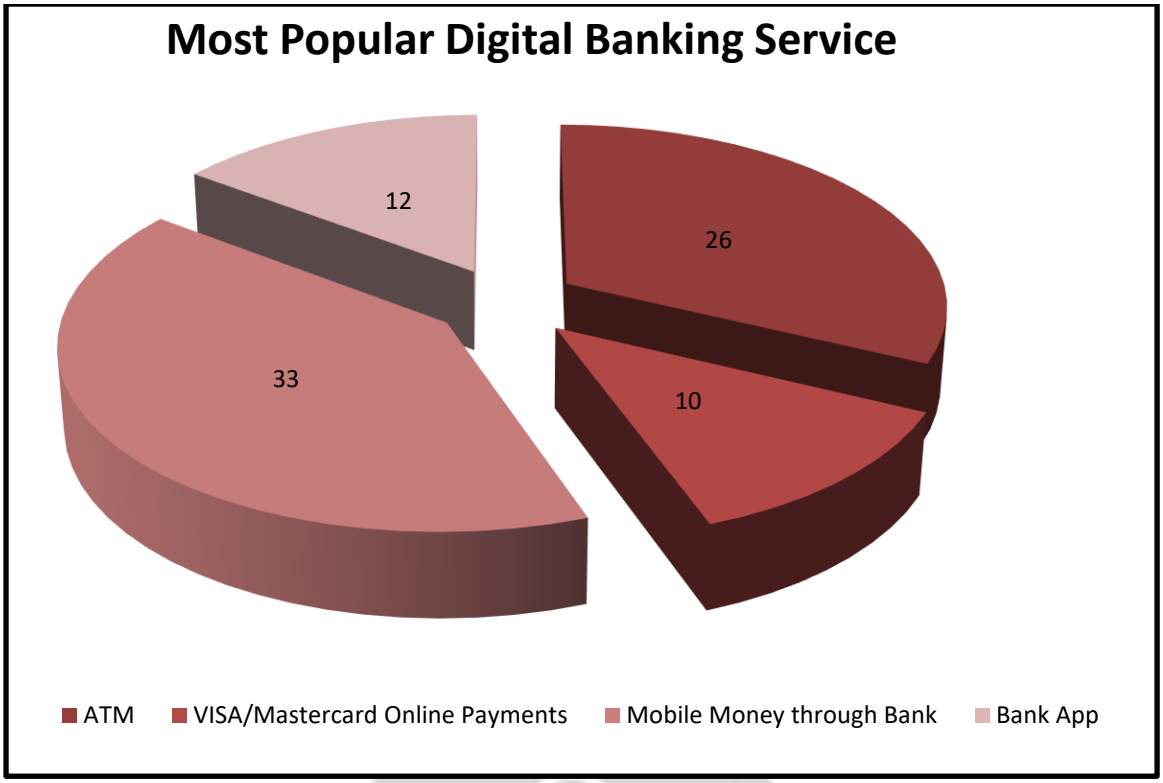


Figure 4.1: Customers' view on the most popular digital banking service

Source: Field Data, 2020

To the extent that digital technologies are used to facilitate banking service, customers believe that mobile money services through the bank are their most preferred followed by using ATMs and the use of bank apps, and online payments are about the same range.

Banks have formed partnerships with the Ghana Interbank Payment Services System (GhIPSS) to pioneer products and services such as the Direct Debit Network of the Automated Clearing House (ACH), a quick, safe and reliable service that allows organizations of all sizes to receive and send funds via bank accounts, as well as individuals.

4.3.1 Banking innovations and Bank Efficiency

Customers are convinced that the ability to access banking services on their mobile devices and use the internet by other means has made the delivery of banking services more effective. The answers show that simple handsets enable customers to access their bank accounts. Banks in Ghana have had mobile banking applications and USSD codes aimed at making banking as quick and easy as possible since the proliferation of smartphones and tablets. These systems are easy to use and reasonably safe, allowing customers to access their accounts and through their smartphones and tablets, carry out banking transactions conveniently from any part of the world. The viewpoint of clients on banking creativity and banking performance is shown in Table 2 below.

Table 4.2: Do you think digital banking increase banking efficiency?

Statement	**Min**	**Max**	**Mean**	**Std. Deviation**
Importance of digital banking innovations to service efficiency	2.00	5.00	4.20	.78595

Source: Field Data, 2020

It can be seen above that on a scale of 1-5, customers strongly agree (Mean=4.2) that banking innovations have a strong impact on the level of efficiency experienced in banking, the standard deviation is relatively small indicating good consensus.

A fuller picture of how customers assess digital innovations carried out by their respective banks is shown in table 4.3 below.

Table 4.3: Electronic Banking and Banking experience

STATEMENT	Min	Max	Mean	Std. Deviation
Electronic banking has made money transfer easier for me	3.00	5.00	4.5556	.59161
My bank uses electronic banking services	3.00	5.00	4.4938	.69144
Electronic banking has made banking services easier for me	3.00	5.00	4.3951	.68336
Electronic banking has eliminated long queue in my bank	1.00	5.00	4.2963	.91439
Electronic banking has improved quality of banking offered	2.00	5.00	4.1358	.83296
I am happy with the security of electronic banking services	2.00	5.00	3.8765	.96673
My bank offers good services using different technologies	1.00	5.00	3.8642	.95855
Electronic banking has made banking services cheaper	1.00	5.00	3.6790	1.08198

Source: Field Data, 2020

Ghanaian banks are going through digitization at very different paces. The most advanced banks are readily presenting their digital strategies and reforms of the IT system and experimenting with new service development methods. The new activities and experiments, however, are still expressed only to a limited extent in the financial reports and balance sheet figures of banks. The above table demonstrates that electronic banking has made money transfer simpler for customers, has contributed to

increased service quality, and other key areas of performance measurement in the last few years. The mean scores on the Likert scale items are reassuring and reinforce the positive impact of digital technologies on the performance of the banks sampled.

4.4 Effect of digital innovations on bank Performance

Despite a slight improvement in recent years, the profitability of Ghanaian banks has remained rather challenging, on average. Higher market volatility, escalation of default risks, the COVID-19 pandemic, and a weaker outlook for the global economy dragged down banks' profitability in recent months.

An analysis of interviews responses shows that with the various staff members of the sampled banks, it was found that technology-based products provide universal banks in Ghana with opportunities and substantial cost advantages, thereby increasing efficiency and promoting lower risk than conventional banking products. Moreover, the interview answers indicate that there would be a strong return on investment for the banks surveyed in a short time if there is ample consumer demand for a technology-based product bank. This is because it is expected that electronic banking services can boost the efficiency of banks. The expected results could however be seen in cases where investment in banking infrastructure is not adequate and customers prefer conventional branch-based banking.

The perception that digital skills provide a variety of capabilities, including advanced analytics, intelligent process automation, and digitization, was surveyed by most managers. While customer-facing products and touchpoints have become more digitized (e.g., online interactivity with customers and mobile payments), business processes are less so. Embedding digital connectivity in business process workflows

aims to open up steep increases in the productivity of workers, contributing to the industry's substantial value creation.

Therefore, the emphasis now lies in automation as the primary lever for digitizing business processes. In reality, automation has great potential that banks are slowly realizing. What will differentiate leaders from laggards as more routine tasks become automated is how they prepare their staff for the teamwork needed for complex tasks, both front-line and information workers alike.

The managers surveyed also expect that sales and income would move to banks on a scale that effectively use digital technology to automate processes, develop new goods, enhance compliance with regulations, change their customers' experiences, and disrupt key components of the value chain. This is against the backdrop of the fact that customers, financial markets, and sometimes regulators will punish banks which resist digital innovation. Some respondents further assume that up to 35% of net profit may be eroded by digital laggards, while winners may recognize a profit upside of more effective digital banking channel deployment.

4.4.1 Ghana Commercial Bank in perspective

It was revealed in an interview with a branch manager at a GCB bank branch that the bank recently revamped its mobile money network, now known as G-Money, which has since helped the bank achieve a 10-fold increase in its mobile services and has been the basis, more broadly speaking, for the creation of a new banking ecosystem. This is against the backdrop of the fact that there is a rapid growth of mobile payment services. Approximately 73 percent of all purchases nationwide are now made using mobile money, from making payments at various physical and online retail outlets, to

buying phone credit and purchasing a wide variety of goods and services. Mobile cash transactions in Ghana have risen more than 100 percent year-on-year in recent years. By September 2018, in a country of roughly 30 million people, there were reportedly already more than 31.4 million mobile money accounts and 8.2 million regular active users nationwide. It is to get an accurate understanding of the impact of G-money on the performance of the bank but the growth in the number of users alone means that it has the potential to contribute significantly to the performance of the bank.

The manager added that

> *'the largest commercial bank in Ghana is Ghana Commercial Bank (GCB). For more than 60 years, GCB has served clients and has over 1.5 million active bank accounts on a monthly basis and more than 180 physical branches. It claims that mobile money is fundamentally a banking service not a carrier issue and it has therefore offered a mobile money service since 2018'*

GCB aimed to expand this mobile money service into one that could be used for simple cross-platform payments, and a mobile money platform. By incorporating other banks into a broader mobile payment ecosystem, the bank also decided to give customers a big portfolio of services. GCB strongly believed that mobile money would help to expand its market share by delivering services at minimal cost to more customers, in turn enhancing Ghana's payment experience and helping to improve the lives of people by providing additional financial services such as small loans. GCB devised a strategy for the introduction of its mobile money network with this in mind.

Being one of the largest banks in Ghana, the GCB bank limited has ramped up efforts to dominate the digital banking space and it seems to be paying off. The table below

is a summary of the key performance indicators of the bank for the 2019 financial year. After massive investments in digital banking.

Source: Data from GCB

Ratios & Margins Ghana Commercial Bank Ltd.

All values updated annually at fiscal year end

Valuation

* P/E Ratio (TTM)	2.10
** P/E Ratio (including extraordinary items)	2.10
Price to Sales Ratio	0.67
Price to Book Ratio	0.76
Price to Cash Flow Ratio	2.99
** Enterprise Value to EBITDA	-
** Enterprise Value to Sales	0.40
Total Debt to Enterprise Value	1.19
Total Debt to EBITDA	-
EPS (recurring)	1.62
EPS (basic)	1.62
EPS (diluted)	1.62

Efficiency

Revenue/Employee	840,536
Income Per Employee	179,346
Receivables Turnover	-
Total Asset Turnover	0.17

Profitability

Gross Margin	-
Operating Margin	+29.06
Pretax Margin	+28.52
Net Margin	+21.34
Return on Assets	3.69
Return on Equity	26.53
Return on Total Capital	24.27
Return on Invested Capital	23.01

Capital Structure

Total Debt to Total Equity	53.89
Total Debt to Total Capital	35.02
Total Debt to Total Assets	7.66
Interest Coverage	-
Long-Term Debt to Equity	12.46
Long-Term Debt to Total Capital	8.10
Long-Term Debt to Assets	0.02

Source: Wall Street Journal, 2020

The bank has an impressive net margin and above-average return on assets and returns on investment. All these point to the positive returns from the investments being made in digital banking innovations over the last few years.

4.4.2 Examining the performance of listed banks in the light of investments in technology.

The sector has seen a downward trend in the net interest margin for the second year running, according to a recent Ghana banking survey study prepared by PwC. The

average NIM of the top 5 banks (GCB, GTB, FBN, SG-GH and BOA), however, rose from 9.38% in 2018 to 9.44% in 2019. From 10.5 percent in 2018 to 7.5 percent in 2019, UBA reported a substantial decrease in NIM. This is attributed to a fall in interest income on loans to consumers over the year by 38 percent. While gross loans rose by 34 percent in 2019, the new loans disbursed were towards the end of the year as such, not much interest income was received on these properties. In 2019, GTB posted an increased NIM of 9.7% from 7.7% in 2018. A GHS 21 million drop in interest spending on consumer deposits to GHS 80 million in 2019 explains this. While renegotiating the price of term deposits during the year, the bank increased efforts to mobilize call and current deposits. As the bank continues to deploy funds into long-dated government securities, interest income has also risen by 35.1 percent. For the third Conservative year the SCB proceeded to witness a decline in its net interest margin. Assets producing non-interests such as cash on hand and cash kept with the central bank rose by 38.2% from GHS 1.8 billion to GHS 2.6 billion. The bank also recognized GHS 217 million on the back of the acceptance of IFRS 16-Leases as a right to use properties. For the period from GHS 488 million in 2018 to GHS 595 million in 2019, this increase in assets outperformed the 21.7 percent growth in net interest income. It was passed in May 2019 in line with the 2019 Payment Systems and Services Act (Act 987). The aim of this Act is to consolidate existing laws and guidelines on payment systems and electronic money and to broaden the ecosystem's category of participants and services. The BoG has established a National Payment Systems Strategic Plan (2019 - 2024) to facilitate efficient payments, strengthen financial inclusion, and accelerate financial innovation in order to achieve the goals of the Act. In response to restricted conventional banking

operations, market advances in the expansion of service and payment options significantly facilitated transactions during the COVID-19 crisis.

4.4.3 Cumulative Net interest margin of Banks

	2019	R	2018	R	2017	R	2016	R	2015	R
GCB	10.1%	1	9.6%	2	12.6%	3	16.6%	2	16.5%	2
GTB	9.7%	2	7.7%	11	8.9%	15	9.2%	13	7.8%	24
FBN	9.3%	3	5.6%	17	10.5%	10	10.5%	8	12.7%	4
SG-GH	9.3%	4	8.9%	4	10.9%	8	8.9%	14	9.5%	14
BOA	8.8%	5	7.3%	13	5.8%	25	9.8%	11	8.2%	20
SCB	8.8%	6	9.1%	3	11.6%	5	11.9%	7	10.9%	7
EBG	8.7%	7	8.8%	5	9.3%	13	9.6%	12	10.9%	8
FNB	8.6%	8	4.8%	18	10.3%	11	13.9%	3	18.2%	1
CAL	8.3%	9	8.6%	7	9.1%	14	7.1%	23	8.0%	23
ZBL	7.6%	10	8.3%	8	8.7%	16	8.8%	15	9.8%	11
ABSA	7.6%	11	8.7%	6	11.1%	6	10.4%	9	12.3%	5
UBA	7.5%	12	10.5%	1	16.8%	1	12.3%	6	8.2%	19
ADB	7.3%	13	7.4%	12	10.7%	9	7.1%	24	8.4%	18
FBL	7.3%	14	8.1%	10	8.6%	17	8.6%	16	10.4%	10
RBL	7.1%	15	7.2%	14	8.5%	19	7.0%	25	9.5%	12
SBG	6.9%	16	8.1%	9	8.3%	20	7.3%	22	8.7%	16
CBG	6.6%	17	-	-	-	-	-	-	-	-
PBL	6.6%	18	6.5%	16	8.6%	18	7.8%	20	8.1%	21
ABG	4.4%	19	6.5%	15	7.6%	21	7.8%	19	8.5%	17
FABL	-	-	4.8%	19	5.9%	24	7.9%	18	7.2%	25
BOB	-	-	-	-	12.7%	2	12.4%	5	12.1%	6
OBL	-	-	-	-	11.9%	4	17.7%	1	-	-
TRB	-	-	-	-	11.0%	7	8.3%	17	8.9%	15
UMB	-	-	-	-	9.7%	12	6.8%	26	14.0%	3
PRB	-	-	-	-	6.9%	22	5.1%	29	-	-
BSIC	-	-	-	-	6.4%	23	7.7%	21	8.1%	22
ECB	-	-	-	-	5.6%	26	5.5%	28	4.9%	26
TCB	-	-	-	-	3.6%	27	0.0%	-	-	-
SBL	-	-	-	-	-	-	13.3%	4	-	-
GNB	-	-	-	-	-	-	10.4%	10	-	13
UGL	-	-	-	-	-	-	6.3%	27	4.6%	27
NIB	-	-	-	-	-	-	-	-	10.4%	9
Industry	7.9%		8.0%		9.4%		9.2%		9.8%	

4.5 Challenges of digital innovations to Bank customers

The respondents acknowledged that there were difficulties, despite the advantages of e-banking, as all banks have varying degrees of challenges in their implementation and incorporation of customer-side e-banking. These challenges can be broadly grouped into two categories as defined by the respondents to this study; challenges the bank faces in its implementation of e-banking and challenges customers who patronize the services faced. High implementation costs, a lack of solid technology infrastructure in the country and security concerns are the challenges facing banks in implementing digital banking projects. The survey responses clearly indicate that the sampled banks' digital banking initiatives are seriously impeded by the high cost of implementation, the lack of sound technological infrastructure in the country and security issues. Ghana's low technology infrastructure has made some banks outsource some of their banking processes to external service providers.

Most respondents (52 percent) stated in this study that insufficient network systems are the main challenge facing the e-banking system in the surveyed banks. This is true since the internet connection that linked the systems together might easily fail, resulting in the failure of the E-banking network system. The Internet access is not however, provided by banks.

Table 4.4: Challenges of digital banking to customers

	Min	Max	Mean	Std. Deviation
Access to internet limits my ability to use digital banking products	1.00	5.00	2.9259	1.26271
Some of the digital banking products are difficult	1.00	5.00	2.8025	1.18764

to use				
Using digital channels is more expensive	1.00	5.00	2.6420	1.19696
I am not able to trust the digital channels	1.00	5.00	2.5556	1.14018
I do not have a good understanding of how to use digital banking channels	1.00	5.00	2.1111	1.27475
I lose money to fraudsters due to digital banking	1.00	5.00	1.9259	1.20185

A tabulation of the challenges that customers go through in their use of electronic banking products is presented in table 3 above. Customers highlight internet access, the difficulty of using the various platforms, cost, and fraud as the key challenges they face in their use of digital banking products of the various banks. The technologies available to employees for collaboration in the digital banking era also present a number of challenges. These tools are typically disconnected from actual information flows related to business processes, and this lack of integration results in an unneeded back-and-forth on status, hand-offs, and inquiries among employees, hurting their productivity. It can be deduced from this study that embedding digital collaboration into process workflows will unlock the next employee productivity is critical if banks are going to be successful in their digital banking endeavours. Assuming that core business processes which represent 15 to 20 percent of spending could be streamlined to improve productivity by 8 to 10 percent the result of scaling up to the entire banking industry might generate new value for participants and customers.

4.6 Discussion of Findings

The importance of electronic-based banking products is increasing day by day. There is no question that electronic-based banking offers relatively low risk, high yield and

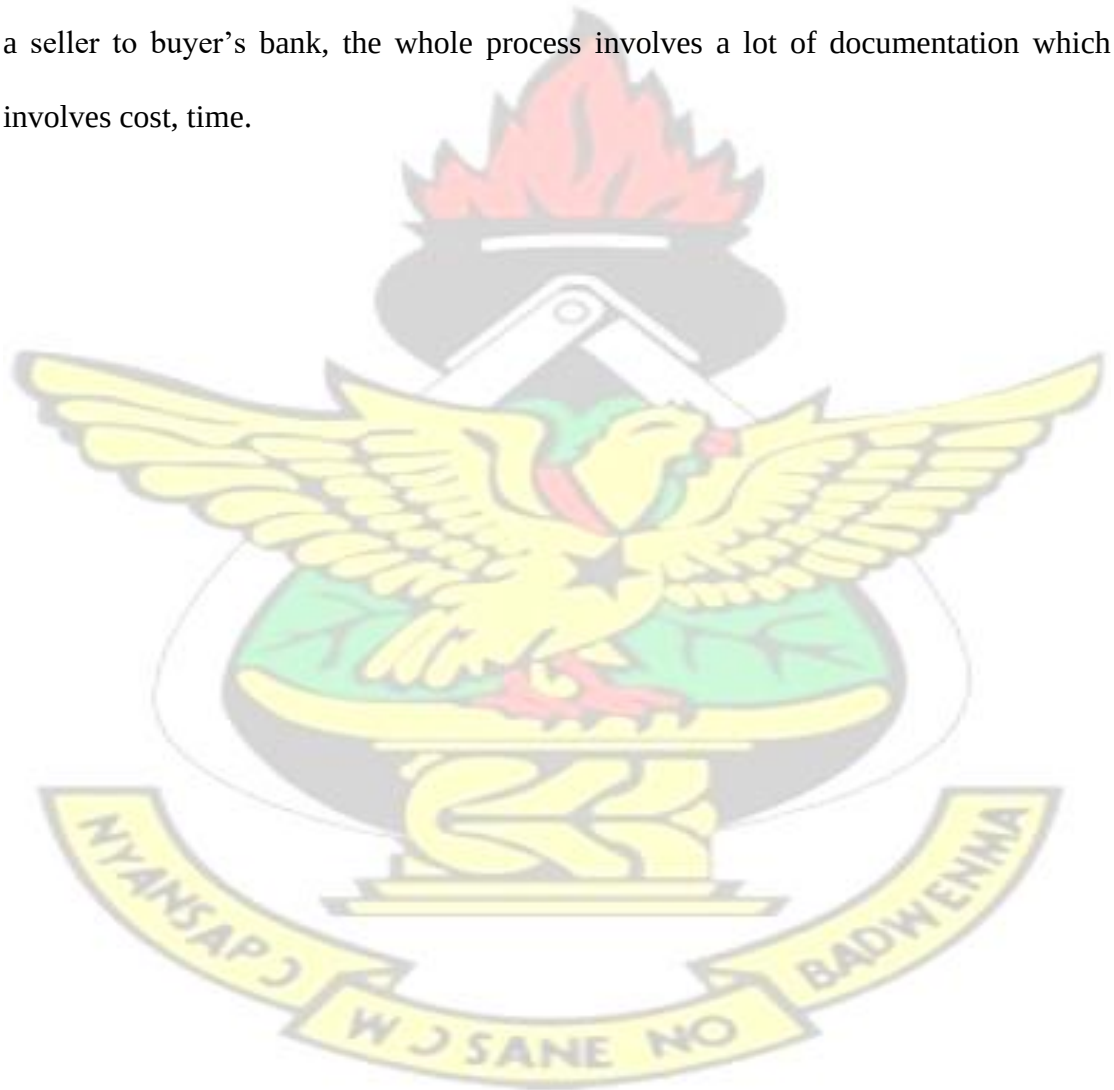
cost benefits. There are several studies focused on the profitability of banks providing electronic banking products that discuss the effect of efficiency.

The effects of electronic banking products on performance data were examined in this study by using answers to survey questions and interview responses from managers and other senior staff in different banks.

The results show that the profitability of the bank in question is affected by almost all investments in digital banking services. However, the number of POS terminals and the number of clients using internet banking services are calculated by the interviewees to positively impact profitability. As the sample had variations in the electronic banking infrastructure and socio-cultural characteristics of customer behaviour between the different banks, this situation can be interpreted. The number of bank cards issued, including credit cards, debit cards and the ATM ratio to the number of branches, has a positive impact on profitability. Customers are most familiar with electronic banking applications as ATMs for any one of the nine banks sampled for the report, which decreases operating costs based on branch office. Other studies support these results. For example, studies show that electronic banking applications reduce operating costs and increase bank efficiency in terms of profitability, according to Gutu (2014). It takes a very short time to deal with the initial setup costs of internet banking and other electronic activities and to surpass them. Electronic banking activities in developed countries are encouraged by this situation. However, in order to improve bank profitability, customer portfolios must be increased (Sumra et al., 2011). Overall findings affecting developing countries are consistent with those obtained from developed countries. On the other hand, a study found that the effect on the profitability of some electronic banking is negative for the Jordanian banks Al-Samadi and Al-Wabal (2011). These studies have shown that

advanced technology is needed for electronic banking applications to increase the overall profitability of banks in the US and European countries. In essence, internet banking has been found to make a major positive contribution to the growth of competition in the banking sector and the efficiency of banks. Accordingly, internet banking apps make banks focus on technological advances (Arnaboldi and Claeys, 2008, Ciciretti et al. 2009). Technology-based and in particular, internet banking products have been found to reduce banks' operational risk (Hasan 2002, Ciciretti et al., 2009). Internet banking apps improve the quality of banks' assets and thus directly increase operational profitability and ROE results (Kagan 2005). A significant proportion of respondents (Mean=3.75; SD=0.764) accepted that to simplify their routine processes, the commercial bank has widely deployed the new digital options. This finding is in line with Kamra's (2015) study, which claimed that commercial bank digitization is far beyond merely shifting from the old banking system to a digital system. This is a major shift in how commercial banks communicate with and meet the needs of customers. Successful digitization begins with the identification of the actions of digital patrons, dislikes, preferences, interests, choices, favourites, spoken and unspoken needs. The implication of these findings is that digital banking channels will continue to grow and possibly become the new normal. Customers will continue to make mobile payments and money transfers, access loans and raise funds, as well as manage financial assets from mobile devices without entering a banking hall, and this has huge implications for strategic decision making in banks and other financial institutions which have relied on traditional banking setups. To grow and survive in the future, traditional banking institutions need to build and support an ecosystem that supports the government’s digitisation agenda forward, provide a better environment for customers to adopt new technologies which are being

developed. Collaboration between banks is useful in ensuring that common goals like risk mitigation, regulatory controls, Service excellence, higher revenues and profitability are attained. The results suggest that digitization might eliminate some repetitive costs as a positive impact on revenues shall be utilized in developing alternate channels. Bringing transaction banking products on the digital platform may reduce the processing time because currently, trade finance is purely manual-paper based and processed through multiple phases, for instance, manual intervention from a seller to buyer's bank, the whole process involves a lot of documentation which involves cost, time.



CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

This is the final chapter of the study. In this chapter, the author presents a summary of the study, conclusions drawn based on the findings, and recommendations. The summary section discusses the findings of the study in line with the research questions without much detail, the broad view of the study is covered in the conclusion whiles the recommendations of the researcher to the beneficiaries of the study are also presented in this chapter. Generally, the chapter sums up the end results of the study.

5.2 Summary of Findings

The findings of the study are grouped according to the research objectives.

5.2.1 The use of digital innovations in the Ghanaian banking industry

This study has shown that there are major variations in the universal banking model of traditional banks in recent times as opposed to how things were years ago. Banks are now working to implement the Mobile Money Bank2Wallet Service and other services with telecommunication organizations. The service enables mobile phone users to connect their conventional bank accounts to their mobile money wallets on a 24/7 basis to make payments for products and services, make transfers of funds, etc. Banks have also developed partnerships with the Ghana Interbank Payment Services System (GhIPSS) to pioneer products and services, such as the Direct Debit Automated Clearing House (ACH) platform, a quick, safe and reliable service that allows, among other new technologies, organizations of all sizes, as well as

individuals, to receive and send funds via bank accounts. Customers believe that the ability to access banking services on their mobile devices and use the internet by other means has made the delivery of banking services more effective. The answers show that the simple handsets enable customers to access their bank accounts. Banks in Ghana have had mobile banking applications and USSD codes aimed at making banking as quick and easy as possible since the proliferation of smartphones and tablets. These platforms are easy to use and reasonably safe, allowing customers to access their accounts and perform banking transactions conveniently from any part of the world through their smartphones and tablets.

5.2.2 The effect of digital innovations on bank performance in Ghana

Through interviews with the various staff members of the banks sampled, it was learned that technology-based products give opportunities and significant cost advantages to universal banks in Ghana thus, increasing performance and facilitating lower risk than traditional banking products. Furthermore, the interview answers indicate that if there is ample consumer demand for technology-based goods, the banks surveyed would receive a strong return on investment in the short term. This is because electronic banking services is supposed to boost the efficiency of banks. The expected results, however, could be seen in instances where investment in banking infrastructure is not adequate and customers prefer conventional branch-based banking.

The view of digital skills encompasses a variety of capabilities, including advanced analytics, intelligent process automation, and digitization, was surveyed by most

managers. Although goods and touchpoints are becoming more digitized for consumers,

5.2.3 Challenges of digital innovations to Bank customers

The survey responses show clearly that high cost of implementation, lack of solid technological infrastructure in the country and security issues as challenges severely hampers digital banking initiatives of the sampled banks. In Ghana, the limited technology infrastructure has made some banks outsource to external service providers some of their banking processes. Customers highlight internet connectivity, the complexity of using different channels, prices, and fraud as the main obstacles they face in their use of different banks' digital banking products. A variety of challenges are also posed by the technology available to workers for collaboration in the digital banking age. Usually, these instruments are isolated from real business process-related information flows, and this lack of integration results in an unnecessary back-and-forth hurting their efficiency on rank, hand-offs, and inquiries among employees. This research will deduce that incorporating digital communication into process workflows would unlock the next productivity of employees if banks are to succeed in their digital banking efforts.

5.3 Conclusion

It is therefore concluded, on the basis of the findings of this study, that the convergence of digital technology with traditional banking services is having a strong impact on the performance of commercial banks in Ghana. In order to meet the demands of customers, commercial banks in Ghana need to pay greater attention to the digitalisation processes of banking services. If banking services' digitization processes are mastered, the dilemma of customers still visiting the banking halls and

waiting for long queues to solve small problems would be a thing of the past. Reducing waiting times, breaking bottlenecks and making transactions quicker is the essence of digitizing banking service processes. If this is properly and correctly implemented, then the digitization process, ceteris paribus, should have a wider, important positive relationship with the performance of commercial banks in Ghana. It is instructive to remember, based on the results, that product innovation impacts the efficiency of commercial banks. This is not to say that there are not enough banking products and services, but the very current ones should be worked upon and improved to meet the needs and demands of customers so as to avoid consistent visit to commercial banks and waiting in queues to be attended to.

5.4 Recommendations

The recent changes within the technology space and access to mobile phones and increasing digitization of the banking sector come with a lot of opportunities and challenges. As highlighted by the findings of this study, the following recommendations are made to banks within the Ghanaian commercial banking space.

The study revealed that the use of digital innovations in banking will continue to rise rather than decrease. It is therefore recommended that banks take a proactive approach to identify context-specific digital solutions to traditional banking challenges that customers face in order to stay competitive and ahead of the market.

It is also recommended that banks dedicate enough time to training and helping customers to learn how to use the digital channels that have been set up. This is because some customers argue that although the banjoing channels are provided, very little effort is made to prepare them to use the created systems. Most customers are

left to figure out how to use these systems themselves rather than being actively helped by the banks' staff to learn and improve their usage of these platforms.

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APPENDIX

Interview Guide

1. What's your assessment of the current growth trajectory of applications of technology in traditional banking?
2. Do you think this is a short-term phenomenon or it's going to stay for a long time?
3. What are some of the banking innovations introduced by your bank in the last three years?
4. Do you think these new uses of tech in finance has a strong impact on your bottom line?
5. To what extent do you consider these innovations essential to your profitability in the short term?
6. Can you share some more thoughts on the general situation of technology innovations in finance?
7. What are some of the challenges banks face in using technology to scale financial services?

Link to Questionnaires;

https://forms.gle/oHzwpqTmsQpq99deA

Banks in Ghana

The banks operating or issued with universal banking license as at June 2020 are presented in the table below.

Bank	Year bank commenced business	Majority ownership	Number of branches
Absa Bank Ghana Limited	1917	Foreign	54
Access Bank (Ghana) Plc	2009	Foreign	53
ADB Bank Limited	1965	Local	83
Bank of Africa Ghana Limited	1997	Foreign	25
CALBank Limited	1990	Local	31
Consolidated Bank Ghana Limited	2018	Local	106
Ecobank Ghana Limited	1990	Foreign	67
FBNBank Ghana Limited	1996	Foreign	19
First National Bank Ghana Limited	2015	Foreign	11
Fidelity Bank Ghana Limited	2006	Local	69
First Atlantic Bank Limited	1994	Foreign	37
GCB Bank Limited	1953	Local	185
Guaranty Trust Bank (Ghana) Limited	2004	Foreign	32
National Investment Bank Limited	1963	Local	48
OmniBSIC Bank Ghana Limited	2019	Local	46
Prudential Bank Limited	1993	Local	41
Republic Bank Ghana Limited	1990	Foreign	42
Société Générale Ghana Limited	1975	Foreign	42
Stanbic Bank Ghana Limited	1999	Foreign	38
Standard Chartered Bank Ghana Limited	1896	Foreign	21
United Bank for Africa (Ghana) Limited	2005	Foreign	28
Universal Merchant Bank Ghana Limited	1972	Local	36
Zenith Bank Ghana Limited	2005	Foreign	28