UNIVERSITY OF CAPE COAST

EFFECTS OF FINANCIAL INNOVATION ON GROWTH OF RURAL BANKS IN GHANA

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BY

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DECLARATION

Candidate's Declaration

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

Candidate's Signature: ……Date: …….....

Name: Miriam Mensah

Supervisor's Declaration

I hereby declare that the preparation and presentation of the dissertation were supervised in accordance with the guidelines on supervision of dissertation laid down by the University of Cape Coast.

Supervisor's Signature: …… Date: ……

Name: Dr. Anthony Adu-Asare Idun

ABSTRACT

The arrival of internet and spread of mobile telecommunication companies within the Ghanaian economy has offered both opportunities and tests for the banking sector in Ghana particularly rural banks. The research sought to investigate the effect of financial innovation, particularly product and process innovation on the financial growth of rural banks in Ghana. Product innovation was measured using alternate delivery channel service points, the use of roving staff in rural banking, automated teller machines and merchant point of sales system. Financial growth on the other hand was measured using net operating profit. The research selected thirty-eight registered rural banks. Data on these rural banks were retrieved from the World Bank website. The research made use of explanatory research design and used SPSS to process the data. Data was analysed quantitatively through the use of inferential statistics namely correlation and regression analysis. The study revealed that the introduction of financial innovations does not necessarily translate to reduction in operational cost or increase in profit levels resulting in financial growth of rural banks. It was further revealed that although the use of alternate delivery channel service points, automated teller machines, and merchant point of sale service does not lead to financial growth among rural banks in Ghana, the use of roving staff does. The study therefore recommends that rural banks must focus on those financial innovations that positively impact on their performance in order to benefit from their use as other banks or telecommunication companies are doing.

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DEDICATION

To Mr. Bright Agozie and Mrs. Florence Mensah

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LIST OF ACRONYMS

ATM	Automated Teller machine
POS	Point of Sale
ADC	Alternate Delivery Channel
BoG	Bank of Ghana
IT	Information Technology

CHAPTER ONE

INTRODUCTION

Financial innovation, like other economic behaviors, generally arises in anticipation of material gains following a cost-benefit analysis. The innovation makes possible either a reduction in costs or an increase in revenues, or both. This dissertation is about how financial innovation influences on growth of rural banks in Ghana. The main chapters are five and this is the preparatory chapter of the thesis which presents an over view of the study to enable a reader to situate the research in its right context. The chapter starts off by providing the background of the study. This is followed by the statement of the problem, justifying the existing research gap that this study seeks to fill. Accordingly, this part of the chapter provides the purpose, specific objectives and the research hypothesis. The chapter then proceeds to define and provide the boundary of the study, that is its delimitation. The limitations, which are the caveats of the study are also provided. This chapter ends with how the rest of the dissertation has been organised.

Background to the Study

Profit-seeking enterprises such as rural banks and individuals are constantly seeking new and improved products, processes, and organizational structures that will reduce their cost of production, better satisfy customer demands, and yield greater profits (Gurbuz, 2018). Sometimes this search occurs through formal research and development programs; sometimes it occurs through more informal “tinkering” or trial-and-error efforts. When successful, the result is an innovation (Sekhar, 2018; Maltese, Simpson & Anderson, 2018).

The centrality of finance in an economy and its importance for economic growth naturally raises the importance of financial innovation (Allen, Berger, Molyneux, & Wilson, 2015; Qamruzzaman & Wei, 2017; Beck & Levine, 2018). Since finance is a facilitator of virtually all production activity and much consumption activity, improvements in the financial sector will have direct positive ramifications throughout an economy (Allen, Berger, Molyneux, & Wilson, 2015).

Financial innovation, like other economic behaviors, generally arises in anticipation of material gains following a cost-benefit analysis (Khraisha & Arthur, 2018). The innovation makes possible either a reduction in costs or an increase in revenues, or both. On the cost-reducing side, in particular, exogenous technological change provides room for cost reduction that induces innovation (Marshall & Parra, 2019). For example, advances in information technology have significantly lowered the cost of accounting-intensive products such as mutual funds (Solomon & van Klyton, 2020).

Other product innovations relying on speedy calculation and action, such as portfolio insurance and index arbitrage transaction, have similarly been made feasible by upgrade in computer speed. The ATMs, which reduce banks' operating costs by efficiently executing much of a teller's duty over the retail counter, is one of the renowned innovations that benefit from technological advances (Shirai, 2020).

It has become a crucial reality for the rural banks to look at how fast the telecommunication companies are innovating to take away business from them (McGivern, 2016). The telecommunication companies have been innovating their processes and products to capture the financial space of the traditional

banks and rural banks in Ghana and elsewhere (Wiredu, Labaran, Nketiah & Osibo, 2020). The rural banks used to have a competitive advantage in banking with the "unabankable" in the past as compared to the traditional banks and other quasi-nonfinancial institutions such as the telecommunications companies (Jirapa, 2015).

In recent times, the telecommunication companies have been eroding the gains made by the rural banks especially banking with the rural folks in the angle that, these telecommunication companies have innovative products via their network to the rural folks and other peoples who use to bank with the rural banks (Williams, 2011). Due to the ease in the telecommunication company's way of innovating their processes and designing simple to use products and services they had pose huge challenge to the rural banks (Fichman, Dos Santos & Zheng, 2014).

It was reported by the ARP Apex Bank in the year 2019 that the rural banks have been having a declining customer base due in part to other available innovative products that had flooded the market space for the ordinary consumer of banking products (The Rural Banker, 2019). The Bank of Ghana in 2020 reported that mobile money transactions from the telecommunication companies have exceeded the normal financial threshold of the rural banks financial transactions with their customers and notwithstanding the commercial banks is also having challenge in delivering such performance in comparison to the telecommunication companies (Saliu, 2016; Andersson-Manjang & Naghavi, 2021). It is obvious that the telecommunication companies saw the financial space created by the traditional banks and rural banks and for that

matter these telecommunication companies filled such a gap to make profit from the niche (Osei-Owusu, 2015).

Several reasons could be assigned to the failure of the banks to fast fill such a need that was easily filled by the telecommunication companies. It is left now to the rural banks to take on the task of fast-pacing their processes and products to create the needed growth expected of them in the Ghanaian economy and elsewhere (Osei-Owusu, 2015; Wiredu, 2020). Rural banks are now at a cross-road to re-examine their innovations in process and products to be able to capture or recapture the current market being exploited by the telecommunication and insurance companies in Ghana and elsewhere (Anti, 2012). Such studies into the innovation on the growth of the rural banks could be the catalyst for understanding the slow pace of innovation and help facilitate faster innovation in both processes and products to be much competitive and profitable to remain in business (Allassani, 2013).

This calls for an investigation into the innovation of processes and products within the circle of the rural banks in Ghana to ascertain why they left such a gap to be created in the financial space. Or it was due to the limited space created by the legislative and regulatory instruments creating the rural banks and the services they were to provide or explore to deliver to the people in both the rural and peri-urban areas? Or any other factor that may be emanating from the rural banks themselves. These and many other unanswered questions have posed an empirical gap to be filled by a study of this form investigating the effects of innovation on growth of rural banks in Ghana.

Statement of the Problem

Financial growth is the ability of an organization to gain and manage the resources in several ways so as to gain competitive advantage (Edwards, 2014; Othmana, Arshada, Arisb & Arif, 2015). Due to the global competition, both individuals and companies began to evaluate and to apply their innovation strategies and entrepreneurial abilities with the purpose of gaining competitive advantage and to ensure financial growth (Beck, Chen, Lin & Song, 2016; Bara & Mudzingiri, 2021).

According to Mensah and Casadevall (2019), financial innovation has a considerable impact on corporate performance by producing an improved market position that conveys competitive advantage and superior performance. Gitau (2011) stated that when the flow of newness and innovations desiccates, firms' economic structure settles down in an inactive state with little growth. Therefore, financial innovation plays a significant role in creating the differences of growth and competition among firms, regions and even countries.

More than 82% of Ghanaians rely on rural banks to access financial services (Ababio, 2016; Arthur, 2017). However, the use of rural banks by Ghanaians as a financial service provider has been declining over the last five years (The Rural Banker, 2020). The decline has been from a high of 13.5% in 2009 to a low of 9.1% by the end of the year 2020. During the same period, customers accessing commercial banks for financial services grew from a low of 13.5% in 2006 to 29.2% in 2020 (Bank of Ghana, 2020). This trend in loss of customers is attributed to sustained competition from banks through proactive outreach, offering of easy access transactions accounts as well as consumer loans and other forms of financial innovations (FinAccess, 2009).

Rural banks have been losing their market share in spite of their geographical spread in the country compared to other financial providers (Nyaga, 2012).

Although scholars such as Mensah and Casadevall (2019), Ababio (2016), Arthur (2017), Khraisha and Arthur (2018) and Błach (2020) have carried out studies on the effect of financial innovation on the growth of financial institutions, there is a clear gap in scholarship as far as the study of the impact of financial innovation on the growth of rural banks is concerned. Most of the studies that have been conducted concentrated on commercial banks (Gitau, 2011; Nekesa & Olweny, 2018, Bara & Mudzingiri, 2021; Arthur, 2017). Those that focused on rural banks are, however, limited in scope. They isolate aspects of financial innovation for investigation (Angko, 2013; Pazarbasioglu, Mora, Uttamchandani, Natarajan, Feyen & Saal 2020).

In fact, process innovation promotes growth by simplifying the processes through which products are generated and delivered, which raises the total number of transactions per customer. It also aids in streamlining the rural bank's services in order to make their product more accessible to customers. On the other hand, product innovation affects customer satisfaction since new products and services are developed and given to consumers depending on their needs, which causes customers to increase their number of transactions, hence extending the services of the rural bank.

This current study is unique in that it integrates both product and process innovations in a single study, whereas the other studies analyzed looked at process or product innovation individually. In fact, this analysis employs secondary data that was obtained and approved by the IFC and World Bank financial market data pool. The majority of other studies used likert-scaled

index surveys to assess product or process innovation. This study, on the other hand, used the IFC/World Bank innovation index, which is meant to assess product or process innovations.

Finally, this study employed robust multiple regression analysis to determine the impact of financial innovation on the financial growth of rural banks in Ghana. This necessitates comparing and contrasting product and process innovations, as well as critically analyzing their influence on financial growth in the Ghanaian rural banking sector, in order to produce credible evidence to support theory and practice.

Purpose of Study

The purpose of this study is to investigate into the effects of financial innovation on growth of rural banks in Ghana.

Specific Objectives

The specific objectives for the study are to:

1. Examine the effects of product innovation on growth of the rural banks.
2. Examine the effects of process innovation on growth of the rural banks.

Hypotheses

H1: Process innovations have no statistically significant effect on growth of rural banks.

H2: Product innovations have no statistically significant effect on growth of rural banks.

Significance of the Study

Findings would indicate how financial innovation contributes to rural banks' financial growth. Therefore, rural bank managers would clearly

understand the same and would strive to encourage or discourage financial innovation based on such findings.

This study would be of importance to the Ghanaian rural bank consumers who would benefit from increased financial innovations should the study positively apprise the same. Such innovations would end up contributing positively to the economy and reduce the number of unbanked citizens in the country.

The study would form a good literature base upon which further studies and references would be drawn. Academicians would, thus, benefit from the findings of this study as it would add to the body of existing knowledge in finance. These would comprise of the Ghanaian current and future scholars and researchers since it would broaden their knowledge on the how financial innovation contributes to banks' growth.

Scope of the Study

This study focuses on selected rural banks under the ARB-Apex Bank, that submit annual financial reports to the IFC/World Bank mixed market financial data project. The rural banks are considered because most of the financial innovation research studies had focused on the commercial banks and there are little to no reports on rural banks. Further, the study will be delimited to only rural banks in Ghana and that no other rural banks outside Ghana would be considered for the study. Finally, theories and literature review would be delimited to financial innovations and their effect on growth of the rural banks. However, selected classic studies in the commercial banking sector would be selected to support the empirical studies reviewed.

Organization of the Study

The dissertation composed of five chapters, Chapter one reviews the background to the study, problem statement, research questions and objectives as well as the scope and significance of the study justifying the reason for the investigation. Further, chapter two reviews related literature on innovation and financial growth or growth of firms including commercial banks and rural banks. Furthermore, chapter three presents the research methodology helping to address the research questions of the study. Chapter four presents the results and discussion in the context of the theoretical and empirical literature reviewed for this study. Finally, the chapter five reviews the summary, conclusions and recommendations based on the findings of the research.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter reviews the related theoretical and empirical literature for the topic under investigation. The literature review is presented based on the themes of the research questions of the study. The theoretical literature precedes the empirical literature of the study.

Theoretical Review

Constraint Induced Financial Innovation Theory

This theory was advanced by an American Economist Silber. He defines a constraint as something that limits or restricts progress. According to Silber (1975, 1983), the main reason for financial innovation is profit maximization. However, in the process of pursuing profit maximization, financial institutions tend to face some restrictions which are either external or internal. These constraints can either be self-imposed, market imposed or government imposed. Silber (1983) provides a framework for discussing financial innovation as a way of reducing the cost imposed by regulation.

He, however, recognizes regulation as a frequent motivation to innovate. He views a financial firm as a utility maximize which operates in a given environment constrained by some set of internal rules, set of macroeconomic conditions in a given regulatory environment, set of tax laws and given levels of technology and knowledge.

The constraint induced financial innovation theory is relevant to the current study because this study sought to determine innovations put in place by rural banks as a means of achieving profit maximization while appreciating that

in the process, the rural bank may have faced some constraints. This research also identifies the various constraints that are faced by the rural banks and analyzes them to establish whether they have prompted the organizations to be innovative. There was also the need to find out whether indeed the firms with the ability to access external funds displayed a higher growth rate.

Transaction cost innovation theory

The main proponents of this theory are Hicks and Niehans (1983). The theory looks at the relationship between reduction in transaction costs and technological advancement. A transaction cost is a cost that is incurred in the exchange of a good or service. According to Hicks and Niehans, transaction costs are varied. They include quality of service or good, durability, communication charges, legal fees, informational cost of finding the price and transportation costs. This theory holds that the dominant factor in financial innovation is the response to advancement in technology. This causes the transaction cost to reduce. Consequently, the cost reductions stimulate financial innovation as well as efficiency in service delivery.

Frame, Wall and White (2018) describe the theory of cost reduction as a driver of financial innovation. They cite examples as reduction from improvements in payments, processing or reduction resulting from new ways meant to deliver services electronically to customers. However, regulatory restrictions and requirements are also a cost and some innovations are aimed at avoiding or reducing that cost (Lev-Aretz & Strandburg, 2020). Transaction costs innovation theory is relevant in this context.

For instance, the use of internet-connected Information Technology (IT) can substantially reduce a firm's transaction costs as it enables efficient

coordination, management and use of information. Mobile, Internet-connected IT may further lower transaction costs as it provides also offsite access to the firm's internal database and other relevant sources of information (Reinartz, Wiegand & Imschloss, 2019).

Consequently, reduction of operation costs through agency banking, internet banking and mobile banking may influence growth in profitability for a rural bank (Mawutor, 2014; Adusei & Elliott, 2015; Nazaritehrani & Mashali, 2020). The theory discusses financial innovation from the perspective of microscopic economic structure change. However, this theory has some weaknesses (Khraisha & Arthur, 2018). According to Khraisha and Arthur (2018), the theory overemphasizes individual party's minimization of transaction costs while holding other factors constant.

Regulation Innovation Theory

This theory was put forward by Scylla et. al., (1977, 1982). They believe that it is very difficult to have space for financial innovation in a planned economy with strict regulatory controls. As such any change instigated by regulation reform in the financial system can be regarded as financial innovation. These Omni- directional financial innovative activities can only appear in the market economy controlled by the government.

The regulation innovation theory also regards government activity as the origin of financial innovation. In particular, it regards rules and regulations which are used to control firms as financial innovation. Financial control is the obstructive force of financial innovation. So, rules and regulations which are regarded as the symbol of financial control should be the direction of financial reform and innovation.

Ultremare (2017) tested the preposition that regulation constraint induces innovation. She did this by constructing a linear programming model to estimate the opportunity costs (shadow prices) of deposits, debentures and capital (net worth) for large banks Brazil. It was found out that the rising shadow prices of these items as they approached regulatory constraints were associated with some of the major innovations of the banks in Brazil.

This theory is relevant in this research because rural banks in Ghana are regulated by the government. Bank of Ghana is a government agency which has the mandate to license rural banks that have been duly registered under the Rural and Communities Banks Act to operate (Banks and Specialised Deposit-Taking Institutions Act, 2016, Act 918). The researcher applies this theory in our analysis of regulations in Ghana and their impact on financial innovation in rural banks. The researcher uses the theory to determine whether the regulations are a two-edged sword that encourages and at the same time discourages financial innovation in these rural banks.

Empirical Literature

Product Innovation on Financial Growth

Product innovation is the introduction of a new good or service, or one that is substantially improved. This includes, but is not limited to, improvements in functional characteristics, technical abilities, or ease of use (Ganzer, Chais & Olea, 2017; Larsson, 2017; Gurbuz, 2018). It is not supposed to include minor customization and superficial/aesthetic design characteristics, though there have been some calls for such activities to be included, perhaps as “soft” innovations (Roos, 2015). Successful product innovation is vital to many firms

(Larsson, 2017). The commercial success of a new product typically depends on how well the product's design meets customers' needs (Gurbuz, 2018).

Tabas et al., (2012) carried out a study on the influence of product innovation on financial growth of small and medium sized enterprises in the Czech Republic. Using a statistical sample of 100 companies he found out that the growth of all these companies had increased above the industry average and contrary to service and trade companies it had stabilized above the industry average hence the need for continuous innovation. The findings of this study served as a backdrop from which we identified the product innovations that have been in place in rural banks and which are meant to promote service delivery to their clients and attract more customers.

Omwenga (2010) studied the relationship between financial innovations and financial growth of commercial banks in Kenya. Descriptive research design was used to study a sample of forty-five (45) licensed commercial banks that were dully registered with CBK. The study recommended that the banks should introduce products that are relatively simple and standard and that offer value addition. Since this investigation sought to determine the significance of innovation to value addition in terms of financial growth of rural banks, Omwenga's views became of great importance to the current study.

Githakwa (2011) investigated the relationship between financial innovation and profitability of commercial banks in Kenya. Using causal research design on a sample of 44 registered commercial banks in Kenya in the period of 2005-2010, he found out that many commercial banks have embraced financial innovation as a way of increasing efficiency and improving bank growth. These innovations have included massive branch network expansion,

development of unique products and automation of banking services that have enabled customers to carry out banking transactions outside the confines of the banking premise, on their phone and over the internet. Although Githakwa's study was on banks, his findings were useful to us because we intended to determine how product innovation impacts financial growth in rural banks.

Process Innovation on Financial Growth

Process innovation is the implementation of a new or significantly improved production or delivery method. This includes significant changes in the techniques, equipment and/or software used to make or deliver the product. Process innovations can be intended to decrease unit costs of production or delivery, to increase quality, or to produce or deliver new or significantly improved products (Karabulut, 2015). Process innovation covers the introduction of new business processes leading to increased efficiency, market expansion, etc. Examples include office automation and use of computers with accounting and client data management software (Bourgeois, 2014).

Gunday et al., (2011) studied the effects of financial innovations on firms' growth. They sought to explore the effect of the organizational, process, product and marketing innovations on the different aspects of firms' growth including innovative, production, market and financial growths based on an empirical study covering 184 manufacturing companies in Turkey. They found out that there is a positive relationship between the various forms of innovation that ultimately impact a firm's growth. This study enables us to get insight into the type of identifiable innovations put in place by banks and how they have affected the financial growth.

De la Torre (2017) carried out a study on 1100 British financial institutions and he contends that the likelihood of financial innovation to occur is dependent on the size of the financial firm, employee education, greater expenditure on research and development, availability of finance and the extent to which the firm cooperates with similar institutions. Although this study was on financial innovation in the context of British financial firms, this research applies its findings in determining whether the size of rural banks in Ghana, their investment in staff education, research and development and their co-operation with other financial institutions have resulted in their embracing financial innovation hence the betterment of the financial growth of the rural banks.

Kwaning et al., (2014) studied the impact of organizational restructuring on the financial growth of public banks a case of agricultural development banks in Ghana. Using a case study sample of banks, they found out that organization restructuring is beneficial in a number of ways that are not limited to lowering operational cost and assisting in formulation and implementation of strategies. This study will therefore analyze the restructuring put in place by rural banks meant to reduce operational cost and any challenges that they are facing in their obligation to increase their financial growth.

Yilmaz, Bengtson and Hadjikhani (2015) studied on the nature of the relationship between international expansion and growth: The case of emerging market on Turkish firms in Romania composed of both manufacturing firms and service firms over a period covering five years covering between 1998-2014.The study found that, service sector firms tend to get the gains of international expansion sooner than manufacturing firms. This study therefore

relied on Yilmaz, Bengtson and Hadjikhani's (2015) findings to isolate the expansions put in place by rural banks in Ghana.

Watiri (2013) sought to establish the contribution of agency banking in financial growth of commercial banks in Kenya. The study adopted a descriptive survey. It found out that low transaction cost through agency banking had a positive impact on financial growth of Kenya commercial banks. We used Watiri's conclusion to analyze whether agency banking had a positive effect on organizational innovation and if there is a reduction in transaction cost in the rural banks that will lead to a positive effect on financial growth.

Research gaps

Previous studies on financial growth on rural banks have restricted their views on only product innovation. Thus, limited single researches have been done on product innovation on financial growth of rural banks. It is this research gap that motivated this particular study. Thus, it sought to fill the gap by establishing the effects of product and process innovation on the financial growth of rural banks in Ghana.

Chapter Summary

This chapter presented the theoretical and empirical literature with the developed conceptual framework that guided the study. The constraint induced financial innovation theory, the transaction cost innovation theory and the regulation innovation theory were reviewed to expose the foundation underlying the concepts of financial innovation and growth of rural banks. The Empirical review revealed that there is a significant relationship between financial innovation and growth of rural banks. And finally, based on the literature reviewed.

CHAPTER THREE

RESEARCH METHODS

Introduction

This chapter presents the research methods comprising the research approach and design, the populations, sample and sampling techniques, the data sources and data collection instruments as well as the ethical consideration of the study. The chapter finally presents on the data processing and analysis of the data collected.

Research Philosophy

Certain beliefs, values, and view of the world influence every researcher during the study process (Adjei, 2015); this is referred to as paradigms or philosophical assumptions which set the scene for the study to begin (Guba, 1990). Research philosophy thus is a set of beliefs and assumptions about the development of knowledge (Saunders, 2009). The individual researchers' stand based on these beliefs and assumptions often drive them to choose either one of approach for their research: qualitative, quantitative, or mixed-methods (Creswell & Creswell, 2018). Saunders opines that a planned and coherent assumptions forma reliable research philosophy, which in turn determines one's choice of research methods. Johnson and Clark (2006) note that, as business and management researchers, we need to be aware of the philosophical commitments we make through our choice of research strategy, since this will have a significant impact on what we do and how we understand what we are investigating into. Saunders suggests three types of research assumptions to distinguish research philosophies: ontology, epistemology and axiology.

Positivist researchers adopt and follow a highly organized approach in order to facilitate replication (Gill & Johnson 2010). Positivist place importance on quantifiable observations that lend themselves to statistical analysis. However, occasionally positivist research extends itself to other data collection methods and seeks to quantify qualitative data, for example by applying hypothesis testing to data originally collected through interviews (Saunders et al., 2019). This study adopted the positivist research philosophy to aid in arriving at the findings of the study.

Research Approach

The main research approaches known to researchers are the Quantitative, Qualitative, and Mixed-Methods approach (Boateng, 2014). The prudent use of any of these approaches is largely dependent on the nature of the study, as well as the philosophy of the researcher. According to Boateng (2014), quantitative (structured) research seeks to determine the extent of a problem or the existence of a relationship between aspects of a phenomenon by quantifying the variation. Quantitative research often seeks to test to support or disprove a proposed relationship between two or more aspects of the phenomenon.

Quantitative research is structured because it starts with specific hypotheses or questions derived from theory or previous research and uses objective instruments like fixed choice questionnaires to collect data from selected sample. Results are presented using statistics and inferences made to the population. Throughout this process, the researcher is viewed as being independent from subjects involved in the research.

Qualitative research tends to explore the meanings, attitudes, values, beliefs people associate with a phenomenon in order to establish a better

understanding, rather than to test to support or disprove a relationship (Seltman, 2015). This approach is useful for describing the nature or variation of a problem, issue, situation, or phenomenon. Qualitative research is arguably unstructured, as it starts with general research problems and not by formulating hypotheses. It uses relatively unstructured instruments like interviews and observations.

Data is collected from a small purposive sample which may or may not be representative of the larger population. Results are presented mainly or exclusively in words. It is more about explanation, and deemphasizing generalizations to the population. Throughout the process, the researcher is aware of his/her own orientations, biases or experiences and personal interaction with subjects or the context of the study. This approach allows flexibility in all activities of the research process (Boateng, 2014).

Mixed-methods approach tends to combine the strengths of both quantitative and qualitative approaches to research (Boateng, 2014). Some studies require the researcher to combine both approaches. According to Creswell, Plano Clark, Gutmann & Hanson (2003) mixed methods research is a research design with philosophical assumptions as well as methods of inquiry. As a methodology, it involves philosophical assumptions that guide the direction of the collection and analysis of data and the mixture of qualitative and quantitative approaches in many phases in the research process. As a method, it focuses on collecting, analyzing, and mixing both quantitative and qualitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches in combination provides a better understanding of research problems than either approach alone.

Though the mixed methods is superior to that of the quantitative approach, the quantitative approach offers a more comprehensive evidence for studying a research problem compared to the qualitative method. The advantage of using the quantitative approach is that the results generated will be valid, reliable and generalizable to a larger population (Dowd, 2018). According to Creswell (2014), the Quantitative method is a means of testing objective theories by examining the relationship that exists between their variables. These variables in turn can be measured typically on instruments so that numbered data can be analyzed using statistical procedures. These procedures include descriptive and inferential statistics. This method encompasses the use of assumptions about testing theories deductively, building in protections against bias, controlling for alternative explanations and been able to generalize and replicate the findings (Creswell, 2014).

Research Design

Research design to be adopted for this study is conclusive and cross-sectional descriptive research design. According to Malhotra (2007), conclusive research/explanatory research design is typically more formal and structured than exploratory research. It is based on large, representative samples, and the data obtained are subjected to quantitative analysis. The findings from this type of research are considered to be conclusive in nature in that, they are used as inputs into managerial decision making. Conclusive research design may be either descriptive or causal, and descriptive research design may be either cross-sectional or longitudinal.

The conclusive/explanatory research design is unobtrusive and the act of research does not affect the results of the study and it is also a description of

affairs as they exist. This is well suited for cross sectional analysis and in this study that aims at establishing the effect of financial innovation on financial growth involving comparison of the financial results of the subject rural banks with the innovation parameters. The study design is chosen because it is appropriate for finding answers to questions through assessing opinions or attitudes of individuals towards events of procedures (Kim, 2017). According to Peersman (2014), these analysis compromise principles, methods, and techniques to present questionnaires, compile and construe empirical data. This facilitates working with empirical data gathering, analysis and interpretation of information since it accommodates the use of tables and diagrams for better understanding.

Sample size

The sample of dataset consists of data from 2005 - 2019 making up of 14 years of accumulated data from World Bank data collection on Ghanaian rural banks. This sample datasets would be targeted to analyze the 38 rural banks out of the 143 as of 2020 that had reported to the World Bank Mix Market Financial Performance data on financial products, processes and financial growth of the rural banks since 2005.

The Data and Variables

Data

This study data is taken from the World Bank website, the World Mix Financial Market Performance Data (2005 – 2019). This empirical investigation focuses on the study of the impact of the process and product innovation indicators on financial growth of rural banks in Ghana. The sample is on rural banks in Ghana over the period between 2005 and 2019.

Variable Description

The choice of the period was dictated by the availability of variable indicators which started from 2005. All data came from the World Bank's statistics: Mix financial market performance data. The researcher relies on Table (1) to sum up the definitions of the variables and their source.

Table 1. Data Description and source

Variable	Description	Source
PRDT (Product innovation)	Number of registered ADC service points (Total sum of alternate delivery channel service points.) Number of active ADC service points (Total sum of active alternate delivery channel service points.) Roving staff to branches ATMs to branches, Merchant POS to branches, Sub-branches to branches Agents to branches Active roving staff / Branches Active ATMs / Branches Active merchant POS / Branches Active sub-branches / Branches Active agents / Branches Number of transactions (Number of transactions that are initiated from a customer's account (including OTC where specified) during the reporting period. This excludes payment or deduction of interest, fees or commissions by the Mobile Money Provider on the account.) Number of transactions > Delivery channels > Agents (Number of transactions that are initiated from a customer's account (including OTC where specified) during the reporting period. This excludes payment or deduction of interest, fees or commissions by the Mobile Money Provider on the account. > Segmentation based on mode of delivery of financial services. > An agent outlet is a location where one or several provider-issued tills are used to conduct transactions for clients. Number of transactions > Delivery channels > ATMs (Number of transactions that are initiated from a customer's account (including OTC where specified) during the reporting period. This excludes payment or deduction of interest, fees or commissions by the Mobile Money Provider on the account. > Segmentation based on mode of	WB

delivery of financial services. > Related to machines with a fixed location that customers use to access services. They may be accessed through different identification means (card, PIN, biometrics) and used for different kinds of cash or non-cash-based operations (deposits, withdrawals, but also transfers, account balance consultation, etc.). They may be proprietary ATMs or managed by third parties.

Number of transactions > Delivery channels > Internet (Number of transactions that are initiated from a customer's account (including OTC where specified) during the reporting period. This excludes payment or deduction of interest, fees or commissions by the Mobile Money Provider on the account. > Segmentation based on mode of delivery of financial services. > Related to internet-based banking services that clients can access through a personal device (smartphone app, website) using standard internet protocols.)

Number of transactions > Delivery channels > Mobile banking (Number of transactions that are initiated from a customer's account (including OTC where specified) during the reporting period. This excludes payment or deduction of interest, fees or commissions by the Mobile Money Provider on the account. > Segmentation based on mode of delivery of financial services. > Related to mobile services based on USSD or SMS communications that clients can access through their own device.)

Number of transactions > Delivery channels > Merchant pos (Number of transactions that are initiated from a customer's account (including OTC where specified) during the reporting period. This excludes payment or deduction of interest, fees or commissions by the Mobile Money Provider on the account. > Segmentation based on mode of delivery of financial services. > Related to a networked merchant using a physical payment processing device located at the merchant's place of business (e.g., POS) to accepts payment for sales (of its goods or services) from the FI's customers using the customer's FI identification means (card or other). The merchant could be acquired by the FI, or simply part of a network enabling the merchant to process payments.)

Number of transactions > Delivery channels > Roving staff (Number of transactions that are initiated from a customer's account (including OTC where specified) during the reporting period. This excludes payment or deduction of interest, fees or commissions by the Mobile Money Provider on the account. > Segmentation based on mode of

delivery of financial services. > Related to units that serve customers outside the branch and in their place of residence or business. They may or may not be associated to a particular branch. Only staff or mobile units that manage deposits or handle account opening (other than loan origination) should be counted in this category.)

Number of transactions > Delivery channels > Sub branches (Number of transactions that are initiated from a customer's account (including OTC where specified) during the reporting period. This excludes payment or deduction of interest, fees or commissions by the Mobile Money Provider on the account. > Segmentation based on mode of delivery of financial services.)

Value of transactions (Value of transactions that are initiated from a customer's account (including OTC where specified) during the reporting period. This excludes payment or deduction of interest, fees or commissions by the Mobile Money Provider on the account.)

Value of transactions > Delivery channels > Agents (Value of transactions that are initiated from a customer's account (including OTC where specified) during the reporting period. This excludes payment or deduction of interest, fees or commissions by the Mobile Money Provider on the account. > Segmentation based on mode of delivery of financial services. > An agent outlet is a location where one or several provider-issued tills are used to conduct transactions for clients.)

Value of transactions > Delivery channels > ATMs (Value of transactions that are initiated from a customer's account (including OTC where specified) during the reporting period. This excludes payment or deduction of interest, fees or commissions by the Mobile Money Provider on the account. > Segmentation based on mode of delivery of financial services. > Related to machines with a fixed location that customers use to access services. They may be accessed through different identification means (card, PIN, biometrics) and used for different kinds of cash or non-cash based operations (deposits, withdrawals, but also transfers, account balance consultation, etc.). They may be proprietary ATMs or managed by third parties.

Value of transactions > Delivery channels > Internet (Value of transactions that are initiated from a customer's account (including OTC where specified) during the reporting period. This excludes payment or deduction of interest, fees or commissions by the Mobile Money Provider on the

account. > Segmentation based on mode of delivery of financial services. > Related to internet-based banking services that clients can access through a personal device (smartphone app, website) using standard internet protocols.)

Value of transactions > Delivery channels > Mobile banking (Value of transactions that are initiated from a customer's account (including OTC where specified) during the reporting period. This excludes payment or deduction of interest, fees or commissions by the Mobile Money Provider on the account. > Segmentation based on mode of delivery of financial services. > Related to mobile services based on USSD or SMS communications that clients can access through their own device.)

Value of transactions > Delivery channels > Merchant pos (Value of transactions that are initiated from a customer's account (including OTC where specified) during the reporting period. This excludes payment or deduction of interest, fees or commissions by the Mobile Money Provider on the account. > Segmentation based on mode of delivery of financial services. > Related to a networked merchant using a physical payment processing device located at the merchant's place of business (e.g., POS) to accepts payment for sales (of its goods or services) from the FI's customers using the customer's FI identification means (card or other). The merchant could be acquired by the FI, or simply part of a network enabling the merchant to process payments.

Value of transactions > Delivery channels > Roving staff (Value of transactions that are initiated from a customer's account (including OTC where specified) during the reporting period. This excludes payment or deduction of interest, fees or commissions by the Mobile Money Provider on the account. > Segmentation based on mode of delivery of financial services. > Related to units that serve customers outside the branch and in their place of residence or business. They may or may not be associated to a particular branch. Only staff or mobile units that manage deposits or handle account opening (other than loan origination) should be counted in this category.

Value of transactions > Delivery channels > Sub branches (Value of transactions that are initiated from a customer's account (including OTC where specified) during the reporting period. This excludes payment or deduction of interest, fees or commissions by the Mobile Money

	Provider on the account. > Segmentation based on mode of delivery of financial services.	
PRO (Process Innovation)	Percentage of total transactions at agents, number Percentage of total transactions at merchant POS, number Percentage of total transactions at ATMs, number Percentage of total transactions by internet, number Percentage of total transactions by mobile banking, number Percentage of total transactions at roving staff, number Percentage of total transactions at sub-branches, number Percentage of total transactions at ADCs, number Percentage of total transactions at agents, value Percentage of total transactions at merchant POS, value Percentage of total transactions by internet, value Percentage of total transactions by mobile banking, value Percentage of total transactions at roving staff, value Percentage of total transactions at sub-branches, value Percentage of total transactions at ATMs, value Percentage of total transactions at ADCs, value	
FIN (Financial Growth)	Profit margin (Net Operating Income / Financial Revenue) Yield on gross portfolio (real) (((Yield on Gross Portfolio (nominal) - Inflation Rate) / (1 + Inflation Rate) Return on equity ((Net Operating Income - Taxes) / Average Total Equity) Return on assets ((Net Operating Income - Taxes) / Average Total Assets)	WB

Source: World Bank Mix Financial Market Performance Data (2020)

Data Processing and Analysis

This study relies on secondary data sources to be extracted from the World Bank financial index, reports and datasets. The panel datasets of rural banks comprising the years 2005 to 2019 was be extracted and analyzed to answer the research questions of the study. The main objective of this study is to analyze the effects of product and process innovation on financial growth of rural banks from 2005 to 2019. To start, the direct relationships between product, process innovation on financial growth and the researcher estimated that relationship by the regression models below:

Regression equation will be as follows:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \varepsilon_{it} \quad (1)$$

Where,

Y represents financial growth of rural banks

β_0 coefficient represents the intercept;

X represents different construct of 1, 2, 3, and 4 which consist of product innovations such as Alternate Delivery Channel service points, roving staff, Automated teller machine, merchant Point of Sale service.

β denotes the coefficients of the various variables used as proxy for the purpose of this study.

ε represents the error term

$$FIN_{it} = \beta_0 + \beta_1 ADCs_{it} + \beta_2 RS_{it} + \beta_3 ATM_{it} + \beta_4 POS_{it} + \varepsilon_{it} \quad (2)$$

Where;

FIN represents financial growth;

ADC represents alternate delivery channel;

RS represents roving staff;

ATM represents automated teller machine;

POS represents point of sale service;

ε represents the error term;

Whiles β_0 and $\beta_{1...}\beta_4$ are the constant and the intercepts respectively.

$$FIN_{it} = \beta_0 + \beta_1 TADCs_{it} + \beta_2 TRS_{it} + \beta_3 TATM_{it} + \beta_4 TPOS_{it} + \varepsilon_{it} \quad (3)$$

Where;

FIN represents financial growth;

TADCs represent total transactions at alternate delivery channel service points;

TRS represents total transactions by roving staff;

TATM represents total transactions at automated teller machine;

TPOS represents total transactions at merchant point of sale services;

ε represents error term;

Whiles β_0 and $\beta_1 \ldots \beta_4$ are constant and the intercepts respectively.

Chapter Summary

This chapter explained in details the methodology followed in carrying out the research. The theoretical foundation of the study, research approach, research design, sampling technique, procedures for data collection, data collection instrument and data analysis were thoroughly discussed. The positivism research paradigm was used as the theoretical foundation of the study. The quantitative research approach was employed for the study because the data collected using questionnaire was quantitatively analyzed by using both descriptive and inferential statistics. Descriptive research design was adopted to ensure objectivity in the research process. Simple random sampling technique was used to select samples for the study. The data collection instrument used was a 7-Likert scale questionnaire. The Statistical Package for Social Sciences (SPSS) version 26 was the software used to analyze the data to establish the relationship and the extent of the influence between financial innovation and growth of rural banks in Ghana.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter presents and analyses quantitatively the results for the study. The chapter begun by examining the extent of financial innovation among rural banks in Ghana and how the introduction of these new products and processes have reflected in their performance and growth in general over the years. Specifically, it aimed at assessing whether the financial innovations have resulted in simplified processes through which products are generated and delivered resulting in increased in total number of transactions per customer. This was achieved through a correlational analysis between new products introduced and the total number of transactions undertaken per customer using the product. Further, the chapter examines the effect process and product innovations have on the growth of rural banks through the use of regression analysis.

Examining the extent of Product and Process Innovation

This chapter begins with discussing the extent of financial innovation among rural banks in terms of the introduction of new products and improved processes, accessibility of new products to customers, and increases in the number of transactions. For the purpose of the study, four (4) variables were used as the proxy for product innovation. These include the number of registered alternative delivery channel service points (ADCs) used in banking activities, the use of roving staff, the use of Automated Teller Machine, (ATM), and the use of merchant point of sale system (POS).

Variables such as the total number of transactions at alternative delivery point, total number of transactions by roving staff, total number of transactions at ATM and total number of transactions at merchant point of sale system were used as proxies for process innovation.

Data on the thirty-eight (38) rural banks sampled for the study was obtained from the World Bank website for the purpose of the statistical analysis for the study. A correlational analysis was then conducted to determine the association of product and process innovation to determine the extent to which the introduction of these new products by rural banks has translated into their performance and growth measured by the simplicity in the processes of generating and delivering products. The direction as well as the magnitude of the relation was also investigated. The results from the analyses is presented in tables below and discussed accordingly.

To begin with, the relation between registered ADCs and active ADCs were examined. Alternative Delivery Channel Service point is amongst the financial innovations whose introduction has led to tremendous improvement in the performance and growth of financial institutions particularly banks. This has become possible as the introduction of ADCs streamline bank services and makes their products assessable to clients leading to increases in the number of transactions by customers and hence extending the services of these banks. Customers of these banks on the other hand also benefit from the use of ADCs in the form of lower cost, increase in comfort and providing more convenience. The results from the analyses is presented in table 2 below and discussed accordingly.

Table 2: Correlation between active and registered ADCs

		Active ADC service points	Registered ADC service points
Active ADC service points	Pearson Correlation	1	-.849**
	Sig. (2-tailed)		.000
	N	38	38
Registered ADC service points	Pearson Correlation	-.849**	1
	Sig. (2-tailed)	.000	
	N	38	38

**. Correlation is significant at the 0.01 level (2-tailed)

Source: Field survey (2022)

The above results show a statistically significant co-efficient of 0.000. Also, it depicts a strong inverse association between the number of registered alternative point of sales and those that are actively been used by clients. It can therefore be inferred from the results that, an increase in the number of registered ADCs by rural banks does not necessarily translate into its active use by clients. However, its use decreases over the years as more are been registered. This finding may be as a result of neglect in maintaining ADCs by rural banks. Thus, rural banks unlike other commercial banks are not fully incorporating the use ADCs in their banking activities and in serving clients and hence may be unable to take advantage of its associated benefits.

Table 3: Correlation between active ADCs and total transactions at ADCs

		Total transactions at ADCs	Active ADC service points
Total transactions at ADCs	Pearson Correlation	1	.394*
	Sig. (2-tailed)		.014
	N	38	38
Active ADC service points	Pearson Correlation	.394*	1
	Sig. (2-tailed)	.014	
	N	38	38

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Field survey (2022)

Further, the association between active ADC service points and the total number of transactions at these service points were examined. The result from the analyses is presented in table 3 above. The table shows a statistically significant co-efficient of 0.014 at a significant level of 5%. Also, the results reveal a positive moderate association of 0.394 between active ADCs and the total number of transactions at these ADC service points. It can therefore be inferred that as the number of active ADCs increases, the total number of transactions executed through them also increases, but in a smaller magnitude compared to the increase in the number of active ADCs.

Table 4: Correlation between roving staff and total transactions by roving staff

Correlations

		Total transactions of roving staff	Roving staff
Total transactions of roving staff	Pearson Correlation	1	.894*
	Sig. (2-tailed)		.021
	N	38	38
Roving staff	Pearson Correlation	.894*	1
	Sig. (2-tailed)	.021	
	N	38	38

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Field survey (2022)

Also, the relation between roving staff and the total transactions of roving staff was examined. The use of roving staff is a major financial innovation that most banks particularly rural banks use in providing banking services to their clients. The results presented in the table above shows a statistically significant coefficient of 0.021 at a significance level of 5%. It also shows a strong positive correlation between roving staff and the number of transactions that by the roving staff. This means that an increase in the number of roving staffs results in an increase in their transactions and hence increases in the performance and eventually growth of these rural banks. This finding may be associated with the fact that most clients of rural banks would prefer to perform banking activities particularly, deposit or withdraw from their account without visiting their various banks.

Table 5: Correlation between active ATMs and total transactions at ATMs

Correlations

		Active ATMs	Total transactions at ATM
Active ATMs	Pearson Correlation	1	-.007
	Sig. (2-tailed)		.967
	N	38	38
Total transactions at ATM	Pearson Correlation	-.007	1
	Sig. (2-tailed)	.967	
	N	38	38

Source: Field survey (2022)

In addition, the study investigated the relation between the number of active ATMs and the total transactions executed through its use. The result is presented in table 5 above. The results show a weak negative relation between active ATMs and the total number of transactions at these ATMs. This means that an increase in the number of ATMs by rural banks does not result in an increase in their use in performing bank transactions by clients. This is however the opposite with their commercial counterparts which have increased number of transactions by their customers at their ATMs outlets. This has undoubted resulted in limited number of banking transactions by customers of rural banks and ultimately on the growth of these banks.

Table 6: Correlations between active merchant POS and total transactions at merchant POS

Correlations

		Active merchant POS	Total transactions at merchant POS
Active merchant POS	Pearson Correlation	1	.054
	Sig. (2-tailed)		.748
	N	38	38
Total transactions at merchant POS	Pearson Correlation	.054	1
	Sig. (2-tailed)	.748	
	N	38	38

Source: Field survey (2022)

The last part of this section examined the relation between active merchant POS and the total number of transactions at these service points. The results are presented in Table 6. From the table, there exist a weak positive relation between active merchant POS and the number of transactions that are executed through that means. This means that the number of transactions executed through merchant point of sale service increase as the number of active merchant POS increases, but in a lower magnitude compared to the increase in the number of active merchant POS. Thus, few transactions are performed at these POS leading to minimal growth compared to commercial or other banks.

The effect of Product innovation on the growth of rural banks in Ghana

This section of the chapter provides results on the regression analysis to determine the effect of product innovation on the growth of rural banks in Ghana. This is to help address the first objective of the study and also test its associated null hypothesis and to model a regression equation. For the purposes of this study, the growth of rural banks in Ghana was measured using net operating profit while ADCs service points, roving staff, ATMs and merchant POS were used as proxies for product innovation. A regression analysis was then conducted with net operating profit as the dependent variable and the proxies for product innovation as the independent variables. The findings from the regression analysis are presented and discussed in the tables below.

Hypothesis 1:

H_0: Product innovation has no statistically significant effect on the growth of rural banks in Ghana.

H_1: Product innovation has a statistically significant effect on the growth of rural banks in Ghana.

Table 7: Effect of Product innovation on the growth of rural banks

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics			
					R Square Change	F Change	df 1	df 2	Sig. F Change
1	.988[a]	.976	.973	.09643	.976	320.507	4	32	.000

a. Predictors: (Constant), Merchant Point of Sale, Alternate Delivery Channel, Roving Staff, Automated Teller Machine

Source: Field survey (2022)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.921	4	2.980	320.507	.000[b]
	Residual	.298	32	.009		
	Total	12.218	36			

a. Dependent Variable: Financial Growth

b. Predictors: (Constant), Merchant Point of Sale, Alternate Delivery Channel, Roving Staff, Automated Teller Machine

Source: Field survey (2022)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.978	.161		24.655	.000
	Alternate Delivery Channel	-.901	.181	-.709	-4.987	.000
	Roving Staff	.232	.044	1.407	5.329	.000
	Automated Teller Machine	-.313	.561	-.166	-.559	.580
	Merchant Point of Sale	.055	.133	.150	.415	.681

a. Dependent Variable: Financial Growth

Source: Field survey (2022)

The model summary table shows results of the model from the regression analysis. The predictors for the model were alternate delivery channel service points, roving staff, automated teller machine and merchant point of sale service. Per the results, the model has an adjusted R^2 = .973 depicting that the model explains 97.3% of the variation in the dependent variable (financial growth). Thus, taken as a set, the predictors or independent variables; alternate delivery channel service points, roving staff, automated teller machine, merchant point of sale service, account for 97.3% of the variance in financial growth.

The ANOVA table contains findings that show the significance of the model presented in the model summary table. The results reveal an overall significant regression model with a statistically significant coefficient of 0.000. Therefore, the null hypothesis that, product innovation does no statistically significant effect on the financial growth of rural banks was rejected, indicating that there is a statistically significant relationship between the predictors and the outcome variable.

The coefficient table shows a statistically significant coefficient for the constant variable. Also, both alternate delivery channel service point and roving staff have significant coefficients of 0.000 meaning that they are significant predictors of financial growth in rural banks in that, they account for a significant amount of unique variance in the financial growth of rural banks and hence will be included. The coefficient of -0.901 for alternate delivery channel service point means that a 1 unit increase in the alternative delivery channels will reduce the financial growth of rural banks by 0.901 units. Also, for every 1 unit increase in the use of roving staff in rural banking, financial growth of rural banks will improve by 0.232 units.

The regression equation can therefore be modeled as;

$$FIN_{it} = \beta_0 + \beta_1 ADCs_{it} + \beta_2 RS_{it} + \beta_3 ATM_{it} + \beta_4 POS_{it} + \varepsilon_{it}$$

FIN = 3.978 - 0.901 ADCs + 0.232 RS – 0.313 ATM + 0.055

FIN = 3.978 - 0.901 ADCs + 0.232 RS

Where, FIN = financial growth

ADCs = alternate delivery channel service points

RS = roving staff

The effect of Process innovation on the growth of rural banks in Ghana

This is the final section of this chapter. It presents the results of the regression analysis of the effect of process innovation on the growth of rural banks in Ghana. This is to address the second objective of the study and to test the related null hypothesis while modeling a regression equation. A linear regression analysis was employed for this purpose by using net operating profit as the dependent variable and the proxies for process innovation as the independent variable. The findings from the regression analysis are presented and discussed in the tables below.

Hypothesis 2:

H_0: Process innovation has no statistically significant effect on the growth of rural banks in Ghana.

H_1: Process innovation has a statistically significant effect on the growth of rural banks in Ghana.

Table 8: Effect of process innovation on the growth of rural banks

Model Summary

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df 1	df 2	Sig. F Change
1	.922[a]	.850	.831	.23952	.850	45.244	4	32	.000

a. Predictors: (Constant), TMPOS, TRS, TADCs, TATM

Source: Field survey (2022)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.383	4	2.596	45.244	.000[b]
	Residual	1.836	32	.057		
	Total	12.218	36			

a. Dependent Variable: Financial Growth

b. Predictors: (Constant), TMPOS, TRS, TADCs, TATM

Source: Field survey (2022)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.663	.290		2.283	.029
	TADCs	.040	.026	.116	1.551	.131
	TRS	.760	.062	.890	12.217	.000
	TATM	.011	.037	.087	.299	.767
	TMPOS	.024	.143	.049	.166	.869

a. Dependent Variable: Financial Growth

Source: Field survey (2022)

The model summary table shows results of the model from the regression analysis. The predictors were total number of transactions at alternate delivery channel service points, total number of transactions by roving staff,

total number of transactions at automated teller machines and total number of transactions at merchant point of sales. According to the results, the model has an adjusted R^2 = 0.831 indicating that model explains 83.1% of the variation in the dependent variable.

The results from the ANOVA table show a statistically significant model with a coefficient of 0.000. As a result, the null hypothesis that, process innovation has no statistically significant effect on the financial growth of rural banks in Ghana was rejected, indicating that there is a statistically significant relationship between the predictors and the outcome variable.

The coefficient table shows a significant coefficient of 0.029 and 0.000 for the constant variable and roving staff respectively. The coefficient of 0.760 for roving staff means that a 1 unit increase in the total number of transactions by roving staff due to improvement in service delivery through product innovation will increase financial growth of rural banks by 0.760.

The regression equation can therefore be modeled as;

$$FIN_{it} = \beta_0 + \beta_1 TADCs_{it} + \beta_2 TRS_{it} + \beta_3 TATM_{it} + \beta_4 TPOS_{it} + \varepsilon_{it}$$

$$FIN = 0.663 + 0.040\ TADCs + 0.760\ TRS + 0.011\ TATM + 0.024\ TPOS$$

$$FIN = 0.663 + 0.760\ TRS$$

Where; FIN = financial growth

TRS = total roving staff

Chapter Summary

This chapter began with a description of the respondents to the study. The chapter included an assessment of the effects of financial innovation on growth of rural banks in Ghana. The first objective examined the effects of

product innovation on growth of the rural banks. The results of the study concluded that growth is seen by means of product innovation. The study also showed that there was a positive relationship between process innovation and growth of rural banks in Ghana. The next chapter presents the conclusions and recommendations of the study.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This is the final chapter of this study and it presents the conclusions from the analysis performed and offers recommendations for future research studies. The aim of the study was to examine the effect of financial innovation, specifically product and process innovation, on the growth of rural banks in Ghana. The analysis began by assessing the extent of financial innovation among rural banks in Ghana through the use of inferential statistics particularly, correlation. Regression analysis was then used to test the hypotheses for the study and subsequently model their related equation.

Summary of Findings

The study began by examining the extent of financial innovation among rural banks in Ghana. This was done in the light of new products introduced in the banking system and how it as increased transactions and ultimately the financial growth of rural banks. The results of the analysis are summarized as follows;

The study found out that rural banks like their commercial counterparts have taken advantage on product innovation by employing the use of alternate delivery channel service points in their banking services. However, the number of active alternate delivery channel service points that customers can actually access banking services through reduces over time as more as registered.

Moreover, the total number of transactions performed at these alternate delivery channels reduces over time hence rural banks do not fully benefit financially from its use. Also, the use of roving staff by rural banks in providing

banking services to its clients particularly, rural folks and those who are predominantly involved in marketing activities increases overtime. This increase subsequently results in increased transactions by these roving staff resulting in enhancement in financial growth.

Further, the study reveals that the total number of transactions at automated teller machines by of rural banks decreases over time which is the opposite of the reality with other banks. In addition, the study reveals that the total number of transactions at merchant point of sale increases as more is introduced by in a smaller magnitude.

The first objective of the study was to determine the effect of product innovation on the financial growth of rural banks in Ghana. The proxy for performance was net operating profit. Proxy for financial innovation was alternate delivery channel service points, roving staff, automated teller machines and merchant point of sale service. It was established that alternate delivery channel services do not affect the financial growth of rural banks significantly. It was further revealed that the use of roving staff in rural banking significantly improve the financial performance of such banks that employ its use. Finally, the use of automated teller machines and merchant point of sales in rural banking does not necessarily increase their financial performance.

The study revealed that process innovation had an effect on the financial performance of rural banks in Ghana. This can be seen by the adjusted R^2 of 83.1%. Specifically, the study revealed that the number of transactions by roving staff through improvement in banking processes significantly results in financial growth.

Conclusions

The chapter included an assessment of the effects of financial innovation on growth of rural banks in Ghana. The first objective examined the effects of product innovation on growth of the rural banks. The results of the study concluded that growth is seen by means of product innovation. The study also showed that there was a positive relationship between process innovation and growth of rural banks in Ghana. The next chapter presents the conclusions and recommendations of the study.

With respect to the first objective, the study examined the effects of product innovation on growth of the rural banks. The results of the study concluded that growth is seen by means of product innovation.

With respect to the second objective, the study concluded that there was a positive relationship between process innovation and growth of rural banks in Ghana.

The introduction of internet into banking activities has offered opportunities. However, the study revealed that the use of ADCs, ATMs and merchant POS does not lead to increase in profit levels of rural banks even though their commercial counterparts have a differing experience. Notwithstanding, the use of roving staff significantly improves financial growth and hence most beneficial to rural banks.

Recommendations

The following suggestions are recommended to rural banks on the basis of the results from the study to help improve their financial growth.

First, rural banks in Ghana should offer innovative financial products that meet the unique needs of their customers. For example, they can offer loans

for agricultural purposes or loans for small businesses. By offering innovative financial products, rural banks can attract new customers and increase their customer base

. Further, rural banks should can leverage technology to improve their operations and reach more customers. They can use digital channels to offer banking services and mobile banking applications to reach customers who are not able to physically visit their bank. This can help rural banks to expand their customer base and increase their revenue.

Also, rural banks should collaborate with fintech companies to offer new financial products and services. For example, they can partner with a fintech company to offer mobile payments or digital wallets. This can help rural banks to reach more customers and improve their competitiveness. Rural banks can provide financial education to their customers to help them make informed decisions about their finances. This can include providing information about savings, investments, and budgeting. By providing financial education, rural banks can help their customers to become more financially literate and better able to manage their finances.

Ans finally, rural banks should focus on providing excellent customer service to their customers. This can include providing personalized services and responding quickly to customer inquiries. By providing excellent customer service, rural banks can build a loyal customer base and attract new customers through word of mouth.

Suggestions for Future Research

This research did not factor moderating variables such as management and leadership styles which mostly affect performance. Further research can be

conducted on the moderating role of leadership and management styles of rural banks in their fiscal performance.

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