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The Effects of Managing Strategic Innovation and Technology on Competitive Advantage: The Case of Commercial Bank of Ethiopia Office of Strategy and Innovation

A Thesis Submitted to the School of Graduate Studies of Addis Ababa University in Partial Fulfillment of the Requirements for the Master of Science in Management (M.Sc.)

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May, 2020

Addis Ababa, Ethiopia

Statement of Declaration

I, the undersigned, declare that this thesis entitled “The Effects of Managing Strategic Innovation and Technology on Competitive Advantage (A Case of Commercial Bank of Ethiopia Office of Strategy and Innovation)” is my own original work. I have carried out the present study independently with the guidance and support of the research advisor, Yohannes Workaferahu (PhD). Any other contributors or sources used for the study have been appropriately acknowledged. Moreover, this study has not been submitted for the award of any Degree in this or any other universities.

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Statement of Certificate

This is to certify that Mesfin Milkias has completed his thesis entitled “The Effects of Managing Strategic Innovation and Technology on Competitive Advantage (A Case of Commercial Bank of Ethiopia Office of Strategy and Innovation)” is his original work and is submitted for examination with my approval as a thesis.

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This is to certify that the thesis entitled, “The Effects of Managing Strategic Innovation and Technology on Competitive Advantage (A Case of Commercial Bank of Ethiopia Office of Strategy and Innovation)” was carried out by Mesfin Milkias under the supervision of YohhanesWorkaferahu (Ph.D) submitted in partial fulfillment of the requirements for the degree of Master of Science in Management complies with the regulations of the University.

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ABBREVIATION AND ACRONYMS

ANOVA	Analysis Of Variance
ATM	Automatic Teller Machine
CBE	Commercial Bank of Ethiopia
DOI	Diffusion of Innovation Theory
DOI	Digital Objective identifier
E-banking	Electronic banking
Fin techs	Financial Technology
IBM	International business machines
ICT	Information Communication Technology
POS	Point of Sales Terminal
R&D	Research and Development
SMEs	Small and Medium Enterprises
SPSS	Statistical package for social sciences
SWIFT	Society for worldwide interbank financial telecommunications

ABSTRACT

As today's business environment becomes increasingly competitive, business organizations are becoming more aggressive and dynamic in identifying competitive strategies. This study sought to establish the effect of managing strategic innovation and technology on competitive advantage by focusing on commercial Bank of Ethiopia office of strategy and innovation. The general objective of the study was to investigate the effects of managing strategic innovation and technology on competitive advantage while the specific objectives of the study were; to establish the effect of managing strategic innovation on competitive advantage, to analyze the effect of technology management system on competitive advantage; to examine the combined effect of product, process, marketing, organizational and technological innovation on the competitive advantage and lastly to investigate the moderating effect of firm size on relationship between strategic innovation, technology and competitive advantage. To realize the research objectives, a descripto - explanatory research design with a survey strategy was employed. The target population for the study was commercial Bank of Ethiopia office of strategy and innovation. From probability sampling technique, stratified random sampling was adopted and 92 samples were drawn out of 120. Questionnaire was used as the principal tool for the data collection. Statistical package for social sciences (SPSS version 21) windows software was employed for data analysis. Descriptive and inferential statistics were used to analyze data. To test the reliability of the instrument, the Crobach alpha test was used. Multiple Linear regression and correlation model was used to analyze relationships and the effect of strategic innovation on competitive advantage. Study findings reveal that strategic innovation, technology management and combined innovation had significant effect and positive influence on competitive advantage. The study also revealed that firm size had insignificant moderating effect on strategic innovation, technology and competitive advantage relationship. The study recommends that company should consider reinventing its corporate strategy, increase human capability on technology and creating new market space instead of looking within the accepted boundaries. Lastly the study recommends further research should undertake relevant variables that might add value pioneering to maintain sustainable competitive advantage.

Keywords: Strategy, strategic innovation, competitiveness, technology, managing technology and competitive advantage

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Strategic Innovation and technology management practices are fundamental in banking sector. Innovations have become the main source of competitive advantage in modern business environment. Proactive firms seize market opportunities and make an innovation to get competitive advantage that makes them remain market leaders. Innovation entails new products, processes of production, new sources of supply, new markets and new ways in which the businesses carry out activities (Osuga, 2016). Technology is making a tremendous impact upon service companies in general and the financial service sector in particular. Firms depend on innovative ideas to survive and compete in the fast-changing, aggressive and competitive markets of the 21st century (Nusair & Osman, 2016). Today's business environment is very dynamic and undergoes rapid changes as a result of technological innovation. Business organizations especially banking industry operates in a complex and competitive environment characterized by these changing conditions and highly unpredictable economic climate. Banks are in serious competitions with each other and offer their clients with more convenient products with acceptable levels of costs (Agwu & Carter, 2014).

Technological advancement is considered to be one of the driving forces to create new opportunities for the development of the banking sector. Technological innovations are of great value to gain competitive advantage and in today's world this has changed the outlook and approach of the banking sector when compared with traditional banking services (Shabbir, Rehman, Shabbir, 2016). According to Tukker et al. (2017) Innovation is the ability of an organization respond to environmental turbulence for future opportunities. Parker and Alstyne (2017) noted that this environment turbulence emanates from advancement on technology and change in business environment. To become innovative, most organizations have heavily invested in research and development followed by launching of new products and services as a way of responding to ever changing needs and wants of customers.

Product innovation is the generation diffusion and translation of customer, competitor and technology related information into products of higher value. Saeed, Yousafzai, Paladino and De Luca (2015) also noted that product innovation is an organizational renewal process resulting from the incorporation of internal and external knowledge.

An evaluation of how innovation can help an organization to gain competitive advantage was carried out by Chatzoglou and Chatzoudes (2018). This was an empirical examination and the data was analyzed using structural equation modeling technique. The findings of the study indicated that innovation and competitive positioning of a firm had direct relationship. This shows that as firm strengthen innovative ability, its chances to remaining competitive also increases. Kiveu M.N (2017) conducted study on the Effect of innovation on firm competitiveness by focusing on manufacturing SMEs in Nairobi, Kenya. The findings of the study revealed that innovations: product, process, marketing and organizational innovation had positive effect on firm competitiveness.

Muthoni (2017) conducted a study on how innovation resulted in to competitive advantage of firms by a case of Fast Moving Consumer Goods. Data was collected by using questionnaires and the findings of the study noted that competitive advantage is influenced by process, products and market innovation. Thus, innovation helps an organization to effectively compete.

Commercial Bank of Ethiopia is largest bank in the country which is playing a catalytic role in social and economic development. CBE is the top taxpayer by paying over 3.5 billion birr and awarded by ministry of revenue in the fiscal year 2018/19 (CBE, 2019). This shows that the bank has great role in progress of the country. The bank is also adopting many technologies to the country in banking industry. Currently the bank has facing many challenges in industry to manage technology. Strategic innovation is imperative in the product, process, technology, marketing and organization to sustain being competitive in the market. Incorporating technology to the company is not enough but able to manage strategic innovation and technology is so vital. In this point, the researcher interested to undertake the Effects of Managing strategic Innovation and Technology on competitive advantage, the Case of CBE office of strategy and innovation.

The study was coined by Resource Based Theory, Diffusion of Innovation Theory, Schumpeter's Theory of Innovation, and Porter's Theory of Competitive advantage. Literature was reviewed on the concept of strategic innovation & technology, types of strategic innovation and relationship with competitive advantage, managing technology, Firm size and competitive advantage. Empirical review and Conceptual Framework was developed by identifying the knowledge gap.

1.2 Background of the Organization

Commercial bank of Ethiopia is one of the oldest and state owned banks in Ethiopia. It was legally established as a Share Company in 1963 to take over the commercial banking activities of the State Bank of Ethiopia, which was founded in 1942 with twin objectives of performing the duties of commercial and central banking. During the 1974 revolution, CBE got its strength by merging with the privately owned Addis Ababa Bank. Since then, it has been playing a significant role in the development endeavor of the country. Commercial bank of Ethiopia set vision and striving to become a world-class commercial bank by the year 2025, is serving being state-of-the-art and reliable to its millions of customers.

It has strong correspondent relationship with more than 50 renowned foreign banks like Commerz Bank A.G.; Royal Bank of Canada, City Bank, HSBC Bank. CBE has a SWIFT bilateral arrangement with more than 700 others banks across the world (CBE, 2019). Pioneer to introduce Western Union Money Transfer Services in Ethiopia early 1990s and currently working with other 20 money transfer agents like Money Gram, Atlantic International (Bole), and Xpress Money. The business strategies of the Bank focus on the interest of the public it serves. The state-owned CBE still dominates the market in terms of assets, deposits, capital, and customer base and branch network, despite the growing competition from private banks. This makes it one of the most reliable and strong commercial banks in the country and the region. Currently CBE has more than 22 million account holders, 1456 branches and the number of Mobile and Internet Banking users also reached more than 2.5 million as of June 30th 2019 (CBE, 2019).

1.3 Statement of the Problem

Strategic innovation is considered to be one of the most important factors influencing firm performance worldwide (Yang, 2014). It refers to the entire process through which companies redesign their business processes and products to enable them to provide more superior products and services to their customers (Seybold, 2014). The significance of strategic innovation is described by Roberts and Amit (2013) as a means leading to a competitive advantage and superior financial performance. The world today has undergone massive changes and innovation is on the forefront in both emergent and advanced economies, in the global competition for talent, resources and market share. It is important for firms in an industry to develop competitive advantage over its competitors. Stiff competition among existing players has left firms with no option but to find ways to attain competitive advantage through innovation. The firm with a capacity to innovate is in a better position to compete in markets than one which lacks the innovative ability (Morrison, 2014).

According to Schroeder (2013), the available evidence shows that the companies that are most successful at innovation approach it in a systematic and holistic way, developing an innovation strategy that is fully integrated with their business mission, vision and goals, and aligning their organizational culture and organizational systems with the strategy. El-Awad, Gabrielsson and Politis (2017) conclude that sustainable innovation results from the development and institutionalization of a mind-set and processes that support repeatable innovative actions. Strategic innovation directly affects the ability of companies to develop their products to fulfill the wide range of customer and market needs. Building organizational capacity for sustainable innovation is critical to successfully nurturing the culture of innovation among the team members as exemplified by companies such as Apple, IBM, IKEA furniture and Nintendo electronics and Video Game Company.

In a constantly changing environment, executives need to develop technological capability that will deliver performance and controls that will cushion firms against their competitors. Firms should focus on their internal performance and also pay attention to the external environment. Technological capability enables company to perform any relevant technical function or volume activity within the organization including the ability to develop new products, processes and facilities to operate effectively Teece (2017). A study by Nguyen, Tran and Wang (2014)

concluded that the application of technology to banking service is a good way to enhance the service. Technological innovations play a significant role in improving the efficiency of the banking sector as well as reducing the costs of banking transactions for customers. But this does not come easy. Whilst some banks benefit from the introduction of technologically innovative products and services, others fail to realize the expected benefits of innovations. According to Hilal (2015), innovation and introduction of new technologies are privileged means for improving banks productivity. One of the benefits of electronic innovations in banking is cost saving to both banks and customers. This suggests that banks need to ensure innovative products and services are appropriately priced to attract and provide satisfaction to customers.

Banking industry is undergoing a radical shift, one driven by new competition from Fin Techs, changing business models, and disruptive technologies. Commercial Bank of Ethiopia is largest bank in the country which encountering many challenges like industry, operational and Management challenges. Strategic and Human resource capability, security problem through technological advancement, connection problem due to late to upgrade core banking system, and compete the same product in the same market in stiff competition are some of challenges. From E-banking, Process inconsistency, lack of clear transactional processing of mobile and internet banking, lack of reverse access for the customer if the error of transaction is made are some of technology management limitations of the bank.

Adopting strategic innovation and technology capability is vital for the bank to get competitive advantage and to keep in pace with the technological wave or speed of competition. Technology has been viewed as one of the determinants of firm performance and competitive advantage (Zakuan & Tan, 2018).

Globally, Ionescu and Dumitru (2015) critically examined how firms can leverage on innovation to gain competitive positioning in the market. The findings of the study indicated that innovative ability of the firm drives its ability to gain competitive advantage. Conto, Junior, Valle and Vaccaro (2016) examined how innovation can result in to competitive advantage. It was noted that innovation helped organization to align products with the needs of customers resulting in satisfaction. The study was however done in companies producing organic juice and wine producer and not banking industry. In Thailand, Tangkit and Panjakajornsak (2016) assessed

how innovation has affected firms in the furniture sector. The study established that firms stood to significantly benefit from adoption of radical innovation since it leads to competitive edge.

Despite the fact that all the above researches and studies exposed existence of relationship between innovation and competitive advantage, all were contextual different. This study drives to investigate the effect of managing strategic innovation, technology, and implementation of various innovations on competitive advantage through investigating the role of firm size on this relationship to fill study gap in the research stream. Currently, no study has been undertaken that shows the effects of managing strategic innovation and technology on competitive advantage and this created knowledge gap.

To fill these gaps, the study strived to answer the following Research Questions.

1. How efficiently does CBE manage strategic innovation to get competitive advantage?
2. Does current technology management system could results CBE to achieve its competitive advantage?
3. Does combined innovation (product, process, marketing, organizational and technological) has effect on competitive advantage of CBE?
4. Does firm size have moderating effect on the relationship between strategic innovation, technology and competitive advantage of CBE?

1.4 Objectives of the Study

1.4.1 General Objective

The main objective of this study was to investigate the effects of managing strategic innovation and technology on competitive advantage: A case of Commercial Bank of Ethiopia, office of strategy and innovation, Head office.

1.4.2 Specific Objectives

The study aimed at achieving the following specific objectives:

- To establish the effect of managing strategic innovation on competitive advantage
- To analyze the effect of managing technology on competitive advantage

- To examine the combined effect of product, process, marketing, organizational and technological innovation on the competitive advantage
- To investigate the moderating effect of firm size on relationship between strategic innovation, technology and competitive advantage

1.5 Research Hypotheses

The study was aimed at testing the following Research hypotheses in line with the specific objectives;

Ho1: Managing strategic innovation has no significant effect on the competitive advantage

Ho2: Managing technology has no significant effect on competitive advantage

Ho3: Combined innovation (product, process, marketing, organizational and technological) has no significant effect on competitive advantage

Ho4: Firm size has no moderating effect on the relationship between strategic innovation, technology and competitive advantage

1.6 Significance of the Study

This study will contribute to a better understanding of the strategic innovation and technology management in Commercial Bank of Ethiopia and how it gets competitive advantage. This is important to banking sector in Ethiopia, management of the bank, policy makers, government agencies and other researchers and scholars. Specifically the study findings will provide a basis to manage strategic innovation and technology to remain competitive in this unpredictable environment. For banking industry, financial institutions, science and technology, existed and newly emerging companies, the study findings will provide knowledge necessary for the formulation of relevant and effective policies and programs not only adopting technology and strategic innovation but also managing strategic way to enhance development.

This study's will add to the existing body of knowledge through developing new conceptual framework of strategic innovation and technology to gain competitive advantage by managing effectively. The study also attempts to validate existing theoretical knowledge in the area of

strategic innovation, technology and competitive advantage. Lastly, the study findings may ignite further research in this area of managing strategic innovation technology and competitive advantage to fill up any research gaps or to widen the scope.

1.7 Scope of the Study

The study sought to investigate the effect of managing strategic innovation and technology on competitive advantage focusing on banking sector in commercial Bank of Ethiopia office of strategy and innovation. A sample 92 was drawn out of 120 from office of strategy and innovation which consists four departments. Other factors can affect competitive advantage such as branding, reputation, human resource management, and organizational culture. This study focused only on strategic innovation (product, process, marketing, organizational) and technology (technological innovation) on competitive advantage. Information technology, technology capability, technology push from technology and disruptive innovation, architectural innovation, and service innovation from strategic innovation, are not considered to this study.

Data on strategic innovation and technology on competitive advantage was collected for a period of three months September, October and November, 2019. The dependent variable of competitive advantage was focused on constructs: profitability and market share while independent variable of strategic innovation and technology was focused on product, process, marketing, organizational, and technological innovation. Firm size was taken as moderating variable in the relationship between strategic innovation, technology and competitive advantage. Multiple linear regression and correlation analysis were used to analyze the effect of managing strategic innovation and technology on competitive advantage.

1.8 Limitations of the Study

The study was targeted at Commercial Bank of Ethiopia office of strategy and innovation, head office. Data was collected from samples which were drawn from four departments under strategy and innovation. All head office departments were not included except office of strategy and innovation due to time limitations and this may introduce some biased. Office of strategy and innovation is newly established after new structure implementation of commercial Bank of Ethiopia and this may lead to limitations of access and prior research studies on the topic.

For the study, most available data of previous research conducted may not explain specific to our country context. Customers of the CBE and private banks were not considered to the study. Hence, the generalizability of results of the study may be limited. Lastly, data collection on the dependent and independent variables of the bank was self-reporting and this can lead to subjectivity.

1.9 Definition of key Terms

1.9.1 Conceptual Definition

Strategic Innovation

Strategic innovation refers to the process undertaken by firms, which totally changes the nature of competition within an industry as well as the gaining of a competitive advantage by employing strategies different from their competitors. It does not just refer to activities in the Research & Development department performed for the creation of next generation products and services; they also challenge the conventional wisdom in particular areas (Belderbos, Carree, Lokshin, & Sastre, 2015)

Strategy

The term strategy refers to long-term scope and direction of an organization which include the ability of the firm to align itself with the changing environment Grant (2016).

Product Innovation

Product innovation is the process of conceiving and implementing new products and activities such as the technical design, R&D and commercial activities involved in the marketing of a new or improved product Löfsten, (2014).

Process Innovation

According to Un and Asakawa (2015) process innovation refers to the new techniques and processes introduced into operations that help to promote efficiency or effectiveness, and lower the costs of production and delivery.

Market Innovation

Market innovation is concerned with improving the mix of target markets and how chosen markets are best served (Mitchell, 2013).

Organizational Innovation

Organizational innovation is defined as the creation of valuable and useful new products or services, and more efficient and adaptive administrative mechanisms that support product or service innovation. An organizational innovation is the execution of the novel organizational procedure in the industry organization practices, workplace business, or outside relations (Angel, Meroño-Cerdan, & López-Nicolas, 2013).

Technology

Technology is defined as the integration of human know-how, equipment, machinery, buildings, process technology, technical skills and information and knowledge about equipment, marketing, management and organizational know how (Mian, 2004).

Technological Innovation

According to Rubera and Droge (2013), technological innovations refer to the changes in the functionalities of a product.

Competitive Advantage

A competitive advantage is the good performance that the company may develop depending on the use of resources and the potential for developing new skills (Porter, 1985), with which they manage to guarantee its permanence in the middle even though competition also carry out activities to maintain their status in the market (Horta et al., 2015).

Firm size:

Quantity and array of production capability and potential a firm possesses or a quantity and diversity of services a firm can make available concurrently to its clients Shaheen and Malik (2012).

1.9.2 Operational Definition of terms

Technology:

Technology refers knowledge of modern methods and systems to solve problem which used for practical purposes.

Strategic Innovation:

Strategic innovation is an organization's process of reinventing or redesigning its corporate strategy to drive business growth and to create competitive advantage.

Competitive advantage: It is a favorable position a business holds in the market which results in more customers and profit.

Market share: Market share represents percentage of customer base of the Bank to products and services in the industry.

Profit: Profit is the financial benefit realized when revenue generated from a business activity exceeds the expenses.

Product innovation: Development of new product, improvement and add new feature to the existing product.

Process innovation: It is implementation of a new or significantly improved production or delivery method.

Marketing innovation: It is deployment of new marketing methods and significant change of system.

Organizational innovation: Organizational innovation is implementation and development of new methods, procedures, and systems.

Technological innovation: It is successful implementation of a technical idea, modern or new method to the company.

1.10 Organization of the Study

This study is organized in five different chapters. Chapter one of the study introduces the research, the research variables and the context. The chapter contains the background information, statement of the research problem, research objectives, significance of the study, scope of the study, the study limitations, definition of key terms and organization of the study. Chapter two will presents literature review that includes theoretical, conceptual and empirical literature of the main study variables of competitive advantage, strategic innovation and Technology. Based on the literature reviewed, a conceptual framework depicting the hypothesized relationship of the variables will be developed.

Chapter three will presents the research methodology that include a description of the research design, the research philosophy, the target population, sampling design and sample size and operationalization of the variables. The chapter also will contain empirical models used in the study as well as data collection methods and instrument and lastly ethical considerations of the study.

Chapter Four will presents the research findings, results of data analysis and a detailed discussion of the findings. The chapter also contains the descriptive statistics, diagnostic tests, and inferential statistics. Finally, Chapter Five will present the summary of research findings, conclusions, recommendations, contribution of the study to knowledge, and suggests areas for further research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents the theoretical and empirical literature with developed conceptual framework that guides the study. Relevant theories were reviewed to expose the foundation underlying the concept of strategic innovation, technology and competitive advantage. They include Resource based theory, Diffusion of Innovation Theory, Schumpeter's Theory of Innovation, and Porter's Theory of Competitive advantage. Literature was reviewed on the concept of strategic innovation; types of innovation, managing technology, Firm size and competitive advantage. The chapter captures theoretical, conceptual framework and empirical literature focusing on strategic innovation, technology and competitive advantage. Review of variables, summary of the theoretical and empirical review was developed by identifying knowledge gap.

2.2 Theoretical Literature Review

The theoretical review is a critical examination of theories that form the basis of the study. Yin (2017) defined a theory as a set of principles that guide how something is done. It is the 'blueprint' or guide for a research (Grant & Osanloo, 2014). It is a framework based on an existing theory in a field of inquiry that is related and/or reflects the hypothesis of a study. This study was anchored on Resource based theory, Diffusion of Innovation Theory, Schumpeter's Theory of Innovation, and Porter's Theory of Competitive advantage.

2.2.1 The Resource Based Theory

The resource based theory (RBT) is defined as "a collection of productive resources, where the choice of different uses of these resources over time is determined by administrative decision. The theory lays emphasis on how a firm's unique resources and capabilities can enable it to develop a sustained superior performance. According to Juma *et al* (2014) employees need access to sufficient resources to be creative and to create a climate of innovation. The Resource-Based theory is one of the most widely accepted theories inquiring firms' competitive advantage. Resource based theory (RBT) analyze and interpret resources of the organizations to understand

how organizations achieve sustainable competitive advantage. It tries to explain the internal sources of a firm's sustained competitive advantage.

The theory argues that firms own resources which they can employ to become competitive and a firm can gain competitive advantage by being in possession of distinctive resources or capabilities which are valuable, difficult to imitate and rare in the marketplace. It emphasized on the development of resource based capacities difficult for others to imitate or copy and makes performance difference with other firms based on firm specific, rent-generating and valuable resources and capabilities. As businesses are becoming increasingly global, companies need to develop a different orientation in terms of corporate resources (Panda & Reddy, 2016).

The resource-based Theory (RBT) does not consider firms as a set of product-market positions, rather treats as a collection of resources and capabilities. The strategy seeks to balance and maintain the company in its increasingly multifaceted market environment (Ocasio & Radoynovska, 2016). The existence of the strategy is a market factor that indicates the importance of developing a conceptual system, which the companies can use to anticipate and explore competitive imperfections in strategic market factors. The essence of strategy is to achieve better performance when compared to rivals (Porter, 1996). Company environments are always changing, including the emergence of new rules for the competitive game. Companies take aggressive actions because of competitors, who rapidly copy efficient actions and try to better use them (Olson, Duray, Cooper, & Olson, 2016).

A strategic resource is a rare resource on the market, generally perceived as positive in terms of performance, i.e. with an expected level of productivity that is greater than its cost (acquisition or development). Such a resource is considered a potential source of rents. Malen (2015) argues that underutilized firm resources present a challenge to firm management to find ways to make more effective use of those resources. Acquiring resources entails costs to the firm. Accordingly, managers' fall under pressure to conceive new approaches, processes and activities capable of more effectively extracting value from resources that are not being used to their full capacity. These characteristics of slack resources motivate the search for innovation. Excess resources are capable of providing value to the firm at near-zero marginal cost if the firm can devise new ways to put them to use. In other words, underutilized resources facilitate the introduction of new combinations of resources that enhance innovation. Innovation provides means to competitive

advantage of the firm by providing outputs that are valuable, rare, and hard to imitate (OECD, 2009).

2.2.2 Diffusion of Innovation Theory

Diffusion of Innovation (DOI) Theory, developed by Rogers (1962) explains how, over time, an idea or product gains momentum and diffuses through a specific population or social system. It seeks to clarify how, why, and at what frequency new concepts and technology spread. Through the diffusion, people adopt the product, behavior, or new idea. The theory presumes that a new idea, practice or object has a perceived channel, time and mode of being adopted by individuals or organizations. For adoption to take place, the person must perceive the idea, behavior, or product as new or innovative. In this theory therefore adoption means the decision to fully use an innovation as the best alternative and thus the person does things differently from the way they did previously. Owolabi (2013) states that innovation is an idea, object, or practice, that is perceived as new by an individual or other unit of adoption; and diffusion as the process by which an innovation is communicated within a social system, and adopted or rejected by its members. DOI views innovation as being transferred through certain medium over a time and in a specific social system. The movement of the innovation greatly underscores the innovative marketing strategies that a firm employs. Diffusion can be defined as the intake and usage of the new concepts and innovations by the members of society. There is a time lag in adopting to these new innovations as some regardless of their goodness, the target individuals or parties may take long to adopt them. Diffusion of innovation may be a subject of resistance in cases whereby the target is not readily in position to adopt the new change.

Diffusion of Innovation (DOI) Theory explains individual's objective to embrace technology as a modality to perform a traditional activity. Embracing new ideas, culture, or else product does not occur concurrently in social system; however, it is a practice where certain persons stay more appropriate to embrace the innovation than others.

DOI has been incorporated by some researchers. Wang (2003) Studied embracing Internet banking by means of TAM model and presented a new concept 'perceived credibility' that mirrors the consumer's security and confidentiality concerns in the approval of Internet banking (Casolaro & Gobbi, 2007). They bring in to being the major influence of supposed ease of use,

supposed usefulness and supposed credibility on the purpose to use internet banking. Critical element defining the embracing of an innovation at broad level are: relative advantage, compatibility, complexity, triability and observability (Rodger, 1995). The normalized factors are complexity, triability and observability. The key to implementation is that the individual need to identify idea, behaviour or product.

2.2.3 Schumpeter Theory of Innovation

This theory was developed by Schumpeter (1934). According to Schumpeter, entrepreneurs can use innovation for greater profits. The large amount of profits will set in imitators who shall ultimately reduce the level of supernormal profits in the industry. According to Schumpeter (1934), entrepreneurs play an important role in coming up with completely new ideas that are novel, untried and untested. The role of innovation in an organization has been indicated by various scholars. Schumpeter's assertions have been supported by Porter (2010) that innovation is vital for a country's long-run economic growth and competitive advantage. Porter (2010) argues that to compete effectively in international markets, a nation's businesses must continuously innovate and upgrade their competitive advantages. Innovation and upgrading come from sustained investment in physical as well as intangible assets. Financial markets play critical roles in mobilizing savings, evaluating projects, managing risk, monitoring managers, and facilitating transactions.

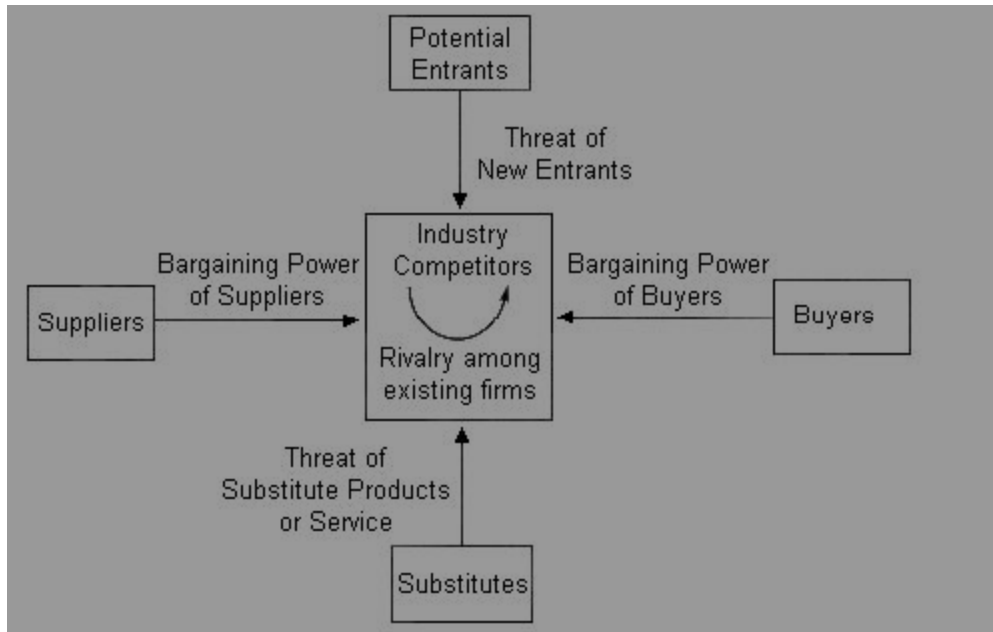
According to Porter (1992), innovation is way one that organizations gain competitive advantage and stay relevant in the market. Anderson et al. (2014) argues that for an innovation strategy to be effective in an organization, it needs to meet the ever-changing needs, preferences and wants of customers. Through innovation, new products emerge to the market that imitators copy because of the supernormal profits being generated by the product. De-Vries, Bekkers and Tummers (2016) applied this theory to study innovation in the context of public sector. This theory is relevant because banking industry need to be innovative in coming with new products in the market in order to stay competitive in this time of environmental turbulence and intensified competition.

2.2.4 Porter's Theory of Competitive Advantage

This theory was formulated by Porter (1979). According to this theory, the ever changing and dynamic business environment triggers competitive responses among organizations. Competition emanates from the environment surrounding the business. The industry structure will determine the rules of the game and therefore the adequate strategy to undertake in response to these forces of competition. The theory suggests that there are five forces within the industry that an organization operates that determine the competitive position of the firm (Porter, 1979). These forces include barriers to new entrants, rivalry among other firms, bargaining power of suppliers of the business, bargaining power of customers/buyers and the threats of substitute products. The level and nature of success (profit margin) will be determined by firms in the industry (Porter, 1979).

Kiragu (2014) used this theory to assess the challenges that Kenyan insurance companies face in their pursuit for competitiveness. Banker, Mashruwala and Tripathy (2014) applied this theory to determine how firms can effectively differentiate their products and gain competitive advantage. Camison and Villar-Lopez (2014) relied on this theory to assess how firms can use technology to remain innovative and thus gain a competitive edge ahead of their rivals in the market.

This theory can help an organization to get itself in a favorable competitive position within the market. The theory is relevant to the study because it shows how an organization could gain competitive advantage in its industry. Although not explicitly stated by the theory, but it is implicit that strategic innovation and technology in a firm would guide the competitive positioning of the firm in its industry.



Source: <http://www.brs-inc.com/porter.asp>

Figure 2.1 Porter's Five forces

2.3 The concept of Strategic Innovation

In a world that is changing rapidly and in unpredictable ways, strategic innovation becomes vital for adapting to change. Kariuki (2014) posits that strategic innovation is a key component for long-term firm success and innovative businesses are more successful than others that are not. The competitive environment that companies face today is very different from the competitive environment that created the concept of strategy a years before. However, the rapidly changing strategy environment has become a power that partially depresses some traditional strategy concepts such as industry structure analysis while evoking a lot of new thoughts at the same time. Indeed, this context changing for the strategy has encouraged many new ideas on strategy content.

Ambrosin (2015) defined strategy as a perspective, position, pattern, ploy or plan. Any form of business or organization requires strategies. The new themes in the strategy world include foresight, knowledge, competencies, coalitions, networks, extra-market competition, ecosystems, transformation and renewal. In order to maintain their existence in an “innovate or die” environment of the new economy, companies must develop a new strategy, which is highly important for them (Hamel, 1998).

Innovativeness is one of the fundamental instruments of growth strategies to enter new markets, to increase the existing market share and to provide the company with a competitive edge. Innovation is the ability to implement new products (goods and services) or improve on the existing business practices like marketing, organizational structure and culture and other systems and processes within an organization. It is a successful process of making sure that creative ideas are fully implemented within an organization (Wachira & Ondigo, 2016).

Motivated by the increasing competition in global markets, companies have started to grasp the importance of innovation, since swiftly changing technologies and severe global competition rapidly erode the value added of existing products and services. Thus, innovations constitute an indispensable component of the corporate strategies for several reasons such as to apply more productive manufacturing processes, to perform better in the market, to seek positive reputation in customers' perception and as a result to gain sustainable competitive advantage.

Innovations provide firms a strategic orientation to overcome the problems they encounter while striving to achieve sustainable competitive advantage (Kuratko et al., 2015). Innovation as a term is not only related to products and processes, but is also related to marketing and organization.

Johnson et al. (2015) described different types of innovation: new products, new methods of production, new sources of supply, the exploitation of new markets, and new ways to organize business. Innovation is also the process of equipping in new, improved capabilities or increased utility. The strategic management of innovation indicates an important component of the corporate strategy and an important factor that has a significant contribution to a company's competitive advantage. For this reason, strategic management of innovation has become a fundamental issue in the field of strategic management. An innovation can be a new product or service, a new production process technology, a new structure or administrative system or a new plan or program pertaining to organizational members (Keupp et al. 2012: 367).

In recent years, widespread researches into scientific and managerial conception of strategy and innovation have been observed. Nevertheless, most of these researches are either focused on strategy or innovation; so that strategy and innovation have evolved considerably separately in the schools of thought. In this context, the strategy literature is primarily focused on the level of the institution and the business units while the innovation literature is mostly focused on the

product level. However, researchers have tackled the innovation and corporate strategy together unlike the traditional tendency in recent years. In this regard, strategic innovation can be expressed as the implementation of innovation on corporate strategy (Schlegelmilch, Diamantopoulos and Kreuz, 2003).

2.3.1 Incremental Innovation

Incremental innovation attempts to meet the needs of current customers or markets at a rate consistent with the current technological trajectory. The strategic focus of incremental innovation is market dominated growth with diversification by improving and expanding current products and services within a short time (Taylor and Greve, 2006). Incremental innovation projects call for the ability to reinforce, recombine, and take advantage of existing knowledge resources.

In this case, exploitative learning occurs with a narrow and in-depth search to take in well-defined solutions of a firm (Kang and Snell, 2009). Outputs of incremental innovation projects are slight variations of existing products, services, practices or approaches.

2.3.2 Radical Innovation

Conversely, radical innovation seeks to meet the needs of emerging customers or markets. The magnitude of change in radical innovation is bigger than in incremental innovation. Based on an aggressive long-term strategy, organizations attempt to disrupt the prevailing technological trajectory and create new designs, technologies, and distribution channels for new markets Gatignon et al. (2002). Accordingly, radical innovation projects build on knowledge resources that a firm does not yet have or that differ from existing resources (Danneels, 2002). In this case, exploratory learning becomes critical in that the firm needs to search a wide range of available knowledge to expand existing knowledge domain to novel or unfamiliar areas (Kang and Snell, 2009). Put differently, the success of a radical innovation project depends on the ability to make prevailing technologies obsolete by transforming the old knowledge into new knowledge, thereby producing fundamental changes in an organization.

2.4 The Concept of Managing Technology

Technology is integration of human know-how, equipment, machinery, buildings, process technology, technical skills and information and knowledge about equipment, marketing,

management and organizational know how (Mian, 2004). Technology is commonly defined as the process of converting input into output, through the use of knowledge, tools, techniques, and actions (Rousseau, 1979). It is the application of scientific knowledge to the practical aims of human life or, as it is sometimes phrased, to change and manipulation of the human environment. In today's highly globalized and technologically advanced world, the companies or countries with obsolete technology, poor management of technology, old way of thinking and obsolescent production processes cannot exist in highly globalized economy.

Companies having advanced technology but lacking proficient technical skills, required knowledge and capacity, poor management of technology are worthless. It's the management of technology which makes profit not the technology itself (Mary and Ann, 2006).

In the dynamic global environment, with continuous and exponential technological growth and development, management of technology and change is of high priority. Technology, innovation and change management are the crucial competitive factors today for any organization.

White and Brutton, (2007)state that the necessity of technology management has been necessitated by; the rapid pace of technological changes which requires multidisciplinary approach, the rapid pace of technological development which shortened product lifecycles, the need to cut time for product development and create more flexible organizations, the need to maximize competitiveness effectively by using new technologies and the importance of changing management tools caused by rapid technological changes.

Managing technology is a method of operation that leverages human resources, technology and other business assets by optimizing the relationships between the technology functions of the business enterprise. It is the process of integrating science, engineering and managing with research, development and manufacturing in order to meet the operational goals of the business unit effectively, efficiently and economically. It includes managing the totality of the technology operations from concept through commercialization (Gaynor, 1989).

In advanced sectors, technology and ability to innovate are key aspects of the organizational knowledge of a firm that give it distinctive capabilities and competitive advantage. However it is also necessary to combine these capabilities with ability to commercialize the technology. Such combination requires effective, intensive and responsive relationships between marketing, formal

R&D and design engineering. Companies that spin out variants more rapidly and leverage their core technology across more markets earn more returns. The ability to make better use of generic features of key contemporary technology is another feature of firm level competitiveness (Nevens et al, 1990).

2.5 The Concept of Competitive Advantage

Competition issues first entered the literature when Adam Smith published his famous book entitled *The Wealth of Nations*. Until the late 1980s, there was no theoretical framework for the analysis, retention, and improvement of competition for a country or an industry, and thus, economic analyses were made for competition using various criteria.

Throughout the 1980s, strategy books compiled by Michael Porter were very popular in the field of competitive analysis. These books included *Competitive Strategy*, *The Competitive Advantage of Nations*, and *Competitive Advantage*, all of which were pressed by The Free Press in 1980, 1985 and 1989; respectively Tehran et al (2016). Competitiveness defined by Pedraza (2014) as the ability of firms to sell products that meet market requirements while ensuring profits overtime for the firm to enable it survive and thrives in competition.

Competitive advantage can be defined as the ability of a firm to outdo the other firms in the same industry. Firms have been seen to employ different strategies in order to gain competitive advantage over others. Competitive strategies aim at establishing profitable and sustainable positions against forces that determine industry competition (Porter, 1980). Competitive advantage is also obtained when an organization develops or acquires a set of attributes or executes action that allows it to outperform its competitors (Wang, 2014).

Competitive advantage, according to Porter can be seen as growing out of the value a firm is able to create for its buyers and that value must exceed the firms' cost of creating it. Value can come out of offering lower prices than competitors for equal benefits, or providing unique benefits that more than offset a higher price. The value should be what buyers are willing to pay for. Competitive advantage is at the core of survival of any firm (Porter, 1980). Competitive advantage is an important concept because it defines the uniqueness of the firm when compared to its competitors. In today's dynamic environment, competitiveness is an important issue in

business. A competitive advantage is the “how” of strategy and it defines in what ways the firm intends to achieve its long-term goals within the chosen scope.

A firm has a competitive advantage when it has the means to edge out and outsmart rivals when contesting for the favor and following of customers. Schermerhorn *et al.* (2014) says a competitive advantage comes from operating in successful ways that are difficult to imitate. The concept of competitive advantage has changed over time because of the technological innovations. The Company’s innovation capability is now being considered as one of the most important tool towards development and sustainable competitive advantage.

The management of the company and its ability to seize resources can be easily and effectively exercised through innovations. Usage of technology and developing this strategy will help the company to conform itself to the dynamic environment and enhance its competitive position.

2.6 Technology products and services of the Bank

CBE-birr

CBE-birr is an agent banking service which introduced by commercial Bank of Ethiopia. CBE-birr helps customers to transfer money to subscribed or unsubscribed users, deposit and withdraw cash, buy airtime, and pay for goods and service. It is still a relatively new channel, and being technologically driven, in a time and country for mobile money transfer, would be expected to elicit plenty of excitement. Mobile money, which is a subset of electronic money, refers to financial services and transactions made on a mobile phone. It is not always the case that these services are tied directly to a personal bank account. Services offered on the mobile money platform is providing money transfer services allows people to send money and pay bills without having to rely exclusively on cash (Mas and Siediek), 2008.

Mobile Banking

Mobile banking is any activity that allows currency to change hands via a mobile phone (Krum, 2010). Mobile banking was defined as financial transactions undertaken using mobile device such as a mobile phone. It is a system or platform in which customers are automatically updated on any changes in their account. These changes are may come in the form of account debits and credits or any charges to the account. All it needs for mobile banking is a mobile phone with a well-functioning text messaging system. Mobile banking is being regarded in the industry as “the

delivery channel of the future” for various reasons. First and foremost is the convenience and portability afforded. It is just like having a bank in the pocket. Other key reasons include the higher level of security in comparison to the internet and relatively low costs involved. The possibility that customers will adopt mobile banking is high, considering the exponential growth of mobile phone users worldwide.

Automated Teller Machine (ATM)

Rose (1999) defines ATM as a computer terminal, database system and cash vault that permits customers to access their account. It is plastic card containing a PIN (personal identification number) or by punching a special code number into the computer terminal linked to the banks computerized records 24 hours a day. ATM dispenses cash at any time of the day and night, unlike the traditional method where customers have to queue for a very long time in order to withdraw cash or transfer funds. An ATM device allows a bank customer to withdraw cash from account via a cash dispenser (machine), and the account is debited immediately. A fundamental advantage is that it needs not to be located within the banking premises. It is usually in stores, shopping malls, fuel stations and other convenient places. It saves customers time in service delivery as alternative to queuing in bank halls, customers can invest such time saved into other productive activities. ATMs are a cost-efficient way of yielding higher productivity as they achieve higher productivity per period of time than human tellers.

Internet banking

Internet banking is a relatively new front-office technology. Internet banking provides convenient and flexible services to customers. It enables customers to transact almost all their banking transactions online. One could check accounts, query the bank and also transfer funds to other people on different accounts, it is the most financially savvy innovative method for yielding higher profitability. Another feature of internet banking is that, it gives a 24/7 access to customers.

Point of sale (POS): POS also sometimes referred to as point of purchase (POP) or checkout is the location where a transaction occurs. A ‘checkout’ refers to a POS terminal or more generally to the hardware and software used for checkouts, the equivalent of an electronic cash register. A

POS terminal manages the selling process by a salesperson accessible interface. The same system allows the creation and printing of the receipt. POS systems record sales for business and tax purposes.

Funds Transfer

Customers can now electronically transfer funds across the globe without any problem or delay as compared to the traditional method before the advent of information technology when funds are seriously delayed before they are delivered to the recipients.

On-line Banking

With the aid of information technology, online banking provides the opportunity of paying bills and performing transactions of any kind electronically. Electronic payments can be credited or debited the same day. Customers can make payments for goods or services without necessarily coming in contact with physical cash and running the risk of handling a large amount of money.

Electronic Mail

Information technology has given rise to electronic mail which improves communication between individuals, external parties and the bank within or across various geographical regions or boundaries. The availability of online information provides bankers and customers with a powerful vehicle for research.

Commercial Bank of Ethiopia provides Products and services such as account opening (local currency and foreign currency), deposit (cash/negotiable instruments), payment, cheque clearance, money transfer (local currency and foreign currency). CBE extends the following credit facilities to its esteemed customers: overdraft, merchandise loan facility, pre-shipment export credit facility, revolving export credit facility, special truck loan financing, short term loan, medium and long term loans, agricultural input loan, agricultural investment loan, coffee farming term loan financing, micro-finance institutions loan.

2.7 Empirical Literature

2.7.1 Strategic Innovation, Technology and Competitive Advantage

As today's business environment becomes increasingly competitive, business organizations are becoming more aggressive and dynamic in identifying competitive strategies that will ensure profitable existence. Competition may be attributed to business innovations, advancement in technology and the changing demand of customers (Misati et al., 2010). Innovativeness is one of the fundamental instruments of growth strategies to enter new markets, to increase the existing market share and to provide the company with a competitive edge (Li & Atuagene-Gima, 2011). Innovation involves acting on the creative ideas to make some specific and tangible difference in the domain in which the innovation occurs (Davila, 2016). Innovation is defined as the successful implementation of creative ideas within an organization. Strategy is the direction and scope of an organization over the long term which achieves advantage in a changing environment through its configuration of resources and competences with the aim of fulfilling stakeholders' expectations.

Motivated by the increasing competition in global markets, companies have started to grasp the importance of innovation, since swiftly changing technologies and severe global competition rapidly erode the value added of existing products and services. Thus, innovations constitute an indispensable component of the corporate strategies for several reasons such as to apply more productive manufacturing processes, to perform better in the market, to seek positive reputation in customers' perception and as a result to gain sustainable competitive advantage (Hitt et al., 2011).

Strategic innovation is an organization's process of reinventing or redesigning its corporate strategy to drive business growth, generate value for the company and its customers, and create competitive advantage. This type of innovation is essential for organizations to adapt to the speed of technology change. Companies employing strategic innovation do not necessarily need to make changes to the goods and services sell to customers, nor to the technologies that support these products, to be successful. Strategic innovation often refers to innovation projects that occur at the executive level. Kalay and Lynn (2015) studied the influence of strategic innovation on performance among manufacturing companies in Turkey and found a positive relationship.

Kariuki (2017) assessed a link between the strategies of innovation and competitiveness of banking entities. The study revealed that products, market, process and technology innovation strategies affected competitive positioning of Kenyan banks.

Porter (1985) is the guru of competitiveness who defined it as the ability of an organization to carry operations at relatively lower costs as compared to other similar players in an industry. Competitive advantage is the added value in operational circumstance of an organization in relation to other firms in an industry offering similar products. Highly competitive companies are always progressive to sustain the lead in the market. Competitive advantage is a superior or unique position gained by an organization over its firms. Firms drive competitive advantage through their products, processes or ways of carrying out operations and activities (Harrison, Jaumanderu, Mairesse & Peters, 2014). Understanding sources of competitive advantage is critical to any firm. The greatest sources of competitive advantage are the resources, internal capabilities, opportunities & threats and the key competencies of an organization own (Klewitz & Hansen, 2014). Firms should not just be interested in gaining competitive advantage but it should be sustained. Firms strive to be competitive by its rare resources that cannot easily be sustained by competitors and that they have no perfect substitutes (Lara, Kolasani & Ramamurthy, 2014).

2.7.2 Technological Innovation, management and Competitive Advantage

Successful innovation is very essential for the economy of any organization. According to Pantano (2014), the adoption of innovation is the introduction of new and creative ideas, systems, technologies, products, processes that are regarded as novel to the adopting organization. Technological innovation and design as a new product technology into a given market is becoming increasingly important especially when competing in the global market Sun and Lee (2013). According to Subramanian and Nilakanta (1996), Technological innovation is another major component of organizational innovation and is clearly defined as the process of adopting new ideas pertaining to new products or services and also the introduction of new elements in an organization's service operations or production process. Subramanian and Nilakanta (1996) further stated that it mainly occurs in the operating component and affects the technical system of an organization through the methods and equipment's that are used to transform information or raw materials into products or services. Researchers come up in to

conclusion by stating that technological innovation is thus considered as the important driver of explaining business efficiency, corporate success and competitive advantage. This is because it appears to have a great impact competitive environment, work productivity, competitive advantage and overall performance of an organization.

Technological innovations are necessary for a knowledge-oriented business which promote not only the welfare of each entrepreneur but also the economic competitiveness of the whole country. Griffith and Rubera (2014) have further noted that both design and technological innovations offer consumers new options in the market place. Researchers also acknowledged that innovations surpass old technological standards and offer consumers the opportunity to enhance their capabilities in order to accomplish tasks and enhance their social status.

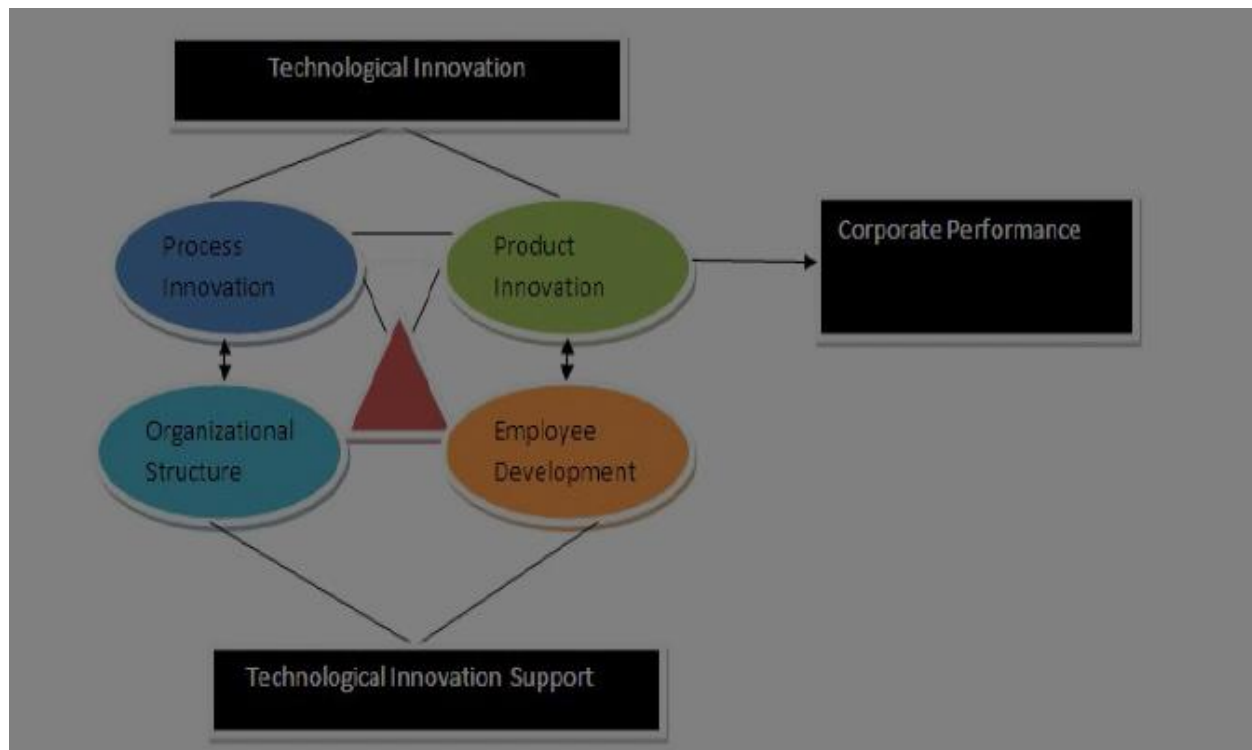


Figure 2.2 Technological Innovation and Corporate performance

Source: Eisenman (2013).

2.7.3 Product Innovation and Competitive Advantage

The product can be a tangible commodity or service (Haverila & Fehr, 2016). Product innovation is also associated with new developments in activities carried out by firms to deliver the core product while making it more attractive to consumers (Acquah & Mensah, 2015). In business perspective product innovation include a new products invention, quality improvements and technical specification given to a product, or the addition of new materials, components or valuable functions into an existing product. Product innovation is the introduction of a new good; one which consumers are not yet familiar with, such a good has new/improved quality (Schumpeter, 1939). Schumpeter underscores the role of product innovation in spurring organizational growth. On product innovation, Schumpeter further argues that competition resulting from new products far outweigh marginal variations in the price of existing products.

Oslo Innovation Manual defines product innovation “as the introduction of a good or service that is new or significantly improved in relation to its characteristics or intended functionality” (OECD, 2005). Significant improvements may be in relation to technical specifications, components and materials, built-in software, user friendliness or other functional characteristics. However design changes in products that do not involve a significant change in its functional characteristics or intended uses does not comprise product innovations. Product innovation is one of the sources of firm competitiveness that can be applied to improve the quality of products leading to improved firm performance and competitiveness (Sidek & Rosli, 2013). Product innovation also provides a variety of choice of a firm’s products to the customers and greater perceived value as compared to the old products.

Atlay, Anafarta and Sarvan (2013) in their study on firms in the automotive supplier industry in Turkey concluded that product innovation had a positive significant impact on firm performance. Belderbos, Duvivier and Wynen (2010) carried out a study on innovation and Export competitiveness in Flemish firms by examining the effect of innovation on export intensity and growth using both cross-sectional and panel data of 733 firms. They concluded that the implementation of innovations especially product innovations had a robust positive correlation with export intensity of firms.

Löfsten, (2014) investigated the relationship between product innovation processes and firm performance with a special focus on Swedish medium-sized technology-based industrial firms with R&D and findings indicated that innovative processes contributes to sales and employment. Innovative products may create new demand and, thus, facilitate firm growth (Rosebushet *al.*, 2011). When an organization has strong and robust product development processes that achieve efficient in their development, they find it easier to meet their budgeted costs, reduce costs that are not necessary and cooperate with the other departments. This enhances the overall performance of the organization and leads to strengthening of innovative strategies. Unique distinct products which are of high quality are easily identifiable by target consumers with a potential to create a competitive edge for the firm. Rosen Busch *et al.*, (2011) remarks that by offering highly innovative products, small firms can avoid price competition and create new demand which facilitate firm growth.

Ar and Baki (2011) carried out a study on the antecedents and performance impacts of product versus process innovation in SMEs in Turkish Science and Technology parks. This study confirmed a positive and significant influence of product and process innovation on firm performance. Sidek and Rosli (2013) carried out a study on “the impact of Innovation on the performance of Small and Medium Manufacturing Enterprises in Malaysia” using a sample of 284 and research findings indicate that product innovation influenced firm performance positively.

2.7.4 Process Innovation and Competitive Advantage

Process innovation is the introduction of a new method of production, not yet tested in the Industry (Schumpeter, 1934). Process innovation has also been defined as “the process of reengineering and enhancing the internal operation and capabilities of business process” (Sidek & Rosli, 2013). Such processes involve manufacturing, technical design, management and commercial activities. It includes new procedures, policies, organizational forms and knowledge embodied in products, distribution channels, applications as well as customer expectations, preferences and needs. According to Oslo OECD Innovation Manual, a process innovation involves “the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software” (OECD, 2005). A

process innovation consists of new or significantly improved methods for the production and provision of services.

Process innovation is often a complex and risky activity that requires experienced employees and access to tacit knowledge. When firms obtain technical information and support and leverage on imported advanced technologies their employees are able to learn skills and knowledge from foreign competitors which can significantly improve process innovation resulting to sustainable competitive advantages (Shuet *et al.*, 2015). Employees are prone protect existing processes, practices and routines that enabled their prior development even though they are required to be on the frontline to innovate strategic processes. Rosenbuschet *et al.*, (2011) continues to emphasize the need for process innovation to be understood and embraced by the whole organization requiring social impetus, and functional groups coordinated effort resulting in a challenge to link the processes of organization parts to a whole. By doing this the organization promotes process innovation to transform its existing structure and practices strategic innovative practices leads to competitive advantage.

Rubera and Kirca, (2012) in their study on the relationship between firms' innovativeness, strategic orientations and performance agree that process innovation leads to an organization's ultimate performance outcomes such as financial position and firm value. The pursuit of efficiency, operational excellence, cost advantage in raw material procurement and economies of scale are critical ingredients to the performance of a firm when coupled with strategic innovative processes. By this, study concludes that internally oriented firms pursue efficiency in all processes of their value chain activities, such as low cost or cost leadership strategy and thereby increasing the performance of the firm. Oke *et al.*, (2013) reiterates that process innovation should be emphasized in manufacturing enterprises as a primary distinctive competence. Consumers will prefer products and services that are processed using superior technological advancements.

Process innovation is very pertinent to firms facing a lot of competition as it enhances productivity and it has a direct and immediate impact on productivity performance of SMEs and due to their organizational simplicity (Castillejo *et al.*, 2013). Process innovations typically consisting of backstage initiatives aimed at improving efficiency and productivity; technology investments are the key factors to the performance of a firm. The strong dynamism and growth in

the service industry is attributed to strong process innovation strategies because it is a critical source of competitive advantage and consequently of performance.

2.7.5 Marketing Innovation and Competitive Advantage

Marketing innovation is the implementation of a new marketing method that involves significant changes in product design or packaging, product placement, product promotion or pricing. Market innovation deals with the market mix and market selection in order to meet a customer's buying preference. Continual market innovation needs to be done by a firm because advanced marketing tools, particularly through the Internet, make it possible for other competitors to reach potential customers across the globe at the speed of light. Market innovation plays a crucial role in fulfilling market needs and responding to market opportunities. In this respect, any market innovation has to be directed at meeting customers' demand and satisfaction (Sidek *et al*, 2013).

Market innovation has a positive effect on sales growth of a firm; it would augment sales by increasing demand for products, which in turn yields additional profit to innovative firms (Mwangi & Bwisa, 2013). According to Rosenbusch *et al.*, (2011) when an innovating SME manages to set high barriers preventing competitors from market entry, the SME's position in the industry is strengthened and the innovation can lead to persistent above-average returns. This leads to competitive advantage through enhancement, recombination or creation of resources and their deployment in value-creating strategies.

Suraksha (2016) conducted research showing the link between marketing innovations in an enterprise and an increase in the competitiveness of the brand or retailer. This study also recommends that information should be pooled and used by both the purchaser and the seller to ensure better implementation of innovations. In their paper, Kamp & Parry (2017) proved that modern innovative marketing has a beneficial impact on boosting sales and reducing costs, thus improving competitiveness. Innovations in enterprises, which are linked to the gradual implementation of digitization, have recently taken on turbulent speed. Lee et al. (2017), focusing on the impacts of innovative marketing in relation to an enterprise's technological level, conducted research which drew the following conclusions. The research proved that there was a positive link and synergy between the impacts of innovative marketing on enterprises from the high-tech sector. The research demonstrated the positive impacts of both radical and incremental innovations. In

contrast, in cases where an enterprise's technological level is low, marketing innovation is not an important factor in increasing the positive effect of incremental innovation activity on a firm's performance (Aksoy & Cengiz, 2016).

Market innovation has a direct impact on performance as it contributes to greater economic and financial performance (Rubera & Kirca, 2012). This is because innovation allows a company to reach higher levels of customer satisfaction, loyalty and perceived quality; consequently, it obtains better economic results through increased sales and market shares in the short-term, while in the long-term, innovation tends to have an indirect effect on economic, marketing and financial results. Campo et al (2014) also adds that market innovation as a key to increasing business profits and improving competitiveness in uncertain environments. When customer needs and markets change rapidly in a dynamic setting, the firm that remains afloat and increase its performance is one that adopts market innovative strategies. Rubera and Kirca, (2012) continue that market innovation leads to higher sales through lower prices or higher margins by identifying market niches that the competitors have not identified. Researchers conclude by saying that a firm has to understand how its marketing orientation affects its performance in order to come up with strategic market innovations.

2.7.6 Organizational Innovation and Competitive Advantage

The organizational innovation is wide theory or thought that include many concepts such as strategic, structural and behavioral scope, there is no accord on this defined definition (Mothe & Nguyen-Van, 2015). Many studies or many researches include the all types of organizational innovation in one side and on the other side some of the researches distinguished that organizational innovation is a technological innovation, and define the difference between the technological and non-technological innovation, but mostly organizational innovation is the improvement or change in the organization practices and knowledge management in the industry or the workplace of the firm (Haneda, Motheb, & Thic, 2014).

“Organizational innovation involves the implementation of new organizational methods in the firm's business practices, workplace organization or external relations” (OECD, 2005). These include the “implementation of new methods for organizing procedures and routines for the conduct of work, introduction of management systems, business re-engineering, lean production,

and quality-management system, implementation of new methods for allocating responsibilities and implementation of new ways of organizing relations with external firms /institutions” (OECD, 2005).

Organizational innovation is like outsourcing, partnership, subcontract plus organization work practice such as quality management, reengineering, and lean management. Organizational innovation is serious outcome for the business and a foundation to create value (Thakur, Hsu, & Fontenot, 2012). CEOs who display transformational leadership accelerate organizational innovation by encouraging information sharing, cultivating trust, and fostering shared vision among members. First, transformational leaders develop close emotional ties and higher levels of trust with team members who can then trust one another’s intentions regarding decisions and implementation during times of uncertainty and vulnerability.

Those firms which are engaged in creativity or organizational innovation has many objectives behind it such as to enhance the value of the business, to earn more profit, enhance the performance of the organization and minimize the organizational cost. It also strive to enhance the place of work satisfaction and also labor productivity and get the access to non-tradable assets like a non-codified information and lower the cost of the goods (Jurado, Gracia, & Fernández-de-Lucio, 2009). Other factors may be reasons of the organizational innovation related with the marketplace, goods, quality and capability to learn the execution of changes in the organization (Tejada & Moreno, 2013).

Organizational methods are intended to improve a firm’s performance by reducing administrative/transaction costs, improving workplace satisfaction, gaining access to non-tradable assets (such as non-codified external knowledge) or reducing costs of supplies (OECD, 2005). Lin & Chen (2007) argued that organizational innovations as opposed to technological innovations are most crucial for total sales.

Find out the organization objectives for the innovation and the value can be understood when the market forces that comply the innovation activities like a huge competition and to gain opportunities for to get access in the new business (Mothe & Nguyen-Van, 2015).

Organizational innovation can be more distinguished in two aspects such as intra organizational and inter organization, although the intra organizational innovation happened inside the industry

like an execution of teamwork, quality, constantly enhancement in the procedure, certification of departments and occupation inside the organization. On other side inter organizational innovation involves latest business formation within the organization limitations such as latest formations of the organization and atmosphere of the organization and material, buyers or competitors (Armbruster, 2008).

Mensah and Acquah (2015) in their study of “the effect of innovation types on the performance of SMEs in Takoradi metropolis” found a positive significant relationship between organizational innovation and firm performance.

Jiménez and Fuentes (2013) carry out study on the relationship between knowledge, innovation and firm performance acknowledge that Knowledge combination capability and innovation are precursors of firm performance. Results of the study also show that knowledge combination capability may be necessary for the success of the innovative performance of technology organizations. The implication of this finding is that mere possession of knowledge is not enough to obtain benefits from it, other than ability to combine this knowledge and capabilities into unique goods and services. For firms to succeed, managers should therefore disseminate and promote knowledge combination capability among all members of their organization to support the development of innovations and generate better entrepreneurial results.

Yuniset *al* (2017) tested the relationships between ICT, innovation, corporate entrepreneurship, and organizational performance. Results of the study emphasize the overwhelming evidence of the importance of ICT innovation being seized and used in a timely way to drive forward firm performance. Business process re-engineering, new business models, just-in-time and stockless inventory supply chain, and new services, like e-banking are few of many examples of innovations that were made possible by ICT adoption and use.

2.8 A Firm size, Strategic Innovation & Technology and Competitive Advantage

Firm size as a moderator has gained the attention of various strategic management researchers. Firm size is an important internal factor affecting both the innovation capacity and firm competitiveness. It defined differently in different countries and economies. Firm size has been defined as organization's resources, turnover, or workforce size (Zhang *et al.*, 2013). It has been noted by researchers that firm size is a contextual or enabler variable in the use of technologies

and that it is common for small manufacturers to lag behind larger manufacturers in implementing new technologies (Kalkan *et al.*, 2011). Firm size is variously measured in terms of number of employees, organization's resources, amount of investment, turnover, capital employed, total assets, or market value of equity. Firm size moderated the relationship between innovation and both financial and operational performance. However, the relationship is more pronounced in large firms than that of smaller firms (García-Zamora *et al.*, 2013). This study uses organization's resources to indicate the size of the firm.

Large firms are expected to have more competitive power due to their resource advantage and economies of scales hence more competitive as compared to small firms. Larger firms are also thought to engage more in internal R&D which results in innovation a precursor for firm competitiveness. According to Lin & Chen (2007) firm size maybe an antecedent for firm performance. Schumpeter (1942) posits that larger firms were more innovative due to their ability to access to funds and spread R&D risk.

Secluk (2016) conducted study on “factors affecting firm competitiveness: evidence from an emerging market”, found positive significant effect of firm size on firm competitiveness indicated by profitability and return on assets. Firm resources have been associated with firm size and in some cases firm size has been used to denote firm resources. Based on the resource based theory, firm level competitiveness can be viewed as competencies based on available physical and human resources and networks that allow a firm to compete effectively in its market (Szerb & Ulbert, 2009). Financial resources, human resources, capabilities and organizational process are key factors contributing to the competitiveness of firm. Among the key firm processes affecting competitiveness is innovation that is influenced by the availability of key firm resources.

Dogan (2013) study the of impact of firm size on profitability using a data set of 200 listed companies for the period 2008-2011, found a significant positive relationship between firm size and profitability. Giovanis and Ozdamar (2014) study focused on the determinants of profitability found firm size to have positive effects on profitability only up to a certain point after which the relationship turns negative.

Ramasamy, Ong and Yeung, (2005) found that the association between firm size and firm performance was ambiguous and cautioned need for industry specific consideration while,

advising researchers to proceed on a case-by-case basis of analysis and avoid the tendency to generalize. Vintila and Florinita (2013) in their study on the linkage between firm size and profitability found a significant negative relationship between firm size and profitability. Study conducted by Mohamud, J. A, Elegwa, M, John, M.K, & Joyce, D.N, (2016) noted that firm size does not moderate the relationship between management participation and firm performance in the manufacturing firms in Kenya and found insignificant.

2.9 Summary of Literature Review and Research Gaps

The concept of strategic innovation and technology was reviewed from various literatures and several measures were identified. Most used performance measures that include profitability, productivity, market share and export performance as a firm competitiveness and some also as a competitive advantage (Sidek & Rosli, 2013; Lalinsky, 2013).

Beyene, Shi and Wu (2016) conducted study on how innovation strategies affected learning and innovation performance. The study employed structural equation modeling analysis. The investigation was done in the textile industry in Ethiopia. The findings of the study showed that innovation strategies and product innovation performance are positively correlated with each other. The study however did not relate strategic innovation and technology with competitive advantage. In another related study, Vergara F, Vergara L.F, and Otero (2015) looked at how innovation strategies and innovative performance were related with each other. The study was conducted in Colombia among food and beverage firms. The study established that in initial stages of innovation, firms strive to cultivate good relationship with key stakeholders including suppliers. This study only focused on innovation strategies influenced performance and not competitive advantage.

Table 2.1 Previous Studies and Knowledge Gaps Author(s)

Author	Study	Key Findings	Knowledge Gaps	Focus of the current study
Okeet <i>al.</i> , 2013	Innovation types and performance in growing SMEs	Product & process Innovation had a	Study focused on SMEs in Uk	This Study focused on managing strategic innovation

	in UK	positive effect on firm performance		and technology on competitive advantage of CBE, office of strategy and innovation
Rojas et al., 2013	Innovation and competitiveness in SMEs in Mexico	Study found a high significant relationship between innovation and competitiveness	Study carried out on SMEs in Mexico	Study focused on managing strategic innovation and technology on competitive advantage of CBE, office of strategy and innovation
Njogu, 2014	The effect of Innovation on the financial performance of SMEs in Nairobi County, Kenya	Study findings indicate that Product, Process and marketing Innovation has positive significant effects on financial performance of SMEs in Nairobi, county	The study focused on only three dimensions of Innovation, Product, process and marketing in all SMEs in Nairobi County.	This study focused on five dimensions of Innovation including organizational and technological innovation
Mensah&Acquah, 2015	Effect of innovation types on the performance of SMEs in Ghana	Process, Marketing and organizational Innovation had positive significant effects on firm performance. Product innovation had	The study considered the effect of innovation on SMEs performance in Ghana	This Study considers the effects of managing strategic innovation & technology on competitive advantage of CBE, office of strategy and innovation

		non-significant effects on performance.		
Aziz & Samad, 2016	The effect of innovation on the competitive advantage of Food manufacturing SMEs in Malaysia	Findings indicate Innovation had a positive impact on SMEs' competitive advantage	Study was carried out on Food manufacturing SMEs in Malaysia	This Study carried out CBE, office of strategy and innovation
Secluk, 2016	Factors affecting firm competitiveness: Evidence from an emerging market.	Study found that innovation had positive significant effect on competitiveness	Study was carried out on firms in Turkey	This Study carried out CBE, the effects of managing strategic innovation and technology on competitive advantage

Source: Author, 2020

Empirical literature review is so imperative and innovation plays important role in the growth, survival and competitiveness in many industry sectors. This study was sought to add to the body of knowledge in banking industry by investigating the effects of managing strategic innovation and technology on competitive advantage. Currently, no known study has been carried out in Ethiopia that seeks to empirically investigate on the selected study. This study thus sought to fill knowledge gap by investigating a deep insight on the effects of managing strategic innovation and technology on competitive advantage with a focus on CBE, office of strategy and innovation.

2.10 The Conceptual Framework

The conceptual framework shows how the dependent variable is related to the independent variable and the role of the moderating variables in the strategic innovation and technology relationship with competitive advantage.

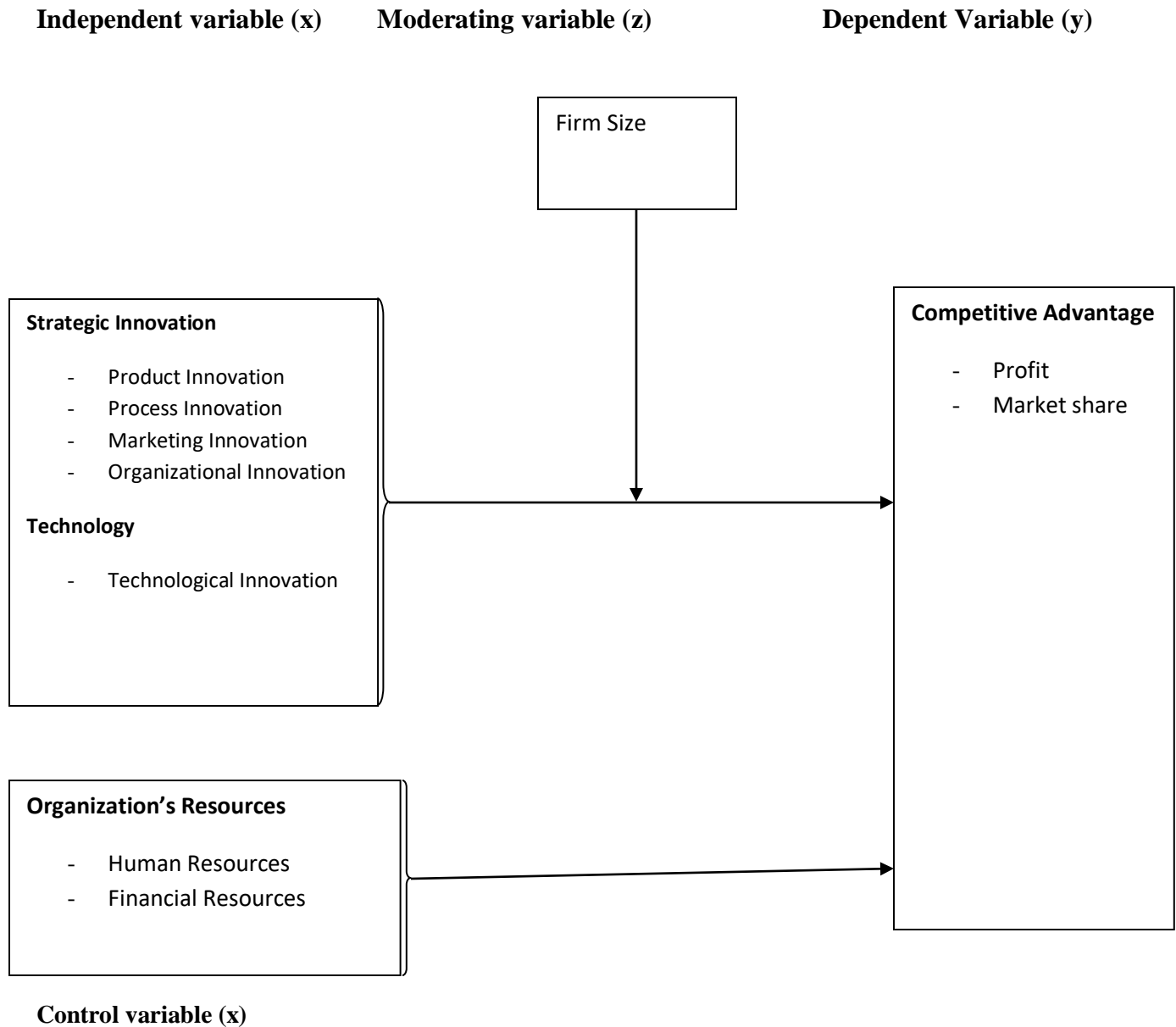


Figure 2.3 Conceptual Framework

Source: Author, 2020

The conceptual framework in Figure 2.3 consists; the Independent variables: strategic innovation and technology, comprising of Product innovation, Process innovation, Marketing innovation, organizational innovation and technological innovation; moderating variable: firm size; the Dependent variable: competitive advantage represented by profit, market share, differentiation and cost leadership.

Based on the above conceptualized framework, it is hypothesized that managing strategic innovation, managing technology and combined innovation (Product, Process, Marketing, organizational and technological) innovation have positive effect on competitive advantage. The framework also hypothesize firm size has a moderating effect on the relationship between strategic innovation, technology and competitive advantage.

As articulated in theory part, resources are very crucial in organization and without knowing resources which firms bear; it is much harder to demonstrate the cause-effect relationship between independent and dependent variables. A control variable has been included in order to avoid biases of the regression coefficients of the target variables during analysis. Inclusion of control variable is found necessary because of the respective control variable itself has an effect on dependent variable. As researcher using statistical analysis of causal relationship, inclusion of control variables increases accurate of result and enables it to know the level of influence or contribution on dependent variable.

As mentioned in literature review, there are different firm sizes some are large, medium and small and resource usage and amount may also differ across firms. From this point, firm size was taken as moderator variable and it changes the cause-effect relationship between two variables as its value increases or decreases. Moderator variable included systematically to change the effect of the target variable by hypothesizing and no main effect of the target variable but the effect is conditional or moderator. It does not specify causal relation, but the relation between independent and dependent variable differs across level of moderator.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter provides a detailed description and explanation of the methodological approach like methods and procedures. Chapter covers the following sections: Research philosophy; research design; the Empirical model, operationalization and measurement of variables; a description of the target population and the study sample; sampling design, sampling frame and sample size, data collection methods, instrument of data collection, data collection procedure, data analysis and presentation and ethical consideration.

3.2 Research philosophy

Research Philosophy relates to the development and foundation of knowledge upon which assumptions and predispositions of a study are based. These assumptions underpin the research strategy and the methods chosen to be used in the study (Saunders, Lewis & Thornhill, 2012). For this study Positivist Research Philosophy was adopted and it has the assumption that social reality is singular, objective and is not affected by the act of investigation (Collis & Hussey, 2009). The philosophy stresses the importance of scientific rigour in the quest for knowledge. Positivism is quantitative, objective and scientific, using a highly structured methodology to facilitate replication (Saunders, Lewis & Thornhill, 2012). Based on the philosophy, formulated variables, hypotheses and operational definitions were deduced based on existing theory.

According to Saunders, Lewis and Thornhill (2012), only observable phenomenon by a researcher can lead to the production of credible data in positivism. Based on the philosophy, data was collected from an observable reality (phenomena). Trends, regularities and causal relationships in the data were used to create generalizations. The research strategy used in the study is also generated based on existing theories. A hypothesis was tested using data and confirmed based on the result obtained for further contribution to theory (Saunders, Lewis & Thornhill, 2012).

In positivism, the researcher is independent (neither affects nor is affected by the subject) of the research. This has the implication of the research being conducted in a value freeway, where the researcher is external to the process of data collection to ensure little interference with data (Collis & Hussey, 2009).

Based on positivism, the study applied a deductive approach which involved collection of data that is used in evaluating prepositions related to existing theories. The study sought to explain causal relationships between variables which were operationalized in a way that enabled facts to be measured quantitatively. In order to generalize the results, a sample of sufficient size was selected carefully (Saunders, Lewis & Thornhill, 2012).

3.3 Research Design

According to Sekaran and Bougie (2016), research design refers to the overall strategy that you choose to integrate the different components of the study in a coherent and logical way. This enables the researcher to address research problem effectively. Research design constitutes the blueprint for the collection, measurement, and analysis of the data. The research problem determines the type of design. Research design is also the means and the manner in which the research is conducted or to be undertaken. Mainly, the design provides the overall plan, the structuring and timing.

The study adopted a descripto-explanatory design which combines descriptive and explanatory designs (Saunders, Lewis & Thornhill, 2012). Descriptive design is appropriate in describing the characteristics of a given entity/population or phenomenon and ascertaining the status and nature of managing strategic innovation and technology and effects on competitive advantage at CBE, office of strategy and innovation. Descriptive design enables a researcher to gather, summarize, present and interpret information for purposes of clarification. On the other hand explanatory design is useful in establishing causal relationships between the independent and dependent variables. The design is useful in explaining the effects of managing strategic innovation and technology on competitive advantage (Collis & Hussey, 2009; Saunders, Lewis & Thorn hill, 2012).

The study adopted a cross-sectional survey in conducting the research and it was used to collect data and to gain a snapshot in the effects of managing strategic innovation and technology on

competitive advantage from CBE, office of strategy and innovation at a particular period. This method is significant when a specific tendency of a subject over a given period (Kothari, 2014). The survey strategy is deemed appropriate in view of the fact that it allows the collection of large amounts of data from a sizeable population in an economic way while giving the researcher more control.

3.4 Empirical Model

An empirical model was used to test the relationship between the independent variables and dependent variables. For this study, multiple linear regression models were employed as it allows simultaneous investigation of the effect of two or more variables (Zikmund et al., 2010). Correlation was also applied to know the moderating effect of firm size on relationship between strategic innovation, technology and competitive advantage. Competitive advantage, dependent variable represented by (Y) while independent variable (X) represented by the strategic innovation, technology management, combined innovation (product, process, marketing, organizational, and technological innovation).

The model takes the following form;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \varepsilon \dots\dots\dots 3.1$$

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon \dots\dots\dots 3.2$$

Whereby:

Y = Competitive advantage

β_0 = Constant of the equation

$\beta_1 - \beta_n$ = Regression Coefficients (The estimated change in the dependent variable for a unit change of the independent variable)

X1- X n= Independent variables which are:

X1=Managing strategic innovation

X2=Managing technology

X3=combined innovation (Product, Process, marketing, organizational and technological innovation).

X4=Firm Size, moderating variable

ε = Error term

The Empirical Model for the moderating variable is

$$Y = \beta_0 + \beta_1X_1 + \beta_2Z \dots\dots\dots 3.3$$

Hence Regression Model would be;

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4Z + \beta_5X_i Z + \varepsilon \dots\dots\dots 3.4$$

Where,

Y = Competitive advantage

β_0 = Constant of the equation

$\beta_1 - \beta_3$ - Regression Coefficient for variables X1, X2 X3

β_4 = Regression Coefficient for moderating variables Xi

Z = Moderating Variable

$\beta_5 X_i * Z$ = Interaction effect between the independent and the moderator variable

ε = Error term

Moderation Decision-Making Criteria

The moderation effect on the relationship between strategic innovation, technology and competitive advantage was tested using three-step hierarchical regression approach .The test for moderation involves determining whether the p value for the interaction term is statistically significant. If the p value for the interaction variable is significant i.e. $PZ < 0.05$ then we do not accept the hypothesis that the independent variable is a moderator variable. If the interaction effect between the independent variable and the moderator variable is not statistically significant, then Z is not a moderator variable.

To test the hypothesis, the study used the Whisman and McClelland (2005) three-step hierarchical regression approach to test for moderation

- i.** In Step one, independent variables were regressed on competitive advantage (dependent variable).
- ii.** In step two, the strategic innovation, technology management and combined innovation variable (independent variable) and firm size (moderating variable) were regressed on Competitive advantage.
- iii.** In step three, the interaction variable strategic innovation, technology management, joint innovation* firm size was included in the model as an independent variable.

3.5 Test of Significant

In order to test the model significance, the study used ANOVA to test the model level of significance at 95% confidence level and 5% level of significance.

3.6 Operationalization and Measurement of variables

The variables of the study was measured and operationalized as presented in following table.

Table 3.1 Operationalization and Measurement of Variables

Type of Variable	Variable Definition	Indicators	Operationalization of the Variable	Measure
Dependent	Competitive advantage	-Profit -Market share	-Growth of net profit in the last 2 years -Customer base	5 point Likert scale
Independent	Managing strategic innovation	Corporate strategy	Reinvent and design strategy	“
	Managing technology	Technology advancement	Technology capability and timely update	“
Strategic innovation typology		Product Innovation	Product innovations developed in the last 2 years	“
		Process Innovation	Continuous improvement of technology	“
		Marketing Innovation	Marketing innovations developed in the last 2 years	“
		Organizational Innovation	Innovative leadership	“
		Technological Innovation	Using modern methods & adopting technology	“
Moderating Variables	Firm Size	Organization's Resource <ul style="list-style-type: none"> ▪ Finance ▪ Human 	<ul style="list-style-type: none"> ▪ Growth of net income & profit in last 2 years ▪ Competent & qualified employees 	“

Source Author, 2020

3.7 Target Population and Sampling Design

3.7.1 Target Population

According to Saunders (2012), a population is defined as a full set of cases from which a sample is taken. Saunders also defines population as a group of people or objects that are similar in one or more ways and which form the subject of a study in a particular way. On the other hand, population defined as the total collection of all the elements on which the study would like to infer. The target population of this study was CBE office of strategy and innovation, Head Office.

Table 3.2 Population Distribution

Department	Population	Percentage %
Strategy planning, evaluation & monitoring and change management	20	17
Economic and business research	28	23
Marketing which includes product development, brand and promotion	31	26
Corporate communication	41	34
Total	120	100

Source: Survey data, (2020)

3.7.2 Sampling Technique

There are two basic sampling techniques which are probability and non-probability sampling. For this study, Probability sampling technique was used. Accordingly, stratified random sampling was employed for the study since the population is stratified into strata on the basis of

vital characteristics, departments. Stratified random sampling is defined as a two-step process in which the population is partitioned into subgroups or strata. Stratified sampling is the best to use in this study since it can provide greater precision, often requires a smaller sample, which saves money, time and guards against unrepresentative of population. It is better to take census but the researcher selected sample due to nature of respondent's work and their busy schedule to collect questionnaires. Respondents were focuses on giving training, cross selling and visiting different branch outlets and majority works at office. Due to this, the researcher selected sampling through statistical formula and relied on statistical approach by checking sufficiency of it's representation of total population to reach valid conclusion.

3.7.3 Sampling Frame

According to Cooper and Schindler (2006), a sampling frame is defined as a list of elements from which a sample is drawn. Saunders (2009) also defines a sampling frame as a working population. In this study, the sampling frame was a list of Strategy planning, evaluation & monitoring and change management, Economic and business research, marketing department which includes product development, brand and promotion, and corporate communication from office of strategy and innovation.

3.7.4 Sample Size

According to Cooper and Schindler (2006), a sample size is defined as a smaller set of the larger population. Several approaches are available for sample size determination and include a census for a small population; use of a similar sample size for a similar study; use of published tables or through a statistical approach by computing the sample size based on statistical formulas. The study used Yamane (1967) formula to calculate sample sizes at 95% confidence level

$$n = \frac{N}{1+N(e)^2}$$

Where n is the sample size,

N is the population size,

e is the level of precision/acceptable sampling error expressed as a proportion at 0.05

When this formula is applied to the above population, we get

$$\text{Hence } n = \frac{120}{1+120(0.05)^2}$$

$$= 92$$

According to the above calculation, a sample size of 92 respondents was selected from a total population of 120, which is sufficient and representative of the whole population.

Table 3.3: Sample Size Distribution

Strata of Population	Population (N)	Sample size (n)	Percentage %
Strategy planning, evaluation & monitoring and change management	20	16=92*0.17	17=20/120*100
Economic and business research	28	21=92*0.23	23=28/120
Marketing which includes product development, brand and promotion	31	24=92*0.26	26=31/120
Corporate communication	41	31=92*0.34	34=41/120
Total	120	92	100

Source: Survey data, 2020

3.8 Sources of Data

The study employed both primary and secondary sources to achieve objectives of the study. The choice of particular method of data depends upon the purpose of collecting data, the information being collected, and the resources available for the research and the skills of the researcher (Saunders et al, 2009). There are two kinds of data collection: primary and secondary sources of data.

3.8.1 Primary Sources of Data

According to Kothari (2004), Primary data are those data collected a fresh and for the first time, and thus happen to be original in character. Primary data are more accurate and reliable compared to secondary data (Collis and Hussey, 2009). Primary data was obtained from a structured self-administered questionnaire.

3.8.2 Secondary Sources of Data

Secondary data collected from publications, reports, magazines, web addresses and other documents available within and outside of the organization in line with considering reliability, suitability and adequacy of the data.

3.9 Validity and Reliability of the Research Instrument

3.9.1 Validity of the study

Validity is the extent to which a measure measures what it is supposed to measure and how well the concept is defined. Validity tests can be content validity, criterion validity and construct validity. According to Bhattacharjee (2012) there are two assessments of validity: theoretical or translational validity and empirical or criterion-related validity which includes Content validity, Predictive Validity, Convergent validity and Concurrent validity. Content validity is an assessment of how well a set of scale items matches with the relevant content domain of the construct that it is trying to measure. Convergent validity refers to the closeness with which a measure relates to (or converges on) the construct that it is purported to measure. Predictive validity is the degree to which a measure successfully predicts a future outcome that is theoretically expected to predict. Concurrent validity examines how well one measure relates to other concrete criterion that is presumed to occur simultaneously. Face validity was used at initial stage of the study to comprehend reality. To ensure content and construct validity, the preliminary questionnaire was pre-tested with a sample of respondents from office of strategy and innovation of the Bank.

3.9.2 Reliability test

Tharenou et al., 2007) defined reliability as, the extent to which a measure is free of random measurement error. It is the ratio of the true score variance to the observed score variance because each observed or measured score is composed of a true score and measurement error. Reliability test includes, test re-test (the reliability coefficient obtained with a repetition of the same measure on a second occasion), and parallel-form reliability (measures by comparing two different tests that were created using the same content). The reliability of the questionnaire was calculated using the Cronbach's alpha coefficient (Cronbach, 1951). Cronbach's Alpha is perhaps the most widely used reliability coefficient. Nunnally, J (1978) found that a scale of 0.7 that was widely accepted as consistent and reliable in social science research. In the study, reliability coefficient for all variables registered above the benchmark 0.7 Cronbach's Alpha. Accordingly, it was deemed reliable for further analysis and this is given in table 3.4

Table 3.4 Reliability test results

S.no	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	Remark
1	.933	.913	43	Reliable

Source: survey data, 2020

Table 3.4 shows that overall internal consistency of 43 items was tested and the result showed the high Alpha value ($\alpha=0.913$). From this it could concluded that the questionnaire was reliable and consistent, because the Alpha value was greater than 0.70 which was sufficient for analysis.

3.9.3 Pilot Test

A pilot-test was carried out on a small sample of the population to test the research instrument. The response to questions in the questionnaire was used to evaluate the instrument in terms of questions' variation, meaning, clarity, length of questionnaire, and ease of answering questions by the respondents. The pilot study was also used to assess whether each question measured what

it was supposed to measure, that is if all the respondents interpreted the questions in a similar way. Based on the response, the questionnaire was revised to improve validity.

3.10 Data Collection Methods

Data collection method for this study was done mainly through primary data. Primary data collected through survey method by self-administered questionnaire as a main tool for data. Qualitative and Quantitative data collection methods also employed for the study. Questionnaires were administered for each department, strategy and innovation of CBE. The choice of self-administered questionnaire was because the researcher anticipated that all the respondents, Strategy and Innovation office of CBE are literate and able to read and respond. A questionnaire was developed based on the objectives of the study. It is important to use primary data in this study specifically surveys through questionnaires because they are quick, inexpensive, efficient, accurate and flexible. The structured questionnaire contains close ended questions which designed in to sections by 5 point Likert scale measurement.

3.10.1 Data Collection Procedure

A pilot study was conducted on the data collection instrument to pretest it before the main survey. The pilot study enables the researcher to determine the reliability, validity and clarity of the questionnaire. Items that were found redundant are either modified or discarded to improve the quality of the research instrument to increase its validity. The pretest involved 20 employees of the sample population. After the pretest, the questionnaires were amended and finally administered by hand delivery to each department under strategy and innovation. The researcher obtained an introductory letter from CBE Human Resource, as per requesting letter provided from Addis Ababa University to collect required information in line with research objectives. The questionnaires were distributed through the heads of the various departments. A cover letter was attached to the questionnaires to introduce respondents to the research topic and also in order to avoid any mistrust or suspicion that respondents might have about the study.

3.10.2 Data Analysis and Presentation

Data analysis refers to the process by which the data collected is reduced to a more controllable and convenient size so that the researcher can identify patterns or trends, apply statistical

techniques and summarize the data (Cooper et al, 2014). This consisted of data editing, data entry and also to detect unanswered questions and irregularities or to eliminate errors such as double answers. Data was analyzed using descriptive and inferential statistics. Before carrying out data analysis, the collected data was cleaned, errors identified and corrected. Data coding was done to translate other data types to numeric codes to ensure quick data entry and to facilitate analysis. Descriptive statistics were used to obtain and understanding of the data; to describe, summarize and display the data. Descriptive analysis was useful in establishing the types and nature of strategic innovation & technology in CBE, office of strategy and innovation. The study used frequencies, percentages and measures of dispersion that include sample means and standard deviation to attain this objective. These statistics were presented using frequency tables. Descriptive statistics were useful in identifying patterns and trends in the data that served as a basis for inferential statistics.

Inferential statistics were used to test cause and effect relationships between variables. Data was analyzed using the Statistical Package for social sciences (SPSS version 21). Multiple Linear Regressions were used to analyze the effects of strategic innovation & technology on competitive advantage. Before performing regression analysis, the researcher carried out various diagnostic tests to test the underlying statistical assumptions for the linear and multiple regressions (Field, 2009). Diagnostic tests carried out include Normality, Linearity, Homoscedasticity, Autocorrelation and Multicollinearity tests.

Table 3.5: Summary of Data Analysis Techniques used in the study

Objective(s)	Hypotheses	Analytical Model	Hypothesis Test
Objective 1: To establish the effect of managing strategic innovation on competitive advantage	Hypothesis 1: H₀₁: Managing strategic innovation has no significant effect on the competitive advantage	$Y = \beta_0 + \beta_1 X_1 + \varepsilon$ Where: Y= Competitive advantage β_0 = intercept β_1 = Coefficient for X1 X1= strategic Innovation ε = Error term	H ₀₁ : $\beta_1 = 0$ H _a : $\beta_1 \neq 0$ Reject H ₀₁ if p-value is ≤ 0.05 , Otherwise do not reject at 5% significance level.

<p>Objective 2: To analyze the effect of technology management system on competitive advantage</p>	<p>Hypothesis 2: Ho2: Managing technology has no significant effect on competitive advantage</p>	<p>$Y = \beta_0 + \beta_2 X_2 + \varepsilon$ Where: Y= Competitive advantage β_0= intercept β_2 = Coefficient for X2 X2= Technology management ε = Error term</p>	<p>H02: $\beta_2=0$ Ha : $\beta_2 \neq 0$ Reject H02 if p-value is ≤ 0.05, Otherwise do not reject at 5% significance level.</p>
<p>Objective 3: To examine the combined effect of product, process, marketing, organizational and technological innovation on the competitive advantage</p>	<p>Hypothesis 3: Ho3: Combined innovation (product, process, marketing, organizational and technological) has no significant effect on competitive advantage</p>	<p>$Y = \beta_0 + \beta_3 X_3 + \varepsilon$ Where: Y= Competitive advantage β_0= intercept β_3 = Coefficient for X3 X3= combined Innovation ε = Error term</p>	<p>H03: $\beta_3=0$ Ha : $\beta_3 \neq 0$ Reject H03 if p-value is ≤ 0.05, Otherwise do not reject at 5% significance level</p>
<p>Objective 4: To investigate the moderating effect of firm size on relationship between strategic innovation, technology and competitive advantage</p>	<p>Hypothesis 4: Ho4: Firm size has no moderating effect on the relationship between strategic innovation, technology and competitive advantage</p>	<p>$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 Z + \beta_5 X_i Z + \varepsilon$ Where: Y= Competitive advantage $\beta_1 - \beta_5$= Coefficient for X1= strategic innovation x2= technology management, x3= joint innovation β_4= Regression Coefficient for moderating variables Xi Z = Moderating Variable ε = Error term</p>	<p>H04: $\beta_i \beta_4, \beta_5 = 0$ Ha : $\beta_i \beta_4, \beta_5 \neq 0$ Reject H04 if p-value is ≤ 0.05, Otherwise do not reject at 5% significance level</p>

Source: Author, 2020

3.11 Ethical considerations in the study

To ensure the research complied with the research ethical standards, the study started by obtaining research authorization letter from Addis Ababa University (AAU) and provided the letter to selected study company to know willingness. Ethics are the moral distinction between right and wrong, and what is unethical may not necessarily be illegal (Bhattacharjee (2012)). In order to be ethical a researcher should consider voluntary participation and harmlessness. The researcher attached an introductory letter (Appendix I) that explains the purpose and significance of the research, requested for participation while giving an assurance for privacy, confidentiality and anonymity of the information collected. Subjects in a research project must be aware that respondents' participation in the study is voluntary, it is possible to withdraw from the study at any time without any unfavorable consequences, and respondents are not harmed as a result of their participation or non-participation in the study. Name of the respondents are not asked to write in order to increase the confidentiality of the information. In questionnaires, it was explained that the purpose of research is for academic purpose and finally the respondents are included based on their willingness. Furthermore, the researcher tried to avoid misleading or deceptive statements in the questionnaire and questionnaires was distributed only to voluntary participants.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION OF FINDINGS

4.1 INTRODUCTION

This chapter presents data analysis and discussion of findings on the effects of managing strategic innovation and technology on competitive advantage based on research objectives. The chapter begins with a discussion on descriptive statistics and it also outlines research findings based on inferential statistics used to test the study hypotheses that explain the relationship between strategic innovation, technology and competitive advantage.

4.2 Response Rate

Response rate is the percentage of questionnaires returned. Ninety two questionnaires were distributed to the respondents and collected fully thus, achieving a response rate of 100%. According to Babbie (2010) a response rate of 50% to be adequate for analysis and reporting, whereas 60% is considered good and 70% and above is deemed very good. In view of the foregoing discussions, the obtained response rate was adequate for the purpose of further analysis, reporting and publication.

4.3 Descriptive statistics

Descriptive statistics is meant to provide background to the study before further analysis can be carried out. This was done through presentation of percentages, frequencies, means, and standard deviation by means of tables, charts and graphs.

To clearly understand the respondents of the study, the researcher collected general information. These included gender, age, educational level, marital status and work experience.

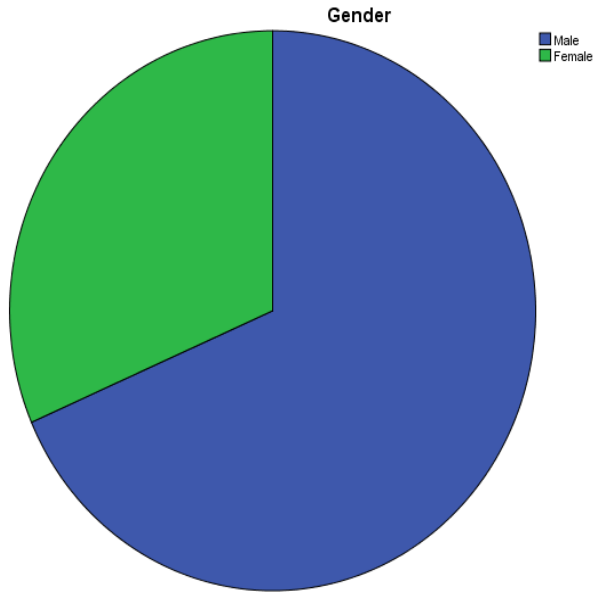


Figure 4.1 Pie chart: Gender distribution

Figure 4.1 shows the gender distribution on which 68.5% of respondents were male while 31.5% were female.

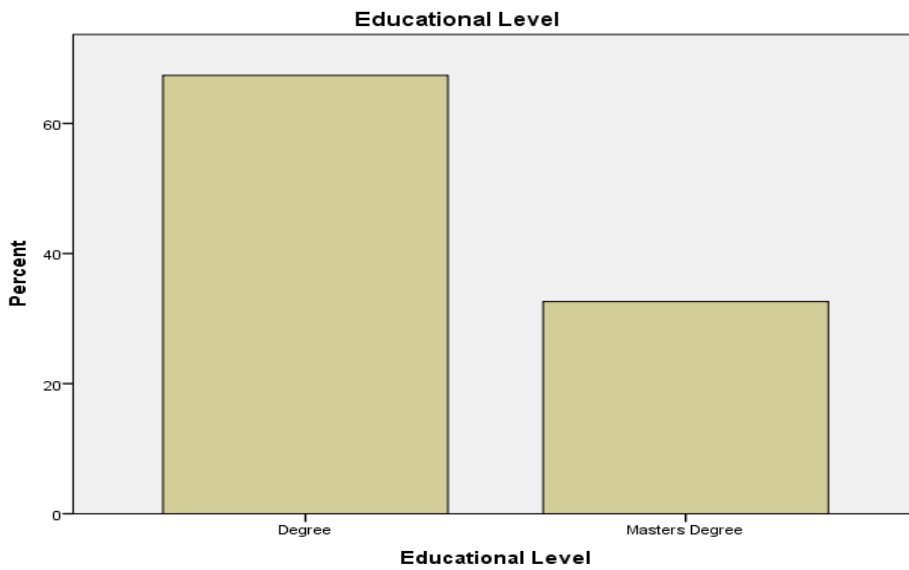


Figure 4.2 Bar chart: Educational level

Figure 4.2 shows the educational level of employees on which majority of employees 67.4% had degree and 32.6% master's degree holders.

The findings are established in following table. **Table 4.1**General Information on Respondents

Category	Classification	Frequency	Percentage
Gender distribution	Male	63	68.5
	Female	29	31.5
	Total	92	100
Age	Below 20 Years	-	-
	20-30 Years	37	40.2
	31-40 Years	44	47.8
	41-50 Years	11	12.0
	Above 50 Year	-	-
	Total	92	100
Educational Level	Diploma	-	-
	Degree	62	67.4
	Master's Degree	30	32.6
	PHD and above	-	-
	Total	92	100
Marital Status	Single	41	44.6
	Married	51	55.4
	Divorced	-	-
	Widowed	-	-
	Total	92	100
Work Experience	1-3 Years	2	2.2
	4-6 Years	36	39.1
	7-9 Years	42	45.7
	Above 10 Years	12	13.0
	Total	92	100

Source: Survey data, 2020

The first general information sought to establish the distribution of gender in the study. Table 4.1 shows that 68.5% of respondents were male while 31.5% were female. This means the office of strategy and innovation of CBE is male dominated and it should have to increase female employees. The second general information sought to determine age of respondents. According to the above age composition, there are 5 age categories.

The first age category covers those employees who have the age below 20 years. In this category, there were no respondents. The second age category includes those employees who have the age that ranges from 20-30 years. From 92 sample respondents, 37 of them or 40.2% from the total respondents are fall under this age category. The other category constitutes those employees who have ages between 31-40 years. In this age category there are 44 respondents or it covers 47.8% from the total respondents. Fourth age category covers from 41-50 years. From sample respondents, 11 of them or 12% from the total respondents. The last age category covers those respondents with the ages of 50 and above and no respondents found in this age category. . From this it can be understood that, employees currently working in CBE, office of strategy and innovation belong to productive and active age professionals (40.2% from 31-40 and 47.8% from 31-40 age category).

Third general information sought to determine level of education of the respondents as presented in Table 4.1. From the findings, there were no Diploma holders, 62 respondents had Degree which constitutes 67.4% and 30 respondents had Master's Degree constitutes 32.6%. There were no respondents who had PHD and above. This finding indicates that respondents of the study were generally literate and thus could effectively read and interpret the questionnaires. Being highly educated, it can infer that respondents were knowledgeable on matters of strategic innovation and technology, and relationship with competitive advantage. Fourth general information of the respondents was marital status. From total respondents, 41 were single which is 44.6% and 51 were married constituting 55.4%.

The last general information of respondents was work experience. From the findings, 2.2% had worked 1-3 years, 39.1% had worked 4-6 years, 45.7% had worked 7-9 years and 13% had worked 10 years and above. Thus, the respondents had worked in company for a relatively long period of time hence they were knowledgeable on how strategic innovation and technology management results to competitive advantage.

Table 4.2 Banks efficiency to manage strategic innovation

Statements, N=92	Mean	Std. Deviation
Commitment of top management towards technology through a technology policy	4.07	.992
Company has clear-cut strategy with manageable technology capacity	3.88	.982
Bank has managing capability which strengthens competitiveness in the industry	3.72	1.213
Organization has a practice to improve technology on a timely basis to reduce cost	3.82	1.048
Innovation vision in our company created new markets for industry	3.67	1.223
Overall mean score	3.83	1.09

Source: Survey data, 2020

Above table 4.2 shows that respondents result on bank's strategic innovation management to get competitive advantage. Accordingly, Commitment of top management towards technology through a technology policy (4.07), Company has clear-cut strategy with manageable technology capacity(3.88), Organization has a practice to improve technology on a timely basis to reduce cost (3.82), Bank has managing capability which strengthens competitiveness in the industry (3.72), and Innovation vision in our company created new markets for industry (3.67). On average respondents agreed (M=3.83) that strategic innovation management system of the bank results to competitive advantage. Statements with high mean and low standard deviation are commitments of top management, existence of clear-cut strategy with technology capacity, and having practice to improve technology on timely basis. On other hand, low mean and high standard deviation occurred for innovation vision in our company created new markets for industry and Bank's managing capability to strengthen competitiveness in the industry.

Table 4.3 Technology management of the bank

Statements, N=92	Mean	Std. Deviation
Company is ready to give sooner response on technology difficulties	3.93	1.036

Company use technology forecasting to determine trends towards which technology is heading	3.77	1.130
Company uses market oriented products to generate competitive advantage	3.97	1.104
Existence of technology which aligned with strategy within the organization	3.79	1.105
Company provides real time alerts or updates on technology	3.63	1.211
Overall mean score	3.81	1.11

Source: Survey data, 2020

As presented in table 4.3 by employing a five point Likert scale, the study sought to obtain insights from respondents about Bank’s efficiency to manage technology. Majority of respondents affirm that Company uses market oriented products to generate competitive advantage (3.97), Company is ready to give sooner response on technology difficulties (3.93), Existence of technology which aligned with strategy within the organization (3.79), Company use technology forecasting to determine trends towards which technology is heading (3.77) and Company provides real time alerts or updates on technology (3.63). On average, respondents agreed (M=3.81) on Bank’s efficiency to manage technology and innovation to get competitive advantage. High standard deviation shows that the value is spread out over mean, for above question “Company provides real time alerts or updates on technology”, low mean and high standard deviation obtained.

Descriptive analysis on combined innovation (product, process, marketing, organizational and technological)

Table 4.4 Product Innovation

Statements, N=92	Mean	Std. Deviation
In new product introduction, our company is often first-to-market	3.87	1.215
Bank manages technology to cope with market demand by developing new products quickly	3.78	1.067
In comparison with competitors, our company has introduced more innovative products during two years	3.91	1.034
Our company has a product which leads the market	4.00	1.059

Overall mean	3.89	1.09
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Source: Survey data, 2020

As stated on table 4.4, on average (M=3.89) respondents agreed that product innovation leads to competitive advantage. Study revealed that majority of respondents (M=4.00) responded Bank has a product which leads the market. Statement in detail shows that: In comparison with competitors, company has introduced more innovative products during two years (M=3.91), in new product introduction, company is often first-to-market (M=3.87), and Bank manages technology to cope with market demand by developing new products quickly (M=3.78). Statements were also supported by low value of standard deviation showing that there was convergence in views expressed by respondents.

Table 4.5 Process innovation

Statements, N=92	Mean	Std. Deviation
Company has strong business strategy in managing versions and upgrades	2.42	0.408
We continuously improve old products and raise quality of new products	2.71	0.134
We continuously modify design of our products and rapidly enter new emerging markets	2.59	0.131
Our company is up to date in adopting the latest technological innovations in our processes	2.56	0.278
Overall mean score	2.57	0.23

Source: Survey data, 2020

From table 4.5, Respondents were asked to give opinions on process innovation as a means for competitive advantage. From given statements on average (M=2.57), respondents agreed that process innovation is means for Bank’s competitive advantage. The lowest rating and highest standard deviation was found in Bank’s business strategy in managing versions and upgrades (M=2.42) by following company’s strategy to update and adopting the latest technological innovations in processes (M=2.56) with standard deviation 0.408 and 0.278 respectively. Highest rating was obtained for company continuously improve old products and raise quality of new

products (M=2.71) by following company continuously modify design of products and rapidly enter new emerging markets (M=2.59). From majority respondents' answer, it can be inferred that bank has practice to continuously improve old products by adding quality of new products and modify its designs rapidly to compete in emerging markets to get better position.

Table 4.6 Marketing innovation

Statements, N=92	Mean	Std. Deviation
We periodically review our product development	3.91	0.215
We are high to detect fundamental shift in our industry	3.78	1.067
Improving product and service quality is one of our key objectives	3.87	1.034
Our market access has greatly increased over two years	4.00	0.059
Overall mean score	3.89	0.593

As shown in Table 4.6, marketing innovation was measured by given statements to now effect on dependent variable, competitive advantage. Accordingly, high rating was obtained for company market access has greatly increased over two years (M=4.00) and periodically review product development (M=3.91) by following standard deviation 0.059 and 0.215 respectively. High rating indicates that there were agreement and low standard deviation shows that results or responses were varied among respondents. Low rating and high standard deviation was found on statements Improving product and service quality is one of our key objectives (M=3.87) and company is high to detect fundamental shift in our industry (M=3.78). On average (M=3.89), respondents agreed that given statements on market innovation as a base for competitive advantage of the company. Going by responses by a majority, it can be deduced that increment of market access like customer base, periodically review product development, and improving product and service quality as a key objective in strategy are critical factors for competitive advantage of the Bank.

Table 4.7 Organizational innovation

Statements N=92	Mean	Std. Deviation
Bank has leadership which actively seeks innovative ideas	2.15	.833
Our firm is more effective than our competitors at capturing ideas and convert them into new products	3.42	.269
Improving managerial routines in the firm is seen as part of innovation strategy	3.30	.307
Organizational culture of the bank is open to new ideas	2.21	.825
Overall mean score	2.77	0.558

Source: Survey data, 2020

From Table 4.7, the findings revealed that respondents agreed Bank has leadership which actively seeks innovative ideas (M=2.15) with varied response 0.833. Firm is more effective than competitors at capturing ideas and converts them into new products (M=3.42) with standard deviation 0.269 which shows results variation. Improving managerial routines in the firm is seen as part of innovation strategy (M=3.30), Organizational culture of the bank is open to new ideas (M=2.21) with responses variation 0.307 and 0.825 respectively. On average (M=2.77), respondents agreed that bank has strategic innovation concerning organization to get competitive advantage. Highest mean shows that majority of respondents agreed on Bank is more effective than competitors at capturing ideas and convert them into new products following by Improving managerial routines in the firm is seen as part of innovation strategy. For both statements, there was low standard deviation showing that variation of results among respondents. Going by responses by a majority, it can be deduced that Bank has ability to convert ideas in to organizational innovation through improving managerial routines.

Table 4.8 Technological innovation

Statements, N=92	Mean	Std. Deviation
Embracing new technologies and use of modern methods added competitive advantage to the bank	4.53	0.963
Company made improvements on product functionalities timely basis	4.15	0.994
Technology system has reduced operation costs for the bank	4.79	0.880
Company ensure efficiency of transaction in banking technology promptly	3.07	1.010
Overall mean score	4.13	0.961

Source: Survey data, 2020

As presented in table 4.8 by employing a five point Likert scale, the study sought to obtain insights from respondents about the practice of technological innovation of the bank. Accordingly, statements with highest mean and lowest standard deviation was technology system has reduced operation costs for the bank (M=4.79) and embracing new technologies and use of modern methods added competitive advantage to the bank (M=4.53) with variation of responses 0.880 and 0.963 respectively. Moderate rating was found for company made improvements on product functionalities timely basis (M=4.15) with standard deviation indicating variation of responses 0.994. Lowest mean and highest standard deviation was found to statement company ensure efficiency of transaction in banking technology promptly (M=3.07) and standard deviation 1.010. On average (M=4.13), respondents agreed that given statements through managing technology would strengthens competitive advantage of the company. From this, it can be inferred that technological innovation has made the Bank to reduce operation cost. In addition to this, majority of respondents also affirmed that embracing new technologies and adopting modern methods has added competitive edge for the Bank.

Table 4.9 Competitive Advantage

Statements, N=92	Mean	Std. Deviation
We have maintained a superior market position because of strategic innovation	4.18	.851
In your bank, customers have served at a lower cost as competitors	4.17	.872
My company has improved its image in the market	4.20	.873
The profit of the bank has consistently increased over two years	4.23	.891

Bank's overall market share has greatly increased over two years	4.42	.715
Overall mean score	4.24	0.840

Source: Survey data, 2020

As shown in Table 4.9, the researcher sought to establish how company obtains competitive advantage through managing strategic innovation and technology. Competitive advantage was a dependent variable of the study. On average, respondents agreed (M=4.24) on the level of competitive advantage by the presented statements. Accordingly, the highest rating was found for the statement 'Bank's overall market share has greatly increased over two years' (M=4.42) and 'following the profit of the bank has consistently increased over two years' (M=4.23). From 92 sample respondents, the majority agreed that market share and profit of the Bank had increased over two years. A moderate rating was found for the statement 'company has improved its image in the market' (M=4.20). By a mean value of 4.18, respondents agreed that Bank has maintained a superior market position because of strategic innovation. The lowest rating was found for 'cost comparison on customers' service with other competitors' with a mean value of 4.17. From this, it can be inferred that CBE has charged more to customers as compared to other competitors.

Descriptive analysis on moderating variable, Firm size

Table 4.10 Human Resources

Statements, N=92	Mean	Std. Deviation
Company has relative better competence in the industry	4.26	.754
Availability of qualified personnel and domain experts in the Bank	4.03	.931
Company requires more human resources when company grows large	4.15	.913
We use technology based tools to leverage our firm's human capital	4.24	.987
Overall mean score	4.17	0.896

Source: Survey data, 2020

The Table 4.10 depicts the status of company human resource as per firm size and its role on competitive advantage. To measure human resource, a set of statements were formulated. According to the formulated statements, the company has relative better competence in the industry (M=4.26) and uses technology based tools to leverage firm's human capital.

(M=4.24). The measure of dispersion around the mean of the statements was 0.754 and 0.987 respectively indicating the responses were varied. Company requires more human resources when company grows large (M=4.15) with measure of dispersion around the mean 0.913. Availability of qualified personnel and domain experts in the Bank (M=4.03) with measure of dispersion around the mean 0.931. On average (M=4.17), respondents agreed that company human resource availability and linkage with technology on competitiveness. High mean was found for company competence in industry relatively better with low measure of dispersion following by usage of technological based tools.

Table 4.11 Financial Resources

Statements, N=92	Mean	Std. Deviation
Our company financial position increasing (net profit, income growth) in the past two years	4.15	.968
Our financial resources are very adequate	4.22	.849
Company effectively pool resources and expertise towards a shared goal	4.09	.834
We are utilizing more financial resources to earn high profit	4.12	1.034
Overall mean score	4.14	0.921

Source: Survey data, 2020

Table 4.11 shows the status of company financial resources as a base for competitiveness. As per formulated statements, respondents agreed that company financial resources are very adequate (M=4.22) and financial position increasing (net profit, income growth) in the past two years (M=4.15). Measure of dispersion around the mean 0.849 and 0.968 respectively shows that variation of responses among respondents. Company utilizing more financial resources to earn high profit (M=4.12) and company effectively pool resources and expertise towards a shared goal (M=4.09) with standard deviation 1.034 and 0.834 respectively. On average (M=4.14) respondents agreed that company has sufficient financial resources, increasing financial position and profit with measure of dispersion around the mean on average 0.921.

4.4 Inferential Statistics

After highlighting descriptive statistical analysis, the study sought to know cause and effect and establish the relationship between strategic innovation, technology management, firm size and competitive advantage. This necessitated the determination of the bivariate nature of both the independent and dependent variables. To assess the strength and direction of relationship among the variables, correlation analysis was used. Based on the results obtained from the study, findings were discussed with respect to each hypothesis.

4.4.1 Diagnostic Tests and Assumptions of Classical Linear Regression Model

Assumptions of classical linear regression model hold true when the coefficient of estimators ordinary least square (OLS) with a number of desirable properties which known as Best Linear Unbiased Estimators (BLUE) were fulfilled. Results of regression analysis and diagnostic tests were based on five assumption of classical linear regression model (CLRM) including linearity, homoscedasticity, autocorrelation, Multicollinearity, and normality.

A. Linearity Test

Linearity test was used to determine whether there is a linear relationship between the independent variables and the dependent variables. The linearity assumption could ascertain from the equation of multiple linear regression models of the independent variables and dependent variable (Gujarat, 2004). Linearity also can tested using the linearity test in the regression model. This was indicated by the sig. value for Deviation from Linearity p, if $p > 0.05$ then we accept the H_0 ; the relationship is linear and if $p < 0.05$, we reject H_0 that the relationship is not linear. Table 4.12 shows the result of linearity test

Table 4.12 Test of linearity

Variables	Sum of Squares	df	Mean Square	F	Sig
Competitive advantage * strategic innovation	0.54	2	.564	.402	.621
Competitive advantage * technology management	0.63	2	.203	.301	.282

Competitive advantage * joint innovation	0.47	3	.621	.206	.502
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Source: Survey data, 2020

As per result of linearity from table 4.12, all sig. values deviation from linearity $p > 0.05$ which was insignificant. From this, accept H_0 showing that the relationship between competitive advantage, dependent variables (profit, market share, cost leadership and differentiation) and independent variables (strategic innovation, technology management, and joint innovation) fulfilled and assumptions of linearity ascertained.

B. Homoscedasticity Test

Homoscedasticity is the assumption that ascertains error of variance is constant between dependent variables and across the range of the independent variables. If there is no equal variance across the independent variables, heteroskedasticity would occur that violates the assumption of linear regression. To test the variance of the error terms, Levene’s test statistic was used. According to Levene’s test, if $p < 0.05$ test statistic is significant reject H_0 . Levene’s test, if $p > 0.05$ test statistic is insignificant accept H_0 , hence the assumption of homoscedaticity is fulfilled.

Table 4.13 Test for Homogeneity of Variance

Independent variable	Levene Statistic	df1	df2	Sig.
Strategic innovation	.505	3	166	.280
Technology management	.302	2	178	.242
Joint innovation	1.607	4	158	.123

Source: Survey data, 2020

As per above presented data in table 4.13, Levene’s statistics for all variables indicates that the variances were equal since the p value $p > 0.05$ accept the H_0 hypothesis, thus insignificant. From this it can be concluded that Levene,s test was verified, equality and homogeneity of variance ascertained.

C. Test for Multicollinearity

According to Brooks (2008), multicollinearity will occur if some or all of the independent variables are highly correlated with one another. It shows the regression model has difficulty in explaining which independent variables are affecting the dependent variable. Existence of strong correlation between two or more independent variables reduces the predictive power of individual variables. In order to test this, multicollinearity statistics of Tolerance and Variance Inflation factors (VIF) were applied for this study. VIF indicates whether the independent variable has a strong linear relationship with other independent variable. VIF values of greater than 10 indicate multicollinearity and Tolerance values of below 0.1 indicate serious multicollinearity problems. Table 4.14 below shows the result of collinearity tests.

Table 4.14: Collinearity Tests

Variables	Collinearity Statistics	
	Tolerance	VIF
(Constant) Strategic innovation	.467	2.143
Technology management	.367	3.006
Joint innovation	.376	2.582
Human resource	.253	3.526
Financial resource	.329	2.821

Source: Survey data, 2020

As per indicated in table 4.14, VIF values for all independent variables are less than 10 and Tolerance value were greater than 0.1, indicating that non-existence of multicollinearity. VIF and Tolerance values were accepted level of range for above discussed variables (Field, 2009). As ascertained from collinearity tests, there was no collinearity between independent variables that could affect predictive power.

D. Normality Test

Normality test is used to determine whether sample data has been drawn from a normally distributed population or the population from which the data came is normally distributed. Normality was checked by kurtosis and skewness by using SPSS. For kurtosis the normal value is within the range of ± 3 whereas for skewness the normal value is within the range of ± 6 (Field, 2009).

Table 4.15: Skewness and Kurtosis

Type		Strategic innovation	Technology management	Joint innovation
N	Valid	92	92	92
	Missing	-	-	-
Skewness		0.412	0.252	0.415
Std. Error of Skewness		0.132	0.184	0.135
Kurtosis		-1.38	-1.254	-1.206
Std. Error of Kurtosis		0.226	0.287	0.265

Source: Survey data, 2020

As shown in table 4.15, skewness values are all under three for all independent variables (Strategic innovation, Technology management, and Joint innovation) and competitive advantage, dependent variable. Kurtosis values also fewer than six for dependent and independent variables as mentioned skewness and kurtosis table above. From this it can draw that data was normally distributed among the sample population.

E. Autocorrelation test

Autocorrelation refers to the degree of correlation between the values of the same variables across different observations in the data. According to (Brooks, 2008) when the error term for any observation is related to the error term of other observation, it indicates that autocorrelation

problem. The result of T-test, F-test or the confidence interval will become invalid due to the variances of estimators tend to be underestimated or overestimated. Due to the invalid hypothesis testing, it may lead to misleading results on the significance of parameters in the model. The Durbin-Watson statistic is used to test for the presence of serial correlation among the residuals. In this study to test for the existence of autocorrelation, the popular Durbin-Watson statistic Test was employed. The residuals are not correlated if the Durbin-Watson statistic is approximately 2, and an acceptable range is 1.50 - 2.50. From the result DW was within the range of 1.50-2.50, as a result, the assumption of independence of residuals was satisfied.

Table 4.16 Durbin Watson Test

Model	R	R Square	Adjusted R Square	Std. Error Of The Estimate	Durbin-Watson
1	.743 ^a	.562	.524	.4201	2.113

Source: Survey data, 2020

4.5 Correlation Analysis

Correlation refers to synonym for association or the relationship between variables and it measures the degree to which two sets of data are related. The Pearson correlation coefficient is a statistic that indicates the degree to which two variables are related to one another. The sign of a correlation coefficient (+ or -) indicates the direction of the relationship between -1.00 and +1.00. When the correlation is 1 or -1, a perfectly linear positive or negative relationship exists; when the correlation is 0, there is no relationship between variables (Ruud et. al. 2012).

Table 4.17 Correlation value of coefficient

Value of coefficient	Relation between variables
0.70-0.90	Very strong association
0.50-0.69	Substantial association
0.30-0.49	Moderate association
0.10- 0.29	Low association
0.01-0.09	Negligible association

Source: (Ruud et. al. 2012).

4.6 Result of the Pearson Correlation Analysis (PCA)

A correlation matrix was run in order to identify the existence of relationship between the variables. When $r = (+) 1$, it indicates perfect positive correlation and when $r = (-) 1$, it indicates perfect negative correlation, indicating that variations in independent variable explain 100% of the variations in the dependent variable. It also means that a unit change in independent variable, if there happens to be a constant change in the dependent variable in the same direction, correlation will be perfect positive (Kothari, 2004).

The results of the correlation analysis revealed that there was positive correlation between managing strategic innovation and competitive advantage ($r=0.603$, $p\text{-value} < 0.001$), Thus an increase emphasis on managing strategic innovation in the firm resulted increase in competitive advantage by 60.3%. Technology management also exhibited a positive correlation with competitive advantage ($r=0.589$, $p\text{-value} < 0.001$), indicates that managing technology of the bank results for better competitive advantage. Joint innovation ($r=0.803$, $p\text{-value} < 0.001$) shows strong positive correlation with competitive advantage. Firm size represented by organizations resources, showed a weak positive correlation with competitive advantage ($r = 0.271$, $p\text{-value} > 0.001$). The correlation analysis result essentially exhibited positive results; hence the variables were selected for further regression analysis.

Table 4.18 Correlation Matrix for the Study Variables

Correlations

		CA	strainno	Tecmgmgt	combinno	Fisz
CA	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	92				
strainno	Pearson Correlation	.603**	1			
	Sig. (2-tailed)	.000				
	N	92	92			
Tecmgmgt	Pearson Correlation	.589**	.438**	1		
	Sig. (2-tailed)	.000	.000			
	N	92	92	92		
combinno	Pearson Correlation	.803**	.816**	.475**	1	
	Sig. (2-tailed)	.000	.000	.000		
	N	92	92	92	92	
Fisz	Pearson Correlation	.271**	.863**	.549**	.941**	1
	Sig. (2-tailed)	.162	.142	.213	.123	
	N	92	92	92	92	

Source: Survey data, 2020

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

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

N =92

Key: CA =competitive advantage

Tecmgmgt= Technology management

Strainno= managing strategic innovation size

combinno= combined innovation and Fisz= firm size

4.7 Hypothesis Testing

Table 4.19: Goodness of Fit- Regression of strategic Innovation and technology Variables on competitive advantage

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change
1	.513(a)	.306	.272	.64886	.306
2	.716(b)	.728	.605	.66582	.575

Source: Survey data, 2020

- a. Predictors: (Constant), Human resource, Financial resource
- b. Predictors: (Constant), HR and Financial resources , strategic innovation, technology, combined innovation
- c. Dependent Variable: Competitive advantage

According to the table results 4.19, R value of 0.513 revealing the strength of association of control variables (human and financial resources) with competitive advantage in model one. The R of 0.513 shows there is Substantial positive association among control variables and competitive advantage. The Coefficient of determination (R^2) shows the level of variance in the dependent variable as a result of inclusion of the independent variables in the model. The R^2 measures how much the Percentage difference in the dependent variable is explained as a result of the change in the independent variable. It also measures the goodness of the fit of model and explanatory variables in explaining the variation in dependent variable. The coefficient of determination (R^2) in the table is 0.306 implying that control variables contributes up to 30.6% for competitive advantage of the Bank. The remaining is explained by stochastic error term (ϵ) which explained by other factors not included in the model. The standard error of 0.64886 shows the deviation from the line of best fit as results shown in Table 4.19 (a). Change in R^2 for model 1 is 30.6% and it is the same with R Square since no other variables were added.

In model two, R value is 0.716 revealing very strong positive associations between explanatory variables (strategic innovation, technology management, combined innovation) including control variables and dependent variables (competitive advantage). The coefficient of determination (R^2) in the table is 0.728 implying that explanatory variables contributes up to 72.8% for

competitive advantage of the Bank. The remaining 27.2% is explained by stochastic error term (ε) which explained by other factors not included in the model. The standard error of 0.66582 shows the deviation from the line of best fit as results shown in Table 4.19 (b). Change in R^2 for model two is 57.5% meaning that strategic innovation, technology management, combined innovation contributes to competitive advantage of the Bank and remaining by organizational resources.

Table 4.20: ANOVA for Regression of strategic Innovation and technology Variables on competitive advantage

Model		Sum of Squares	df	Mean Square	F	Sig.
1 control variables	Regression	36.677	4	14.166	13.053	0.00 (a)
	Residual	52.237	92	.063		
	Total	88.914	96			
2 Strategic Inn & technology	Regression	37.253	3	13.023	14.014	0.00 (b)
	Residual	51.661	93	.052		
	Total	88.914	96			

Source: Survey Data, 2020

- a. Predictors: (Constant), Human resource, Financial resource
- b. Predictors: (Constant), Human resource, Financial resource, strategic innovation, technology management, combined innovation
- c. Dependent Variable: Competitive advantage

As per ANOVA results indicated on above table 4.20, there is a statistical significant correlation between dependent and independent variable sig value 0.000. This reveals that the explanatory variables; strategic innovation, technology management, combined innovation and control variables have impact on competitive advantage. Analysis of variance for model one reveal F statistic of $F(4, 92) = 13.053$, $p = .000 < 0.05$ signifying a significant effect of organizations resources (Human and financial) on competitive advantage. While the F statistic for model two, $F(3, 93) = 14.014$, $p = .000 < 0.05$ indicating a significant effect of explanatory variables; strategic innovation, technology management, and combined innovation on competitive advantage. This therefore reveals that the regression model developed is statistically significant and the variation in the results is insignificant that cannot result to a much difference in case of a

change in the study units (population) and therefore the model can be relied upon to explain the effect of managing strategic innovation and technology on competitive advantage.

Table 4.21 Regression Coefficients of strategic Innovation and technology Variables on competitive advantage

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.432	.105		.414	.000
	Human resource	.143	.038	.172	2.52	.574
	Financial resource	.152	.042	.187	2.63	.003
2	(Constant)	.325	.102		.411	.002
	Human resource	.135	.053	.167	2.38	.592
	Financial resource	.125	.022	.134	2.42	.000
	Strategic Innovation	.168	.056	.213	2.874	.004
	Technology management	.182	.054	.193	3.376	.001
	Combined Innovation	.321	.088	.327	3.640	.000

Source: sample survey, 2020

Based on the regression findings, table 4.21 shows that all the independent and control variables showed a positive coefficient indicating a positive effect on competitive advantage. Thus, the model indicates that, holding the predicator constant, the competitive advantage of the Bank would be 0.325. This explains that, without the influence of predictive values, the value of competitive advantage of the bank would be 0.325. Regression coefficient results shows that strategic innovation ($\beta = 0.168$, $p = 0.004 < 0.05$) indicating a statistically significant relationship between strategic innovation and competitive advantage. Strategic innovation had a coefficient of 0.168 indicating that, a unit increase of strategic innovation would result in to an increase in competitive advantage by 16.8%.

Regression coefficient results of technology management shows that ($\beta = 0.182$, $p = 0.001 < 0.05$) indicating a statistically significant relationship between technology management and competitive advantage. Technology management had a coefficient of 0.182 indicating that, a unit

increase of technology management would result in to an increase in competitive advantage by 18.2%.

From the above table 4.21, the coefficient of regression of combined innovation was ($\beta = 0.321$, $p = 0.000 < 0.05$) indicating a statistically significant relationship between combined innovation and competitive advantage. Combined innovation had a coefficient of 0.321 indicating that, a unit increase of combined innovation would result in to an increase in competitive advantage by 32.1%.

Table 4.22: Goodness of Fit for Regression of strategic Innovation and technology Variables on competitive advantage with the inclusion of Moderating variable

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change statistics				
					R Square Change	F change	Df1	Df2	Sig. F change
1	.624(a)	.457	.403	.68345	.457	26.353	4	97	.000
2	.657(b)	.468	.435	.67563	.178	3.305	2	95	.620
3	.699(c)	.562	.529	.43568	.208	161.284	2	93	.000

Source: sample survey, 2020

- a. Predictors: (Constant), HR, financial resource
- b. Predictors: (Constant), Human & financial resources, strategic Innovation, technology mgmt., combined innovation, firm size
- c. Predictors: (Constant), Interaction effect of firm size (Independent variables * firm size)
- d. Dependent variable: Competitive advantage

Above table 4.22 results shows that, Coefficient of determination (R^2) =0.457 and adjusted R^2 =0.403 for model one. This indicates that explanatory variables with organizations resources explained 45.7% variation in competitive advantage. In model two including firm size as independent variable, there was increase of R^2 change 17.8% from 0.457 to 46.8%. This shows

that explanatory variable including firm size explains 46.8% variation in competitive advantage. In model three, interaction variable was introduced and changes on variables also found. Accordingly, $R^2=0.562$ and adjusted $R^2=0.529$ this results change in R^2 in to 0.208 or 20.8%. This implies that there was improvement on the explanatory power of the model due to introducing interaction variable which brought changes in competitive advantage.

Table 4.23: ANOVA for Regression of strategic Innovation and technology Variables on competitive advantage with the inclusion of Moderating variable

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	46.677	2	10.166	14.062	.000 (a)
	Residual	62.237	91	.163	0.562	
	Total	108.914	93			
2	Regression	47.253	1	13.023	10.263	.000 (b)
	Residual	61.661	92	.242	0.269	
	Total	108.914	93			
3	Regression	78.296	3	14.122	16.054	.000(c)
	Residual	30.618	90	.252	0.682	
	Total	108.914	93			

Source: Survey data, 2020

- a. Predictors: (Constant), HR, financial resource
- b. Predictors: (Constant), Human & financial resources, strategic Innovation, technology mgmt., combined innovation, firm size
- c. Predictors: (Constant), Interaction effect of firm size (Independent variables * firm size)
- d. Dependent variable: Competitive advantage

As shown above table 4.23, F statistics $F(2, 91) = 14.062$, $P = 0.000 < 0.005$ for Model 1, for explanatory variables including organizations resources. This shows that explanatory variables with organizations resources have significant effect on competitive advantage of the bank. In model two, firm size taken as independent variable shows F statistic $F(1, 92) = 10.266$, $P = 0.000 < 0.005$. This implies that model is fit to use; firm size (moderating variable),

organizations resources and strategic innovation, technology management and combined innovation as an independent variable has significant effect on competitive advantage of the bank. Model three introduces interaction factor as independent variables with F statics $F(3, 90) = 16.054$, $P = 0.000 < 0.005$ this shows that overall model is fit to use. Interaction variables (moderating variable) organizations resources, and strategic innovation, technology management and combined innovation as an independent variable has significant effect on competitive advantage of the bank.

Table 4.24: Regression coefficients for Regressing of strategic innovation on Competitive advantage with the inclusion of the moderating variable

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.231	.109		.312	.460
	Human resource	.131	.028	.152	2.49	.562
	Financial resource	.152	.034	.142	2.37	.000
2	(Constant)	.036	.102		.412	.562
	Human resource	.134	.037	.152	2.251	.583
	Financial resource	.123	.043	.172	2.48	.000
	Strategic Innovation	.158	.062	.263	2.781	.000
	Technology management	.168	.056	.103	3.354	.000
	Combined Innovation	.318	.069	.305	3.153	.000
	Firm size	.042	.038	.083	1.872	.056
3	(Constant)	.052	.106		.417	.522
	Human resource	.045	.34	.90	1.432	.071
	Financial resource	.056	.33	.92	1.566	.083
	Strategic Innovation	.147	.066	.252	2.762	.000
	Technology management	.162	.052	.106	3.344	.000
	Combined Innovation	.320	.070	.308	3.253	.000
	Firm size	.045	.042	.073	1.876	.652
	Stinn, tec* Firm size	.017	.018	.553	12.103	.057

Source: Survey data, 2020

- a. Predictors: (Constant), HR, financial resource
- b. Predictors: (Constant), Human & financial resources, strategic Innovation, technology mgmt., combined innovation, firm size
- c. Predictors: (Constant), Interaction effect of firm size (Independent variables * firm size)
- d. Dependent variable: Competitive advantage

The results of regression coefficients were presented in table 4.24 by using three models as follows.

Model one: - Human resources ($\beta= 0.131, p=0.562>0.05$) shows positive relationship with competitive advantage but the effect is statistically insignificant. Strategic innovation, technology management and combined innovation had a positive relationship and statistically significant effect with the dependent variable, competitive advantage. On other hand, financial resources ($\beta= 0.152, p=0.00< 0.05$) indicating a statistically significant relationship between financial resources and competitive advantage. This shows that financial resources positively influence competitive advantage of the bank and the effect is statistically significant.

Model two: - Firm size was introduced in model two consisting ($\beta= 0.042, p=0.0562>0.05$) indicating that the value statistically insignificant even if it positively influences competitive advantage. Human resources ($\beta= 0.134, p=0.583>0.05$) shows positive relationship with competitive advantage but the effect is statistically insignificant. Financial resources ($\beta= 0.123, p=0.00< 0.05$) indicating a statistically significant relationship between financial resources and competitive advantage. The coefficients of β and P value of Strategic innovation, technology management and combined innovation had a positive relationship and statistically significant effect with competitive advantage respectively.

Model three: - Interaction effect was introduced in model three to know the effect of moderating variable (firm size) relationship between explanatory and response variable. The results of the multiple regression analysis given in table 4.24 shows that Interaction effect strategic innovation, technology*firm size ($\beta= 0.017, p=0.57>0.05$) have positively influences competitive advantage but statistically insignificant effect on response variable, competitive advantage. Control variables: Human resources ($\beta= 0.045, p=0.562>0.071$), and financial resource ($\beta= 0.056, p=0.083>0.05$) also shows statistically insignificant effect on competitive advantage even if positively influences dependent variable. Firm size ($\beta= 0.045, p=0.652>0.05$) indicating that the relationship is statistically insignificant effect and positively influences response variable. Predictor variables including Strategic innovation ($\beta= 0.147, p=0.000< 0.05$), Technology management ($\beta= 0.162, p=0.000< 0.05$), Combined Innovation ($\beta= 0.320, p=0.000< 0.05$) have positive significant effect on the explained variable, competitive advantage.

Based on the findings in Table 4.24, the following model was formulated:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4Z + \beta_5X_i Z + \varepsilon$$
$$0.052 + 0.168x_1 + 0.182x_2 + 0.321x_3 + 0.045x_4 + 0.017$$

Where,

Y = Competitive advantage

X1= Managing strategic innovation

X2=Managing technology

X3= combined innovation (Product, Process, marketing, organizational and technological innovation).

X4= Firm Size, moderating variable

Z = Moderating Variable

$\beta_5X_i * Z$ = Interaction effect between the independent and the moderator variable

ε = Error term

From Table 4.24, the possible level of competitive advantage of the bank all other factors held constant is 0.052. A unit increase of strategic innovation would cause an increase in competitive advantage by 16.8%. A unit increase in managing technology would lead to an increase in competitive advantage by 18.2%. Further unit increase in combined innovation of the bank would lead to an increase in competitive advantage by 32.1%. The study further revealed that the P-value was less than 0.05 in managing strategic innovation, managing technology and combined innovation, which shows statistically significant and positive influence on competitive advantage. Firm size and interaction effect shows positive relationship and statistically insignificant effect on the competitive advantage.

4.8 Discussion of the Findings

The descriptive and regression analysis indicated that studied company had developed various techniques to advance its competitiveness. Thus, managing strategic innovation, technology, practices of various innovations and firm size were considered in this study to know the effect on competitive advantage. From descriptive analysis, bank focuses on incremental innovation and less on radical innovation. Among regression analysis, strategic innovation ($\beta = 0.168$, $p = 0.004$

< 0.05) indicating a statistically significant relationship between strategic innovation and competitive advantage. This indicates that a unit increase in managing strategic innovation would result in a 16.8% increase in competitive advantage. Strategic innovation was revealed to have greatly created competitive edge for the company. The finding agrees with Ionescu and Dumitru (2015) who argued that strategic innovation results in new products, processes and technologies that transform the way organizations carry out operations for better competitiveness. These findings are in line with Ansoff, 1975 who described effects of managing strategic innovation would result for better competitive edge of the company. This reflects that ability of company managing structural conduct offers for significant help on surviving business instability and trials faced by organization.

From regression results, the study established technology management ($\beta = 0.182$, $p = 0.001 < 0.05$) indicating a statistically significant relationship between technology management and competitive advantage. From this, it can be inferred that a unit increase of technology management would result in to an increase in competitive advantage by 18.2%. This study corresponds to Camison and Villar-Lopez (2014) on how firms can manage technology to remain innovative and thus gain competitive edge ahead of its rivals in the market. This study indicated that managing technology and competitive advantage are positively correlated with each other. In addition to this, study conducted by Anzere (2016) supports that, managing technology appropriately will result enterprises to reduce the production cost while increasing productivity which enables company for better competitive advantage.

Combined innovation ($\beta = 0.321$, $p = 0.000 < 0.05$) indicating a statistically significant relationship between combined innovation and competitive advantage. Combined innovation had a coefficient of 0.321 indicating that, a unit increase of combined innovation would result in to an increase in competitive advantage by 32.1%. This study is in line with YussufA (2018) established that product, process, market and technology innovation had significant influence on competitive advantage. This study also supports the findings of Kiveu M. (2017) established that product, process, marketing and organizational innovation jointly had significant effect on firm competitiveness. According to the study of Kiveu, individual hypothesis noted that four types of innovations had positive effect on firm competitiveness. Process, marketing and organizational innovation result shows significant effect but product innovation had insignificant effect on firm

competitiveness. This study finding was also in line with previous study findings which concluded that innovation has positive effects on firm competitiveness (Aziz & Samad, 2016; Secluk, A. 2016). However the findings are not consistent with Kiss (2011) who found no significant relationship between innovation and competitiveness.

Firm size ($\beta = 0.045$, $p = 0.652 > 0.05$) indicating that the relationship is statistically insignificant and positively influences response variable. Interaction effect*firm size ($\beta = 0.017$, $p = 0.57 > 0.05$) have positively influences competitive advantage but statistically insignificant effect on response variable, competitive advantage. Study conducted by Mohamud et al. (2016) noted that firm size does not moderate the relationship between management participation and firm performance in the manufacturing firms in Kenya and found insignificant. Amato and Burson (2007) as cited in Pervan & Višić (2012), who tested size-profit relationship for firms operating in the financial services sector and found the link statistically insignificant. Becker-Blease, Kaen and Etebari (2010) concluded the relationship between size and profitability was industry specific. Palangkaraya, Stierwald and Yong (2009) in their study showed that larger and older firms were less productive, but found the evidence less than conclusive.

Table 4.25: Results of the Hypothesis

Hypothesis	Findings/ Results	Decision	Implications
Hypothesis 1 Ho1: Managing strategic innovation has no significant effect on the competitive advantage	$\beta=0.168$, $p=0.004 < 0.05$ hence significant	Reject H01 Conclude that strategic Innovation has a significant effect on competitive advantage	A unit increase in strategic Innovation leads to 0.168 increase in competitive advantage
Hypothesis 2: Ho2: Managing technology has no significant effect on competitive advantage	$\beta=0.182$, $p=0.001 < 0.05$ hence significant	Reject H02 Conclude that Managing technology has a significant effect on competitive advantage	A unit increase in technology management leads to 0.182 increase in competitive advantage
Hypothesis 3: Ho3: Combined innovation (product, process, marketing, organizational and technological) has no significant effect on competitive advantage	$\beta=0.321$, $p=0.000 < 0.05$ hence significant	Reject H03 Conclude that Combined innovation has a significant effect on competitive advantage	A unit increase in Combined innovation leads to 0.321 increase in competitive advantage
Hypothesis 4: Ho4: Firm size has no significant moderating effect on the relationship between strategic innovation, technology and competitive advantage	$\beta= 0.017$, $p=0.57 > 0.05$ hence insignificant	Fail to Reject H04 Conclude that firm size has no moderating effect on the relationship between strategic innovation, technology and competitive advantage	The interaction of strategic innovation, technology and Firm size leads to an increase of 0.17 in competitive advantage which is insignificant

Source: sample survey, 2020

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter highlights the summary of the study findings as guided by the specific objectives of the study, conclusions, relevant recommendations, theoretical and empirical contribution and directions into new research vistas drawn from the study findings.

5.2 Summary of the Findings

The study sought to determine the effect of managing strategic innovation and technology on competitive advantage of CBE, office of strategy and innovation, head office. Strategic innovation plays a significant role and considered as a key factor for company competitiveness. Strategic innovating is regarded as a means of obtaining competitive advantage and this ascertained when company capable to manage strategic innovation and technology. Creating a new market space through managing strategically results company for competitive edge by value pioneering not only through technology pioneering. Empirical studies focusing on managing strategic innovation and technology to competitive advantage are very scanty. The purpose of this study therefore was to establish the effect of managing strategic innovation and technology on competitive advantage. A descripto -explanatory design with a cross sectional survey strategy was adopted. Data was collected from CBE, office of strategy and innovation inclusion of four departments. Multiple linear regression and correlation methods have been used in the analysis to establish the effect of the independent variable strategic innovation and technology on dependent variable, competitive advantage.

The first objective of the study was to establish the effect of managing strategic innovation on competitive advantage. From literature reviewed, the study hypothesized a positive relationship between managing strategic innovation and competitive advantage. The research findings revealed a positive significant relationship between managing strategic innovation and competitive advantage. This finding reveals that managing strategic innovation clearly increases competitive advantage of the company.

The second objective of the study was to analyze the effect of technology management on competitive advantage. The study hypothesized a positive relationship between technology management on competitive advantage. The research findings revealed a positive significant relationship between technology management and competitive advantage. Hence with the capability of managing technology, competitive advantage of the company increases.

The third objective of the study was to examine the combined effect of product, process, marketing, organizational and technological innovation jointly on the competitive advantage. The study hypothesized a positive relationship between combined innovation and competitive advantage. This was confirmed by the research findings. From the study findings it was ascertained that implementation of various innovation had higher effect on competitive advantage as compared to individual innovations which reviewed on literature. Implementation of product, process, marketing, organizational and technological innovation jointly results company for better competitive advantage. Study findings also indicate that company has practice of incremental improvements or changes on already existing innovation rather than radical innovation.

The fourth objective of the study was to investigate the moderating effect of firm size relationship between strategic innovation, technology and competitive advantage. The study hypothesized a positive relationship. Research findings confirmed a positive but insignificant relationship between strategic innovation, technology and competitive advantage with the inclusion of the interacting variable. From the study it was confirmed that firm size not moderating the relationship between strategic innovation, technology and competitive advantage. This means that as the firm size increases there is equal impact on large, medium and small firms. Hence, irrespective to firm size, company should emphasis on managing technology and strategic innovation to enhance competitive advantage.

5.3 Conclusions

On the basis of the findings, the study made the following conclusion. The study affirms that since banking industry in Ethiopia is facing multiple pressures in the ever changing environment, CBE have to adapt greater strategic innovation and new way of technology management to consolidate its competitive advantage. Research findings indicate that strategic innovation had

statistically significant effect on competitive advantage. Company has prominent strategic positioning by technology policy and strategic vision which aligned with projects and initiatives to reduce cost. Accordingly, the profit and market share of the company has increased significantly over two years.

From the study it was confirmed that managing technology had statistically significant effect on competitive advantage. This affirms that developing market oriented products, increase practices of technology forecasting, and being alert on technology is vital to sustain being competitive. Joint innovation had statistically significant effect on competitive advantage. Literature review shows that implementation of various strategic innovation has more effect than individual innovation and this ascertained by the study. This indicates that implementing different types of strategic innovation is highly relevant to the company as compared to any one type of innovation.

Study findings also revealed that financial resources had a positive significant effect on competitive advantage whereas human resources had an insignificant effect on the competitive advantage. The study showed that firm size has insignificant moderating effect on the strategic innovation and competitive advantage relationship. Interaction effect strategic innovation, technology and firm size has statistically insignificant effect on competitive advantage. The study ascertained that firm size does not moderate relationship between strategic innovation, technology and competitive advantage.

Study also points that some variables has low explanatory power and this indicates that unexplained variables also contributes to company competitive advantage. From literature reviewed, such factors include other firm resources; physical, intellectual and capital resources, R&D activities of the firm, firm competences and other external factors. Based on literature reviewed, the external environment including market conditions, economic conditions and legal environment also influences a firm's competitiveness. This shows that competitive advantage of the company is summation of being aware of internal and external conducive environment with strategic managing capability of technology.

5.4 Recommendations of the study

From the review of literature and finding of this study, some recommendations were proposed. Technology is with us and it is dynamic which brings new ideas, invention and innovation. Thus adopting competitive strategies for the bank is essential to remain relevant and strengthen its competitive edge. In order to pursue strategic innovation, it is important that management carefully considers value pioneering with capability of managing technology. From the study, strategic innovation had statistically significant effect and positively influences competitive advantage. The study recommends that company should manage strategic innovation through ensuring continues improvement, incorporate learning and defining sustainable innovation by updating products and services by industry standard. Company should reinvent or redesign its corporate strategy of products by creating differentiation though focusing on less competition market than saturated.

Managing technology had statistically significant effect on competitive advantage as confirmed from the study. Company should note that only pioneering technology is not enough; it must be transformed into technological capability. Technology development, heavily invest in electronic banking, realizing digitalization, increase efficiency of transaction, reducing physical visit of customers by fostering online banking and increase human capability on technology though training are further recommends of the study. Implementation of various innovations positively influences competitive advantage as noted in this study. From this, Study also recommends that company should carry out innovation that is new in the market and industry in addition to updating existing innovation.

Company has to be alert to manage strategic innovation and technology irrespective to firm size either large or small. Large companies sometimes become less innovative by relying high customer base, but this leads to loss and other companies flourish due to strategic innovation and continuous improvement. CBE has high market share, high profit, public trust and accessibility. Existing advantage that company gained has to be sustainable through managing corporate strategy and being open to innovation. Foreign banks are still not open in Ethiopia but for the future it is inevitable. To compete with international banks, operate abroad and to succeed, managing strategic innovation and technology is highly relevant.

5.5 Contribution of the Study to Theoretical and Empirical Knowledge

Various studies have undertaken and drawn ideas on the impact of innovation on firm performance. Studies that undertaken on managing strategic innovation, technology and effects on competitive advantage is scanty. This study contributes to the body of knowledge on strategic innovation, managing technology and competitive advantage by providing empirical evidence. The study contributes by developing ideas on how to manage technology and strategic innovations to accelerate knowledge in research and policy framework. The study also highlights the need to improve the quality of innovation in pursuit to increase company competitive edge. Most studies and literature have focused on the quantity of innovations rather than managing strategic innovation and technology. Lastly the study also contributes to the body of knowledge by providing a framework that can be used for strategic innovation, technology management and competitive advantage for further research /study.

5.6 Suggestions for Further studies

The present study focused on the effect of managing strategic innovation and technology on competitive advantage with reference to CBE, office of strategy and innovation. The same has revealed areas of potential research interest going forward. The study hereby recommends that a comparative study can be carried both public and private banks and other financial institutions. This will provide a comprehensive conclusion and recommendation on policies that need to be put in place to ensure that financial institutions benefit from innovative ideas in their businesses competitiveness. Future research should investigate the possible moderation by not only firm size but also, by other realities, age of the firm, type of ownership, and regulatory issues. Future research should emphasize on variables which not explained in this study by investigating level of novelty of innovation and its effects on competitive advantage.

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APPENDIX I

Introduction Letter for the Questionnaire

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የቢዝነስና ኢኮኖሚክስ ኮሌጅ
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ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
DEPARTMENT OF MANAGEMENT

Date: July 04, 2019
Ref. No. CBE/MGT/345/11

To Whom It May Concern

Addis Ababa University offers a variety of disciplines in its various colleges and respective schools, Management is among the various Business and economics program which are being given in the university. The department has a good reputation in flowering a respectful and professional graduate to the country. The department encompasses different core and supportive courses from the management. Economics, Marketing, Risk & Insurance, Accounting, research, IT & IS and other disciplines. But barely the theoretical concepts will not be enough to produce a high caliber graduate. so, our students have to observe and asses the real-world practice of management activities in order to produce a management graduate that can combine both the theoretical and practical terms together in a business or other sector. So, our department is requesting your assistance to give our nominee graduates an internship opportunity in your respected organization to observe the management practice.

Candidate's full Name Mesfin Milkessa Kassa

Sincerely,

Workneh Kassa, PhD
Chairman, Department of Management

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APPENDIX II: RESEARCH QUESTIONNAIRE

ADDIS ABABA UNIVERSITY COLLEGE OF BUSINESS AND ECONOMICS

DEPARTMENT OF MANAGEMENT MASTERS PROGRAM IN MANAGEMENT SCIENCE
(M.sc)

Questionnaires to be filled by Employees

Dear Respondents,

I'm a graduate student at Addis Ababa University in Master of Science in Management, specialized in Quality Management and Organizational Excellence. Currently, I'm conducting a Research entitled "**The Effects of Managing Strategic Innovation and Technology on Competitive Advantage**" The Case of Commercial Bank of Ethiopia, office of Strategy and Innovation, as partial fulfillment to completion of the Masters of science in Management.

The purpose of this questionnaire is to gather data for the proposed study, and you are kindly requested to assist the successful completion of the study by providing the necessary information. This study is purely for academic purpose and in no ways that affects the respondent's personality. It will be kept confidential. Your participation is entirely voluntary and the questionnaire is completely anonymous. So, your genuine, frank and timely response is vital for the success of the study. I would like to say thank you in advance for your kind cooperation and dedication of your precious time to fill this questionnaire.

Sincerely yours,

Mesfin Milkias Yuma

Tel. +251955938318

E-mail:- Mesfinmilkias@gmail.com

Note:

1. No need of writing your name.
2. Indicate your answer with a check mark $\{\sqrt{\}$ on the appropriate block for all questions. Your unbiased response is highly appreciated

Section One: General Background of Respondents (Demographic Information)

Kindly indicate the extent of your agreement by ticking “√” appropriately

1. Gender
 Male { } Female { }
2. Age
 Below 20 years { } 20-30 { } 31-40 { } 41-50 { } Above 50 { }
3. Educational level
 Diploma { } Degree { } Masters { } PhD and above { }
4. Marital status
 Single { } Married { } Divorced { } Widowed { }
5. Your work experience at Commercial Bank of Ethiopia
 1-3 years { } 4-6 years { } 7-9 years { } 10 years and above { }

Section Two: Managing Strategic Innovation

Below are several statements **to assess how Commercial Bank of Ethiopia manages Strategic Innovation**. Kindly indicate the extent of your agreement by ticking “√” appropriately using a five point rating scale where 5 – Strongly agree, 4 - Agree, 3 – Neither Agree or Disagree, 2 - Disagree, 1- Strongly disagree.

Statements	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
Commitment of top management towards technology through a technology policy					
Company has clear-cut strategy with manageable technology capacity					
Bank has managing capability which strengthens competitiveness in the industry					
Company has a practice to improve technology on a timely basis to reduce cost					
Innovation vision in our company created new markets for industry					

Below are several statements on **technology management** system of Commercial Bank of Ethiopia. Kindly indicate the extent of your agreement by **ticking** “√” appropriately using a five point rating scale where 5 – Strongly agree, 4 - Agree, 3 – Neither Agree or Disagree, 2 - Disagree, 1- Strongly disagree.

Statements	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
Company is ready to give sooner response on technology difficulties					
Company use technology forecasting to determine trends towards which technology is heading					
Company uses market oriented products to generate competitive advantage					
Existence of technology which aligned with strategy within the organization					
Company provides real time alerts or updates on technology					

Section three: Human and Financial Resources

Kindly indicate the extent of your agreement by ticking “√” “appropriately with the following statements related to your human and financial resources by using a five point rating scale where 5 – Strongly agree, 4 - Agree, 3 – Neither Agree or Disagree, 2 - Disagree, 1- Strongly disagree.

Statements:	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
HUMAN RESOURCES					
Company has relative better competence in the industry					
Availability of qualified personnel and domain experts in the Bank					
Company requires more human resources when company grows large					
We use technology based tools to leverage our firm’s human capital					
FINANCIAL RESOURCES					
Statements:	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
Our company financial position increasing (net profit,					

income growth) in the past two years					
Our financial resources are very adequate					
Company effectively pool resources and expertise towards a shared goal					
We are utilizing more financial resources to earn high profit					

Section four: Specific questions on Strategic Innovation

Below are several statements on strategic innovation and of Commercial Bank of Ethiopia. Kindly indicate the extent of your agreement by ticking “√” appropriately using a five point rating scale where 5 – Strongly agree, 4 - Agree, 3 – Neither Agree or Disagree, 2 - Disagree, 1- Strongly disagree.

Statements:	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
Product innovation					
In new product introduction, our company is often first-to-market					
Bank manages technology to cope with market demand by developing new products quickly					
In comparison with competitors, our company has introduced more innovative products during two years					
Our company has a product which leads the market					
PROCESS INNOVATION					
Statements:	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
Company has strong business strategy in managing versions and upgrades					
We continuously improve old products and raise quality of new products					
We continuously modify design of our products and rapidly enter new emerging markets					
Our company is up to date in adopting the latest technological innovations in our processes					
MARKETING INNOVATION					

Statements:	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
We periodically review our product development					
We are high to detect fundamental shift in our industry					
Improving product and service quality is one of our key objectives					
Our market access has greatly increased over two years					
ORGANIZATIONAL INNOVATION					
Statements:	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
Bank has leadership which actively seeks innovative ideas					
Our firm is more effective than our competitors at capturing ideas and convert them into new products					
Improving managerial routines in the firm is seen as part of innovation strategy					
Organizational culture of the bank is open to new ideas					
TECHNOLOGICAL INNOVATION					
Statements:	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
Embracing new technologies and use of modern methods added competitive advantage to the bank					
Company made improvements on product functionalities timely basis					
Technology system has reduced operation costs for the bank					
Company ensure efficiency of transaction in banking technology promptly					

Section five: Competitive Advantage

Below are several statements on competitive advantage. Kindly indicate the extent of your agreement by ticking “√” appropriately

Statements	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
We have maintained a superior market position because of strategic innovation					
In your bank, customers have served at a lower cost as competitors					
My company has improved its image in the market					
The profit of the bank has consistently increased over two years					
Bank’s overall market share has greatly increased over two years					

Thank you for your time and kind response!