CORPORATE GOVERNANCE AND ITS EFFECT ON ADOPTION OF FINANCIAL INNOVATION: THE CASE OF PRIVATE COMMERCIAL BANKS IN ETHIOPIA

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STATEMENT OF DECLARATION

I, hereby, declare that this thesis entitled “Corporate governance and its effect on adoption of financial innovation: the case of private commercial banks in Ethiopia” is submitted in partial fulfillment of the requirement for the Degree of Master of science in Accounting and Finance with the guidance and support of the thesis advisor. This study is my original work and it has not been presented for any degree or diploma program in this or any other university/ institution, and that all source of materials used have been dully acknowledged.

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Statement of Certification

This is to certify that Alene Aynalem has carried out his research work on the topic entitled, "Corporate governance and its effect on adoption of financial innovation: the case of private commercial banks in Ethiopia". This thesis has been submitted for examination with my approval as a university advisor for the partial fulfillment of degree of Master of Science in Accounting and Finance at the Addis Ababa University, to the best of my knowledge, it is an original work and not submitted earlier for any degree either at this University or any other University.

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This is to certify that the thesis prepared by Alene Aynalem Birhanu entitled Corporate governance and its effect on adoption of financial innovation: the case of private commercial banks in Ethiopia and submitted in partial fulfillment of the requirement of the Degree of Master of science in Accounting and Finance complies with the regulations of the University and meets the accepted standards with respect to originality and quality

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Advisor		_____
External Examiner		_____
Internal Examiner		_____

Date: _____

DEDICATION

This paper and master's degree is wholly dedicated to my mother. My mother, you lived your entire life for me believing that your success is the mirror image of mine. I am grateful for you and you are deep rooted in my heart. May GOD kept you in Heaven!

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Abbreviations and Acronyms

ATM	Automatic Teller Machine
BDGD	Board Gender Diversity
BMF	Board Meeting Frequency
BMQ	Board Members Qualification
BS	Board Size
CBE	*Commercial Bank of Ethiopia*
CEO	Chief Executive Officer
CLRM	*Classical Linear Regression Model*
FSIZE	Firm Size
INVEST	Investment
LOG	Logarithm of a Number
LOGFSIZE	Logarithm of Firm Size
LOGINVEST	Logarithm of Investment
LOGOWNSHIP	Logarithm of Ownership
LVRG	Leverage
NBE	National Bank of Ethiopia
OBS	*Observation*
OECD	Organization for Economic Development
OLS	Ordinary Least Square
OWNSHP	*Share* Ownership Concentration
POS	Point Of Sale
R&D	Research and Development
ROA	*Return on Asset*
ROI	*Return on Investment*
SPCOMIT	Existence of sub-Committee
VIF	Variance Inflation Factor

Appendices

Abstract

Nowadays business competence is influenced by a turbulent context, characterized by constant and unpredicted changes, where the introduction of new practices in to the market, of all kinds, organizational, commercial, financial, institutional, or technological, are becoming crucial tools to improve companies' competitiveness and survival. Thus innovation has become a crucial element for the creation and improvement of competitive advantage in the long term. Therefore, the purpose of this study was to empirically investigate the effects of some of the internal corporate governance mechanisms on the adoption of financial innovations by private commercial banks in Ethiopia. Accordingly secondary data obtained from annual reports of companies and primary data obtained through questionnaire were analyzed for the period 2013-2018 for the population of all private commercial banks in Ethiopia. The study adopted a quantitative and explanatory research approach and design respectively. Among the internal corporate governance mechanisms, the impact of board characteristics (specifically board size, board gender diversity, Existence of Business/ Technology Development committee, industry related qualification of directors and board meeting frequency), and share ownership dispersion are addressed in the Ethiopian context using two theories of corporate governance, which are agency theory and stewardship theory. Adoption of Financial innovation is measured using innovation investment/R&D spent. The study used panel data and random effect regression model to analyze the relationship between corporate governance mechanisms and firm innovation using a data set of 16 private commercial banks in Ethiopia. The results show that board size, existence of business/ technology development committee, board meeting frequency, industry related qualification of directors, profitability and firm size have a significant positive effect on adoption of financial innovation. However, share ownership dispersion is identified to have a negative and significant impact on firm innovation. Board gender diversity and leverage have no effect on firm innovation. Accordingly, based on the finding of the study banks and other financial institutions recommended to increase their board size, and to incorporate business/technology development committee in their committee room, to elect board members having industry related qualification, balance the costs and benefits of board meeting frequency and to have concentrated share ownership.

Keywords: *Corporate governance, firm innovation, private commercial banks, innovation investment/R&D cost spent, board of directors, ownership dispersion*

Chapter One

Introduction

This section presents and highlights the general background of the study, research problem of the study, research question and hypothesis development of the study, significance of the study, and limitation and delimitation of the study area.

1.1. Background of the study

Corporate governance has become a major topic in Ethiopia for the last couple of decades due to reforms like the adoption of market economy, privatization of state-owned enterprises and openings in the financial system.

"The term 'governance' is derived from the Latin term gubernare, meaning 'to steer', usually applying to the steering of a ship, which implies that corporate governance involves the function of direction rather than control" (Solomon and Solomon, 2004:1). On the other hand, according to Bathala, *et al*., (2005), the similarity between the government of cities, nations or states and the governance of corporations is the origin of the term "corporate governance".

There is no single, accepted definition for corporate governance (Solomon and Solomon, 2004). There are significant differences in definition according to the country considered as countries differ from each other in terms of culture, legal systems and historical developments (The Cadbury Report, 2002). Some of the definitions are narrower or shareholder-oriented approach emphasizing only to the basic role of corporate governance of aligning the interest of shareholders with the interest of mangers. Some others are broader or stakeholder-oriented approach in that corporate governance encompasses accountability to a broader group of people than just the shareholders (Solomon and Solomon, 2004).

Corporate governance can be defined as the system by which companies are directed and controlled (The Cadbury Report, 2002). It is a narrower definition which relates corporate governance to control of the company, of corporate management, or managerial Conduct. This definition involves the establishment of arrangement and processes through which management is accountable to shareholders with the objective of enhancing shareholder value.

On the broader vein, as stated by Solomon and Solomon (2004), "corporate governance may be defined as the system of checks and balances, both internal and external to companies, which ensures that companies discharge their accountability to all their stakeholders and act in a socially responsible way in all areas of their business activity." Under this broader definition of corporate governance, companies have a broader level of accountability to shareholders and other stakeholders. The principal players are the shareholders, the management and the board of directors. Other stakeholders include employees, suppliers, customers, banks and other lenders, regulators, the environment and the community at large (Bathala, et ai., 2005).

The purpose of this study is to empirically investigate the impact of internal corporate governance mechanisms on Ethiopian banks financial innovation. Consistent to most of empirical corporate governance studies the shareholder-oriented definition (which is also the accepted definition in the country) is used in this study.

The need for corporate governance arises from the separation of ownership and control in publicly held companies. Investors seek to invest their capital in profitable firms to earn returns in the future. However, many investors lack the time and expertise necessary to operate a firm and ensure that it provides a return. As a result, investors hire individuals with management expertise to run the company on a daily basis (The Institute of Chartered Accountants of Pakistan, 2006). This separation of ownership from control increases the power of professional managers and left them free to pursue their own aims (Muth and Donaldson, 1998). This results in the rise of agency problem between firm owners and managers (Jensen and Meckling, 1976).

According to Belkhir (2009), there are several corporate governance mechanisms to alleviate agency problems between shareholders and managers that results from the separation of ownership from control of firms. These corporate governance mechanisms are classified as internal control mechanisms and external governance mechanisms. The internal control mechanism comprises of board of directors characteristics, compensation packages, ownership concentration, and equity ownership by officers and directors (insider ownership). The external corporate governance includes the product market institutions (such as regulators responsible for competition), the market for corporate control, the labor market for managers, and the financial (capital market) institutions such as financial intermediaries, and the judiciary (Cadbury Report, 2002).

Some of the external governance mechanisms such as the intensity of the market for corporate control and the competitiveness of the labor market for managers and of the product market are common to all companies within an industry, in this case, to all private commercial banks. Thus, no variation will be seen in such type of variables among companies within an industry. Variation may be seen if the focus of an inquiry becomes different industries. Coming to internal governance mechanisms, variation is expected to be seen among companies within an industry as the issues are firm specific.

For the sake of cost reduction in data collection and due to limited time, the current study focused only on one industry i.e. the Ethiopian banking industry. Thus, emphasis is given to internal governance as a prominent mechanism to mitigate agency costs. From the internal governance mechanisms, the study is narrowed down to the effect of board characteristics and share ownership dispersion on firm innovation.

The board of directors according to Bozec (2005) is generally seen as an important internal governance mechanism. With shareholders unable to engage in management and since the managers intend to maximize their self-interest instead of acting in the owners' best interest; it becomes the responsibility of the board of directors to represent shareholder interests. It can be accomplished by overseeing or controlling the act of managers. According to Barnhart et al., (1994), the board of directors is one of the internal governance mechanisms that are intended to ensure that the interests of shareholders and managers are closely aligned, and to discipline or remove ineffective management teams. They are the representatives of shareholders, so their main responsibility is to make sure that the agent (top management) acts to maximize the shareholders interest.

Ownership dispersion is also used as corporate governance mechanisms to reduce agency conflicts between shareholders and manager (Jensen, 1986; Alwi, 2009). Institutional owners and large-block shareholders have both the size and the incentive to discipline ineffective top-level managers and can significantly influence a firm's choice of strategies and overall strategic decisions (Bathala, et al., 2005). Research evidence indicates that institutional and other large-block shareholders are becoming more active in their efforts to influence a corporation's strategic decisions. However, there is no consensus on the role of institutional investors in mitigating such problems and associated costs (Bathala, et al., 2005).

Corporate governance is a highly researched area in the developed world. However, the financial sector has generally received far less attention in the corporate governance literature

than seems warranted by their central role in a nation's corporate governance system (Jr. and Levine, 2002). In addition, only a few empirical studies (e.g., Tian and Lau, 2001; Muth and Donaldson, 1998) have attempted to test agency theory and stewardship theory simultaneously. Besides, to the best of my knowledge there is no any research work conducted on the effect of corporate governance mechanisms on firm innovation particularly on the banking industry in Ethiopia.

Thus, this study was intended to fill these gaps by testing the two theories simultaneously in Ethiopian context. The study attempted to investigate the effect of internal corporate governance mechanisms specifically board characteristics, and ownership dispersion on overall corporate financial innovation in a new setting (Ethiopia) in which financial markets are not well developed and shareholders are not well protected. Board characteristics include: board gender diversity, board meeting frequency, existence of business/technology development sub-committees, board members qualification, and board size. The study controls for firm size, leverage and profitability. Innovation investment/ R&D spent is used as an input measure of firm financial innovation as innovation in financial institutions particularly in banks are divers and hence, output measurements are not consistent and divers too.

1.2. Statement of the problem

This study assessed how corporate governance mechanisms impact corporate firm's financial innovation. Nowadays business competence is influenced by a turbulent context, characterized by constant and unpredicted changes, where the introduction of new practices in to the market, of all kinds, organizational, commercial, financial, institutional, or technological, are becoming crucial tools to improve companies' competitiveness and survival (Aghion, etal., 2006). Thus innovation has become a crucial element for the creation and improvement of competitive advantage in the long term. Corporate innovation is an important concept that is related to the action of creating and popularizing new financial instruments as well as new financial technologies, markets and institutions (Aghion, etal., 2006). This includes innovation in the level of product, process and/or the institution. Financial innovation is primarily a product and organizational service innovation, which allows cost or risk reduction for banks and/or a service improvement for the financial industry as a whole (OECD, 2010). Innovation at the product level is related to new products such as ATMs, POS machines and mortgages. Innovation at the process level has come to

new ways of doing financial business including online banking and mobile banking (Aghion, etal., 2006). But creating and popularizing new products, processes and services for service improvement and/or cost or risk reduction for banks may not exist without good corporate governance practice, as the interest of management may be different from maximizing value and service potential of firms and overall performance of banks.

According to Basel Committee on banking supervision (2006), financial innovations is one of the most important competitive weapons and generally seen as a firm's core value capability. It is considered as an effective way to improve firm's productivity due to the resource constraint issue facing a firm. Innovation by firms is affected by external as well as internal governance mechanisms such as the board of directors and associated characteristics, and ownership dispersion (Aghion et al, 2006).

According to Basel Committee on banking supervision (2006), the banking industry is one of the most important service industries which impact the lives of millions of people. Its service is unique both in social and economic points of view of a nation. Effective corporate governance is critical to the proper functioning of the banking sector and the economy as a whole and it enhances the confidence of investors in the companies and positively contributes towards the overall business environment (Tura A.H., 2012). It has received new urgency mostly because the banking industry became highly exposed to scrutiny by the public and many lessons were learnt because of global financial crisis and major corporate failures that shock major financial centers of the world (Imam and Malik, 2007). The need for strong governance is evidenced by the various reforms and standards developed not only at the country level, but also at an international level (e.g., the Sarbanes-Oxley Act in the US, CLERP 9 in Australia, Combined Code in the UK, and the Organization for Economic Development [OECD] Code) (Jackling and Johl, 2009).

Hence, corporate governance has become an important factor in managing organizations in the current global and complex environment. In Ethiopia however, it is the emergence of market economy, privatization of state owned enterprises and openings in the financial system that results corporate governance to be important topic in the country (Alemayehu, 2008).

Ethiopia has established basic corporate governance rules (commercial code) for share companies in the early 1960. However, despite the presence of corporate governance in the country for more than 50 years without revision, a study conducted by Fekadu, (2010)

indicates that the rules are not adequate to safeguard minority shareholders from undue exploitation and promote innovation and entrepreneurial activity. Besides, Ethiopia has established strategic framework to ensure better corporate governance of corporations, financial institutions and markets which increasingly recognized as a pre-condition for the countries development and it is directed and supervised by the NBE (NBE, 2015).

However, according to Binyam (2009), In general, banks in Ethiopia are trailing behind in acquiring the required quality of banking services to effectively compete in the global market. ATM, Credit Card and debit card services, internet banking, mobile banking and other electronic payment systems are at infant stage. Financial innovation in Ethiopia banking industry is less developed from regional peers for example Kenya has 5.2 commercial bank branches and 9.5 ATMs per 100,000 adults, in contrast with Ethiopia's 2.0 and 0.3, respectively (World Bank, 2013). The most dominant innovation channel among those banks, which are currently providing the service, is ATM card (Mattewos, 2016). High customers' demand, improvement in the banking habit of the society, late adoption of E-banking technology in Ethiopia, commitment of the government to facilitate the expansion of ICT infrastructure and commitment of the government to strengthen the banking industry are among the major factors for the adoption and growth of innovation technology and products in the country (Ayana, 2012).

Therefore, despite the undeniable importance of corporate governance in explaining financial innovation, the impact of corporate governance on innovation is still an area of study that has not been researched in Ethiopia.

Empirical studies for instance, Olani & Getinet, (2015) focus on determinants of the financial performance of commercial banks in Ethiopia from internal corporate governance practice perspective; Ashenafi et.al (2013) focus on corporate governance and impact on bank performance; Abdurazak (2017) focus on corporate governance and its effect on financial performance of the Ethiopian private commercial banks; Kalifa (2012) and Kibrysfaw (2013) studied corporate governance mechanisms and their impact on performance of commercial banks in Ethiopia and recently Temam (2018) studied the effect of financial innovation on profitability of commercial banks in Ethiopia. Thus studies have not looked at the relationship between corporate governance and financial innovation in private commercial banks in Ethiopia.

This study therefore is aimed at filling this gap by answering the following research question: What is the effect of corporate governance on the adoption of financial innovation by private commercial banks in Ethiopia?

1.3 Objectives of the study

The general objective of this study was to examine the effect of corporate governance on adoption of financial innovation by private commercial banks in Ethiopia.

Specifically the research attempted to achieve the following objectives:

- To examine the effect of board size on the adoption of financial innovation by Ethiopian private commercial banks.
- To examine the effect of board gender diversity on the adoption of financial innovation by Ethiopian private commercial banks.
- To examine the effect of board members qualification on the adoption of financial innovation by Ethiopian private banks.
- To examine the effect of board meeting frequency on the adoption of financial innovation by Ethiopian private banks.
- To examine the effect of special committee on innovation called business/technology development committee on the adoption of financial innovation by Ethiopian private commercial banks.
- To examine the effect of share ownership dispersion on firm's adoption of financial innovation.

1.4. **Hypothesis of the study**

According to Kothari (2005) the research hypothesis is a tentative solution to a problem and the research activities are planned to verify the hypothesis and not to find out the solution of the problem or to seek an answear to a question. In this study the following hypotheses were developed based on previous empirical studies and corporate governance theories like agency and stewardship theories. And therefore, the following hypotheses were employed to test the effect of board characteristics such as board size, board gender diversity, board members qualification, board meeting frequency, existence of special committee on firm innovation called business/technology development committee, as well as the effect of share ownership dispersion on firm innovation.

H1a*: (*stewardship theory*). Board size has a significant and negative effect on financial innovation.*

H1b*: (*agency theory*). Board size has a significant and positive effect on financial innovation.*

H2: *(agency theory). Board Gender composition has a significant and positive effect on adoption of financial Innovation by commercial banks in Ethiopian.*

H3: (stewardship theory). *Qualification of board members has a significant and positive effect on adoption financial innovations.*

H4: *(agency theory). Board members meeting frequency has significant and positive effect on adoption of financial innovations.*

H5*: (agency theory). Existence of specialized (Business/Technology development) committee has significant and positive effect on adoption of financial innovations.*

H6*: (agency theory). Share ownership dispersion has a significant but negative effect on adoption of financial innovations.*

1.5.Significance of the Study

The result of this study is assumed to contribute to the existing literature by expanding the understanding of the impact of the board characteristics, and share ownership dispersion on firm innovation in a new setting (Ethiopia) in which financial markets are not well developed and shareholders are not well protected. In which case internal corporate governance mechanisms especially the board of directors, and share ownership dispersion are more important available control mechanism for management opportunism.

Policymakers (regulators), shareholders, corporations, further researchers are among those to be benefited from the finding of this study, if they are better informed about the impact of the board characteristics and share ownership dispersion on firm innovation, and how this country (Ethiopia) practices compared with those of other countries, policy makers will be better able to direct their own policymaking and regulatory efforts.

1.6. Scope and limitation of the study

Firstly, this study is limited only to Ethiopian private commercial banks. The study did not include commercial bank of Ethiopia since it is government owned bank, share ownership concentration/dispersion is not an issue. Second, due to the fact that the financial innovations in most banks applied from 2013 onwards in Ethiopia and therefore, the study is constrained to the period of 2013-2018 financial data.

Besides, firm innovation is the result of the interaction of many drivers and factors such as strategy, network, and social environment that may affect firm innovation and not considered in this study.

Finally, board characteristics are the most important determinants that can have an impact on company's innovation, and characters of board encompass many aspects, for example directors backgrounds such as experience, board members attendance rate, board's affiliation and others. But some of these indicators are not easy to be measured, or data and information are not available. Thus, in this study, the notion of board characteristics is limited to board size, board gender diversity, board members qualification, existence of specialized committee and board meeting frequency.

1.7.Organization of the study

The rest of the paper was organized as follows: Chapter two briefly reviews the literature on the effect of internal corporate governance mechanisms on firm's innovation. It also highlights the historical development of banks and corporate governance practices in Ethiopia. Chapter three presents the detailed research methodology which was employed in carrying out this study. The research design, the sample selection, the method of analysis and the variables are all discussed here. The fourth chapter contains the principal results and discussions. The final section i.e. chapter five summarizes and concludes the study.

Chapter Two

Literature Review

In this section prior literature is reviewed within the context of agency theory and stewardship theory which is used as the basis for the development of the hypotheses stated in chapter one. In addition, nature of banking sector and corporate governance in Ethiopia is highlighted in this section.

2.1. Theoretical and Conceptual Framework for the study

In examining prior literature and developing the research hypothesis, this study employed two theories of corporate governance i.e. (agency theory and stewardship theory).

2.1.1. Agency Theory

According to Jensen and Meckling, (1976) agency theory is a theory which is based on the principal-agent relationships. The separation of ownership from management in modern corporations provides the context for the functioning of the agency theory. In modern corporations the shareholders (principals) are widely dispersed and they are not normally involved in the day to day operations and management of their companies rather they hire mangers to manage the corporation on behalf of them. The agents are appointed to manage the day to day operations of the corporation. However, conflict of interest between the agent and the principal may occurs when the agent fails to act in the best interest of the principal, and instead act to maximize their own value. Such conflict of interest occurs due to difference in their preferred level of managerial effort, and their attitude towards risk, which in turn may lead to divergence in the goals of managers and shareholders. Consequently, different control mechanisms either internal or external to the firm should be put in place in order to align the interests of managers and shareholders and/or to solve the agency problem (Muth and Donaldson, 1998).

According to agency theory, much of corporate governance deals with the limits on managers' discretion and accountability. Agency theorists typically take the maximization of shareholder wealth as the primary standard for evaluating corporate performance and ask how the board can serve to further corporate performance. The theory offers many useful ways to examine the relationship between owners and managers and verify how the final objective of

maximizing the returns to the owners is achieved, particularly when the managers do not own the corporation's resources(Muth and Donaldson, 1998).

According to Jensen and Meckling, (1976) agency theory identifies the role of the monitoring mechanism of corporate governance to decrease agency or controlling costs and to solve the conflict of interest between managers and owners. It is clear that the principal-agent relation is generally considered as the starting point for any debate on the issue of corporate governance. Boards of directors are expected to be independent, diverse and monitor the actions of managers as agents of the owners to ensure they are acting in accordance with the owners' interests. The theory suggests that board composition is important for effectively monitoring top management. Boards have to be diverse in terms of skills, qualifications, experience, and gender balance. This creates a balance on boards and leads to effective monitoring and subsequently to the successful performance of the organization. Therefore, boards of directors are considered as an important device to protect shareholders from being exploited by managers and help to effectively control managers (Muth and Donaldson, 1998).

In summary, with its root in industrial and organizational economics, Agency Theory assumes that human behavior is opportunistic and self-serving. Therefore, the theory recommends strong director and shareholder control. It advocates that the fundamental function of the board of directors is to control managerial behavior and ensure that managers act in the interests of shareholders.

2.1.2. Stewardship Theory

Stewardship theory, which dramatically opposed Agency theory, is based on the view that managers are 'steward' rather than entirely self-interested (Muth and Donaldson, 1998). This theory assumes that managers have a wide range of motives beyond self-interest which implies that goal conflict may not be inherent in the separation of ownership from control. According to Muth and Donaldson (1998), stewardship theory recognizes a range of non-financial motives for managerial behavior, that agency theory failed to recognize, which includes (1) the need for achievement and recognition, (2) the intrinsic satisfaction of successful performance, and (3) respect for authority and the work ethics.

In sum, it assumes that managers are trustworthy and work non-negligently to attain high firm profit and shareholders' returns. Thus Stewardship theory argues that the board should have a significant proportion of inside directors to ensure more effective and efficient

decision making (McKnighta and Weir, 2003) and other control mechanisms are not necessary in disciplining management.

2.1.3. Innovation

The academic conceptualization of innovation emerged with Schumpeter (1939), who defined innovation as a wide phenomenon that involved any new way of doing things in the economic field. From this concept, innovation could be understood as any change; modification, improvement or creation, independently on its object (product, process, structure, method, etc.) as far as it has been implemented or applied in the market. Thus, innovation involves a process with different stages, where the new ideas must be first created, proved, put into production, and finally, placed on the market, to affect individuals, companies and the whole society (Schumpeter, 1939; Thompson, 1965; Van de Ven, 1986).

At the level of firms and industries, many types of changes can be considered, for example, those that affect their methods of work, their use of factors of production, their outputs to improve productivity and performance, etc.… These multiple changes have raised different categories and types of innovation; such as innovation of products, processes and organizations; technological or non technological changes; radical or incremental innovations, etc. (OECD, 2010).

Nowadays business competence is influenced by a turbulent context, characterized by constant and unpredicted changes, where the introduction of new practices into the market, of all kinds, organizational, commercial, financial, institutional or technological, are becoming crucial tools to improve companies' competitiveness and survival. Thus, innovation has become a crucial element for the creation and improvement of competitive advantage in the long term (Becheikh et al., 2006; Johannessen et al., 2001), However, until now, there is not sufficient research to completely understand why companies with similar external conditions show different behavior towards innovation (Belloc, 2012).

Literature on corporate governance offers some useful ideas for the comprehension of innovation in companies (Belloc, 2012), recognizing that businesses differ in the structure and organization of their governance bodies, and that these differences may explain partially, amongst other factors, innovations adopted by them (Barker and Mueller, 2002). Indeed, within the concept of corporate governance itself lies the implication that it may affect innovation, as far as corporate governance involves all the companies' management bodies

with decision-making powers and the distribution of powers amongst them (Jensen and Meckling, 1976).

Despite the link between different aspects of corporate governance and innovation, and the fact that its analysis started decades ago (Johannessen et al., 2001), there have been much fewer research studies conducted on this relationship between corporate governance and innovation, than on the relationship between corporate governance and business performance (Becheikh et al., 2006).

Given the different nature and extent of the concept of innovation, it becomes necessary to see the approaches to measure financial innovation. Firm innovativeness could be dependent variable of interest for researchers concerned with just about any area of management, accounting and finance (Belloc, 2012). But there is no consistency as to what constitutes the proper measure of firm's financial innovativeness (Barker and Mueller, 2002). In other words, there is no single ideal measure of innovation.

According to Barker and Mueller, (2002), firm financial innovation measures had two spectrums: (a) input metrics (R&D spent, the number of innovation projects started, the number of new ideas in the pipeline, the number of new employees in R&D) which are used for measuring your investments in terms of money, time or talent devoted to a specific activity related to innovation management. Measuring inputs is a great way to gain insight in to how your resource allocation or innovation portfolio matches your strategy and can be considered also to cover metrics regarding the process itself as how many ideas are passing through to a certain phase.(b) The other end of the spectrum is output metrics (number of new products launched in X amount of time, ROI of innovation activities, and actual vs. targeted breakeven time for new products) which measures the results your innovation investment have yielded and indicate if your investments are actually turning into something useful (Alegre-Vidal et al., 2004; Coombs et al., 1996).

But innovation in financial institutions in general and banks in particular are divers and includes new products, processes and services which makes all inclusive measurement of output of innovation difficult, if not impossible. So the input measures of innovation specifically innovative investment/R&D spent is used in this study. This choice is based on different reasons. First R&D is seen as a necessary condition to innovate, since R&D

enhances the capacity of firms to innovate, is frequently recognized as one of the most relevant inputs for innovation, and is a starting point for its analysis (Barker and Mueller, 2002; Johannessen et al., 2001). Second, different aspects related to R&D activities have been frequently used as an innovation indicator; for example, R&D expenses or R&D intensity are used to measure the efforts made by companies to innovate (Becheikh et al., 2006); the number of registered patents, obtained as a result of R&D activities, serves as measure or innovation outcomes (Alegre-Vidal et al., 2004; Coombs et al., 1996). Third, many companies organize their innovation activities through R&D departments in charge of finding new uses for the existent products, improving their fabrication processes, and analyzing the novelties of the competences (Becheikh et al., 2006).

2.1.4. Background to Corporate Governance in Ethiopia

The share company is one of the forms of business organizations recognized under the Ethiopian Commercial Code. It is established through the issuance of shares to an unlimited number of members as provided for by Articles 304-509 of the Commercial Code. The Publicly held share companies give rise to a host of complex corporate governance issues which necessitates the transfer of management of the company from the numerous shareholders into the hands of a few managers (Fekadu, 2010). This separation of ownership from management in case of Share Company needs a new rule which is different from the rule applied for businesses managed by the owner or owners.

Ethiopia has established basic corporate governance rules (commercial code) for share companies in the early 1960. Hence, the foundation of corporate governance has been in place for almost fifty years. The code included corporate laws, bankruptcy laws, disclosure law, auditing, and basic structure, duties, and responsibilities of shareholders, board of directors, and managers (Alemayehu, 2008).

However, according to Fekadu, (2010), implementation of corporate governance in Ethiopia is not as old as its foundation rather it is at its infant stage. Reforms during the last couple of decades (two decades) that brought market economy, privatization of state owned enterprises and openings in the financial system in the country results the raising of large amounts of capital from the public through offers of shares in new business ventures by ambitious investors. Rising of money through issuance of shares needs corporate governance as a mechanism for shareholders to minimize management's self-interested act. In other words,

this separation of ownership from control of firms needs the implementation of the commercial code (Alemayehu, 2008).

According to Binyam (2009), as the experiences of the developed countries reveals that a good corporate governance could benefit Ethiopian business by reducing risk, stimulating performance, improving access to capital markets, enhancing the marketability of goods and services, improving leadership, increasing the value of the corporations, enabling the corporation to acquire external finances more easily and at a lower cost. Corporate governance would facilitate access to capital through the banking system and other financial institutions by making company performance visible and reliable. Through increased transparency and better conduct of businesses, Corporate Governance may also lower the costs of capital by reducing the "risk premium" normally added by creditors to borrowing (Mattewos, 2016). Furthermore, corporate governance creates explicit relations between key organs of the corporation – the shareholders, the board of directors and the executive management – which reduces the risks for unexpected corporate failures and improves company performance in general. Last but not least, sound corporate governance framework ensures that insiders do not use their privileged position to the disadvantage of other stakeholders, notably small minority shareholders, creditors and in the case of insurance companies, policy-holders (Fekadu, 2010).

Ayana, (2012) states that, some of the advantages of corporate governance stated in the above paragraph (such as, enabling the corporation to acquire external finances more easily and at a lower cost) are important regardless of the form and size of firms. That is all enterprises irrespective of size and ownership structure need some governance principles to conduct successful business. Nevertheless, the commercial code of Ethiopia gives greater emphasis to large companies (share companies) (Mattewos, 2016).

According to Fekadu, (2010), Firms of different sizes and ownership structure may require different sets and complexities of governance institutions. So, governance institutions for large and small firms and for single or multiple ownership firms should differ. For example, in smaller firms, with concentrated or sole ownership, there is no a strong need for complex legal protection as the principal governance issues concern the implicit or explicit contracts that the owners have with traders and suppliers, and with banks and other financial institutions. But as the size of a firm increases, day-to-day control and overall management

tasks are delegated to non-owners. This separation of owners and managers for large companies (share companies) makes governance issues more complicated (Ayana, 2012).

2.1.5. Board of Directors and Its Roles

The 1960 Commercial Code, has basic rules on the governance of share companies in the country specifies how boards are appointed, the minimum and maximum number of the board, how directors are replaced, remuneration of directors, dealings between a company and its directors, duties of directors, liabilities of directors to the company and the creditors, powers of directors and so on (Commercial code, 1960).

According to the commercial code of Ethiopia (1960), specified in Art. 350, there are three ways according to which boards could be appointed, that is, the memorandum or articles of association, subscribers' meeting, and annual general meeting. As it is stated in article 347(1) only members of a company may manage the company. If "member" is meant to be shareholders, then the composition of the board seems to be only owners not non-owners. And as depicted latter in article 348(4), the general manager *is* an employee of the company and may not be a director, which hints that, the composition of board of directors to be either from inside or outside. It also allows the manager to be a board member or not and indirectly it shows that the manager may or may not be a chairman as chairman is elected by the board from among its members. The code further specifies that corporate bodies may be directors, and the chairman of the board of directors shall be a person. That is corporate bodies are not allowed to be a board chairman by the code. Commercial code of Ethiopia does not prohibit directors from being elected for as long as the shareholders want them and it does not also prohibit a company director from being a director of another company (Commercial code, 1960).

However, according to Alemayehu, (2008), for financial institutions, the national bank of Ethiopia issues various directives regarding board of directors and managing directors or CEOs which seems contradictory to the commercial code. Licensing and supervision of banking business directive issued by national bank of Ethiopia in 2019, requires all the board of directors of financial institutions to have a minimum of a first degree from a recognized university. It also limits an individual's service on the board to two consecutive terms of three years each, and re-election is allowed only after a six-year absence (Directive No. SBB/70/2019). Directors are also restricted from serving on the boards of two financial

institutions at the same time and it further requires the board member to have age of greater than or equal to 30 years. Furthermore, general managers are restricted from being the chairman of the board (NBE Directive, 2019).

The roles of board of directors are presented in Article 362 of commercial code of Ethiopia as follows:

1) Keeping regular records of the management meetings;
2) Keeping accounts and books, that is the financial statements.
3) submitting the accounts to the auditors and an annual report of the company's operations including a financial statement to the meetings;
4) Arrange meetings as provided in the articles of association;
5) Arranging a general meeting without delay where three quarters of the capital are lost;
6) Setting up the reserve funds required by law or the articles of association;
7) Applying to the court where the company stops payments with a view either to a composition with creditors or the winding-up of the company (Commercial code, 1960).

According to the code boards of directors are expected to discharge the above roles with due care and diligence and directors shall be jointly and severally liable for their negligent act. Liability of directors to the company is presented on Article 364 of commercial code of Ethiopia as:

(1) Directors shall be responsible for exercising the duties imposed on them by law, the memorandum or articles of association and resolutions of meetings, with the due care from an agent.

(2) Directors shall be jointly and severally liable to the company for any damage caused by failure to carry out their duties.

(3) Directors who are jointly and severally liable shall have a general duty to act with due care in relation to the general management.

(4) Directors shall be jointly and severally liable when they fail to take all steps within their power to prevent or to mitigate acts prejudicial to the company which are within their knowledge.

(5) Directors shall be responsible for showing that they have exercised due care and diligence.

(6) A director shall not be liable where he is not at fau1t and has caused a minute dissenting from the action which has been taken by the board to be entered forthwith in the directors' minute book and sent to the auditors (Commercial code, 1960).

2.2. Empirical Literatures

2.2.1. Historical Development of Banking and innovation in Ethiopia

In order to grasp the current governance practices adopted, it is necessary to have a broad understanding of the history of banking industry in Ethiopia. Modern forms of banking service were introduced in Ethiopia by Europeans in 1905 when the Bank of Abysinia began to transact

Banking service based on the agreement signed between the Ethiopian Government and the National Bank of Egypt, which was owned by the British. In 1908 Socite Nationaled'Ethiope pour le Development Dei' Agricaltureet du and two other foreign banks (i.e Banque de l'Indochine and the Compagnie del' Afrique Orientale) were also established (Pankhrust, 1968). In 1931 the Ethiopian government purchased the Abyssinian Bank, which was the dominant bank, and renamed it to the Bank of Ethiopia (Belay, 1987 & Fekadu, 2010). It operated for only a few years, being closed after the Italian invasion. During the Italian occupation, several Italian banks opened branches in Ethiopia (Pankhrust, 1968). After the liberation in 1942, the State Bank of Ethiopia was established. It became operational in 1943. The Bank also acted as the country's main commercial bank, while a few much smaller foreign banks continued to operate.

In 1963, a new banking law split the functions of the State Bank of Ethiopia into central and commercial banking as the National Bank of Ethiopia and the Commercial Bank of Ethiopia respectively. The very interesting part of this law is it allowed other commercial banks to operate (Mattwos, 2016). After the fall of the imperial government in 1974, since the remaining private sector commercial banks were relatively small; they were nationalized and concentrated into the Commercial Bank of Ethiopia (CBE). The new Ethiopian socialist government merely shifted from owning most of the banking system to owning it completely (Pankhrust, 1968).

Fekadu, (2010) states that even after the fall of DERGU regime, the financial sector reforms in Ethiopia do not allow private sector participation in existing government banks, nor do they allow the entry of foreign banks until 1994. 1994 is considered as another turning point in the history of banking business whereby local private commercial banks are allowed to operate in the country. Awash international bank S.C is the first indigenous private commercial bank in Ethiopia, which was established by 486 founder shareholders with a paid-up capital of Birr 24.2 million. It was licensed on November 10, 1994, and started banking operations on February 13, 1995. Currently, the industry comprises one state-owned non-commercial bank which is development bank of Ethiopia and 17 commercial banks, one of which is state-owned, which is the dominant bank in Ethiopia i.e. Commercial Bank of Ethiopia (CBE) (Fekadu, 2010). The private commercial banks currently operating in Ethiopia alphabetically: Abay bank, Addis International Bank, Awash International bank, Bank of Abyssinia, Birhan International bank, Buna International bank, Cooperative bank of Oromia, Dashen bank, Debub global bank, Enat bank, Lion International bank, Nib international bank, Oromia International bank, united bank, Wegagen bank, and Zemen bank (NBE, 2015). Broadly speaking, the banking industry in Ethiopia provides products mainly deposit facilities, loans and advances, local transfers, foreign letter of credit facilities, etc. These are traditional commercial banking businesses (Abdurazak, 2017).

According to Afework, (2015) the introduction of financial innovation began in late 2001, when commercial bank of Ethiopia (CBE) introduced ATM to deliver service to the local users and followed by Dashen bank. By the end of 2008 Wegagen Bank has signed an agreement with Technology Associates, a Kenyan based information technology firm, for the development of the solutions for the payment system and installation of network of ATM. United Bank launch ATM service in collaboration with Awash International Bank and Nib International Bank in the year 2012 later joined by Birhan International Bank, Addis International bank and Cooperative Bank of Oromia. Finally, most of the banks introduce ATM and use the most popular Visa and Master cards in order to access this ATM and POS terminals. In Addition, Dashen Bank launched Ethiopia's first American Express debit card in April, 2016 (Mattwos, 2016).

Binyam (2009), claimed United Bank being the first to introduce telephone and internet banking systems including text messages (SMS) by the end of the year 2008. While Zemen Bank, the only Ethiopian bank anchored in the idea of single branch banking by the time, by launching full-blown internet banking in 2010, which is new to Ethiopian banking industry

(Abdurazak, 2017). As Mattwos (2016) concluded that most banks are not sufficiently adopted the latest e-banking channel such as internet and mobile banking and are using traditional services to reach and serve their clients.

According to Binyam (2009), Agent banking is an innovation type, which targets the rural population to deliver banking services for the unbanked society through technological advancement, using the mobile technology. Agency banking system is not well adopted by Ethiopian banking industry due to lack of suitable legal frameworks, low level of ICT infrastructure, lack of customers trust and awareness towards the technology and customers' fear to use the technologies that holds banking industry to adopt the system (Afework, 2015).

According to Abdurazak, (2017), Dashen Bank S.C pioneered in Agency banking service in December 2014 which named as "Endebank", Followed by United Bank. United Bank started the service on March 1, 2014 named Hibir Agent Banking. Unlike, Hibir Agent banking which is only available through United Bank; Hello Cash is available at LIB, Somali Micro Finance Institution (SMFI) and the Cooperative Bank of Oromia (CBO). Hello Cash is a mobile and agent banking service provided by Lion International Bank S.C in which the bank obtained its license in July 2015 (Afework, 2015). Mobile and agent banking is a form of branchless banking which allows people to access bank accounts and retail outlets of merchants, by using a mobile phone device. Unlike Hibir and Hello Cash, M-Birr, an agent banking service provider, works with five different micro finance institutions, Tigray, Amhara, Oromia, Addis and the Omo micro finance institution. M-Birr, through its 1,547 agents, is a key player in the new game in town. By 2015, it facilitated 273,620 transactions and has served almost 50,000 account holders (Mattwos, 2016).

Financial innovation in Ethiopia banking industry is less developed from regional peers for example Kenya has 5.2 commercial bank branches and 9.5 ATMs per 100,000 adults, in contrast with Ethiopia's 2.0 and 0.3, respectively (World Bank, 2013). There is no clearly established legal system to control the participants in the electronic payment system (Afework, 2015).

According to Binyam (2009), In general, banks in Ethiopia are trailing behind in acquiring the required quality of banking services to effectively compete in the global market. ATM, Credit Card and debit card services, internet banking, mobile banking and other electronic payment systems are at infant stage. The most dominant innovation channel among those banks, which are currently providing the service, is ATM card (Mattewos, 2016). Ayana,

(2012) and Binyam, (2009) Concluded that the benefits of technological innovation are well known to the banks and represent a formidable force to drive adoption and implementation of the system. High customers demand, improvement in the banking habit of the society, late adopter of E-banking in technology in Ethiopia, commitment of the government to facilitate the expansion of ICT infrastructure and commitment of the government to strengthen the banking industry are among the major existing opportunities for the adoption and growth of E-banking technology in the country (Ayana, 2012).

2.2.2. Board size

Regarding the optimal board size the higher the number of directors sitting on the board the largely shared wisdom (Belkhir, 2009). When taking into account the size of the board, there is a trade-off between skill or monitoring benefits and disadvantages arising from the coordination problem.

Theoretically, there is a view that larger boards are better for corporate innovation because they have a range of expertise to help make better decisions, and are harder for a powerful CEO to dominate. From an agency perspective, it can be argued that a larger board is more likely to be watchful for agency problems as large number of boards will be reviewing manager's actions. However, empirical researches have not achieved consensus on the idea that larger boards will be associated with better performance **(**Dalton *et al.*, 1999**)**.

There are studies that support agency theory; for example, Using Ordinary Least Squares (OLS) regression, Uadiale (2010) find a strong positive association between board size and corporate financial performance. By examining the relationships between board demographics and corporate performance in 348 of Australia's largest publicly listed companies, Nicholson and Kiel(2003) also find a positive correlation between board size and firm value. Another finding by Jackling and Johl (2009) suggest that larger board size has a positive impact on performance in the view that greater exposure to the external environment improves access to various resources and thus positively impacts on performance. Furthermore, the finding of the study by Belkhir (2009) conducted on the banking industry is in favor of a positive relation between board size and measures of performance.

Nevertheless there are also studies that their findings favor smaller board size on the contrary to agency theory. Yermack (1996) and Andres *et al*. (2005) find negative relationship between board size and firm performance. Opposite to the notion of agency theory, findings

by Yermack and Andres *et al*. shows that the drawbacks of worse Coordination, flexibility and communication in case of large boards outweighs the benefits of better manager control by the board of directors. As it is generally harder for larger groups to reach an agreement too big board is likely to be less effective in substantive discussion of major issues (Jensen 1986; Litov 2005). In addition as to Williamson (1988), large board size would lead to free-rider problems among directors in their supervision of management.

A smaller board reduces the possibility of free riding, and increase the accountability of, individual directors (Rhoades, et al., 2001*)*. Consistently result of recent study by Rashid *et al.* (2010) also confirms that board size has a significant negative effect on firms' performance under the ROA measure. In case of Ethiopia, as is stated in Article 347 (2) of 1960 commercial code of Ethiopia, a company is required not to have less than three and more than twelve board members. Regarding optimal board size, Jensen (1986) recommends that board size should be limited to seven or eight members.

All in all, from the articles reviewed above even if it seems good to have large board size to secure sufficient expertise on the board and to have greater exposure to the external environment that improves access to various resources, recent preference has leaned towards smaller boards. As supported by empirical research, too big board is less effective, harder to coordinate and discuss, process problems and it may also result in free-riding among directors.

2.2.3. Board Meeting Frequency

Several researchers have examined whether frequency of board meeting is related to better firm innovation with inconsistent results. Vafeas (1999) found out a positive relationship between the frequency of board meetings and corporate performance while Jackling and Johl (2009) and Andres *et al*. (2005) documented that the number of board meetings per year is unrelated to performance. According to Vafeas, a firm's share price decline results the increase of annual board meeting and operating performance is improved following the increment of annual board meeting.

Although the empirical evidence is not conclusive, this study proposes a hypothesis in a sense that more frequent meetings should lead to better firm innovation since it is the most usual occasion to discuss and exchange ideas in order to monitor managers.

2.2.4. Industry Related Qualification of the Board

Higher education of directors in organizational contexts is positively related to receptivity to innovation, creativity, and better strategic decision-making. Existence of qualified directors increases banks performance as they promote corporate image, and demonstrate accountability and credibility within the management team (Andres, *et al*., 2005). By bringing expertise and knowledge, the board plays an important role in formulating and implementing business strategy. Academic papers emphasize experience rather than qualifications (Jackling and Johl, 2009).

A board should consist of directors with diverse business experiences relevant to the firm's existing and future businesses (Andres, *et al*., 2005). Resource dependency theory focuses on the role that directors play in providing or securing essential resources to an organization. Directors can be classified as support specialists such as lawyers, bankers, insurance company representatives', public relations experts and these specialists provide support in their individual specialized field (Jackling and Johl, 2009).

2.2.5. Board Gender Diversity

According to Aljifri and Moustafa (2007) the rationale behind the view of diversity as a positive force within boards builds on the assumption that the existence of multiple and divergent viewpoints within a board will decrease the likelihood that the agenda and initiatives will be dominated by management thus improving the monitoring role of the board. From an agency theory perspective, women often bring fresh perspective on complex issues, and this can help correct informational biases in strategy formulation and problem solving. They have better oversight, display participative leadership which is expected to lead to better innovative outcomes.

According to Beasley (1996) and Belkhir (2009) gender diversity, improves board monitoring because hiring directors from different backgrounds gives a different lens to the firm where the female members can challenge the status quo. A gender-diverse board is more fruitful in its monitoring roles, as women tend to question management practices and challenge conventional wisdom.

According to Dalton et al., (1999) female board directors provide unique perspectives, experiences, and work styles as opposed to their male counterparts, which can greatly

enhance deliberations of the board. These attributes will lead to better performance when combined with female characteristics such as communication and listening skills. Beasley (1996) state female directors can make significant contributions to the board due to their higher quality decision-making capability, which helps better explain the higher rates of return, more effective risk management and even lower rates of bankruptcy.

Aljifri and Moustafa (2007) state that the conflict arising from gender diverse board may slow the decision making process, gender diversity may entail costs in digesting different viewpoints and resolving disagreement. Board diversity may increase the probability of ambiguities, misunderstandings, and decision errors.

2.2.6. Business/ Technology Development Committee

According to Jensen and Meckling (1976), committees exist to manage agency problems among partners and to study and determine major policy issues in a manner that is less costly than when performed jointly by all partner.

The effectiveness of the board is influenced by board committees. The regulatory recommendations and the complexity of bank activities place emphasis on the importance of board committees in banks (Andres et al.2005). And in the Ethiopian context the board shall at a minimum set-up the following three sub-committees; these are audit sub-committee, risk management and compliance sub-committee, and human resource affairs sub-committee. Some banks however, set-up specialized sub-committee called business development or technology development or some others call it innovation sub-committee to oversee innovation in banks by providing support and complement board's decision-making and supervisory functions.

The importance of committees is underpinned as the main influence on boards' most important decisions for the control over management (Davies, 2000). Boards use committee structures to facilitate, evaluate, and ratify long-term investment decisions and to monitor the performance of senior management. Hilman and Dalziel (2003) proposes a committee with specialized roles to enhance the board's performance in its productivity and monitoring. That is, each board committee should specialize in either productivity or monitoring issues. Functional effectiveness to a large extent is connected to the inner workings of the board by various standing board committees which support and complement board's decision-making and supervisory functions (Andres et al.2005).

2.2.7. Ownership Dispersion

Stewardship theory argues that greater ownership concentration can eliminate the agency conflict between owners and management and decrease the costs of management monitoring and leads to improved performance and productivity (Fekadu, 2010). Fama and et al., (2004) states that one corporate governance mechanism for preventing managers from deviating too far from the interests of owners is concentrated ownership. Large investors have the incentives to acquire information and monitor managers. Furthermore, large shareholders can elect their representatives to the board of directors and thwart managerial control of the board of directors. Jensen and Meckling (1976) state that minority shareholders realize that the manager's interests will diverge somewhat from theirs; hence the price which they will pay for shares will reflect the monitoring costs and the effect of the divergence between the manager's interest and theirs.

Fama and et al., (2004); and Fekadu, (2010) argue that widely dispersed ownership reduces the effective power of shareholders to control the management of the firm. They argue that concentrated ownership is better in monitoring management, especially in protecting the rights of weak or limited shareholders. It is argued that concentration may have negative effect leading to expropriation of minorities and poor performance. Large concentration owners may have different interests from the minority and seek to achieve their own interest (Fekadu, 2010).

2.3. Research Gap

According to, In general, Banks in Ethiopia are trailing behind in acquiring the required quality of banking services to effectively compete in the global market. ATM, Credit Card and debit card services, internet banking, mobile banking and other electronic payment systems are at infant stage (Binyam, 2009). Financial innovation in Ethiopia banking industry is less developed from regional peers for example Kenya has 5.2 commercial bank branches and 9.5 ATMs per 100,000 adults, in contrast with Ethiopia's 2.0 and 0.3, respectively (World Bank, 2013). The most dominant innovation channel among those banks, which are currently providing the service, is ATM card (Mattewos, 2016). High customers' demand, improvement in the banking habit of the society, late adoption of E-banking technology in Ethiopia, commitment of the government to facilitate the expansion of ICT infrastructure and

commitment of the government to strengthen the banking industry are among the major factors for the adoption and growth of innovation technology and products in the country (Ayana, 2012).

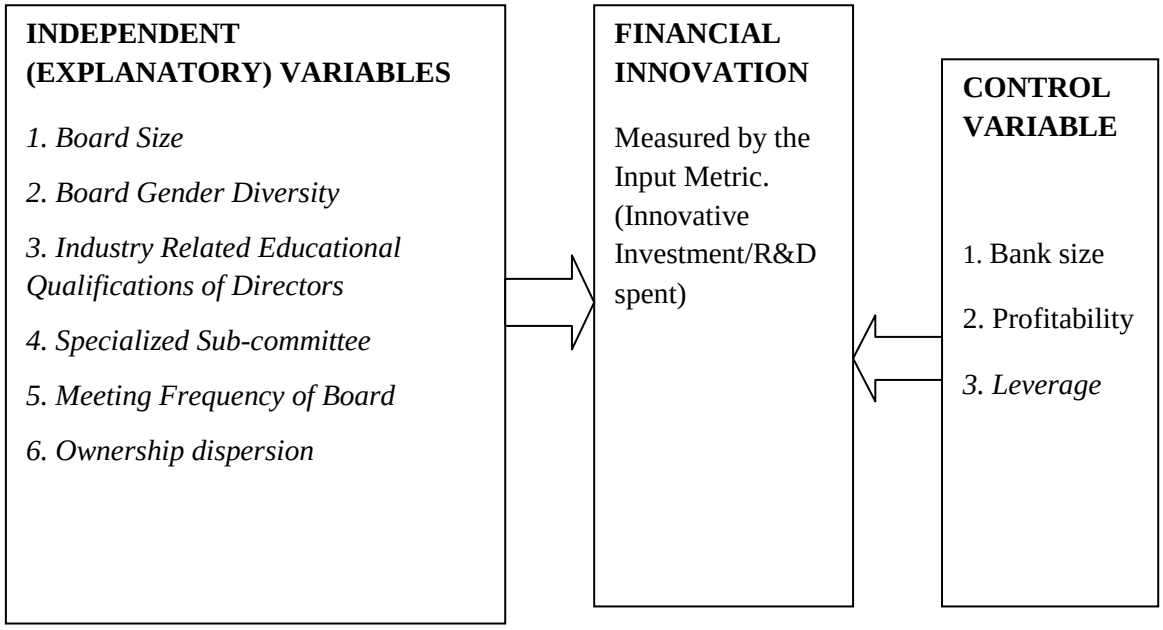
Therefore, despite the undeniable importance of corporate governance in explaining financial innovation, the impact of corporate governance on innovation is still an area of study that has not been researched in Ethiopia.

Past studies conducted on the area of corporate governance have not looked at the cause and effect relationship between corporate governance and financial innovation in commercial banks. For instance, Olani & Getinet, (2015) focus on determinants of the financial performance of commercial banks in Ethiopia from internal corporate governance practice perspective; Ashenafi et.al (2013) focus on corporate governance and impact on bank performance; Abdurazak (2017) focus on corporate governance and its effect on financial performance of the Ethiopian private commercial banks; Kalifa (2012) and Kibrysfaw (2013) studied corporate governance mechanisms and their impact on performance of commercial banks in Ethiopia and Temam (2018) studid the effect of financial innovation on financial performance of commercial banks in Ethiopia. To the best of my knowledge therefore, there is no any research work conducted on the effect of corporate governance mechanisms on firm innovation particularly on the banking industry in Ethiopia. And only few studies were attempted to test agency and stewardship theory simultaneously (Tian and Lau, 2001; Muth and Donaldson, 1998). Moreover, as the literatures reviewed above revealed, findings to date for each internal corporate governance mechanisms (board characteristics (board size, gender composition, meeting frequency, size of committee, and qualification), and share ownership dispersion) are inconclusive.

Therefore, this study attempted to fill these gaps by examining the effect of internal corporate governance mechanisms on adoption of financial innovation by private commercial banks in Ethiopia. The study also attempted to test agency theory and stewardship theory simultaneously.

2.4. Conceptual Framework of the Study

A conceptual framework is a diagram which presents the researchers focal point by showing the relationship between the dependent and independent variables. Thus the study compiled the following diagrammatic framework based on theoretical and empirical literature review in the previous section of this chapter.



Source: extracted from different empirical studies presented above in research gap

Figure 2.1: Conceptual Framework

Chapter Three

Research design and Methodology

This chapter describes the research methodology of this study. Since the aim of the study was to test the effect of internal corporate governance mechanisms specifically board characteristics, and share ownership dispersion on firm's adoption of financial innovation, and therefore, the research design of the study was explanatory research design with a quantitative research approach. Therefore, this chapter describes the participant of the study, method of data collection, the variables used to test the hypothesis and statistical techniques employed to report the results.

3.1. Research Design and Approach

A research design expresses both the structure of the research problem and the plan of investigation used to obtain empirical evidence on the relations of the problem (Kothari, 2005). The primary aim of this study is to examine the effect of corporate governance on adoption of financial innovation by commercial banks in Ethiopia. To achieve this objective explanatory research design with a quantitative research approach is used. Hence, explanatory research design enabled the researcher to examine the effect of corporate governance on adoption of financial innovation by commercial banks in Ethiopia.

3.2. Target Population of the study

Due to financial and time limitations, this study was limited to Ethiopian private commercial banks. A single industry is selected because an empirical analysis focused on companies belonging to the same industry, such as banks, has the advantage that most of the external corporate governance control mechanisms have the same effect on all companies, at least of a certain size, in the industry (Belkhir, 2009).

The study comprises all the sixteen private commercial banks in Ethiopia and this study did not include commercial bank of Ethiopia in the target population. Since commercial bank of Ethiopia is government owned bank, share ownership concentration/dispersion is not an issue and therefore it is excluded in the study. And for the sake of quality this study want to address the whole population and no sampling is required. Due to the fact that the

comprehensive financial innovations in most banks applied from 2013 onwards in Ethiopia and therefore, the study is constrained to the period of 2013-2018 financial data.

The private commercial banks currently operating in Ethiopia are alphabetically: Abay bank, Addis International Bank, Awash bank, Bank of Abyssinia, Birhan International bank, Buna International bank, Cooperative bank of Oromia, Dashen bank, Debub global bank, Enat bank, Lion International bank, Nib international bank, Oromia International bank, united bank, Wegagen bank, and Zemen bank (NBE, 2015).

3.3. Data Collection Instruments

The audited financial reports for all banks included in the study were the basis for obtaining accounting information including total assets, total liabilities and amount and type of innovations and their investment in. Article 359 (1) of 1960 commercial code of Ethiopia required every company to keep at its head office a register of its directors and managers with particulars as to their civil status, profession and any directorship held in other companies, and where the director is a company, the name of the company and the address of its head office (Commercial Code, 1960).

Factual information about board characteristics and share ownership that are not disclosed on the annual reports of companies was collected through questionnaire conducted with each respective company's board secretary, e-banking and share department. Board secretary is chosen as a respondent because he/she is in a better position to know information and access documents about board members qualification or tenure, and board meeting frequency.

3.4. Methods of Data Analysis

The different data gathered from the banks is organized, tabulated, analyzed and interpreted using quantitative methods. This study used descriptive statistics, Pearson correlation analysis and linear multiple regression (inferential statistics) as the underlying statistical tests.

Descriptive analysis shows the average, and standard deviation of the different variables of interest in the study. It is also important to present the minimum and maximum values of the variables considered by this study. In other words, it helps to get a picture about the maximum and minimum values that a variable can achieve. Pearson's Correlation analysis is used merely to observe the direction and magnitude of relations among variables. However, it

doesn't give assurance for causal relation between the dependent variable and independent variables. Inferential statistics is used to test the hypothesis (Brooks, 2008).

This study used regression analysis to test the hypotheses established in chapter one as it is appropriate to describe and evaluate the effect of a given variable and one or more other variables *(*Brooks, 2008). Due to the nature of the data (a 6 year data for 16 banks) the study employed panel data estimation methodology. But the nature of data is unbalanced data type due to age difference in banks, meaning Enat bank is established from 2014 onwards and therefore data of the 2013 is not available. The study used Stata (14) software to analyze financial data. Apart from its advantage of allowing for more data points for analysis, panel data also enables to understand effects that are not detectable in pure cross-section or pure time series data and its control of individual heterogeneity (Brooks, 2008).

Commonly there are three types of panel data analytic models. These are fixed effects models, constant coefficients models (pooled OLS), and random effects models. The former permits independent variables to be endogenous provided that they are correlated only with a time-invariant component of the error, while the other two assumes that independent variables are completely exogenous (have no any correlation with any of the error term) (Brooks, 2008).

The Hausman specification test enables us to differentiate between random and fixed effects models by testing for correlation between the *x* variables and the individual random effects εi. It is a test of strict exogeneity. If there is no correlation, random effects should be used but if correlation exists, fixed-effects should be used (Brooks, 2008). The result of the test shows that there is no correlation between the individual specific time invariant component of the error and the regressors (Prob>chi2 = 0.5467) and hence random effect was selected.

3.5. Model Specification

The specification of the full regression model utilized by this study is given below:

$$INVEST/R\&Dit = \alpha i + \beta_1 BS\ it + \beta_2 BDGD\ it + \beta_3 BMQ\ it + \beta_4 BUS/TECHCOMIT\ it + \beta_5\ _{log}BMF\ it + \beta_6\ _{log}OWNSHP\ it + \beta_7 LVRG\ it + \beta_8\ _{LO} FSIZE\ it + \beta_9 ROA\ it + \varepsilon\ it$$

Where,

- *INVEST/R&Dit* is innovative investment for *i*th firm at time *t*,
- BS *it* is the board size for *i*th firm at time *t*,
- *BDGD it* is board gender diversity for *i*th firm at time *t*,
- *logBMF it* is the board meeting frequency for *i*th firm at time *t*,
- *BMQ it* is the board members industry related qualification *for i*th firm at time *t*,
- *BUS/TECHCOMIT it* is the existence of special committee called business / technology development committee for *i*th firm at time *t*,
- *logOWNSHP it* is the share ownership dispersion *for i*th firm at time *t*,
- *LVRG it is* the leverage for *i*th firm at time *t*,
- logFSIZE *it* is the firm size for *ith* firm at time *t*,
- ROA *it* is the firm profitability for *ith* firm at time *t*,
- α_i is the intercept, β_i is the regression coefficient of *i*th variable and ε_{it} is the composite error terms, and
- The subscript *i* represents the different firms and *t* represents the different years.

The constant α_i represents unobservable individual firm-specific effects which differ between firms and are time invariant (Cameron and Trivedi, 2009). In fixed-effect model, αi is allowed to be correlated with the regressor that allows a limited form of endogeneity (Cameron and Trivedi, 2009). Under fixed effect model the error term is viewed as $ui = (\alpha i + \varepsilon it)$ and regressors are permitted to be correlated with time-invariant component of the error (αi) but not with the idiosyncratic error (εit). In random effects model, however, it is assumed that αi is purely random, which is uncorrelated with the errors of the regressor variables (Cameron and Trivedi, 2009).

3.6. Definition of the Variables and Measurement

This study undertakes the issue of identifying key variables. Choice of the variables is influenced by the previous studies on internal corporate governance control mechanisms. All the variables stated below have been used to test the hypotheses of this study. They include dependent, independent and some control variables:

3.6.1. *Dependent Variable: Firm innovation*

There is no single ideal measure of firm innovativeness (Barker and Mueller, 2002). Input based measures (R&D spent, the number of innovation projects started, the number of new ideas in the pipeline, the number of new employees in R&D) are viewed as somewhat more robust measure of innovation which is used for measuring your investments in terms of money, time or talent devoted to a specific activity related to innovation management (Barker and Mueller, 2002). Measuring inputs is a great way to gain insight in to how your resource allocation or innovation portfolio matches your strategy and can be considered also to cover metrics regarding the process itself as how many ideas are passing through to a certain phase.(b) The other end of the spectrum is output metrics (number of new products launched in X amount of time, ROI of innovation activities, and actual vs. targeted breakeven time for new products) which measures the results your innovation investment have yielded and indicate if your investments are actually turning into something useful (Alegre-Vidal et al., 2004; Coombs et al., 1996).

But innovation in financial institutions in general and banks in particular are divers and includes new products, processes and services which makes all inclusive measurement of output of innovation difficult, if not impossible . So the input measures of innovation specifically innovative investment/R&D spent is used in this study. This choice is based on different reasons (Becheikh et al., 2006). First R&D is seen as a necessary condition to innovate, since R&D enhances the capacity of firms to innovate, is frequently recognized as one of the most relevant inputs for innovation, and is a starting point for its analysis (Barker and Mueller, 2002; Johannessen et al., 2001). Second, different aspects related to R&D activities have been frequently used as an innovation indicator; for example, R&D expenses or R&D intensity are used to measure the efforts made by companies to innovate, the number of registered patents, obtained as a result of R&D activities, serves as measure or innovation outcomes (Alegre-Vidal et al., 2004; Coombs et al., 1996). Third, many companies organize their innovation activities through R&D departments in charge of finding new uses for the existent products, improving their fabrication processes, and analyzing the novelties of the competences (Becheikh et al., 2006).

3.6.2. Independent Variables

a. Board Size

Agency theorists argue that a larger board is more likely to be watchful for agency problem as a greater number of people are reviewing management actions (Jensen, 1986). A larger board is also assumed to bring a greater opportunity for more links and greater access to resources will result from more links. From stewardship theory perspective, however, it is not the size of the total board that matters but the size of insiders in the board because inside directors are assumed to bring superior information to the board on decisions (Jensen, 1986). Considering agency theory, the study expects board size has a significant and positive effect on adoption of financial innovation by commercial banks.

b. ***Board Gender Diversity***

It is one of the proxies used for the corporate governance and it will be measured as the percentage of number of female directors divided by the total number of board members. Board gender diversity is considered to improve company performance since it provides new insights and perspectives (Belkhir, 2008). Female board members will bring diverse viewpoints to the boardroom that is not possible with all male directors (Jensen, 1986). The study expects board gender diversity has a significant and positive effect on adoption of financial innovation by commercial banks.

c. Board Meeting Frequency

The number of board's meeting per year (BMF) reflects how much involvement that the board contributes in monitoring and advising as the board has rights to decide on important issues and supervise the management (Jensen, 1986). Thus, a proper frequency of board meetings may enhance the watchfulness and oversight of firm management and adds to firm innovation (Belkhir, 2008). The study expects board meeting frequency has a significant and positive effect on banks adoption of financial innovation.

d. Industry related Qualification of Board Members

Measured as the proportion of board members who had college degree or higher in either of the fields of finance, accounting, economics, banking, auditing, business administration, law, information technology, investment management to the total board members (NBE SBB/70/2019). The study expects industry related educational qualification has a significant and positive effect on banks adoption of financial innovation.

e. Business/Technology Development Committee

It conceders the existence of specialized sub-committee called business/technology development committee to oversee the innovation effectiveness of private commercial banks. It is a dummy variable which is equal to one (1) if there is business/technology development committee, otherwise zero (0). The study expects that existence of specialized sub-committee on innovation has a significant and positive impact on adoption of financial innovation.

f. Ownership Dispersion

It Measures the share ownership dispersion of banks in a given year and its effect on the firm innovativeness. It is measured by the log number of shares in a bank within a given year. The study expects that share ownership dispersion has a significant but negative effect on banks adoption of financial innovation.

3.7.3 Control Variables

The model in this study control for three possible factors that could influence firm innovation, in addition to board characteristics (including board size, board gender diversity, board members qualification, existence of business/technology sub-committee on innovation and board meeting frequency), and share ownership dispersion. These control variables are (1) Firm size measured using the natural log of assets, (2) Firm profitability measured as return on asset of a company.

3) Leverage of firms in this study is measured by debt ratio. Debt ratio (*LEVER*) is the percentage of total book value of debt to total book value of assets (McKnight and Weir, 2009; Rashid *et al*., 2010). It measures the extent to which a firm relies on creditors for funding.

The firm size (proxy as logarithm of total assets) is established to have an effect on firm innovation. However, the effect of firm size on firm innovativeness could be ambiguous. On one way larger firms seem less efficient than smaller firms as they may encounter more government bureaucracy, bigger agency problems and so on. On the other way, large firms may turn out to be more efficient as they are likely to exploit economies of scale, employ more skilled managers and get market power.

Fama and Jensen (1983) argue that profitability of firms enhances innovation. So, profitable firms are better than non profitable once in innovation. Given the possible influences of firm

profitability on organizational innovation, it was included as a control variable. Profitability was measured as the return on asset (ROA) of a firm.

Table 3.1: Variables' Definition and Measurement

Variable	**Measurement and Operationalization**
logINVEST/R&D	Firm innovation is measured using natural log of innovation investment/R&D spent.
BS	The total number of directors on the board of the firm.
BDGD	Percentage of female directors over total board members
LogBMF	Natural log of total number of board meetings per year
BMQ	Percentage of board members who had industry related college degree or higher over total number of board members
BUS/TECHCOMIT	Existence of business/technology sub-committee on innovation in the board
LogOWNSHP	Natural log of total shares ownership of the bank
LVRG	Is expressed as the debt ratio; (total debt/total assets
LogFSIZE	Natural log of total assets.
ROA	Return on asset as a measure of profitability of a firm which is net income divided by total asset

Source; own construction from model specification

Chapter Four

Data Analysis and Discussion

The analysis of the effect of internal corporate governance mechanisms on firm innovation variables is discussed in this chapter using the data from the population. Descriptive statistics is the first step in the analysis, which shows the average, and standard deviation of the different variables of interest in the study. It also presents the minimum and maximum values of the variables which help in getting a picture about the maximum and minimum values a variable can achieve over the period 2013-2018. Pearson correlation is used to see the simple relationship between variables that is between and among internal corporate governance mechanisms and innovative investment of banks. Finally panel data regression is used to test the hypothesis.

4.1. General Description of Data

Table 4.1 below provides descriptive statistics on the internal corporate governance mechanisms such as board characteristics and share ownership dispersion and innovation of all the private commercial banks in Ethiopia over the period 2013-2018. The explanatory variables are board size, board gender diversity, board members industry related qualification, board meeting frequency, existence of business/technology development committee and share ownership dispersion. The dependant variable is firm's innovation proxied by loginvest/R&D. firm size, leverage and profitability are control variables of the study.

As per the table, average firm financial innovation measured by Invest/R&D is Br.186.23 million ranging from 0 to Br. 1,091.21 millions. This shows that, there are banks with innovation investment of Br. 1,091,210,000 and there are other banks with no innovation investment in a given year. But the average investment being Br.186,230,000. As compared to the mean value, the standard deviation of Br. 231.67 million shows that there is much variation on innovation investment among the private commercial banks in Ethiopia. The cross sections or the number of panels in this study are 16 these are all the 16 private commercial banks over 6 year time. Enat bank has started its operation in the year 2014, and this make the panel to be unbalanced with 95 observations.

Table 4.1: Descriptive Statistics

VARIABLE	*OBS*	*MEAN*	*STD. DEV.*	*MIN*	*MAX*
INVEST/R&D	*95*	*186.2319*	*231.6693*	*0*	*1091.21*
BS	*95*	*10.1125*	*1.1473*	*9*	*12*
BDGD	*95*	*.168485*	*.1451821*	*0*	*.5454*
BMQ	*95*	*.6204375*	*.2493971*	*.3333*	*100*
BUS/TECHCOMIT	*95*	*.4421053*	*.4992716*	*0*	*1*
BMF	*95*	*22.9875*	*10.46331*	*12*	*48*
OWNSHP	*95*	*8790.962*	*5342.466*	*1291*	*19620*
ROA	*95*	*4.466*	*3.603799*	*1.66*	*21.2*
LVRG	*95*	*.4708248*	*.498107*	*.3985*	*63.35*
SIZE	*95*	13462.79	11117.8	969	55268

Source; Stata version 14 Output, 2019.

Note; *INVEST/R&D= innovation investment/ research and development spent, BS=board size, BDGD= board gender diversity, BMQ= board members industry related qualification, BUS/TECHCOMIT= existence business/technology development sub-committee on innovation in the bank, BMF= board meeting frequency, OWNSHP= share ownership dispersion, ROA= return on asset of a firm, LVRG= leverage of a firm, SIZE= the asset size of a firm.*

The average board size of the Ethiopian private banks used in this study is 10 (10.1125). As the table shows the minimum board size is 9 while the maximum is 12. This number is in agreement with the 1960 commercial code of the country, in which the board size is required to be between 3 and 12; Even if, banking sector share companies shall have at least nine board of directors as per licensing and supervision of banking business corporate governance directives no.sbb/70/2019 which complied with the average of the result of the study. The average board size of 10 members of this study is also consistent with optimal board size 8-10 recommended by Jensen (1993). Furthermore, this figure is comparable to the average board size of 20 Nigerian firms, which is 9 (Amidu, 2007).

The average proportion of female board of directors as measured in terms of the proportion of female board members to the total board size was 16.85% (0.1685) having a minimum of zero percent (which is against the licensing and supervision of banking business corporate governance directives no.sbb/70/2019 of the national bank stating that the board shall comprise of female directors provided that eligible candidates are available) and a maximum

of 54.54%. The standard deviation of the proportion of female board of directors among share companies was 14.52% indicating high dispersion of females' involvement in the board of directors' role in companies' corporate governance.

The proportion of female directors in Ethiopian private banks is lower than what is required by some other countries. As the finding of Nicholson, et al., (2008) indicates, Indonesia requires at least 30% of the total number of board members to be female directors; Korea requires 25% of board members to be female directors; Malaysia requires one-third of board members to be female directors; and Thailand require at least two board members to be female directors. According to Rashid (2010), to be optimal, the board should contain proportion of female directors between 30 and 50 percent. In this study the mean proportion of female directors on the board (16.85%) is below the optimal point.

Turning to the mean value of board members industry related educational qualification, As per licensing and supervision of banking business corporate governance directives no.sbb/70/2019, a board may preferably comprise of directors who has core competencies such as banking, finance, accounting, management, economics, legal, business administration, auditing, information technology, investment management. As measured by proportions of directors holding industry related college degree or higher, the average is about 62.04% with the minimum of 33.33% and maximum of 100%. This implies that directors of the private commercial banks possess the necessary industry related educational qualification. The proportions of board members industry related educational qualifications shows 24.94% standard deviation which is more or less high variation as evidenced by the minimum and maximum values of 33.33% and 100%

When we see the existence of business/technology development sub-committee also some others call it innovation sub-committee, about 44% (0.442) of Ethiopian private commercial banks have business/technology development sub-committee on the board. This sub-committee is a dummy variable. A maximum of 1 shows that there are private commercial banks with business/technology development sub-committee on innovation in the board and a minimum of 0 shows that there are banks that have no innovation sub-committee in Ethiopian private commercial banks. The national bank directive recommends that for effective corporate governance the number of committees shall be a minimum of 3. In case of Ethiopian private commercial banks, the practice of having variety size of board subcommittee on the board is improving from time to time. As observed at data collection

time some banks have 6 committees, but some others have the minimum requirement three. Since increasing variety number of board sub-committee's increases the monitoring as well as controlling ability of the board, it also enhances the quality of corporate governance.

Average of frequency of board meetings positioned to 22.99 times per the considered financial year, and the sample firms held the range from 12 to 48 board meetings during the year with a standard deviation of 10.46. In addition to the standard deviation (10.46), the minimum (12) and maximum (48) values of meeting frequency reveals that there is a broad range of variation in the private banks meeting frequency. The national bank directive recommends that for effective corporate governance the number of board meetings shall be to a minimum of once in a month.

The average of share ownership dispersion (OWNSHP) as measured in terms of the total share of the companies was 8,790.96 having a minimum of 1,291 and a maximum of 19,620 shares. The standard deviation of the companies share size was 5342.47 which indicate that the share ownership dispersion is highly variable among banks considering the minimum and maximum size and also the standard deviation value.

When we come to the control variables the average profitability/ROA of the share companies/ banks is 4.46 ranging from a minimum of 1.66 to a maximum of 21.2. The coefficient of variation on the return on asset variable shows that, there is high profitability variation (3.60 coefficient of variation). The average of leverage ratio (LVRG) shows 47.1% with a minimum value of 39.85% and a maximum value of 63.35%. And the standard deviation is 49.81% indicating high dispersion of the leverage of companies from the average value. The average size of the share companies as measured in terms of total asset is Br. 13,462.79 million (13,462,790,000) having a minimum value of Br.969 million and maximum value of Br. 55,268 million. The standard deviation of share companies size is Br.11,117.8 million which indicates that high size variation among the share companies.

4.2. Correlation Coefficient

Table 4.2 below provides the correlation matrix between the variables employed by this study to identify the effect of the corporate governance practice variables on the innovation investment of companies. The sample includes 95 observations over the period 2013-2018. It is 95 observations because of Enat bank is established from 2014 onwards and do not have 2013 year data.

The correlation table generally reveals the extent and direction of the linear relationship between corporate governance practice variables proxy by BS=board size, BDGD= board gender diversity, BMQ= board members industry related qualification, BUS/TECHCOMIT= existence of business/technology development sub-committee on innovation in the bank, log BMF= log number of board meeting frequency, log OWNSHP= log number of share ownership dispersion and the innovation investment variable of private banks proxy by (log invest/R&D) for the period of 2013-2018. As the correlation table reveals the innovation investment variable (log invest/R&D) is positively correlated with the board size, board gender diversity, board members industry related qualification, existence of business/technology development sub-committee, log of board meeting frequency, profitability/ROA and log of firm size, and they are negatively correlated with log of share ownership dispersion and leverage.

As revealed in table 4.2, log of innovation investment/R&D spent is positively and significantly related with board size, business/technology development sub-committee and return on asset at 1% significance level. It is also positively and significantly related with board members industry related qualification, log number of board meeting frequency and log number of firm size at 5% significance level. Meaning that the greater the number of board of directors and committee size the more they actively involves and actually tends to increase firm's financial innovation. Or in other words it indicates that number of directors has impact on firms' strategic choices and hence on firm innovativeness.

Table 4.2: Person's correlation analysis

	Loginvet	*Bs*	*Bdgd*	*Bmq*	*Spcomit*	*logBmf*	*Logown~p*	*Roa*	*Lvrg*	*Ls*
Loginvest	1.0000									
Bs	0.5631***	1.0000								
Bdgd	0.2426	0.3068*	1.0000							
Bmq	0.5439**	0.1875	0.1779***	1.0000						
Spcomit	0.3701***	0.5620	0.3519***	0.3917***	1.0000					
LogBmf	0.4926**	0.6599***	0.1718	0.3652	0.5806*	1.0000				
Logownshp	-0.5189**	-0.2178	0.1659***	-0.6610	-0.3322	-0.3369	1.0000			
Roa	0.0056***	0.0403	-0.2503	0.2589 ***	-0.0392 **	-0.2464	-0.1612 ***	1.0000		
Lvrg	-0.4833	-0.4152	0.1579	0.3149	-0.3632	0.4432	-0.4056	0.5672***	1.0000	
Logsize	0.6840**	0.4953**	0.0667	0.4827***	0.5198*	0.5901**	-0.6389	0.6670***	0.6707 ***	1 0

Source; Stata version 14 Output, 2019.

*N= 95; *P<0.1; **p<0.05; ***p<0.01, *, **, *** indicates that the significance levels at 10%, 5% and 1% respectively.*

From an agency perspective, innovative firms require a greater number of directors to monitor and control a firm's activities. This is supported by this study as there is strong correlation (P value: 0.000< 0.01) between financial innovation and the size of the board. Innovative firms are also identified to have more frequent meeting than none innovative once. It may be because it is difficult for large group to reach an agreement with short period. Log number of meeting frequency is significantly and positively related with log number of innovative investment at 5% significance level. That is innovative firms have more frequent meeting than non-innovative to inculcate ideas and reach an agreement. It is also significantly (at 1%) and (at 5%) and positively correlated with return on asset and firm size respectively. This may be because the decisions to be made by profitable and large firms are more innovative than non profitable and small firms; due to their strong financial condition and economy of scale. But financial innovation is unrelated to the board gender diversity and leverage of companies.

In addition, financial innovation is significantly (at 5% significance level) but negatively correlated with share ownership dispersion of banks. This may be due to the fact that concentrated firms are owned by institution owners and large block share holders that have a

greater feeling of real company ownership and will not demand periodic dividend to be paid rather may prefer the profit to be retained and aspires the future company growth.

When we come to board size it is positively and significantly related to the board gender diversity, log number of board meeting frequency and company size. From an agency perspective, larger companies require a greater number of directors to monitor and control a firm's activities. This is supported by this study as there is strong correlation (P value: 0.0369< 0.05) between the size of the board and company size. Large board size is also identified to have more frequent meeting than boards having small size. It may be because it is difficult for large group to reach an agreement with short period. And as the size of the board increase its chance to include female directors also increase as evidenced by a p value of 0.071 at 10% significance level.

As can be seen from table 4.2, existence of business/technology development sub-committee on innovation is positively and significantly related with meeting frequency, ROA of the companies, and size of the companies. Which shows that as the size, profitability of firm's and meeting frequency increases use of the number of committees also increase to discus agendas at committee level as issues become more complex and require specialization of boards. The number of board meeting frequency is also significantly (at 5%) and positively correlated with firm size. This may be because the decisions to be made by large firms are more complex that needs more time than small firms do. But board meeting frequency is unrelated to the share ownership dispersion, and leverage of companies. Finally, the control variable profitability (ROA) has notably significant positive correlation with firm size and leverage. But has negative and significant correlation with share number or share dispersion.

Khatab, et al., (2011), argue that where one specific corporate governance mechanism is used less; others may be used more, resulting in equally good performance. But this is not supported by this study as Pearson correlation shows there is no substitution effect among corporate governance mechanisms.

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4.3. Estimation Method and Test of OLS Assumptions

As the data used is a six year unbalanced data of 16 private commercial banks, panel data methodology is appropriate. A panel data are repeated measurements at different points in time on the same individual level (such as private banks in this case) (Cameron and Trivedi, 2009). Regression can then capture both variations over private banks and variations over time. There are different linear models for panel data with different assumptions.

To choose among these available linear panel models for this study, different tests are applied. To choose between fixed and random effect models Hausman specification test is used. The result of the test shows that the unobserved time-invariant firm level heterogeneities are not correlated with the independent variables employed in the study (board characteristics, and share ownership dispersion) (Cameron& Trivedi, 2009). The null hypothesis of the test was the random effect method is the preferred regression method and the result on the model shows that the p-value of hausman specification test is greater than 5% (0.54) (see table 4.11 at the appendix). So, based on hausman specification test random effect is appropriate. Thus, random effect regression analysis is used in STATA (Windows 14.0 version) to test the hypotheses. The main results of the regression outcomes are presented in Table 4.8. A robust regression (using the command 'rreg') is performed in order to verify whether OLS findings are affected by outlier observations but there is no notable difference between the results of the two regression methods (see table 4.10 at the appendix). So, regression estimates are consistent, outlier is not a major issue. Therefore, random effect estimation is employed without the need of robust regression.

5.

Before conducting the main analyses, the assumptions for multiple regression analysis are checked. Multiple regressions are subject to several important assumptions of classical linear regression model (CLRM) (Brooks, 2008). Among these the study tests heteroskedasticity, normality of residuals, autocorrelation, functional form test, and multi-collinearity.

Normality Test

The assumption of normality requires the disturbance to be normally distributed around the mean. This test has been conducted statistically using the Shapiro-Wilk W normality test which is best performed for non aggregated data like that of panel data. As a rule of thumb, the null hypothesis of the approach is; the data is normally distributed (Cameron& Trivedi, 2009). Hence for not to reject the null hypothesis of normality at the 5% significance level, the probability value of Shapiro-Wilk normality test should be greater than 0.05 or the W and

V value should be small (Cameron& Trivedi, 2009). Checking for normality of the residuals from the panel random effect regression, using the Shapiro–Wilk test, shows that the null hypothesis that the residuals are normally distributed have to be accepted (p=0.42783). It reveals that the disturbance term (the error term) is normally distributed. So it can be concluded that tha model has no normality problem.

Table 4.3: Shapiro-Wilk test for normal data

Variable	Obs	W	V	Z	Prob>Z
r	95	0.98417	1.087	0.182	0.42783

In addition, graphical test for normality (Kernel Density Estimate) is employed and normality is identified as not a problem.

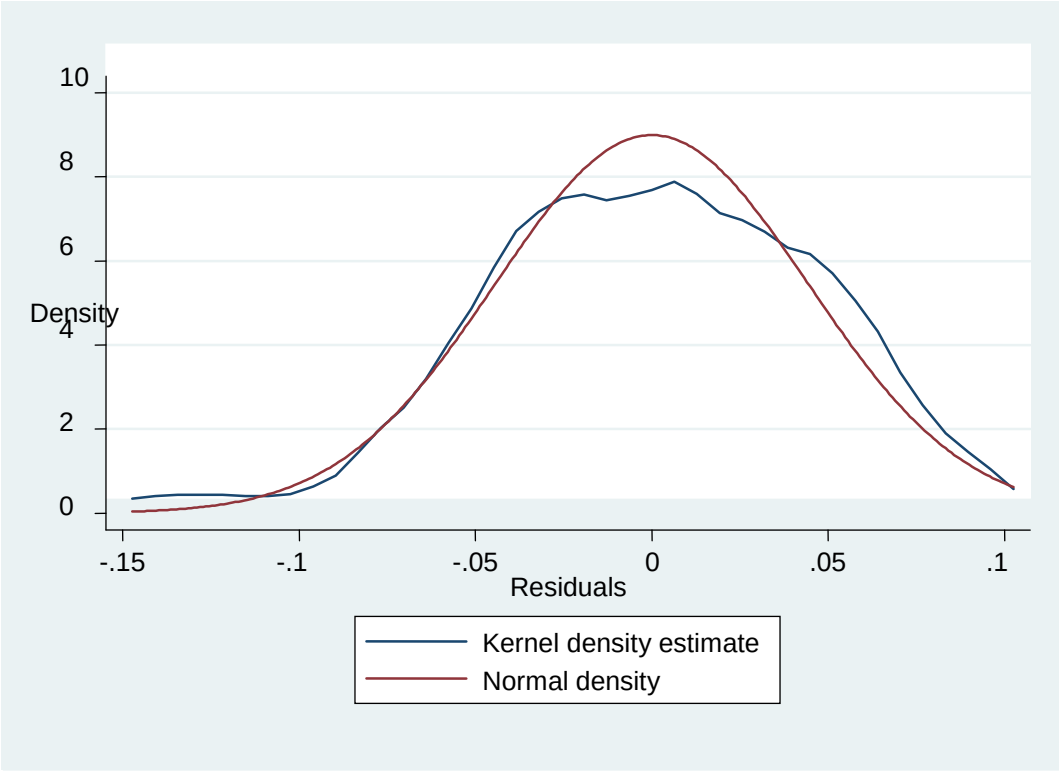

Figure 4.1. Normality test

Heteroskedasticity Test

According to Brooks, (2008), it has been assumed that the variance of the disturbance term is constant, σ2; this is known as the assumption of homoscedasticity. If the disturbances do not have a constant variance, they are said to be hetroscedastic. Consequence of proceeding with the existence of hetroscedasticity is that, the OLS estimators will give unbiased coefficient estimates, but are no longer be BLUE meaning they no longer have the minimum variance among the class of unbiased estimators (Cameron& Trivedi, 2009). So, Breusch Pagan / Cook-Weisberg test is used to detect the existence of heteroskedasticity. The rejection criteria of the test is the probability of the chi2 must be greater than 0.05 to not reject the null hypothesis of constant variance. Results of Breusch Pagan heteroskedasticity test do not reject the null hypothesis of constant variance error term as prob>chi2: 0.1407> 0.05 in the Model.

Table: 4.4. Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables:	chi2(1)	Prob > chi2
Fitted values of loginvest	2.17	0.1407

Since results of the model is above 0.05 (the cutting point), there is no problem of heteroskedasticity in the model.

Multicollinearity Test

An implicit assumption that is made when using the OLS estimation method is that the explanatory variables are not correlated with one another (Brooks, 2008). If there is no relationship between the explanatory variables, they are said to be orthogonal to one another. If the explanatory variables were orthogonal to one another, adding or removing a variable from a regression equation would not cause to change on the value of the coefficients of the other variables (Brooks, 2008).

According to brooks (2008), in any practical context, the correlation between explanatory variables will not be zero, although this will generally be relatively being in the sense that a small degree of association between explanatory variables will almost always occur but will not cause too much loss of precision. However, a problem occurs when the explanatory

variables are highly correlated with each other. An arbitrary rule of thumb has been established conservatively to tolerate simple correlation between explanatory variables to be smaller than 0.7 (Brooks, 2008). Multicollinearity is also checked by using variance inflation factors (VIFs). The rule of thumb for VIF values to tolerate simple correlation between explanatory variables is a VIF value less than 10 (Brooks, 2008). The multicollinearity result were less than 10 for all the variables included in the regression model. These VIF values as shown in the table below indicates that multicollinearity is not a serious problem for this analysis as the VIF values are below the recommended cutoff of 10 (Brooks, 2008).

Table 4.5; VIF Results to check multicollinearity

Variable	VIF	1/VIF
Bmq	3.00	0.333419
Logownshp	2.83	0.352823
Bs	2.72	0.368268
Bus/techcom	2.63	0.380425
Loginvest	2.26	0.443201
Logbmf	2.03	0.492562
Bdgd	1.72	0.582664
Lvrg	1.49	0.673150
Roa	1.35	0.742249
Mean VIF	2.22	

Regarding the correlation matrix, table 4.2 shows that the highest degree of correlations is between board size (BS) and log board meeting frequency (log Bmf), board members industry related qualification(BMQ) and log of share ownership dispersion(log Ownshp), and log number of size (logsize) and ROA with the maximum correlation matrix of 66%. Brooks, (2008) suggested that collinearity should not be considered harmful unless the correlation coefficient exceeds 0.7. Since the highest Pearson correlation in this study is below the cut-off point of 0.70 suggested by Brooks, Multicollinearity does not appear to be a serious problem in interpreting the regression results.

Functional form Test

To test the functional form of the conditional mean, Ramsey RESET test is applied by this study. This is the RESET test resulted from the estat ovtest post estimation command. The null hypothesis of the test says that there is no omitted variable in the linear relationship in the model. The rule of thumb to accept or to not reject the null is the probability of F-value shall be greater than 0.05 cut off point (Brooks, 2008). The result of the test shows that the null hypothesis that there is no omitted variable is accepted in the model since the probability of F-value 0.59 is greater than 0.05.

Table: 4.6. Ramsey RESET test

Ho: model has no omitted variables

Ramsey test	F(3, 82)	Prob > F
using powers of the fitted values of logInvest	0.63	0.5974

Test of Autocorrelation (Serial Correlation)

This assumption test will be conducted when the errors are linearly independent of one another or uncorrelated with one another. If the errors are correlated with one another, it would be stated that they are auto correlated (serially correlated) (Brooks, 2008).Therefore to conduct test of this assumption, the first test was Durbin-Watson (D-W test). However the normal version of this test supposes that the panel data is balanced or equally spaced. Due to its limitation *Baltagi and Wu* (1999) modifies this statistic to account for unbalanced panels or unequally spaced data (*Baltagi and Wu*, 1999). According to Brooks (2008), if the DW test approaches to 2, it is an indication of no autocorrelation. But if the value of the test is 0, it implies the existence of perfect positive autocorrelation. On the other hand if the value approaches 4 there is perfect negative autocorrelation. The result of the test shown in the regression output of the model below implies that the null hypotheses were not rejected for the model so there is no problem of autocorrelation.

Modified Bhargava et al. Durbin-Watson = 1.894264

Baltagi-Wu LBI = 2.1412171

The Modified Bhargava et al. Durbin Watson and Baltagi-Wu LBI test results are 1.89 and 2.14 respectively. Both results approach to 2, these imply that there is no autocorrelation problem in the model. Therefore, the study has no evidence to reject the null hypothesis of no autocorrelation.

However, D-W tests only for a relationship between an error and its immediate previous value. Therefore, in addition to D-W test it is desirable to conduct Breusch Godfrey Serial Correlation LM test to examine a joint test for autocorrelation that will allow examination of the relationship between error term and several of its lagged values at the same time (Brooks, 2008). Thus, Breusch-Godfrey test was also conducted for the model and found no problem of autocorrelation for the model, meaning that p-value of the test resulted 0.21 which is greater than 0.05.

Table 4.7: Autocorrelation Test - Breusch-Godfrey Serial Correlation LM Test

H0: no serial or first-order autocorrelation

	F Statistic	Prob>F
Model	1.58100723518	0.213822630

Moreover, according to Brooks (2008), serial correlation is a problem for macro-panels not micro panels (few years and large number of cases). So autocorrelation is not a major problem in this study.

4.4. Discussion on Regression Result and Hypothesis Testing

This section presents the empirical findings from the econometric regression results of relationship between independent variables and financial innovation measure (R&D cost spent). The previous sections present the output of different tests and appropriate model selections. And in this section detail discussion would be presented and the implied questions posed from hypothesis would be illuminated sufficiently.

Table 4.8: Random Effect Regression Result

Loginvest	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
Bs	.7271212	.1654495	4.39	0.000	.3982184	1.056024
Bus/techcomit	.7448108	.2844861	2.62	0.010	1.31035	.1792711
Bdgd	.7697527	.691773	1.11	0.269	-.6056773	2.145183
Bmq	3.501368	1.377048	2.54	0.013	.7638859	6.238849
Logbmf	3.180839	1.509843	2.11	0.038	.1821603	6.179518
Logownshp	-2.961047	1.196066	-2.48	0.015	-5.337605	-.5844893
Roa	.2282284	.0739011	3.09	0.003	.0812931	.3751637
Lvrg	-3.322951	3.063743	-1.08	0.281	-9.413471	2.767569
Logsize	3.212385	1.413728	2.27	0.026	.4019875	6.022783
_cons	7.435107	5.720886	1.30	0.197	-3.932172	18.80239
Number of obs = 95						
F(9, 85) = 17.33						
Prob > F = 0.0000						
R-squared = 0.6573						
Adj R-squared = 0.6214						

Source; Stata version 14 Output, 2019.

As can be seen from table 4.8 the regressors' are jointly statistically significant, because the overall F static of 17.33 for the Model has P value of 0.000. In other words, independent variables (board characteristics and share ownership dispersion) are jointly capable of explaining the dependent variable (financial innovation in this case). At the same time, much of the variation of dependant variable (financial innovation in this case) is explained by the independent variables (board characteristics and share ownership dispersion) with R-squared of 65.73% and adj R-squared of 62.14% in the model as a measure of goodness of fit test.

According to the regression results provided in table 4.8 above among the nine regressors used in the study as independent variable including the control variables seven are statistically significant. Among those significant variables two variables are significant at 1% significance level, while the rest five are significant at 5% significance level.

Further the table shows that the two predictor variables are insignificant even at 10% significance level. Depending on this regression result detail discussion has been presented in the next section.

4.4.1. Board Size

One regressor of the model is board size and which is the commonly referred one in corporate governance and the discussion of the findings of the study and its implication is given as follows.

H1a*: (stewardship theory). Board size has a significant and negative effect on financial innovation.*

H1b*: (*agency theory*). Board size has a significant and positive effect on financial innovation.*

Among the variables to be tested in the hypothesis, one was board size (BS). According to table 4.8, the random effect estimation result shows that board size has significant and positive impact on financial innovation of companies (with a P value of: 0.000 < 0.01). This means larger boards are more efficient than the smaller once and so lead to better financial innovativeness. The coefficient of the variable is 0.7271, which means other variables remain constant, on average when total board size increase by 1 person, firm innovation investment increases approximately by 73%. This is lin-log model of relationship between independent and dependent variable.

Thus, agency theory which argues that a larger board is more likely to be watchful for agency problems as large number of boards will be reviewing manager's actions (as it provide more monitoring resources) and so increases firm performance and then innovativeness is supported. It may be because as the study of Davies, (2000) shows, the size of the board should be large enough to secure sufficient expertise on the board with a variety of experience and core competence to make effective judgment on the management's performance objectively but not so large that productive discussion is impossible and free-riding among directors is prevalent.

The findings support prior studies such as Amidu (2007) and Uadiale (2010), as their finding indicates that larger boards are significantly positively associated with firm performance. It also supports Vefeas (1999), who concluded that increases in board size are found to be positively associated with financial performance of Turkish firms and annual stock returns.

However, the result contrasts with the earlier work of Yermack (1996), Andres *et al*. (2005), Jensen (1986), Davies, (2000), and Hermalin and Weisbach (2001). These authors found

inverse association between board size and firm performance. Some of them also suggest about the optimal size of the board. For example Jensen (1986), suggests that board size around eight is optimal.

The Ethiopian commercial code under article 347(2) stated an incorporated body should have a minimum of 3 and a maximum of 12 board of directors and the national bank of Ethiopia newly issued corporate governance directive specify the size of the board to be at least nine in banking and insurance companies and seven in microfinance sector. And the directive also directs and advises company board members to have different skills and expertise which is consistent with the regression result of the model as board size increase performance and then innovativeness also increase.

Overall, the result is not in support of the hypothesis (*H1a*) that board size has negatively effect on adoption of financial innovation. It is consistent with the agency theory which argues that a larger board is more likely to be watchful for agency problems as large number of boards will be reviewing manager's actions (as it provide more monitoring resources) and so increases firm performance and then innovativeness.

4.4.2. Existence of business/technology development sub-committee

H5: (agency theory). Special sub-committee on innovation called business/technology development committee has a significant and positive effect on adoption of financial innovations.

The coefficient parameter (β) for business/technology development committee on innovation is 0.7448 with p-value of 0.01. The p-value (0.01) < 0.05; hence the null hypothesis of business/technology development committee has a significant and positive impact on adoption of financial innovations is accepted. The result indicates that business/technology development sub-committee some others also call it innovation committee has a positive and statistically significant effect on bank's innovation. The existence of business/technology development committee on innovation enables the board to be innovative because the special committee oversees innovation activities of the bank to increase the bank's core competency to be competitive. The committee has responsibility as well as accountability for any innovation activities. The coefficient of the variable is 0.7448, which means other variables remain constant on average, the existence of business or technology development sub-committee in banks committee room increases firm innovation investment approximately by

74% than banks that do not have business/technology development committee. The outcome is consistent with agency theory which states that committees exist to manage agency problems, determine major policy issues and monitor performance. The National Bank of Ethiopia in its Corporate Governance Directive No. SBB/70/2019 states that various board committees should be established, the least being three committees.

The finding of Rashid, et al., (2010) is consistent with the result obtained in this model as their finding states that the number of board committee has a positive and significant effect. However the study result contrasts with Abdurazak (2017) who found a study outcome of an insignificant and negative effect.

The implication of the study outcome is that the existence of business/technology development committee for innovation in particular and special committee for any activity in general, above the minimum number required by the national bank, enables the board to significantly contribute for innovation. Moreover, when a committee size increase, the existing board committees may engage in specialized committee compositions like business development and innovation committees which looks on new developments in the business environment and adoption of it. The increase in committee number helps in dealing with productive and monitoring roles that would significantly improve innovation.

4.4.3. Board Gender Diversity

H2: *Board Gender composition has a significant and positive effect on adoption of financial Innovation by commercial banks in Ethiopian.*

Board of director's gender diversity (BDGD) has a positive but insignificant effect on financial innovation of private banks. The coefficient parameter (β) for board gender diversity is 0.769 with p-value of 0.269. This shows board gender diversity has a positive but statistically insignificant effect on bank's adoption of financial innovation. Therefore, the null hypothesis of board gender composition has a significant and positive impact on adoption of financial innovation by commercial banks in Ethiopian is rejected.

The study outcome is inconsistent with agency theory, stakeholder and resource dependency theories which states that women have better oversight and monitoring capacity and that they bring valuable resources and ensures the benefit of stakeholders and leads to efficiency and better performance. The National Bank of Ethiopia in its Corporate Governance Directive

No. SBB/70/2019 states that boards may preferably comprise of directors who provide a gender mixture.

Studies of Rashid, et al., (2010) have consistent outcomes with the study of a positive but insignificant effect of board gender diversity on performance. Whereas Davies et al. (2000); and Rhoades (2001) found a negative and significant result which is not consistent with the result obtained.

The implication of the outcome is that women board of directors have no different contribution or benefit for improvement in financial innovation, increased employee and customer satisfaction through value creation than from their men counter parts in the board. This insignificant result may be a product of low level of education, training and work culture in our country.

4.4.4. Industry Related Qualification of Board Members

H3: *Industry related qualification of board members has a significant and positive effect on adoption financial innovations.*

Industry related qualification of board members has positive and significant impact on log number of innovation investment at 5% significance level. The coefficient parameter (β) for industry related qualification is 3.5 with p-value of 0.013. This shows that holding all other variables constant, on average as the proportion of industry related qualification of board members to total board members increases by 1 percent (here the unit of measurement is percent) , innovative investment increases approximately by 3.50% and it is statistically significant at 5%. The result indicates that industry related qualification has a positive and statistically significant effect on bank adoption of financial innovation.

The result is consistence with stewardship theory which states that incorporation of directors with specialized fields would contribute to better performance. The National Bank of Ethiopia in its Corporate Governance Directive No. SBB/62/2015 states that boards may preferably comprise of directors who provide mixture of core competencies in areas of banking, finance, accounting, law, business administration, auditing, information technology and investment management.

Rashid, et al., (2010), state that the variable has a positive and significant effect on bank performance. The implication of the study outcome is that the proportion of board members

having industry related qualification is adequate to significantly contribute to banks adoption of financial innovation.

4.4.5. Board Meeting Frequency

H4: *(agency theory). Board meeting frequency has a significant and positive effect on adoption of financial innovations.*

The last but not the least variable within board characteristics tested in hypothesis four (*H4*) is frequency of board meeting. In the model presented in Table 4.8 board meeting frequency has significant impact on firm innovation measured by loginvest at 0.038 p-value. The coefficient parameter (β) for board meeting frequency is 3.18 with p-value of 0.038. This shows that holding all other variables constant, as the frequency of board meeting increases by 1%, firms' innovation on average increases by 3.18% and it is statistically significant at 5%. The result indicates that frequency of board meeting has a positive and statistically significant effect on bank adoption of financial innovation. For this reason, boards that meet frequently are more likely to perform their duties non-negligently and in accordance with shareholders interest. That is why the amount of time and effort directors devote to board meetings is taken as an indicator of board effectiveness (Uadiale, 2010). The result in this study is in favor of the work of Vefeas (2003) as his finding shows that frequent board meetings are followed by enhanced firm performance.

In Ethiopia, since shareholders are only allowed to be a board member, high board meeting frequency may indicate significant involvement of shareholders on the management decision. High owner involvement on management decision in turn can promote firm performance and innovation as it may be difficult for the management to pass a decision that benefits him at the expense of the owners closely watching him. So, it is not amazing to get a result that board meeting frequency has positive and significant effect on firm's financial innovation which is consistent to the hypothesis *(H4).*

4.4.6. Share Ownership Dispersion

H6*: (agency theory,) share ownership dispersion has a significant but negative effect on adoption of financial innovations.*

The model in table 4.8, shows that firms that have dispersed share ownership affects firm innovation negatively. The coefficient parameter (β) for share ownership dispersion is -2.96

with p-value of 0.015 at 5% significance level. This shows that holding all other factors constant, as the share ownership dispersion increase by 1%, firms' innovation decreases by 2.96 %. The result indicates that share ownership dispersion has a negative and statistically significant effect on firm's innovation.

The outcome is consistent with stewardship theory which states that performance and then innovation can be increased when there is greater owner concentration leading to improved monitoring and corporate control. Concentrated ownership enables gauge managers to maximize bank performance and stakeholder interest which will maximize long term benefit at the expense of short term interest and which leads more innovation. And it is also consistent with agency theory where widely dispersed ownership increases agency cost and reduces power to control the management.

Ashenafi, et al. (2013); and Abdurazak (2017) have findings inconsistent with the study; insignificant but positive. And the study of Imam and Malik (2007) shows significant and positive effect of the variable on bank performance.

Implication of the study outcome is that the greater ownership concentration can eliminate the agency conflict between owners and management and decrease the costs of management monitoring and leads to improved performance, productivity and innovation (Topak, 2011). Litov, (2005) states that one corporate governance mechanism for preventing managers from deviating too far from the interests of owners is concentrated ownership. The existing composition of board members with dispersed ownership is not significantly contributing to better adoption of innovation through reduction of agency problem.

4.4.7. Control Variables

Firm size has significant and positive impact on firm's innovation with a *p* value of 0.026 in the model. This may suggest that larger firms are likely to exploit economies of scale, employ more skilled managers and get more market power and become innovative. It may also be because corporate governance appears to be better in larger firms (Loderer and Waelchil, 2009). The coefficient for firm size proxied by log (size) is 3.21. This means that holding other variables constant, on average 1 % increase in the size of the firm will result in 3.21% increase in innovation. The other control variable return on asset has positive and statistically significant effect on innovation at 1% significance level. Its p-value is 0.003<0.01. This may suggest that profitable firms are innovative because they have the potential to invest. It may

also be because corporate governance appears to be better in profitable firms (Loderer and Waelchil, 2009). The coefficient for profitability proxied by return on asset is 0.22. This means that holding other variables constant, on average 1 unit change in return on asset will result in 22% change in innovation investment in the same direction. The last control variable is leverage and it has insignificant but negative effect on firm's financial innovation.

4.4.8. Summary

The result shows that board size as a proxy of corporate governance has positive and significant effect on the innovation level of private commercial bank at 1% significance level. Similarly, existence of special committee called business/technology development committee for innovation has a significant and positive impact on innovation. Profitability proxied by ROA has also positive and significant effect on the innovation level of private commercial bank at 1% significance level. Industry related qualification of board members, board meeting frequency, and log size of the bank has positive and significant effect on innovation of banks at 5% significance level. But share ownership dispersion has negative but significant relationship with the financial innovation of the private commercial banks. Board gender diversity and other control variable leverage have insignificant effect on adoption of financial innovations. Summary of the regression result is presented below;

TABLE 4.9; SUMMARY OF FINDINGS

Independent variables	***Predicted sign and impact on loginvest***	***Actual sign and impact on loginvest***
board size	*Negative and significant*	*Positive and significant*
board gender diversity	*Positive and significant*	*Positive but insignificant*
industry related qualification of board members	*Positive and significant*	*Positive and significant*
Existence of business/technology development sub-committee on innovation	*Positive and significant*	*Positive and significant*
board meeting frequency	*Positive and significant*	*Positive and significant*
share ownership dispersion	*Negative and significant*	*Negative and significant*

Chapter Five

Summary, Conclusion and Recommendation

The presiding chapter presented the results and discussions of empirical findings of the study. This chapter therefore, summarizes and concludes on the major findings of the study with respect to the association between internal corporate governance mechanisms and firm adoption of innovation. Then recommendation, research limitations and suggestion for further researches to enhance the application of corporate governance standards and practices in Ethiopia are considered.

5.1 Summary of major findings

The study aimed to examine the effect of corporate governance on adoption of financial innovation the case of Ethiopian private commercial banks. For this purpose the study make census on all Ethiopian private commercial banks for the period 2013-2018. The dependent variable innovation is proxied by log number of investment on financial products and services. On the other hand, to see the effect of corporate governance on innovation, the independent variables were board size, board gender diversity, board members industry related qualification, board meeting frequency, existence of business/technology development committee, and share ownership dispersion were considered. In addition, to capture the effect of other variables other than board characteristics and share ownership dispersion, the study includes three control variables (profitability proxied by ROA, firm size and leverage) in multiple regression analysis. Furthermore, to meet the initial purpose the study reviewed different theoretical and empirical literatures on the issue studied. The study adopted explanatory research design to explain the causal relationship between explanatory and explained variables. The effect of explanatory variables on dependent variables is analyzed using descriptive statistical analysis; CLRM diagnosis tests, model specification tests, and finally random effect panel multiple regression analysis were conducted.

5.2 Conclusion

This study examines whether internal corporate governance mechanisms affect firm innovation by focusing on Ethiopian private commercial banks. The study is conducted on a population of 16 Ethiopian private commercial banks in the period 2013-2018 a six year data using panel data methodology and random effect as a method of estimation. The main

objective of the study was to find whether internal corporate governance mechanisms affect the adoption of financial innovation by commercial banks in Ethiopia.

Although inconclusive, in the literature review it is generally considered important to have a larger board size on the board. Board size is identified to have a significant positive correlation with firm's adoption of innovation. The result for board size is in support of agency theory which argues that a larger board is more likely to be watchful for agency problems as large number of boards will be reviewing manager's actions (as it provide more monitoring resources) and so increases firm performance and then innovativeness is supported. It may be because as the size of the board increases, its chance to secure sufficient expertise on the board with a variety of experience and core competence to make effective judgment increases.

In addition, the more the subcommittees exist in the bank, the better the firm innovation. Because as more committees exist specialization arrangement and then separation of responsibilities and accountabilities therefore, lies on the committee. As observation and the result indicates banks having special committee on innovation called business development or technology development or some others call it innovation committee has special responsibility for looking innovation in products, processes and service in banks. And hence, banks having this committee are better off in innovation.

More frequent board meetings leads to higher firm innovation. Implying that, frequent meetings leads for better communication between management and directors, and strategic decision making which intern can enhance innovative ideas. With regard to directors' qualification, the more industry related directors' qualification above 1st degree exists, the better banks innovation. The reason is industry specific qualification of director's provides a mixture of core competencies and more familiarity for banking service provision and for innovation and adoption of new innovations.

In relation to other internal corporate governance mechanisms the regression result indicates that the level of share ownership dispersion is inversely related to firm innovation. The argument is that greater owner concentration leading to improved monitoring and corporate control. Concentrated ownership enables gauge managers to maximize bank performance and then stakeholder interest which will maximize long term benefit at the expense of short term interest and which leads more innovation. And it is also consistent with agency theory where

widely dispersed ownership increases agency cost and reduces power to control the management.

Finally, from among the control variables firm size and return on asset has significant and positive effect on innovation. However, the effect of leverage on innovation is insignificant.

The study provides support for aspects of agency theory as board size, existence of special sub-committee, industry related director's qualification, and board meeting frequency have positive and significant effect on innovation. Generally, agency theory hypotheses received stronger empirical support under the result of this model.

Despite its limitations, the present study provides valuable contributions to the area of corporate governance. First, it is the first study to address the relationships between internal corporate governance mechanisms and adoption of financial innovation in Ethiopian private commercial banks by examining agency and stewardship theory simultaneously. Secondly, this study also contributes to the literature by providing evidence that board size, board gender diversity, existence of special sub-committee, industry related qualification of board members, board meeting frequency, and share ownership dispersion are important determinants of financial innovation. Furthermore, it adds to the idea that no single theory explains the association between corporate governance and firm innovation.

5.2 Recommendation

Based on empirical findings and conclusion arrived this thesis work placards important areas which require attention so as to meliorate corporate governance practice in Ethiopia; and the following areas emerge as recommended priorities for policy action as well as reforms for share companies to be taken in to account in their corporate governance practice which can foster healthy and sustainable business operations in share companies.

The result of this study proposes banks and financial institutions to increase the size of the committee with specialized roles to enhance the board's innovativeness and in its productivity and monitoring. As observed during the study banks having the minimum number of 3 committees as provided by national bank directive are not innovative as of banks having more committees. Therefore, this study also recommends the NBE to enforce banks, other financial institutions and other share companies to increase the committee size and then to be more innovative.

Board meeting frequency in this study is identified to have a positive effect on firm innovation. So, based on the finding of this study frequency of board meeting should be increased to improve innovation. However, too frequent meetings might also disturb the firm's managers from their day-to-day operational tasks. So, boards should balance the costs and benefits of board meeting frequency and should be willing to increase meeting frequency whenever the situation requires significant board participation and supervision.

The greater ownership concentration can eliminate the agency conflict between owners and management and decrease the costs of management monitoring and leads to improved innovation. So the result of this paper recommends banks and other share companies to have concentrated share holding than dispersed to be more innovative.

The ultimate aim of innovation in banks is to be competitive and attract more customers, therefore, banks and other financial institutions in the industry shall apply the above corporate governance mechanisms to attract more customers.

The country should develop an effective corporate governance framework backed by a sound legal, regulatory and institutional foundation so as to secure an environment which is attractive to investors and that enhances the benefit of investment to the public.

The last but not the least recommendation is the country should update the existing commercial code and develop corporate governance codes with the current changes of business environment and the jurisdictions should strive for active, visible and effective enforcement of corporate governance applicable laws and regulations.

5.3 Limitations and Suggestion for Further Studies

Like any other research, there are some inherent limitations with the findings of this study. First, there are other potentially effective internal corporate governance mechanisms that this study fails to consider such as managerial compensation, shareholding of insiders, and institutions, Secondly, for the purpose of gauging the financial innovation of private banks the output metric was not taken into consideration. And hence, the input measure of innovation which is innovation investment/R&D spent was used because of the divers nature of innovation in banks particularly and it includes new products, processes and services which makes all inclusive measurement of output of innovation difficult. Thirdly the impact of external corporate governance on firm's innovation is not tested. Therefore, further researchers should incorporate and consider such important points in examining the effect of corporate governance mechanisms on firm innovation.

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Appendix

Appendix 1 : Robust Regression and Hausman Specification Test

1. Robust Regression

Table 4.10: Robust regressions to verify whether outlier significantly affects OLS estimates

- Robust regression

Number of obs = 95

F(9, 85) = 17.33

Prob > F = 0.0000

Loginvest	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
Bs	.7606588	.1704425	4.46	0.000	.4217734	1.099544
Bus/Tech com	.741417	.2849956	2.60	0.011	1.308065	.1747693
Bdgd	.8818204	.70825	1.25	0.213	-.5063241	2.269965
Bmq	3.260755	1.408629	2.31	0.023	.460023	6.061487
Logbmf	3.609533	1.900712	1.90	0.061	-.1654449	7.384511
Logownshp	-3.341719	1.191659	-2.80	0.006	-5.709891	-.9735464
Roa	.2424667	.0774984	3.13	0.002	.0905726	.3943608
Lvrg	-2.742743	3.145237	-0.87	0.386	-8.996318	3.510832
Logsize	2.727144	1.528751	1.78	0.078	-.3124219	5.766711
_cons	8.607033	5.657107	1.52	0.132	-2.635278	19.84934

2. Hausman Specification Test

Table: 4.11; Hausman Specification Test

	---- Coefficients ----			
	(b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
bs	.1897726	0.7271212	-.5373486	.3349078
Spcomit	2.018238	0.7448108	1.2734272	.0246296
bdgd	.8818204	0.7697527	0.1120677	.0117558
bmq	.287895	3.501368	-3.213473	.0226863
logbmf	-2.165312	3.180839	-5.346151	.0047549
logownshp	-.7160185	-2.961047	2.2450285	.0723723
Roa	.5916791	.2282284	0.3634507	.1283588
Lvrg	.283931	-3.322951	3.606882	.1236632
Logsize	5.479466	3.212385	2.267081	.1253909

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(9) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 5.94

Prob>chi2 = 0.5467

Appendix 2: Research Questionnaire

ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
DEPARTMENT OF ACCOUNTING AND FINANCE

RESEARCH QUESTIONNAIRE

Dear Respondent,

My name is Alene Aynalem. I am attending MSc program in Accounting and Finance at Addis Ababa University. Right now I am conducting a research on the title ***'The Effect of Corporate Governance on adoption of Financial Innovation: the case of Commercial Banks in Ethiopia'*** as a partial fulfillment of the requirements for the Masters of Science in Accounting and Finance, Addis Ababa University, College of Business and Economics.

This questionnaire is crafted to collect data on The Effect of Corporate Governance on adoption of Financial Innovation: the case of Commercial Banks in Ethiopia. The data to be collected through the questionnaire is highly valuable to meet the objectives of this study. **This questionnaire is targeted to the board secretary and managing director of all banks** and Therefore, you are kindly requested to fill in and return the questionnaire. The information you supply would be used for academic purpose only and will be kept confidential.

Part I: General Questions

1. Does the presence of female board of directors (in terms of board diversity) helps to improve the bank's innovation?

Yes □ / No □
How? ----------.

2. Does the educational qualification and experience of directors have any significant effect on financial innovation of the bank?

Yes □ / No □

Please give your reasons----------
---------.

3. Do you believe that number of internal board sub-committees affects the bank's financial innovation?

Yes □ / No □

How? Please justify it----------
---------.

4. Do you believe that increasing the frequency of the board meeting has impact on the bank's financial innovation?

Yes □ / No □

How? ----------
---------.

5. Does high meeting attendance rate of directors has effect on the bank's financial innovation?

Yes □ / No □

How? ----------
---------.

6. Do you believe that minority representation in the board can influence the bank's innovation?

Yes □ / No □

How? Please justify it----------
---------.

8. Do you believe that increasing the number of board members has effect on banks innovation?

Yes □ / No □

How? ----------

---.

9. Do you believe that share ownership concentration of institutional investors has effect on banks innovation?

Yes □ / No □

How? ----------

---.

Part II: Please fill the number for each period for questions listed below.

No.	Questions	2014	2015	2016	2017	2018
1.	The total number of board members (size) exists in the bank?					
2.	Does gender diversity exist in board? If yes, how many female directors exist in the board?					
3.	How many shares exist in the bank over the years?					
4.	Number of board members who had industry related college degree?					
	Number of board members who had industry related MA/MSc or above?					
5.	Number of board members who had less than 3 years experience in financial institutions?					
	Above 3 years but less than 7 years of experience?					
	Above 7 years of experience?					
6.	Numbers of sub-committees exist under the board of the bank?					
7.	Is there special committee on innovation?					

8.	The actual total number of board meetings held per year?					
9.	On average, what was the attendance rate for the board meetings?					
10	Number of ATM & how much you invest in ATM					
	Number of POS machine and how much you invest in POS					
	Number of Mobile banking customers & how much you invest in mobile banking					
	Number of Internet banking customers & how much you invest in internet banking					
	Number of Agents and customers in agent banking, & the amount of investment					

Thank You For Your Cooperation!!!

June, 2019