

UNIVERSITY OF GHANA

**INVESTIGATING THE PERFORMANCE OF MANUFACTURING AND SERVICE
FIRMS IN GHANA: THE ROLE OF FINANCIAL ACCESS AND FIRM INNOVATION**

BY

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**A LONG ESSAY SUBMITTED TO THE DEPARTMENT OF FINANCE, UNIVERSITY
OF GHANA, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
AWARD OF THE DEGREE OF
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DECLARATION

I hereby declare that this long essay is the result of my own original work towards the Master of Business Administration in Finance and that to the best of my knowledge, neither the whole nor a part of this work has been presented for another degree elsewhere. All references used in this work have been accordingly acknowledged.

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CERTIFICATION

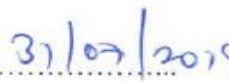
I hereby certify that this long essay was supervised in accordance with the procedures put in place by the University.

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SUPERVISOR


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DEDICATION

This dissertation is dedicated to the Almighty God for His guidance, strength and protection.

My humble effort, I also dedicate to my sweet and loving parents Mr. and Mrs. Konadu for their words of encouragement, moral, emotional and financial support. To my dear husband and beloved daughter Nhyira Abransema Sesah Affresi, our life and love along this journey is a blessing beyond words.

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LIST OF ABBREVIATIONS

GDP	Gross Domestic Product
MDGs	Development Goals
NDPC	National Development Planning Commission
OECD	Organization for Economic Co-operation and Development
OLS	Ordinary Least Squares
R&D	Research and Development
RBV	Resource-Based View
SMEs	Small and Medium-Sized Enterprises

ABSTRACT

Despite the vast and growing empirical literature focusing on the association between innovation, financial access and firm performance, the combined impact of these factors in one study is dearth even though this relationship seems to be important, especially for developing countries. In this research, a conceptual model is developed applying the Resource-Based-View (RBV) theory of the firm to carry out an in-depth analysis of whether firm performance is affected by financial access, and to ascertain, whether innovation mediates this relationship. Firm performance, financial access and innovation are measured by sales growth, the ability of a firm to be given a credit facility, and to offer a new service or product to the competitive market, respectively. The study also controls for firm specific factors (firm foreign affiliation, age, size, and sector type) that may affect firm performance. A dataset from Ghana 2013 Enterprise Survey (ES) put together by World Bank will be used. Using OLS regression techniques, the findings suggest that innovation and financial access are important for performance of firms in Ghana. Also, our findings unearth that specific combinations of financial access with innovation have profound effects on the growth of firms. In particular, the mediating effect of innovation implies an association between financial access and firm performance. Furthermore, the findings indicate that service firms experience a faster growth rate compared to manufacturing firms. Moreover, it is realized that firm size and foreign affiliation affect performance positively, while firm age has a very negligible effect on firm performance. Given, the important roles of financial access and innovation in boosting firm-level performance, it is essential for government to take advantage of them when formulating firm performance policies in Ghana.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

The key goal of this section is to present an in-depth overview of the study and the outline of the contents of the study. It starts by providing an in-depth discussion of the problem statement and research background. It then presents the objectives, justification and scope of the research. The last section is the organization of the study.

1.2 Background of the Study

Recently, the performance of firm has gained the attention and also become the core of development process, making the phenomenal a more researched area in economics and finance (Ayyagari et al., 2008). The field has experienced resurged interest by researchers and policymakers, with a novel concentration on innovation and the financial environment where firms operate. Surveys carried out by researchers have shown that the financial constraints experienced by firms are obstacles to their productivity and growth (Malhotra et al., 2007; Beck et al., 2008), while the intense competition in international and local markets has rendered innovation the critical factor of firm level competitiveness and survival. The importance of innovation and finance to firm performance has been well established in the empirical literature, and the firm-financing gap has become a well-known terminology, showing the challenges faced in terms of their access to credit (Fowowe, 2017).

Firm access to finance is important because it aids in boosting innovation, increasing operations and investing in production facilities and the skills of workers (OECD, 2006b). Recently, there has been a shift in research focus towards investigating the role of firms in influencing employment creation, economic growth and poverty reduction. Due to this, firms in both developing and developed economies have been imperative avenues for employment growth and decent jobs (Fowowe, 2017). But many firms in the developing world that are willing to increase their capacities often experience a lot of challenges in innovating and getting finances from financial institutions. This problem is basically more common in developing economies while it is not such a challenge in the developed world because their firms are innovative and several risk-reducing strategies have been employed by banks for lending to these firms (OECD, 2006b). Hence, this problem is basically found in developing economies. Also, it has been established that out of the group of developing economies, countries in Africa are sternly challenged in terms of innovation and development in financial sector (Allen et al., 2011; Fowewe, 2013).

However, enhancing firm performance has recently gone beyond financial development to using firm-level innovation as a mediator in this relationship. The improvement in innovation at the firm level for achieving competitiveness and long-run productivity growth is a matter which has recently received substantial attention in both the world economic dialogue and global policy debate. This growing interest on the subject has, perhaps been motivated by three key factors. The intensification of the globalization process spurred by the revolution in telecommunication is the first factor, the ongoing technological transformation due to advances in science is the second factor, and the third is the failure of existing policies (see McGuirk et al., 2015). The strong competition in both local and international markets has made innovation the most important variable in determining firm-level competitiveness and survival. Rapid advancement in new

technologies, globalization, information flow and knowledge transfer mainly reinforce the importance of innovation (Gunday et al., 2011). Innovation has been linked to firm productivity and performance from studies such as Criscuolo and Haskel (2003) and Boons et al. (2013). It is therefore crucial to concentrate on firm-level innovation regarding firms, industries and countries to enjoy competitive advantage and growth.

Moreover, in the firm perspective, the study of the determinants of firm performance with a focus on financing and innovation has received a considerably limited awareness especially in developing countries. It is therefore not surprising that firm performance is among the least understood areas in international business (Fowowe, 2017). According to Goedhuys and Sleuwaegen (2010), “firms in Africa lack innovative ideas that will increase their growth, which shows why many countries in Africa are under-developed. In particular, Ghana has been found to have very weak manufacturing and service firms in terms of their contribution to GDP.” These sectors are financially constrained and lack the required innovative ideas for productivity, growth and competitiveness (Amadu & Danquah, 2019). Sarpong and Wolf (2008) revealed that, “the manufacturing and service sectors of Ghana continue to decline and fail to have effective forward and backward linkages.” It is therefore important for Ghana to concentrate on financial development and firm innovation since these factors are necessary for growth and development.

Juxtaposing these claims, the "Asian Tigers" such as Malaysia, Taiwan, Singapore, Korea and emerging countries like India and China have given Ghana the reason to concentrate on firm-level innovation and financial development. These countries have achieved significant growth in productivity, global competitiveness and massive development through investment in innovation (Fu et al., 2016). Hence, Ghana should no longer settle for any myopic position in recognizing innovation and financial development as key drivers of firm performance if it aims at enhancing

the growth of firms to ensure competitiveness at the global market and achieving the Millennium Development Goals (MDGs).

1.3 Problem Statement

Ghana aims to accomplish its goals of improved quality of life to cover all its citizens and accelerated economic growth, by deliberately to reducing poverty levels through aggressive and rapid industrialization, private investment, and direct and aggressive poverty-alleviation efforts, with the economic program "Ghana: Vision 2020". "The overarching goal of Ghana's developmental policy and strategy is making sure that Ghanaians benefit enormously from the dividends of growth, irrespective of location, gender, physical and socioeconomic status. However, the expansion of the economy over the last decade did not manifest properly in providing enough jobs and decent work. For instance, whilst the country expanded and grew at an annual average rate of 5.5% from 2000 to 2016, the total employment rate grew by only 3.3% per year during this same period" (see NDPC, 2016).

In Ghana, the contribution of industry to growth has remained relatively steady around 28% over the last few years. The growth in share of industry, from 19.0% in 2010 to 28.0% in 2013, was almost wholly caused by the production of oil in commercial quantities in 2011, whose share increased from 0% in 2009 to 8.1% in 2013. The manufacturing sector has experienced a steep decline in its contribution to GDP over the years. The performance in the manufacturing sector continues to decline with weak linkages with other sectors. Commodities manufactured locally have increasingly become uncompetitive, both with regards to their price and quality (Amadu & Danquah, 2019). However, the service sector has recently contributed tremendously to Ghana's

GDP (Fu et al., 2016), which appears that the service sector offers the opportunity for the growth oriented initiatives of the government.

Consequently, “the need to promote innovation, finance and the development and growth of firms in Ghana has been of concern to many policy makers for two main reasons. First, for Ghana to be able to compete effectively in the increasingly globalized environment, its manufacturing firms should be financed and be innovative to grow and transform into thresholds where they will be able to adapt efficient production techniques. Secondly, because the small scale end of the manufacturing sector are regarded as job generators, the reason why governments have been preoccupied with finding and supporting the high-growth firms through increasing the R&D fund” (Osei-Assibey, 2013).

However, both theoretical and empirical extensions by scholars have associated finance and innovation to firm growth by opining that firm growth can be sourced from financing (E.g. see, Girma et al., 2008; Ahmed & Hamid, 2011; Aterido et al., 2011; Fafchamps & Schundeln, 2013, among others) or innovations (E.g. see, Klomp & Leeuwen, 2001; de Jong et al., 2003; Vincent et al., 2004; Atalay et al., 2013, among others), which resulted in the introduction of the “Resource-Based View Theory” that explains how the growth of a firm is built on different facets of its capabilities and resources. This has resulted in emergence of vast empirical work at the micro-level relating financing, innovation and firm growth to address this research trend due to greater availability of firm or plant-level data.

In spite of the vast amount of research carried out to explain this phenomenon, the result is still inconsistent and the robustness of these findings remain questionable, prompting further scrutiny as result of extensive areas of economic resources waiting to be tapped and discovered by firms in

Africa. The literature that has emerged basically aims to empirically confirm the RBV theory, using firm or plant-level data, the relationship between financing, firm growth and innovation. Against this background, this study therefore employs the Ghana 2013 Enterprise Survey dataset, the RBV theory and a robust empirical estimation technique to contribute to both theory and literature by analyzing the effects and roles of financial access and innovation in boosting firm performance in Ghana.

1.4 General Objective

The goal of the study is generally to analyze the accompanying effects of financial access and innovation on the performance of service and manufacturing firms in Ghana.

1.4.1 Specific Objectives

The study specifically seeks to address the following:

- I. Explore the direct effects of innovation and financial access on firm performance in Ghana.
- II. Investigate the mediating relationship of innovation with the association between financial access and firm performance in Ghana.

1.5 Research Questions

The study find answers to questions listed below:

- I. Do financial access and innovation have significant effects on firm performance in Ghana?
- II. To what extent does innovation mediate the association between access to finance and performance of firms in Ghana?

1.6 Research Hypothesis

1. H_0 : Financial access does not have a significant effect on the performance of firms in Ghana.

H_1 : Financial access has a significant effect on the performance of firms in Ghana.

2. H_0 : Innovation does not have a significant effect on the performance of firms in Ghana.

H_1 : Innovation has a significant effect on the performance of firms in Ghana.

3. H_0 : Innovation does not mediate the association between financial access and firm performance in Ghana.

H_1 : Innovation mediates the association between financial access and firm performance in Ghana

1.7 Justification for the Study

The study will complement on the empirical and new tentative knowledge of the firm performance literature and offer additional understanding into how firms can advance their performance in both the local and international level. With regards to the increasing significance of financial development and firm innovation in boosting the growth of firms, firm performance has become a priority for practitioners, academicians and policy makers. This study will augment the extant literature in three (3) broad ways.

Firstly, this research will add to the empirical literature by exploring in detail the relationships that exist between firm performance, innovation and financial access. It will determine whether

financial access and innovation can explain firm performance in the perspective of Ghana as a developing nation.

Secondly, the main concentration will be on data at the firm-level for Ghana and will offer new insights on the African firms' behavior and performance, and this would help the development of new innovative approaches to realizing firm growth, which becomes imperative in boosting economic growth and alleviating poverty.

Lastly, the outcomes of this study will initiate for further study and will bring out the importance of firm performance. This will help firm managers to pay serious attention to financial access and innovation to boost their firms' performance. It will also be used as a reference by other scholars; thereby minimizing the literature gap in the area of the study especially in Ghana, and will guide government policy makers on enacting appropriate policies for firm competitiveness and performance.

1.8 Scope of the Study

The scope of the study will be restricted to firm performance nexus and finance, and innovation and firm performance nexus in Ghana. The study will use a rich dataset from the Ghana 2013 Enterprise Survey (ES), which consist of 720 firms (both manufacturing and service sectors) selected strictly based on the availability of information, to analyze these relationships. The study employs five (5) variables: employment growth (FMP) as a proxy for firm performance; financial access (ACCESS); innovation (INNOV); firm characteristics (FMC) as a vector of firm characteristics (firm age, firm size and foreign affiliation) and sector (SECT) (services versus manufacturing).

1.9 Organization of the Study

The research will be structured into five important chapters detailed as follows:

Chapter One gives a background information of the research covering the study background, problem statement, objectives of the research, research questions and hypotheses, research significance, the scope, limitations, and research organization. Chapter Two will go into the relevant literature attributable to the study. The literature will encompass the theoretical literature, the explanation of concepts, analytical perspectives on the empirical literature, and the specification of the conceptual model. Chapter Three concentrates on the methodology, which specifies the empirical model and empirical estimation methods used for the study. Chapter Four reports on the empirical estimation results and analysis. Chapter Five discusses the conclusions with reference to the analysis of the information used, make reasonable recommendations based on the research outcomes, and then suggest areas for subsequent studies.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The main objective of this chapter is certainly to discuss the theoretical and empirical evidence of financial access and firm performance. This section discusses the theoretical framework on firm performance by focusing on the RBV theory as its main theoretical framework. The review of previous studies is then presented.

2.2 Theoretical Review

Any study on the performance of firms requires a well-organized operational structure that provides both the theories and the empirical evidence on the issue. A framework of this sort would give a rigorous underpinning for the relationships studied in this context. For example, the establishment of a framework that is grounded on the simple - yet powerful - notion of firm performance would provide the researcher a good modeling of the dynamic interactions among the factors enhancing the firm performance while addressing the role of access to financial services. For some time now, firm performance is conceptualized in the literature by the RBV theory. Therefore, this study employs the RBV theory as its main theoretical underpinning.

2.2.1 The Resource-Based View (RBV) Theory

The focus of strategic management has been on the notions of business that influence the performance of firms (Barney, 1991). A lot of researchers, including Penrose (1959), Andrews (1971) and Ansoff (1965), had a high in the internal resources of firms and how they add to the

firm success. Consequently, in the mid-1970s and close to 1980s, the concentration of research shifted towards the external factors. Access to credit paradigm, which considers the level of financial development around a given industry as well as the level of competition within the industry, became dominant. This was explained by the works of Porter (1980). However, in the 1980s and 1990s the concentration of research shifted back to inter-firm resources which lead to the development of the RBV theory of the firm framework. The RBV was grounded on the study of Ricardian economics, and specifically on the study of Penrose (1959), basically called the Penrosian economics.

The framework of the RBV is grounded on business management which determines the bundles of resources available to a firm. This theory opines that the foundation for the firm's competitive advantage is based predominantly on the use of bundles of the vital resources by the firm (Wernerfelt, 1984). According to Barney (1991) and Pfeffer and Salancik, (2003), "the transformation of a firm from a short-run competitive position into a sustained competitive advantage position necessitates the resources available are not perfectly mobile or heterogeneous in nature." This means that, resources available can be easily translated into valuable resources that are neither substitutable nor imitable (Barney, 1991). The firm can achieve a sustaining above average returns in case these conditions hold.

Moreover, in international business, the RBV has recently become a widely-used theory with immense contributions from a lot of researchers (see Roth, 1995; Teece et al., 1997; Francis & Collins-Dodd, 2000) across the globe. According to Roth (1995) the conceptual framework of the RBV can be employed to conceptualize firms as entities that possess inimitable stocks of accumulated intangible and tangible resources. The tangible stocks are categorized into two groups, the physical resources (plant, equipment and raw materials) and financial resources

available to a firm, whilst the intangible resources may also include technology, reputation, human resources, training, culture and employee expertise (Roth, 1995). Roth (1995) also argued that the knowledge (human capital) and skills available to a firm can play a vital role in correcting inadequacies in the stock of resources, and can represent possible bases of competitive advantage for the internationalized firm.

2.3 Empirical Review

The association between innovation, financial access and firm performance has received a lot of interest from researchers across the world but the combined effects of these variables in one study is limited. Most studies either focus on the effect of financial access in relation to firm performance or the effect of innovation also in relation to firm performance or the effect of financial access in relation to innovation. This has led to three strands in literature concerning these relationships which we seek to review.

2.3.1 Financial Access - Firm Performance Nexus: Review of Literature

The financial development and economic growth relation have been well recognized in the 1990s from the early works of Schumpeter. A well-equipped financial system spurs economic development and growth by expanding business and investment, locative efficiency, improved household welfare and diversification of risk (Quartey, 2003; Jun et al. 2007). Placed in the growth-financial development nexus, however, is the firm performance and financial access relationship which represents the focus of this research. The dialogue on the link between financial access, specifically, external credit and firm performance starts with the insightful work of Sleuwaegen and Goedhuys (2002) “who examined the drivers of the growth process of

manufacturing firms in African countries with a concentration on firm size, age and access to financial services. They found that the growth of a firm is mainly explained by its age and size, which is made possible through efficiency exploitation, scale enlargements and learning. They further added data on growth obstacles and it was found that, medium sized firms are strongly hurt by inadequate access to financial services.”

In addition, Bigsten and Söderbom (2006) “study looks at the African business environment, with a clear focus on access to credit, risk, labor and infrastructure, as well as how firms structure themselves to do business. They also looked at the research on firm performance indicators such as firm growth, exports and investment. They found that firms that have access to credit facilities exert significant effects on their performance in this region.”

Also, Demirguc-Kunt et al. (2006) “examined how the different legal and financial systems of a country influence the external financing of a firm which boosts growth. They presented that in countries with high efficiency score index have greater proportional use of long-term external financing. They suggested that an active, though not essentially large, stock market coupled with a large banking sector are also related to firm growth that is externally financed. They concluded that the rise in the reliance on external financing takes place because firms in well-developed economies have higher profit rates.”

Consequently, Arnold et al. (2008) “explored the impact of service inputs on performance of firms (productivity) and found that manufacturing firms located in some countries in Sub-Saharan Africa that are foreign-owned and have good access to telecommunication inputs are more likely to be productive, while high constraints in getting credit and rampant power outages had negative effects on firm productivity.” Beck et al. (2008) “argued that even though extant literature demonstrates

that financial development triggers the aggregate growth of the economy, researchers have not made conscious efforts to resolve conflicting theoretical predictions and ongoing policy disputes on the effect of a well-developed financial environment on firm growth. Using a cross-industry, cross-country data they found that financial development has a positive impact on the growth of small firms.”

Ayyagari et al. (2008) “used data at the firm-level to access the relative significance of the different characteristics of the business environment. They opined that even though firms face a lot of impediments to growth, the obstacles have varying impacts on growth. They opined that some of these impediments influence firm growth either indirectly through their effect on other impediments, or not at all. Their empirical results revealed that obstacles associated to crime, finance and policy instability exert a direct impact on firm growth. They concluded that keeping the rate of crime low and engaging in financial sector reforms to in order to lessen the constraints of finance will be the most effective methods to enhance firm growth in China.”

Ayyagari et al. (2010) “employed a dataset of twenty-four hundred Chinese firms to analyse the patterns of finance of firms and their growth. They opined that while small number of firms use bank loans, faster firm growth is explained by bank financing, while finances that come from informal sources are not. They advised that firm growth is enhanced by bank financing.”

Aterido et al. (2011) “examined the business environment of firms and its effect on employment growth of a total sample of 56,000 firms in 90 countries. Their study focused on four areas: corruption, financial access, infrastructure and business regulations. Their results, specifically on the impact of corruption and finance and on growth, relies on whether and how the modelling takes care of the possible endogeneity in the model caused by business regulations. When they controlled

for endogeneity they found that small firms benefit most from financial access, specifically for sources of finance related to growth and investment.”

Butler and Cornaggia (2011) “examined the association between financial access and firm growth (productivity). They asserted that a shift in demand for a product that is exogenous can be explained by how producers adapt their productivity when there is a changing level of access to financial access. They found that in areas with relatively strong access to finance, production increases more. They concluded that the causal relation productivity and financial access explains the larger role of finance in economic growth. Findings in China confirms these findings.” Specifically, Du and Girma (2012) “study on large sample of firms in China suggests that access finance (domestic bank loans) will lead to the growth of larger firms as well as those that have foreign stakes, whereas self-raised finance played a crucial role in the growth of smaller and medium sized firms.”

Buyinza, and Bbaale (2013) “examined the factors inducing firms involved in manufacturing to have access to credit and the impact of credit constraints on the performance of East African Community (EAC) firms, employing the World Bank (2006) enterprise survey. They made use of OLS, simple probit, tobit, and a two-step probit models. Their descriptive analysis revealed that the top five constraints in business in order of severity, which include; financial access, electricity outages and costs, corruption, high and volatile tax rates and macroeconomic instability. They found that 37% of firms in the metal fabrications are credit constrained with regards obtaining a loan. They also found that exporters, high performing firms, medium and large firms increase their likelihood of obtaining credit.”

Fafchamps and Schundeln (2013) “used a merged dataset from Morocco to investigate whether firm performance is influenced by the level of financial development. Their results follow the hypothesis that: local banks availability is robustly associated with the growth of small and medium-size firms in sectors with growth opportunities and a lower probability of firm exit and a higher probability of investment.” Krishnan et al. (2014) argued “also suggested that increased financial access plays a significant role in the productivity and performance of smaller and financially constrained firms. Unlike other extant studies, they used a natural experiment of public and private firms in the manufacturing sector of the United States of America.” Also, the study of Robb and Robinson (2014) “established that increased financial access plays a crucial role in firm performance, especially for start-up and small firms, who depend on banks for finance to operate. They found that a large percentage of start-up firms depend on bank finance for their survival.”

Regasa et al. (2017) “employed an Ethiopian firm-level data to model the impact of different types of financing on firm performance. They postulate that the form of financing of a firm is potentially endogenous to its performance and their study seek to contribute to the literature by introducing a novel instrumental variable which takes care of local variation in financial depth. Their empirical estimation revealed that there is a negative link between external finance use by firms and firm performance, which opines that there are considerable cross-country differences in the growth-finance nexus.”

Bhalli et al. (2017) “examined the effect of credit constraint on firm performance using firm-level data of manufacturing sector of Pakistan for the period of 1974-2010. They employed the Generalized Method of Moments’ approach. The results from their full sample showed that firms in the manufacturing sector are not facing constraint in terms of external financial and the impact of sale on capital ratio shows the availability of investment opportunities for the firms in the

manufacturing sector of Pakistan. In addition, the results for pre-and post-financial sector reform era showed that firms are facing tight external financial constraints in pre-financial reform era relative to the post financial reform era. Furthermore, they suggested that firms that have small assets are constrained by internal finance whereas firms having medium and large assets are not constrained by this kind of finance.”

Bokpin et al. (2018) “investigated the link between financial access and firm growth (productivity) with a focus on Sub-Saharan African manufacturing firms. They employed the Semi-parametric analysis and found that financial facilities such as loans or overdraft services impact firm growth positively. They concluded that it is beneficial for firms in Africa obtain credit facilities since it boosts their productivity and that the financial system of Africa should be well developed to reduce the credit constraints faced by firms.”

2.3.2 Firm Innovation-Firm Performance Nexus: Review of Literature

Generally, all the innovative activities that a firm embarks on must result in good performance of firms compare to those that are not innovative. There are different concepts used in measuring firm performance. The most common performance measures may cover but not limited to: export revenue per employee, sales revenue per employee, rates of sales growth, employment growth and total assets (Sirilli, 2001). The exploration of econometric analysis using survey data further contributes considerably to the fundamental knowledge on the relationship between performance of a firm and innovation.

Specifically, Van Leeuwen and Klomp (1999) “formulated a simultaneous equation model to analyze the link between firm innovation and firm performance. They stated that innovation intensity of a firm depends on prior cash flows, technological opportunities, prior total sales,

subsidies, firm age, R&D and innovation. Sectorial dummies were controlled for. Their model tested for both innovative and non-innovative firms, and a single-equation method as well as a simultaneous approach. All the variables were significant in the single-equation method, whilst in the simultaneous-equation model prior sales, prior cash flow, sales development and subsidies were significant.”

Lööf (2000) “study on the relationship between different performance measurements (value added per employee, employment growth, sales per employee and return on assets) and innovative sales per employee (elasticity). The sales margin was found not to be significantly enhanced by innovative output. Also, it was found that when a distinction is made between service and manufacturing, the link between employment growth and innovative output turns to be insignificant.” Van Leeuwen and Klomp (2001) “study in Netherlands employed the Community Innovation Survey (CIS-2) to examine the input and output processes of innovation and the link between the innovation process and overall performance of firms. They explored the existence of feedback association running from past performance of firms to the input and the output processes of innovation. They established a positive causal effect of innovation on the performance of firms.”

Lööf et al. (2001) “examined how process-related variables (obstacles to innovate, crucial sources of information for innovation, innovation objectives, domestic and foreign cooperation in innovation) affect innovative intensity and the innovative output of firms in Norway, Finland and Sweden. Their results reveal that the innovation objective, information sources and domestic cooperation with customers exert positive and significant effects on firm performance.”

Calantone et al. (2002) “study on firms in US conducted detailed interviews with manager as well as an empirical review of the literature to examine the effects of learning orientation innovation

on firm performance. Their study used four concepts of learning orientation: commitment to learning, shared vision, open-mindedness and intra organizational knowledge sharing. They tested this framework using survey data for US industries. Learning orientation was found to enhance the innovation of firms, which further enhances firm performance.” Diederer et al. (2002) “study concluded that firms that innovate obtain substantial higher profits and growth figures compared to the non-innovative ones. Also, the study of concluded Favre et al. (2002) concluded that there is a positive influence of innovations on profits,” whilst Avantis and Hollerstein (2002) “found that technological opportunity, external knowledge and the degree of innovativeness of firms have positive effects on productivity of knowledge capital.”

Vincent et al. (2004) “employed the structural equations and the meta-analytic methods to analyze the empirical studies that explore the correlates of firm innovation. They used a meta-analytic database of consisting of a sample of 134 based on 83 studies between the period 1980 to 2003. Their study explored the effect of 27 drivers and 3 performance outcomes of innovation using a total sample size of 122,943. They established that innovation is positive and significantly and associated with superior performance.”

Thornhill (2006) “employed a survey data from 845 Canadian manufacturing firms and opined that firms with greater aggregate levels of research and development (R&D) intensity are more likely to have higher rates of firm-level innovation. They further opined that innovation is more common when firm dynamism is observed to be high, and that firms that innovate are more likely to enjoy revenue growth. Their study further revealed that firm dynamism, firm knowledge and innovation interact to enhance firm performance, and that firms in stable manufacturing sector benefit more when they invest in training.”

Similarly, Faems et al. (2010) “studied the role of technology alliances on the overall firm performance and find that differences in alliance portfolio is has a positive link with innovation performance, which in further, boosts the financial performance of firms. They concluded that firms that innovate are more likely to have higher performance.” Gunday et al. (2011) “examined the influence of process, product, marketing and organizational innovations on the diverse concepts of firm performance, including financial, production and innovative performances, using an empirical study of a sample of 184 manufacturing Turkish firms. They found that innovation impacts positively on firm performance in manufacturing firms.”

Rass et al. (2013) “examined the role of social relations and networks in the innovation settings of firms. They followed the previous literature on open innovation and the social capital theory and formulated a conceptual framework that looks at social capital as a possible mediator between firm performance and innovation. Their study adds to the existing knowledge on the role of content and structure of social relations in the context of firm innovation as well as the justifiable side-effects of firm innovation. They found that, despite the direct influence of innovation on performance, there exists a mediated link between these variables. In particular, they suggested that firm innovation enhances the social capital of a firm, which in turn, affect firm performance positively.”

Atalay et al. (2013) “examined the relationships between firm performance and innovation using a survey carried out on top level managers of firms in Turkey. Their empirical analysis results showed that technological innovation taking the form of product or process innovation affect firm performance positively.”

2.3.3 Financial Access - Firm Innovation Nexus: Review of Literature

The role of finance plays in innovation widely remain uncharted. Specifically, O’Sullivan (2010) opined that the fundamental literature on innovation has so far not looked at the link between innovation and finance which is interesting as Schumpeter (1934) argues himself “suggested that the creation of credit is important in triggering innovation, with much emphasis on the crucial role commercial banks play. However, there is an ample literature impact of access to finance on innovation activities of firms.”

For instance, Hubbard (1998) “used survey literature to explore the relationship between financial constraints and capital investment, and found that constraints to finance have a significant role on the capital investment of firms. Vast empirical literature on access to finance mainly looks at its impact on firm growth (see Levine, 2005; Beck, 2008). Despite the wide-ranging lack of research in the literature on access to finance and firm innovation activities, a few authors have attempted to fill the gap.”

Hyytinen and Toivanen (2005) “found that constraints to finance hinder innovation, and that government intervention to address the negative effect of imperfect credit markets is necessary to promote the innovative activities of firms.” Also, Sharma (2007) “used data at the firm-level from a total sample of 57 countries to explore how the level of financial development affects innovation in small firms. It was found that compared to large firms in the same industry, access to finance by small firms is more likely to enhance the level of innovation.” Sharma (2007) therefore concluded that, “small firms are more likely to invest in innovation than large firms, and this gap becomes narrow for countries that have higher levels of financial development. Hence, financial development is important for firm innovation in developing economies.”

Moreover, Ayyagari et. al. (2011) “in their study on developing countries established that financial access, as proxied by drivers of possession of several credit lines and borrowing, for firms in developing countries is associated with more innovation.” In line with this, Schnitzer and Gorodnichenko (2013) study “presented the theoretical explanations on why firms lacking access to finance are less likely to engage in innovative activities. They also established empirically that financially constrained domestic firms are unambiguously restrained to innovate. They concluded that for innovation in ICT industry, a market-based financial system, including a well-developed venture capital market, is important in strengthening financial intermediation and to offer financial access to finance for firm innovation.”

In addition, Agénor and Canuto (2014) “examined the significance of access to finance in enhancing of firms. Specifically, they suggested that inadequate access to finance has a negative effect on innovation, directly, through the financing of fewer research and development (R&D) projects, and also indirectly, as fewer individuals may choose to invest in the skills necessary to work in R&D fields. They emphasized that these dual effects point to the need for public policies aimed at reducing imperfections in the credit market to encourage the production of ideas and increase the incentives for workers to invest in higher skills. They concluded that access to finance influences innovation outputs and long-term economic growth.”

Furthermore, Lee et al. (2015) “analyzed the effect of access to finance with a concentration on small and medium sized firms in the UK, after the 2008 financial crisis, on firm innovation using a dataset of over 10,000 UK SME workers. They found that innovative firms have a higher probability of being turned down for finance than other firms, and this worsened significantly in the crisis. However, after controlling for firm characteristics, their results revealed that the

deteriorating in general credit conditions were more common for non-innovative firms apart from absolute credit rationing which was found to be more severe for firms that innovate.”

Moreover, Mahendra et al. (2015) study “examined the drivers of firm innovation in Indonesia. They focused on the effects of access to finance and institutions on innovative activities of Indonesian firms. They used the World Bank Enterprise Survey dataset and employed the binary logit, ordered logit, and poisson econometric regressions. They found that better quality of institutions focused at the local level is related to higher innovation. They also found that firms facing main difficulty in obtaining finance have lower probability involve in innovation. They then established that financial accessibility is grave for small and medium scale enterprises (SMEs) whilst quality of institutions is more significant for large firms.”

Finally, Efthyvoulou and Vahter (2016) “analyzed how the innovation performance of a firm is influenced by financial constraints; such as, low access to finance (i.e. bank loans and overdraft facilities) and internal sources of finance (new equity or retained earnings). They explored this relationship using Community Innovation Survey dataset from a large sample of 40,000 firms located in 11 Western and Eastern European countries. They also analyzed whether the resulting effects differ between and within firms engaged in both production and services. Their results suggest that firms that face financial constraints have a 15-20% lower probability to be in the group of the most successful innovators. They found this effect to be completely driven by limited availability of internal funds, rather than limited access to external sources of funding. They also found that are innovative in production industries are significantly more sensitive to constraints in obtaining finance than those in services industries.”

2.4 Conclusion

In conclusion, it is noted however that, the previous literature focusing on these relationships have only concentrated on the effect of access to finance (or innovation) on firm performance. Simply put, the relationships between these variables (financial access, innovation and firm performance) in one study has been overlooked. In addition, a lot of the extant studies have drawn attention to the direct relationships among these variables whilst ignoring the reasonable mediating effect firm innovation may have. Consequently, as explained with respect to the RBV theory of the firm, the performance of a firm can be explained by the ability of a firm to have access to financial products and firm innovation in conjunction with their interactions, hence the important need for this to be researched into in Ghana to explore these relations.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This section describes into details the research methodology applied to this study and deliberates how the study would be carried out to accomplish the objectives stated in the introductory chapter. The chapter deliberates how the research objectives and hypothesis were accomplished through a methodological framework adopted for the study. The chapter comprises of the method of analysis, the model specification, description of variables and sources of data.

3.2 Model Specification

“A model is defined as a mathematical representation of a reality. It can also be defined as a simplified view of reality intended to provide the researcher a description, essence and the inter-relationship within the system or phenomenon it illustrates” (Yomere & Agbonifoh, 1999). This section looks at the model specification to help in achieving the main purposes of the study. Specifically, the research is motivated by two main objectives:

- I. To examine the major effects of financial access and innovation on firm performance.
- II. Investigate the mediating effect of innovation on the link between financial access and firm performance.

To address objectives mentioned above, the study employs a robust econometric estimation technique in this context. Simply put, both objectives are achieved by employing a descriptive analysis and using econometric analysis to examine these relationships at the aggregate level of the firm (full sample) and also service and manufacturing firms (sub-samples).

Consequently, the study will adopt the model specified below. This model was used by Ayyagari et al. (2010) and replicated recently by Regasa et al. (2017) to assess the financial access and firm performance relations for firms in China and Ethiopia respectively. The study specifies a firm's performance as a function of financial access, innovation, the interaction between financial access and innovation, characteristics of firm and sector dummy. Firm performance (proxied as sales growth of the firm) represents the dependable variable which is a continuous factor defined as the log difference between the reported total sales revenue by firm i for the prevailing period and total sales revenue reported three years ago before the survey year, divided by three years. The key explanatory variables of concern in this study are innovation and financial access. Innovation is a dichotomous variable and value '1' is assigned to it if the given that the firm launches a new product or service into the competitive market and '0' is also assigned if it does not introduce a new product or service into the market, whilst financial access is also a dichotomous variable and value '1' is assigned to it if a firm has access to credit facilities (loans and overdraft facilities) and '0' if it has no access to these facilities. An Ordinary Least Square (OLS) model is specified in the form below:

$$FMP_i = \beta_0 + \beta_1 ACCESS_i + \beta_2 FMINNO_i + \beta_3 INTR_i + \beta_4 FMCH_i + \beta_5 SECT_i + \varepsilon_i$$

Where, FMP_i is called the dependent variable that indicates the performance (proxied as sales growth) of firm ' i ', $ACCESS_i$ (Financial access) is a dummy variable that receives value '1' if firm ' i ' gets access to finance or '0' if it does not get access to finance, $FMINNO_i$ (innovation) is a dummy variable receives a value of '1' if firm ' i ' innovates or '0' if it does not innovate, $INTR_i$ denotes the interaction $ACCESS_i * FMINNO_i$; $FMCH_i$ denotes a vector of firm characteristics, namely firm age (AGE), which represents the log of the total number of years the firm gets to stay in business, firm size (SIZE) (continuous variable) is the log of the total number of permanent full

time officers employed in the firm, and international affiliation (FOR) (dummy variable) denotes whether the firm has an international equity or not; $SECT_i$ (sector) is a dichotomous variable that receives the value '1' if a firm is from the services sector or '0' if it is in the manufacturing sector; $\beta_1, \beta_2, \beta_3, \beta_4$ and β_5 are vectors of parameters of explanatory variables; β_0 is the intercept term and ε_i is the standard vector that denotes the error term.

To take care of the differences across firms in different sectors (services and manufacturing sectors) the study include the sector dummy in our regression model. This is because access to finance may exert different effects on firm performance across firms in different sectors. Hence, it is essential to keep under control for sector type in our regression model.

3.3 Description of Variables

3.3.1 Variables

The main variables employed to discuss the associations between financial access, firm innovation and also the firm performance are: sales revenue growth (FMP) to represent a proxy for firm performance; Financial access (ACCESS); firm innovation (FMINNO); firm characteristics (FMCH) to represent a vector of firm characteristics (firm age, firm size and international affiliation) and sector (SECT) (services versus manufacturing).

➤ Firm Performance (FMP)

To operationalize the performance outcome of a firm, the study applied self-reported measures of firm performance that were designed from the Enterprise Survey (ES). Specifically, to measure whether firms perform or not, it will utilize two sequential questions. First, respondents were asked

“What is the current total sales of the firm? What was the total sales of the firm three years before the survey?” A 3-year period was used in order to overcome potential biasness coming from measuring the growth in sales of a firm. Answers from both questions were added and the result was divided by three (3). Hence, firm performance is a continuous variable, which is the log difference of recorded total sales revenue by firm i for the current period to total sales revenue reported for three years ago, divided by three. Calculation of growth of a firm in this regard helps to cut down the effect of outliers identified on firm growth (Ayyagari, 2010).

➤ **Financial Access (ACCESS)**

To analyze the impact of a firm’s participation in financial markets on its growth, the study employed the objective measures of access to financial credits provided in the Ghana 2013 Enterprise Survey’s dataset. These measures include line of credit outstanding and short –term loans information on the use of external finance sources and loan applications (Fowowe, 2017). Respondents were asked two sequential questions; *“Does the firm has a credit line or loan? Does the firm has an overdraft facility?”* Firms indicating ‘yes’ on either or both questions were encoded with a value of ‘1’ all other firms with ‘0’. Therefore financial access is a dichotomous variable that receives the value ‘1’ if firm ‘ i ’ gets access to credit or ‘0’ otherwise. Financial access from the literature is anticipated to have a direct effect on firm performance.

➤ **Firm Innovation (FMINNO)**

The research operationalized the innovation outcomes of a firm by applying self-reported measures of innovativeness that were designed from the Ghana 2013 Enterprise Survey’s dataset. In particular, to measure how innovative the firms are, two (2) consecutive questions were employed.

First, respondents were questioned “*Did you introduce new or significantly improved products or services to the market in the last three years?*”. A 3-year period was selected to prevent biasness coming from measuring accidental or one-off innovation. Respondents who answered in the affirmative to this particular question were asked follow up asked “*Was this new or significantly improved product or service also new to your main market?*”. “Yes” answers to both questions were coded with a value of ‘1’ all other firms with a ‘0’. Firm innovation from the literature is anticipated to have a direct effect on firm performance.

➤ **Interaction (INTR)**

This interaction variable represents a relationship between the access to finance and the firm innovation dummy. This variable takes care of the possible mediating effect regarding firm innovation on the association between access to finance and also firm performance in this research. This interaction term is expected to have a direct impact on firm performance. This is because access to financial services by a firm enhances both the access to external information and ideas within innovation processes which in turn have a sustainable benefit to the firm.

3.3.2 Control Variables

To improve the empirical analysis, several control variables have been used. The phenomena that can be controlled are believed to be variable that influence the performance of firms and has been used by other researchers particularly include Regasa et al. (2017) and Ayyagari (2010) to assess the financial access and firm performance relations for firms in Ethiopia and China respectively. This include the following:

➤ **Firm Size (SIZE):**

It is important to control for firm size since larger firms, in general, have vast resources available to them and can therefore free up workers and other resources to enhance growth activities. This is measured as the log of the total number of permanent full time of staff employed in the firm. The Literature recognizes the ambiguity of firm size on firm performance. Most studies predict a positive effect when economies of scale and access to finance are being considered with an enabling investment in skills and technology. In contrast, some studies predict a negative effect on the experience of diseconomies of scale by large firms, which arises from a wide span of control. The existing evidence from the literature establishes that the connection between size and performance is not strong in either direction (Kim et al. 2016).

➤ **Firm Age (AGE):**

The study controlled the age of the firm as it is frequently acknowledged that firms remain more sluggish and less flexible and this will intend to be less likely to grow. A firm's age was ascertained finding the log of the total number of years the firm has operated. Another firm specific feature whose effect on performance is ambiguous is firm age. A positive relation is possible due to learning-by-doing that may arise from the accumulation of experience by firms in production provides an evidence of a positive relation. In contrast, a negative relation may also be possible due to the adaptation of inefficient production practices and the use of old capital equipment by firms. According to the ES firm age is measured by finding the difference between the year of the survey was conducted, 2013 and the particular year the firm began its operations.

➤ **Foreign Affiliation (FOR):**

The study employed a question about the proportion of the firm that private international individuals, companies or organizations own to develop a control variable. First, for any firm that produced an answered of any value greater than 0% to the above question was coded the control variable ‘foreign affiliation’ as ‘1’ and ‘0’ otherwise. “Firms in private foreign ownership may find it especially simple to access external finance while private domestic ownership firms find it especially difficult, but ownership may also be correlated with entrepreneurial capacity and growth potential” (Regasa et al., 2017). Foreign affiliation from the literature is anticipated to have a direct effect on firm performance.

➤ **Sector Dummy (SECT):**

The sector dummy variable takes care of the possible variations existing between firms in different segment of the sector (services and manufacturing sectors). This is due to access to finance may exert different effects on firm performance across firms in different sectors. Thus, it is important to have a control for sector type in the analysis. The variable is dummy, which equals ‘1’ if firm i operates in the manufacturing sector or ‘0’ if it operates in the service sector.

3.4 Method of Analysis

A robust empirical estimation technique will be employed to analyze how the independent variables (access to finance, innovation, firm size, firm age and foreign affiliation) connect to affect the firm performance. Specifically, an Ordinary Least Square (OLS) estimation tool will be employed in this context.

3.5 Sources of Data

The data set for the research is sourced from the Ghana 2013 Enterprise Survey (ES). This data set contains information on innovative capabilities, firm performance and the business environment of firms operating in Ghana. The ES is developed by the World Bank (the Bank) and is a firm-level survey of a representative sample of the country's service and manufacturing firms. The survey includes a vast range of identifiable topics such as access to infrastructure, finance, competition, performance measures etc. The ES is carried out by the Bank to gather data that can be harmonized among developing nations. The Bank, in 2002 has carried out interviews with captains of business and business equity holders of about 130,000 firms located in 135 countries. The ES was carried out in Ghana in 2007 and 2013. We used the 2013 data which covers 720 service and manufacturing firms.

Table 3.1 Variables Descriptions, Expected Signs and Data Sources

Variable	Description	Expected Sign	Source of Data
FMP	Firm Performance	-	Ghana 2013 Enterprise Survey
ACCESS	Financial Access	Positive	Ghana 2013 Enterprise Survey
FMINNO	Firm Innovation	Positive	Ghana 2013 Enterprise Survey
INTR	Financial Access*Firm Innovation	Positive	Author's Computation
AGE	Firm Age	Positive/Negative	Ghana 2013 Enterprise Survey
SIZE	Firm Size	Positive/Negative	Ghana 2013 Enterprise Survey
FOR	Foreign Affiliation	Positive	Ghana 2013 Enterprise Survey
SECT	Sector Dummy	Positive/Negative	Ghana 2013 Enterprise Survey

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This section of the research presents and discusses issues concerning the cross-sectional model and the econometric estimation specified in the previous chapter. The analysis starts with a detailed descriptive analysis of the variables (both dependent and independent) used in the research. It then proceeds to present the correlation between firm performance and the independent variables (access to credit, innovation, firm age, firm size, foreign affiliation and sector type) used in this study. Finally, the results of the actual estimations, using OLS regression techniques are presented and discussed in detail.

4.2 Descriptive Analysis

This section of the research offers a limited discussion on the basic descriptive statistics of the variables applied in the model. These variables are the log of total sales revenue growth (firm performance), access to credit, innovation, firm age, firm size, foreign affiliation and sector type. The summary statistics examined include the standard deviation, mean, maximum and minimum values. Also, the association between the variables (both independent and dependent) applied to the study is presented. Tables 4.1 and 4.2 show the details below:

Table 4.1: Summary Statistics of Variables

Variable	Mean	Standard Deviation	Minimum	Maximum
Firm Performance (FMP)- Continuous	3.841004	0.8363919	1.766106	6.580812
Financial Access (ACCESS)-dummy	0.3333333	0.4717322	0	1
Innovation (FMINNO)-dummy	0.5164835	0.5004161	0	1
Firm Size (SIZE)- continuous	32.72145	72.20062	5	620
Firm Age (AGE)-continuous	15.11831	11.70826	1	104
Foreign Affiliation (FOR)-dummy	0.1611111	0.367889	0	1
Sector (SECT)-dummy	0.5236111	0.4997894	0	1

Source: Author's elaboration using the data

Firstly, the standard deviation section from Table 4.1 calculates the dispersion of the variables from their means. The presence of identified outliers is indicated by large standard deviations which significantly influence the data. The difference that show between the minimum and maximum values of the variables can also assist to determine the spread. The bigger the difference which represent the gap of a variable, the larger the standard deviation of the used variable.

Firm performance (FMP) recorded an average of 3.84. The values of maximum and minimum of firm performance (FMP) are 1.77 and 6.58 respectively within the period. The mean shows that the growth of firms is approximately 3.84 in Ghana. The average of innovation (FMINNO) is about 0.52, with a minimum value recording 0 and a maximum value recording 1, which means that approximately 52% of firms conduct product innovation in Ghana. The mean access to finance (ACCESS) is approximately 0.33, with a minimum value showing 0 whilst the maximum value shows 1. This implies that, in Ghana, approximately 33% of firms have access to loans and overdraft facilities. The mean number of employees is 33, which means that the firms used in the study are medium. Also, the average firm age is 15 years. In addition, about 16% of the firms have at least a foreign affiliation with regards to the shareholding status, while 52% of the sampled firms are in the manufacturing sub-sector. It is estimated that these variables will record a significant effect on firm performance.

Table 4.2: Correlation Matrix for the Variables

	Firm Performance	Financial Access	Innovation	Firm Size	Firm Age	Foreign Affiliation	Sector
Firm Performance	1						
Financial Access	0.2181	1					
Innovation	0.0578	0.1239	1				
Firm Size	0.4927	0.2414	0.1397	1			
Firm Age	0.2626	0.1447	0.1659	0.3638	1		
Foreign Affiliation	0.4079	0.0689	0.0161	0.3282	0.1287	1	
Sector	-0.0692	0.0469	0.075	0.1813	0.1246	0.0134	1

Source: Author's elaboration using the data

Secondly, Table 4.2 indicates the correlation between firm performance (FMP) and the independent variables (access to finance, innovation, firm size, firm age and foreign affiliation) used in this study. From Table 4.2, the interaction between firm performance (FMP) and the other variables agreed with the estimation of the research. The correlation existing between all the variables are commonly low (below 0.5). Thus, there is no pressing concern for high correlation or multicollinearity among the independent variables, since none of the variables recorded 0.5 or more correlation value. The highest correlation is between firm size and firm performance which recorded about 0.49. This is true because the growth of a firm is highly dependent on its size as

shown by many researchers (see Sleuwaegen & Goedhuys, 2002; Cabral & Mata, 2003; Sarpong & Wolf, 2008). Since, the correlation between the variables is moderate it implies that the inclusion of all the variables in the model is key.

4.3 Empirical Results and Discussion

The study estimated the model by employing a robust estimation technique. Specifically, the outcomes shown in Table 4.3 is obtained from calculating equation (1) using the OLS regression tool. Regression analyses were carried out regarding sector dummies (manufacturing and services) to take care of the possible heterogeneity that may exist among firms. This means that the same firm characteristic may exert different impacts on firm performance depending on the sector the firm belongs to. In addition, the presence of heteroscedasticity must be corrected, the study run a robust command as part of the calculation techniques. This method shows standard errors of regression coefficients that are robust to heteroskedasticity. From Table 4.3 Models 1 and 2 consider financial access and innovation with the control variables (firm size, firm age, foreign affiliation and sector dummies) on firm performance, respectively. Model 3 presents the combined effects of financial access, innovation and their interaction, without the control variables, while in Model 4 further control variables (firm size, foreign affiliation, firm age, and sector dummies) are included.

The model performed quite impressively as most of the coefficients of the variables recorded their anticipated signs and statistically significant except the firm age variable, which is statistically insignificant, albeit positive. The constant term in Model 4 shows that if all the coefficients of the explanatory variables amounted to zero, the study would expect a 3.584 increase in firm performance in Ghana.

Generally, the results presented in Table 4.3 show that, innovation and financial access recorded positive and significant impacts on firm performance. As anticipated, there is evidence of faster growth rate among firms that recorded a greater access to financial facilities (loans or overdraft facilities) or introduced new services or product into the competitive market (innovation). Specifically, Models 1 through Model 2 using the OLS regression, indicate that financial access and innovation respectively, exert positive and statistically significant effects on firm performance. The combined impact of these variables are still recorded positive and statistically significant as well as the interaction term in Model 3. In model 4, the model with control variables (firm age, firm size, foreign affiliation and sector dummies) were augmented but the effect of financial access and innovation are still positive and significant. The interaction term is positive and statistically significant as well. The discussion of these results is presented accordingly.

Table 4.3: Estimates of equation (1) using OLS: Dependent Variable - Firm Performance

	Model 1	Model 2	Model 3	Model 4
	(OLS)	(OLS)	(OLS)	(OLS)
VARIABLES	Firm Performance	Firm Performance	Firm Performance	Firm Performance
<i>Independent Variables:</i>				
Financial Access (ACCESS)	0.114*** (0.0804)		0.211*** (0.157)	0.241*** (0.146)
Innovation (FMINNO)		0.013** (0.103)	0.184** (0.149)	0.120*** (0.113)
Financial Access*Innovation (INTR)			0.268** (0.239)	0.340** (0.204)
<i>Control Variables:</i>				
Firm Size (SIZE)	0.004*** (0.001)	0.005*** (0.003)		0.003*** (0.001)
Firm Age (AGE)	0.005 (0.014)	0.007 (0.025)		0.009 (0.013)
Foreign Affiliation (FOR)	0.145***	0.190***		0.188***

	(0.100)	(0.135)		(0.138)
Sector (SECT)	-0.119*** (0.071)	-0.173*** (0.102)		-0.161*** (0.103)
Constant	3.613*** (0.074)	3.691*** (0.099)	3.671*** (0.093)	3.584*** (0.107)
Observations	388	208	210	208
R-squared	0.329	0.342	0.259	0.362

Robust standard errors in parentheses, *** p<0.01, * p<0.05, * p<0.1

Source: Author's elaboration using the data

4.3.1 Direct Effect of Financial Access on Firm Performance

In table 4.3, the financial access variable (ACCESS) coefficient is significantly positive in all the estimations, therefore we fail to reject the hypothesis that an increase in financial access result in to a rise in firm performance in Ghana. The results indicate that access to credits status has enhanced the sales revenue growth of Ghanaian firms. Because the variable, financial access, is a dummy variable for which firms have access to finance or not, it implies that firms that have access to finance namely loans and overdraft facilities have higher probability to experience higher sale revenue growth than firms that do not have access to finance. Therefore, the finding of positive and significant coefficient for financial access implies that access to loans and overdraft facilities

have had a positive effect on the sales revenue growth of firms in Ghana. The results from Model 4 show that a single percentage point increase in access to finance by a firm in Ghana, increases firm performance by about 24 percentage points, relative to firms that do not experience access to finance, all other things being equal. This result is in line with the results obtained from previous studies, who stressed on the significance of finance to the performance of firms. Studies by Fowowe (2017) and Aterido et al. (2011) on Africa and developing countries' firms respectively, suggest that firms that are not credit constrained experience faster growth than firms that are credit constrained. They concluded that finance is very crucial for firm growth, and that measures and initiatives should be designed and implemented to make more finance available for firms in Africa.

In conclusion, the result from this variable rejects the null hypothesis of no significant effect of financial access on firm performance and therefore, accepts the alternative hypothesis of a significantly positive effect of financial access on firm performance. That is, firms that have control over financial facilities experience higher growth. Therefore, high access to loans and overdraft facilities by firms increase their sales growth in Ghana. This outcome is in line with the findings of Fowowe (2017) and Aterido et al. (2011) on firms in Africa and developing countries respectively.

4.3.2 Direct Effect of Innovation on Firm Performance

In Table 4.3, the coefficient of the innovation (FMINNO) is significantly positive in all the estimations, therefore, the research fails to reject the hypothesis that a rise innovation results into growth of firm performance in Ghana. The results show that the innovative nature of a firm has a direct influence on its growth in Ghana. The innovation variable is a dummy variable (whether the firm innovates or not), showing that a firm that brings new products or services into the market

experience a higher growth compared to a firm that does not introduce new products or services into the market. Therefore, the finding of positive and significant coefficient for innovation means that launching new products or service into the competitive market have had a positive effect on growth of the firms in Ghana. In particular, the results from Model 4 show that a single percentage point increase in innovation by a firm in Ghana, increases firm performance by about 12 percentage points, relative to firms that do not innovate. This confirms the findings of Gunday et al. (2011) and Thornhill (2006) for firms in Turkey and Canada respectively, who found positive effects of innovations on firm performance in manufacturing industries. They concluded that innovation is very important for firm growth and that appropriate policy interventions should be enacted to encourage firms to engage in innovation activities.

To conclude, the finding from this variable rejects the null hypothesis of no significant effect of firm innovation on firm performance and therefore, accepts the alternative hypothesis of a positive and significant effect of firm innovation on firm performance. Thus, firms that have control over innovation activities experience faster growth. Specifically, high product innovation by firms increase their sales growth in Ghana. This result confirms the findings of Gunday et al. (2011) and Thornhill (2006) for firms in Turkey and Canada respectively.

4.3.3 Mediating Effect of Innovation

It is observed that the interaction (INTR) between financial access and innovation is significantly positive in all the estimations, therefore we fail to reject the hypothesis that having a high financial access triggers innovation which tend boosts firm performance. It therefore establishes that innovation partly mediates the relationship between financial access and firm performance, even

though the research expects a direct effect of financial access on firm performance. An important aspect of the growth of a firm is its ability to engage in innovation activities (i.e. bringing new products or services into the market). This innovation will itself directly spur potential behavior change by encouraging firms to involve in activities that will lead to their growth, thus, regarded as a potential mediator or the channel through which the effect financial access is felt within the firm. This implies that, financial access on its own cannot lead to firm growth in Ghana except through innovation. Therefore, to achieve higher growth, firms must increase their innovation activities, which can be financed by loans or overdraft facilities. The results in Model 4 indicate that a firm that has access to finance and innovates increases its growth by about 34%. The findings of this study on this relationship is consistent with the research conducted by Ibrahim et al. (2016) on firms in Nigeria, who showed that the combination of innovation and access to finance strengthen each other's effect on firm performance.

To conclude, even though the study expects a direct effect of financial access on firm performance as established by many studies, the study finds a mediating effect of innovation on this relationship, which firms should focus on if they aim to increase their sales levels. The result from this variable rejects the null hypothesis of innovation not being a good mediator and therefore, accepts the alternative hypothesis of innovation being a good mediator on the relationship between access to finance and firm performance. Therefore, innovation is a good mediator for the link between financial access and firm performance in Ghana.

4.3.4 Direct Effects of the Control Variables

Regarding the overall findings from the control variables, Firm size (SIZE) has a positive effect on the growth (performance) of firms, while firm age (AGE) has no effect, albeit positive. This

means that large firms experience faster growth (performance) compared to small firms (Regasa, 2017). However, firm age cannot be said to be a predictor of firm growth in Ghana. The results in Model 4 indicate that a unit increase in firm size increases the growth of a firm by about 0.3%. Although the research finds evidence of a positive link between firm size and firm performance, it concludes that firm age is relatively an unimportant driver of the growth of firms Ghana.

Moreover, foreign affiliation (FOR) has the anticipated positive effect. The implication is firms that have foreign equity experience faster growth than those who have 100% local equity. However, from the results, the foreign affiliation variable is observed to exert the greatest positive effect on firm performance among the control variables. The results in Model 4 show that the growth of foreign owed firms increases by about 19% relative to domestically owned firms in Ghana. It means that foreign ownership is relatively an important driver of the growth of firms in Ghana. This confirms the results of Regasa et al. (2017) for Ethiopian firms, who opined that firm size and foreign affiliation are related to higher growth of firms, whilst firm age was found not to have any significant effect on firm growth.

Finally, the sector dummy variable (SECT) is negative and the estimation is significant. As it has been revealed that the performance of the manufacturing sector of Ghana has continuously declined over the years (Sarpong & Wolf, 2008), this may account for the negative coefficient of the sector dummy. Therefore, the result of negative and significant coefficient for the sector dummy means that manufacturing firms' growth decreases relative to service firms in Ghana. Specifically, the results from Model 4 indicate that manufacturing firms' growth decreases by about 16% relative to service firms' in Ghana.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The section presents the summary and conclusions of the research, including policy recommendations and limitations based on the findings of the study.

5.2 Summary

There is vast literature on the subject to demonstrate the key role finance plays in the economic development and growth of countries world-wide. However, the specific links and channels through which the comprehensive proxies for finance namely, financial deepening, financial development, and financial inclusion influence the growth of countries are scant. Among the channels is the relationship between innovation and firm growth, which the motivation of this research is built upon.

Generally, the key objective of the research is to ascertain the role of financial access and innovation on the performance of firms in Ghana. Specifically, the study explores the effects of financial access and innovation on firm performance, and also to investigate the mediating effect of innovation on the link between financial access and firm performance. The research questions enumerated, the study answered the questions: Do financial access and innovation have significant effects on firm performance? To what extent does innovation mediate the link between financial access and firm performance?

The study used sales growth as dependent variable to measure performance of a firm, financial access proxy by access to loans and overdraft facilities and innovation measured by the ability of a firm to introduce a new product or service into the market. These variables are employed to examine the effect of financial access on firm performance in Ghana as well as the mediating role of innovation in this relationship. As seen in the extant literature, the study controlled for the phenomena that may affect the dependent variable in the model (i.e. firm size, firm age, foreign affiliation and sector type). The study estimated a robust OLS regression model using cross-sectional data of 720 manufacturing and service firms from the World Bank Enterprise survey for Ghana. The robust estimation was to control for serial correlation and heteroskedasticity.

The study discovers that financial access, especially, access to loan and overdraft facilities, have positive effect on firm growth in Ghana. In addition, the combination of financial access and innovation tend to have profound impact on the growth of firms. Also, after controlling for firm size, age, foreign ownership and sector type, the size of the firm and foreign ownership have been found to have positive effects on firm performance, while firm age had no effect on firm performance. However, the foreign affiliation variable is observed to exert the greatest positive effect on firm performance among the control variables. Moreover, the sector dummy had a negative coefficient, which means that manufacturing firms' growth decrease relative to service firms in Ghana.

5.3 Conclusions

The study concludes that financial access, especially, access to loan and overdraft facilities, and the introduction of a new products or services in the market play a vital role in enhancing firm growth in Ghana. This indicates that access to finance and innovation by firms lead to higher sales

growth (performance) in Ghana. Besides, the combination of financial access and innovation tend to have profound impact on the growth of firms. This means that, financial access by itself cannot enhance firm performance in Ghana except through innovation. Hence, these two factors should be combined in good proportions to enhance firm growth. Also, after controlling for firm age, size, foreign ownership and sector type, the size of the firm and foreign ownership have been observed to have direct effects on firm performance, while firm age had no effect on firm performance. This shows that large firms that have foreign equity experience faster growth than those with 100% domestic owned, and that the age of a firm has nothing to do with firm performance in Ghana. However, the foreign affiliation variable is observed to exert the greatest direct effect on firm performance among the control variables, meaning that foreign ownership is relatively a key driver of the growth of firms in Ghana. Moreover, the sector dummy had a negative coefficient, which means that manufacturing firms' growth decrease relative to service firms in Ghana.

5.4 Policy Recommendations

The policy recommendation proposed by this study is that the government of Ghana should together with the central bank of Ghana implement monetary polies aimed to reduce the cost of obtaining loan and over draft facilities to the manufacturing and service sectors. The constraints in borrowing from the commercial banks should also be reduced drastically. Acquiring cheaper credit facilities will enable the manufacturing and service sectors to have easy access to funds for running their operations. These industries in the long run can introduce new products, expand their operations and acquire internationally accredited certification of quality products. Policies to integrate Ghana into the global market should not be mired. This will enable the industries to trade on the international market leading to increase in sales and profit margins.

The capital market in Ghana is developed and internationally recognized. The Ghana Stock Exchange (GSE) provides opportunity for listed firms to gain access to equity finance. Potential investors both international and domestic can invest in these business by providing equity. Manufacturing and service industries can use this avenue for raising funds to expand their operations through innovation. However, challenges confronting firms to be listed on the Stock Exchange must be addressed by the government. Policies and regulations to encourage business to seek equity finance from the Stock Exchange should be enacted.

The findings from this study also have managerial implications. Manufacturing firms and services should allocate adequate funds into their research and development departments. Managers should ensure intense research are conducted into the evolving customer preference. Results from these research will support product or process innovation to meet customer taste. Therefore, access to credit facilities and innovation should be carried out together by managers of firms in Ghana to ensure substantial growth and significant increase in performance.

5.5 Limitations of the Study

The study focuses on the link between financial access and firm performance at a specific-country-level, Ghana. For future studies, it would be much more interesting to investigate this relationship at a cross-country-level, in developing countries. Also, due to data limitations it was not possible in our study to carry out analyses using panel data. Analysis of that sort would give an indication of the specific firm effects on firm performance.

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