UNIVERSITY OF CAPE COAST

COST CONTROL AND GROWTH OF LISTED MANUFACTURING

FIRMS IN GHANA: THE MODERATING ROLE OF PRICING

STRATEGY

SUSANA KYEREBOAH SEKYI

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BY

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Thesis submitted to the Department of Accounting, School of Business,

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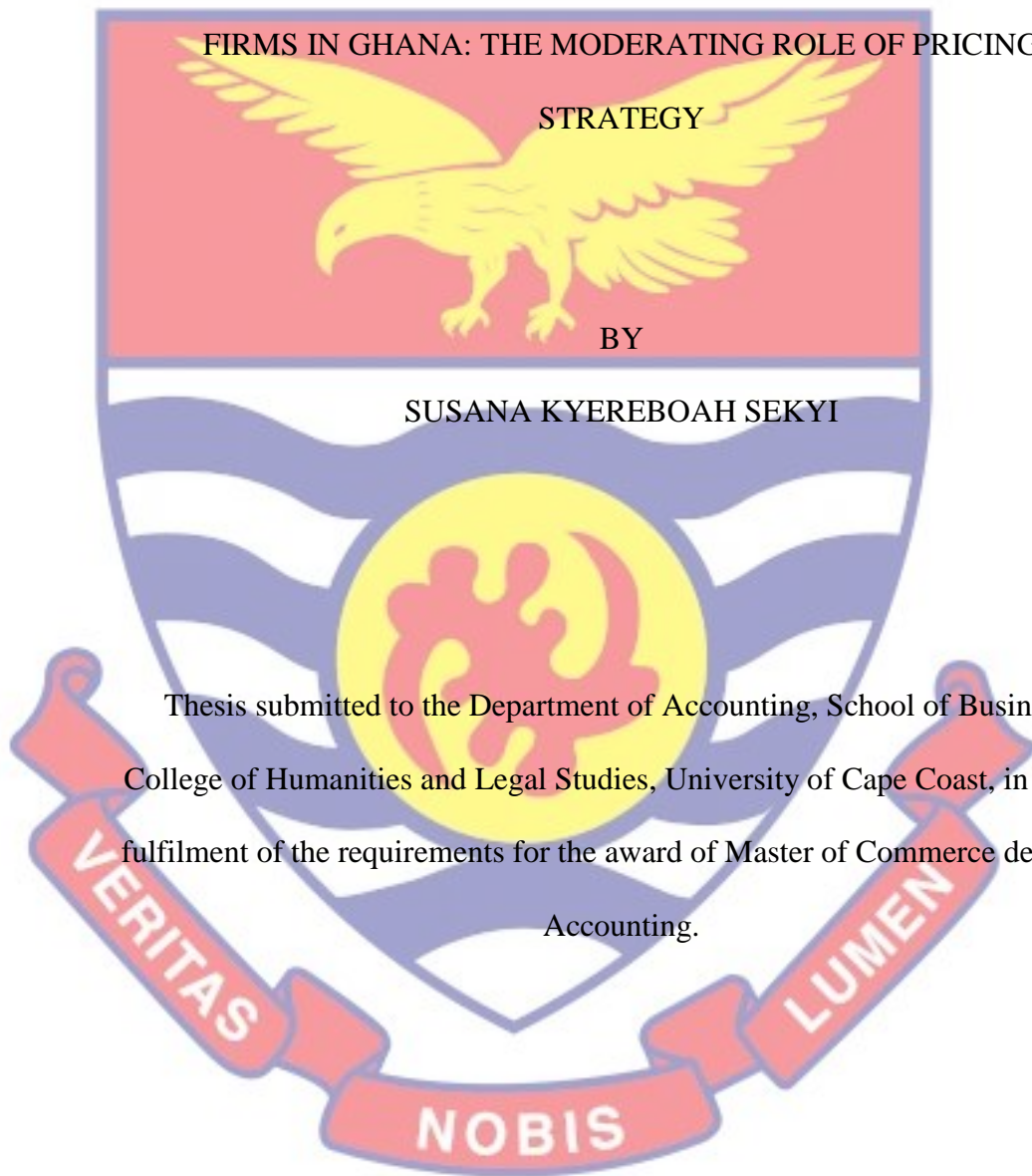
DECEMBER 2022

DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and

that no one has presented part of this work for any degree in this university or

elsewhere.

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

Name: Susana Kyereboah Sekyi

Supervisor's Declaration

I hereby declare that the preparation and presentation of this thesis was

supervised in accordance with the guidelines on supervision of thesis laid

down by the University of Cape Coast.

Supervisor's Signature ……………………….... Date…………………………

Name: Rev. Dr. George Tackie

ABSTRACT

Growth in the manufacturing sector of Ghana has been sluggish due to the recent hikes in input prices. However, manufacturing firms' growth, mainly, depends on their ability to maximize and sustain profit. Hence, many of these manufacturing firms may attempt to achieve this objective through the management of their cost structure and the adaptation of better pricing methods. Therefore, this study determined the effect of cost control on the growth of manufacturing firms in Ghana being moderated by pricing strategy. In achieving this, Levene's test and two-step system dynamic General Method of Moments (GMM) model were used to analyse the panel data for a period of 10 years from 2012 to 2021. The study revealed no statistically significant difference in the level of cost control of listed manufacturing firms in Ghana. Additionally, the findings from the regression analysis indicated that cost control dimensions have statistically significant relationship with firm growth. Even though the competitive-based pricing strategy and customer-value based pricing strategy were weak in influencing cost control dimensions to affect firm growth, cost-based pricing strategy had statistically strong interaction effect on cost control (dimensions) and firm growth. The study concluded that pricing strategy significantly moderate cost control and firm growth (proxied as changes in total sales) and not return on equity as a proxy for firm growth. It was therefore recommended that management of manufacturing firms' policies should be channelled to controlling cost and eliminating wastage in all dimensions. The study also recommended that manufacturing firms' management must focus on cost-based pricing strategy to enable cost control to highly influence firm growth in the Ghanaian manufacturing industry.

KEY WORDS

Cost Control

Firm Growth

Generalised Method of Moments (GMM)

Ghana Stock Exchange (GSE)

Manufacturing Firms

Pricing Strategy

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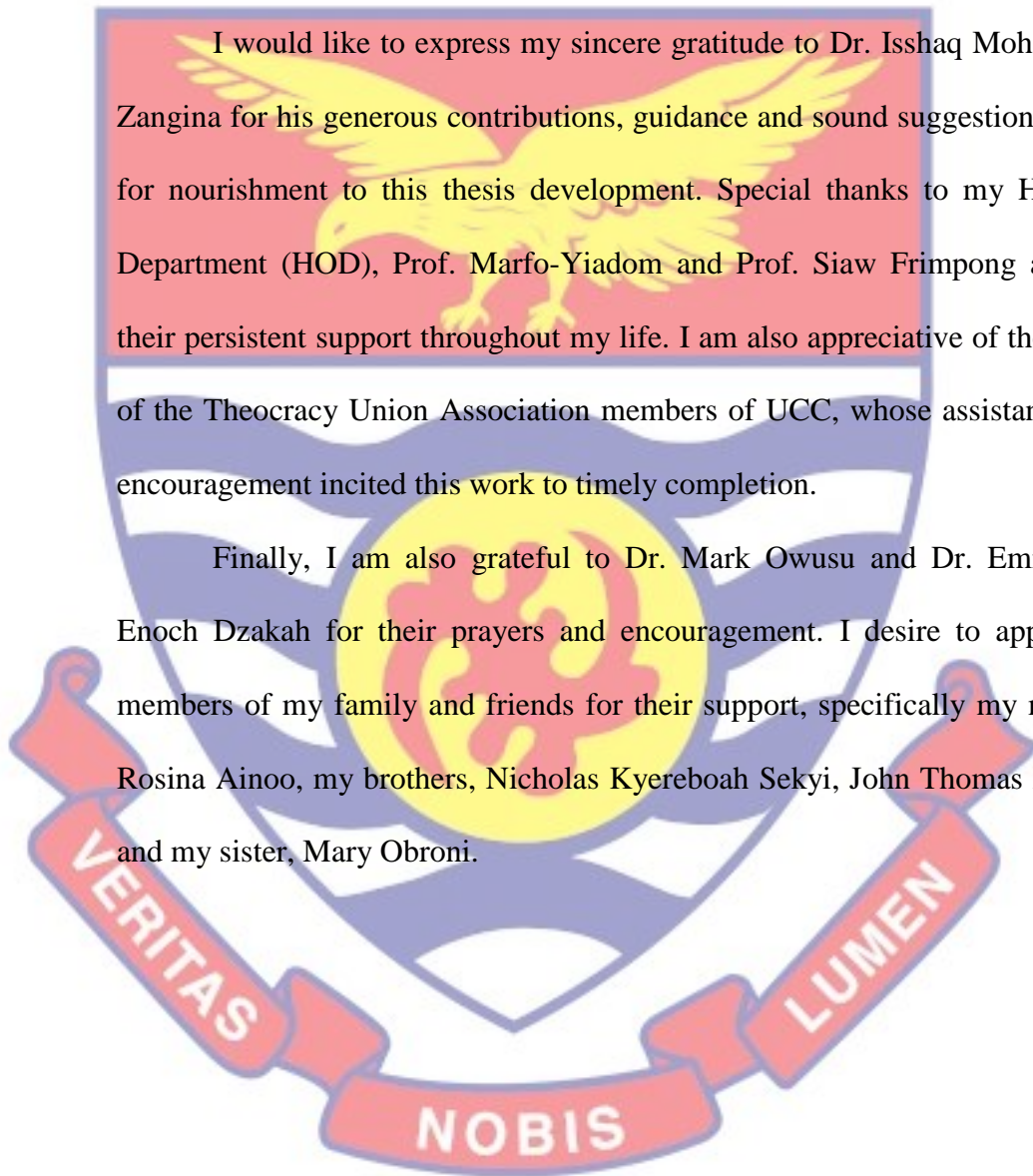
DEDICATION

To my parents; Mr. Paul Kyereboah Sekyi and Miss Rosina Ainoo, and my

siblings

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LIST OF ACRONYMS

CBPS	Cost-based Pricing Strategy
COMPPS	Competitive-based Pricing Strategy
CUSVBPS	Customer value-based Pricing Strategy
GDP	Gross Domestic Products
GMM	Generalized Methods of Moments
GSE	Ghana Stock Exchange
GSS	Ghana Statistical Service
MC	Marginal Cost
MR	Marginal Revenue
OIR	Over-Identifying Restrictions
PS	Pricing Strategy
ROA	Return on Asset
ROE	Return on Equity
UNCTAD	United Nation Conference on Trade and Development
$\Delta lnCTC$	Change in the natural logarithm of Average Composite Cost
$\Delta lnMC$	Change in the natural logarithm of Material Cost
$\Delta lnLC$	Change in the natural logarithm of Labour Cost
$\Delta lnFO$	Change in the natural logarithm of Factory Overhead
$\Delta lnTS$	Change in the natural logarithm of Total Sales

CHAPTER ONE

INTRODUCTION

The manufacturing industry as a hub of industrialization has been classified as an engine for mass employment, enhanced standard of living and above all a means of sustained economic development. However, in spite of all government efforts to improve the performance of Ghanaian manufacturing industry, the growth in the industry has been sluggish (Ghana Statistical Service, 2021). Therefore, this study considered the role played by management in controlling the cost structure and adopting an appropriate pricing strategy which intends to enhance growth of these manufacturing firms in Ghana. This study contributes to existing literature on the effect of cost control on firm growth, moderated by pricing strategy of manufacturing firms listed in Ghana and practically to serve as an essential tool for policy and decision makers as they coordinate efforts to enhance the current state of the manufacturing industry of Ghana.

Background to the Study

Over decades, most manufacturing firms in developing countries have relied mainly on their sales revenue and internal policies in order to boost growth. However, factors such as cost and pricing decision inefficiencies cause most of these manufacturing firms to exhibit far less internal relations with other countries, which occasion them to be limited in scope and in development (Adarkwah & Santuoh, 2018; Addo, 2017). Due to this, the economy has been surrounded with huge unemployment rate, poverty and low standard of living (Addo, 2017; Amenyo, 2016). It is in this disclosure that Laake (2012) suggested cost control and strategic pricing to be the sure ways

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manufacturing firms could spur greatly. This is because the manufacturing sector in an economy industrialisation have been emphasised as definite means for creating job opportunities, spurring revenue mobilisation and ultimately propelling growth (UNCTAD, 2019).

Manufacturing firms are observed as assuming a significant role in the economies of nations. Bhorat and Steenkamp (2018) projected that growth in the manufacturing sector in the years to come will be motivated by increasing connections among African nations and with the remainder of the world. This is verified from analysts' forecast that the fastest growth throughout the following decade (from 2019 to 2029) will happen in the manufacturing sector such as agricultural-processing, cement production, and clothing and footwear (Signé, 2018).

However, Signé (2018) was of the opinion that based on the patterns of development in the manufacturing sector, most nations will encounter fast progress in demand for manufactured products in the near future, with the biggest increases likely to arise in beverages and processed food business. Signé further suggested that incomes would increase in the manufacturing sector by GHS550 (equivalent to $120) billion throughout the following ten years. Moreover, it was further opined that growth in manufacturing sector would improve levels of income and patterns of family spending than any other economic sector.

Cost effectiveness is broadly seen as the essential requirement for growth in manufacturing firms of all sizes (Laake, 2012; Signé, 2018; Siyanbola & Raji, 2013). The studies indicated that Africa is a progressively cost-effective location for manufacturers and a considerable volume of scope

remains for expansion and growth in the manufacturing industry. However, the cost of production rises as the cost of labour rises in developing countries. Similarly, the rise in these cost elements affects the entire profitability of firms and thus the growth of the manufacturing industry in Africa.

Hence, in recent times, management of organisations are being cost conscious and continually looking for better approaches for controlling cost and eliminating wastages (Akeem, 2017; Siyanbola & Raji, 2013). That is, management of most organisations are becoming interested in the growth of the firm and cost control tends to be the major method being used by manufacturing firms to generate profitable revenue. Akeem (2017) expressed that companies should have precise cost modelling methods to manage their cost. Thus, product cost should be able to eliminate unnecessary cost from the product's expected cost by applying improvement process to deal with the expense.

Growth is indicated by many factors such as Tobin's q, return on equity (financial measures by Musah, Kong, Antwi, Donkor, Quansah and Obeng (2019), number of loyal customers (Wangui, Kiragu, & Wachira, 2018) and others. This study focuses on internal quantifiable factor and use changes in the level of total sales (Egbide, Adegbola, Rasak, Sunday, Olufemi, & Ruth, 2019; McKelvie & Wiklund, 2010) and natural log of return on equity (Hart, 2021; Lipson, Mortal & Schill, 2011; Salim & Yadav, 2012) as a proxy for the firm growth of the manufacturing entities.

Moreover, pricing is a vital management decision for practically all companies (Rogerson, 2013). All firms, being it manufacturing, marketing or services set price for their goods and/or services. This is because price

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determines the extent of revenue maximization and profit a company generates (Rogerson, 2013). It has been highlighted that price is the amount connected to an item and the lone component of the marketing mix that generates profit for the company. All firms engaged in either manufacturing, merchandise or service provisions adopt various types of pricing strategy in assigning value to their products or services (Sunarni & Ambarriani, 2019).

Pricing decisions are empirical evidenced to affect growth in sales as well as firm's growth. That is, a study by Deans and Watanabe (2005) among North America's largest companies showed that a percentage increase in price leads to more than seven per cent increase in profit; whereas, a percentage increase in price is three times as effective as a percentage reduction in cost, so the case for increasing prices through the adoption of an appropriate pricing strategy is necessary if total turnover (sales) growth is of concerned (Deans & Watanabe, 2005). It was also asserted that in a very competitive business market, pricing information is the most significant factor to regulate and survive the market.

Economically, the Ghanaian manufacturing sector has seen minimal growth and slight positive results whereas statistically the growth has been at a declining rate (GSS, 2014; Obed, 2016). According to the 2007-2021 annual reports of Ghanaian manufacturing companies, it was evidenced that total sales revenue was declining from 2015-2021 for some of the firms such as Aluworks, Ayrton Drug Manufacturing Company. However, few of these firms such as Starwin Products, FanMilk, and Benso Oil Plantation were having constant growth in total revenue whereas most of these firms (such as Camelot Ghana, Unilever, Sam Woode, PZ Cussons, Produce Buying Limited,

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Guinness Breweries and others) were having fluctuations in total revenue growth.

Adarkwah and Santuoh (2018) were of the opinion that the activities of Ghana's manufacturing companies have improved in areas such as technology and innovation in the business arena which have not reflected yet due to inefficiency in cost control. This inefficiency makes the future growth of the manufacturing firms considerably uncertain. Therefore, it becomes essential that the effect of cost control on growth of manufacturing firms moderated by pricing strategy be empirically assessed in the Ghanaian context.

Statement of the Problem

There is inefficiency in cost control and ineffective pricing strategy in the Ghanaian manufacturing firms which have resulted in most of the manufacturing firms fading out of business leading to unemployment, low standard of living and poverty (Adarkwah & Santuoh, 2018). According to Adarkwah and Santuoh (2018), the inefficiency in the manufacturing firms is due to factors such as high inputs cost, old technology, high taxes, over-staffing, limited skills and limited economies of scale.

Studies from managerial accounting perspective draw presumption that there exists close connection between cost control and firm growth (Egbide et al., 2019; Laake, 2012; Siyanbola & Raji, 2013). This research came across only a few studies conducted on cost control and firm growth, however, results from these studies have been mixed. Whiles a study by Ben-Caleb, Otekunrin, Bamidele, Adewara, Oladipo and Eshua (2019) found a significant relation between cost control and firm growth, other studies such as Oyedokun,

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Tomomewo and Owolabi (2019) found a negative relationship between some cost control dimensions and firm growth.

Wangui et al. (2018) and Rapaccini (2015) found significant positive effect of pricing strategy on growth whereas De Toni, Milan, Saciloto and Larentis (2017) revealed significant influence of pricing strategy on profitability when prices are set at high level but insignificant at low level. However, most of these studies looked at the relationship between cost control and firm growth (Egbide et al., 2019; Oyedokun et al., 2019; Siyanbola & Raji, 2013) whereas other works (e.g., Wangui et al., 2018) also considered pricing strategy influence on firm growth separately.

This study makes contribution to literature by looking at the effect of cost control on growth of listed manufacturing firms, moderated by pricing strategy. To add to existing literature, the current study sought to use the research technique (the two-step system General Method of Moments (GMM)) which has not been used in this study area. The system dynamic general method of moments (GMM) is appropriate such that it resolve methodological gap and contribute to literature by the provision of robust findings which other research techniques could not provide.

Moreover, there exist gap as most of the existing literatures on the subject matter were conducted in different geographical areas (India, America, Nigeria, Indonesia and Kenya) other than Ghana. Majority of prior related studies focused on institutions other than manufacturing firms, and were conducted outside Ghana; thus, making comprehensive application of their findings to decision-making in Ghana unrealistic. The conclusion of studies in the manufacturing sector cannot be applied to Ghana because of the sample

size of these manufacturing firms taking into consideration sample size of 48 firms for Nigeria and 50 companies for the other studies, also the economic conditions in these countries are different from that of Ghana.

Moreover, the cost of sales for most of the listed manufacturing firms have not been consistent for the years under review on the face of the financial statements. This shows that there are significant difference in the level of material, labour and factory cost control. However, this significant difference in cost dimensions on the face of the financial statements of these listed manufacturing firms cannot be determined literally except statistical test have been conducted. Therefore, the current study sought to determined the significant difference in the level of cost control on the face of the financial statement against the control setting.

The study specifically contributes to empirical studies in Ghana and serves as a guide to policymakers since the study did not come across any study to the best of the researcher's knowlegde, on the subject matter in Ghana but very few such as Adjei (2020), Annor-Asubonteng, Tengan and Asigri (2018) as well as Prempeh and Peprah-Amankona (2019) focused on cost control variable and not necessarily firm growth. These studies explored the relationship among cost variables using analysis of variance and ordinary least square approaches, which failed to determine how robust the connection between the instrumental variables can influence firm growth. Thus, the current study used a robust method (system dynamic GMM, specifically, two-step system general method of moments) that takes into consideration the impact of the changes in the instrumental variables on firm growth.

Purpose of the Study

This research determined the effect of cost control on growth of manufacturing firms listed in Ghana being moderated by pricing strategy.

Research Objectives

The study specifically sought to:

1. Determine the significant difference in the level of cost control of listed manufacturing firms in Ghana;

2. Analyse the effect of cost control on growth of listed manufacturing firms in Ghana; and

3. Examine the moderating role of pricing strategy in the relationship between cost control and growth of listed manufacturing firms in Ghana.

Research Hypotheses

To achieve the aforementioned research objectives, the following hypotheses were formulated:

$H_0 1$: There is no statistically significant difference in the level of cost control of listed manufacturing firms in Ghana.

$H_1 1$: There is a statistically significant difference in the level of cost control of listed manufacturing firms in Ghana.

$H_0 2$: There is no statistically significant effect of cost control on the growth of listed manufacturing firms in Ghana.

$H_1 2$: There is a statistically significant effect of cost control on the growth of listed manufacturing firms in Ghana.

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$H_0 3$: There is no statistically significant moderating effect of pricing strategy on the relationship between cost control and growth of listed manufacturing firms in Ghana.

$H_1 3$: There is a statistically significant moderating effect of pricing strategy in the relationship between cost control and growth of listed manufacturing firms in Ghana.

Significance of the Study

The research has both theoretical and practical significant implications. This research unites both practice and theory. The outcome from the second objective of the study is supported by the revenue maximization theory. The statistical findings from analysis of the second objective are in agreement with the rejection of the null hypothesis. Hence, gives empirical contribution to revenue maximization theory which asserts that when marginal cost is controlled to the minimum where marginal cost equals to marginal revenue (i.e., MC=MR), profit is at it optimum. Moreover, this theoretical assumption was obvious in the empirical proof obtained by the findings from the significant difference in the level of cost control as determined in the first objective as well as the second objective since there was statistical significant influence of cost control on firm growth.

Besides the theoretical impact of revenue maximization theory, part of the results also contributed to the economic theory. Based on this theory, pricing strategy has the possibilities to contribute towards the growth of manufacturing firms better than only cost control on the basis of internal factors or policies. The findings for the sensitivity regression aid in the moderating effect of this study affirm these assumptions of pricing strategy.

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This implies that management of manufacturing firms in Ghana can apply this theory and assumptions in their operating decisions and procedure of pricing.

The research will be beneficial to the entire staff of manufacturing firms in their decision-making process on adopting appropriate pricing strategy for their produce that may increase turnover. The results from the relation between pricing strategy and firm growth in the context of manufacturing firms in Ghana gave guidance for performance growth management. Since the outcomes revealed significant positive influence of pricing strategy on firm growth, there is the need for management of manufacturing firms to adopt better and appropriate pricing strategy. Also, the interacting role of cost-based yielded significant influence in the relation between cost control and firm growth. In practice, the study has given measurement scale for manufacturing firms' growth. Consequently, the research outcome will provide foundation for organising training platforms, workshops and seminars on cost control practices and pricing strategy for management of corporate entities specifically the manufacturing firms.

Delimitations of the Study

The study investigated cost control of various cost components mainly; material cost, labour cost and factory overhead of manufacturing firms listed on the Ghana Stock Exchange and the effect of these costs control on firm growth. As described in the introductory background of the study, Ghana's manufacturing sector was selected as the area of the research due to the features of manufacturing firms in relation to cost control. This is because cost control on the various component of direct cost is major challenge in spite of

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the general challenges of the manufacturing concern in Ghana (Amenyo, 2016).

The study used secondary data rather than primary data due to availability of statistical interest in variable of the study. The study period was ten years and data were taken from manufacturing firms audited annual reports for the period of 2012 to 2021 and the individual firm's website for any absence report or data. Variables include cost control, pricing strategy and firm growth. The study used changes in total revenue (ΔlnTS) and natural log of return on equity (lnROE) as proxies for firm growth and used the changes in the various cost elements (ΔlnMC, ΔlnLC and ΔlnFO) as proxies for cost control dimensions. The average of these cost elements was also the main cost control element measured with proxy as average composite cost control (ΔlnCTC).

Delimitations include the population of a study being listed manufacturing firms in Ghana; therefore, this study should not be concluded as listed firms' analysis and a blind commendation of cost elements controls, pricing strategy and firm growth to be discussed herein. This study adopted the dynamic panel regression analysis because the research embraced different firms over different times, which form the panel section of analysis. Thus, statistical analysis and focus of the research were Levene's test statistics, descriptive statistics and dynamic panel system regression using the two-step system dynamic Generalised Method of Moments.

Limitations of the Study

The research employed the econometric technique, the system dynamic Generalised Method of Moments (two-step system GMM). This study is not

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without limitations and it is because the findings of this report cannot be generalized to other firms in different industry due to the sample size. Therefore, future studies can examine the relation between cost control and firm growth in agricultural, mining, construction industries and others. There might be inconsistency due to different level of industry demands, competition and concentration. Moreover, the study investigated growth-cost relationship via growth rate of total sales and cost elements level changes. Besides, the study focused on only the listed manufacturing firms in the manufacturing industry. It failed to include the non-listed manufacturing firms, which likewise fall under the manufacturing industry. The panel period for the study was not long thus yielding small observations. This is due to unavailability of annual reports from the data source for consideration of more years of listed manufacturing firms. Thus, even with the ten (10) year's period of the study, the data gathered was not balanced and thus it may impede effective generalisation.

Definition of Operational Terms

1. **Cost:** In accounting and business, cost is defined as the money value that has been used by a firm to produce a good or offer a service. In an organisation, cost states the amount of money that is spent on the manufacturing of a good or creation of service. Cost does not include any element of margin or mark-up.

2. **Cost control:** Cost control is the act of recognizing and reducing business expense to maximize profits, and it begins with the process of budgeting. For instance, a firm can get offers from various merchants that give the same product or service, which can lower expenses. Cost

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Control deals with measuring changes from the standard cost and taking actions (effective) to correct and attain the actual cost at its minimum. Strategies are applied to monitor costs and performance against the growth of a project. All changes to the cost components are recorded and the final total costs are estimated to determine the average cost.

3. **Pricing strategy:** Pricing strategy refers to technique that companies adopt in valuing their goods and services in the market or for an offer. Almost all production companies, large or small, base the price of their goods and services on materials, labour, direct factory cost and advertising costs and then add on a specific rate for a profit that is deemed to mark-up or margin. These comprises of several pricing methods such as discount pricing, penetration pricing, product life cycle pricing, break-even pricing and even price skimming. However, these pricing methods are classified into three main pricing strategies in the managerial accounting prospective (Sunarni & Ambarriani 2019). These pricing strategies include cost-based pricing strategy, competitive-based pricing strategy and customer value-based pricing strategy. The classifications are illustrated in Appendix A.

4. **Manufacturing firms:** Manufacturing firm is a business entity that utilizes basic materials, parts, and segments to create finished products. Manufacturing organisations often use robots, machines, computers, and human resources to produce and distribute the product and normally use a sequential assembly system, which permits a product to be gathered systematically, moving from one sub-division to another.

5. **Firm growth:** Growth refers to the increase of the scope of a business or firm with time. According to Salman (2019), firm growth is defined as the process that prompts an expansion of the organisation's ability to utilize and train its employees to improve its performance. McKelvie and Wiklund (2010) emphasised in firm growth research that most disscussion on firm growth indicates that sale growth is the most effective growth variable as it translates easily the industry context. Typical measures of firm growth are the return on equity or capital employed (Hart, 2021; Salim & Yadav, 2012) and sales growth/ increase in turnover (Egbide et al., 2019; McKelvie & Wiklund, 2010), increase in total profits and increase on number of loyal customers or employees (Wangui et al., 2018).

Organisation of the Study

The write-up contains five chapters. The first chapter, Chapter One, is made up of the introduction to the research which covers the background to the study, the statement of the research problem, the purpose of the study, objectives of the study, the research questions, hypothesis to be tested, significance of the study, delimitations of the study, limitations of the study, definition of terms and organisation of the study.

Chapter Two reviewed literature of related studies with similar variables. This chapter discusses widely the theoretical and empirical framework of cost control, which underpins this study and provides theoretical explanations to proposed relationships. This chapter also reviewed and discussed similar studies in the area of cost control and pricing. Chapter Three covers the research methods employed in the study. Chapter Four provides

presentation of analysis and interpretation of the analysis in the observations to obtain meaningful information from the relationships based on the study objectives. Lastly, Chapter Five provides summary, conclusions and significant recommendations to enhance growth of manufacturing firms in Ghana thus provide suggestions for future study in the area.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter reviews related studies on cost control and growth of manufacturing firms or corporate entities as well as relevant literature on pricing strategy and growth of companies. There are five sections in this chapter. The primary segment displays the theoretical review that discusses theories such as the revenue maximization theory and economic theory. The second section considers the conceptual review. The third section deliberates on relevant and related empirical literature and the fourth section reveals the conceptual framework of the study. The final section discusses the knowledge gaps and lessons.

Theoretical Review

This section explains the two main theories that underpinned the study. These theories comprise of revenue maximization theory and the economic theory. The revenue maximization theory explains how profit is maximized when a firm produces at a level where additional cost is equal to additional revenue. Economic theory also shows the relation between the prices of commodities and how that influence total revenue.

Revenue Maximization Theory

The revenue maximization theory propounded by Baumol and Bradford (1970) expresses that, a definitive objective of business entity is to increase profit. Revenue maximization theory is a theory on value and growth, which stipulates that once profits reach desired levels, the firm's objective become sales maximization rather than profits maximization (Baumol, 1959).

However, when firm's objective is profit maximization then the Revenue Maximization Rule asserts that, "it must choose that level of output where Marginal Cost (MC) is equal to Marginal Revenue (MR)".

Mathematically, the firm that wants to maximize profit must manufacture at an output level where MC = MR. In this manner, each worker should work towards achieving this objective of maximizing revenue and in turns profit (Li, Lam, Wong, & Sumalee, 2011). The organizations improve on their profit by comparing marginal costs with marginal revenue. This implies that revenue per product can be able to pay for the total variable cost per product or service. Variable costs are costs that increase or decrease in accordance with the level of production. Examples of variable costs are the cost of labour on work, the costs of raw materials, cost of product design and packaging.

The significant point about variable costs is that they vary with the company's level of output. In reality, they can speedily increase, remove a firm's profit margin and lead a firm into an unreasonable loss. Similarly, variable costs can also decrease and cause your company to have sudden profit especially when operation cost decrease with the same level of output. However, both fixed and variable costs have impact on profit margin largely (Shrotriya, 2019). Fixed costs are costs that do not change within some specified period based on production units. Examples of such cost include rent and lease costs, property tax, etc. the most vital part of fixed cost is that when fixed cost is managed within the specified time where it remains fixed, net profit increases. On the other hand, when fixed cost gets out of hand, net profit decreases (Shrotriya, 2019).

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An organization makes profits by changing over its resources into goods and services lastly sells these products and initiatives to customers. The revenue maximization theory competes that the continuity of an organisation depends upon its ability to make profit (Baumol 1959). Employing the profit expansion system, firms choose the revenue and the cost of its products to guarantee it achieve the best results. Profit occurs when total revenue exceeds total expenditure. Most firms adopt strategies with the intent to reduce cost and increase revenue to enable them maximizes profit. According to revenue maximization theory, firm seeks to increase their profit by either reducing cost or increasing revenue. Cost control strategies influence profit by reducing total cost (Hansen, Mowen, & Heitger, 2021).

On the other hand, firms maximize profit by adopting pricing strategy that leads to an increase in total revenue. Wangui et al. (2018) found out in their studies that pricing had a significant positive effect on growth of hotels. Growth in their study refers to the level of sales and number of loyal customers. Therefore, when prices were assigned to goods and services, customers respond to the prices by buying more when the prices are affordable and vice versa all others things being equal. However, as the number of loyal customers increase and level of sales increase in relation to prices of goods and services, total revenue increase along. All other factors being constant, a decrease in the level of sales and number of customers due to rise in the prices of the commodities leads to the fall in total revenue. On the basis of this theory and its practical knowledge, firms must aim to develop and execute any intelligent strategies that attain optimal product prices for maximising company revenue. The theory relationship with the current study was such that

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as a theory on value and growth, it stipulates that once profit reaches desired levels, the firm's objective become sales maximization (which is growth, the direct measure in this study) rather than profits maximization (Baumol, 1959).

Economic Theory

Economic theory was propounded by Smith (1776) and professed by Clark (1908). The theory asserts that the prices charged for goods or services presented by a firm to the market would have an impact on the number of products that will be sold. Economic theory is a pricing theory that forecasts a flexible supply response to increased demand. Price theory had to do with details of economic activity that involves the production and transfer or addition of value, which includes the buying and selling of goods and services between two economic entities (Boateng, 2019). It explains how prices function and how relative prices are determined to harmonize economic activity. Boateng (2019) explained two reasons sellers must understand pricing concepts. The first is to comprehend price concept due to how the industry of a particular company operates. The other is that it enables management gain understanding of how prices are structured and determined as vital as taking into consideration extraordinary economic issues. This is because not understanding the operation of an industry and its pricing system is the source of many economic problems.

Faith (2018) discovered that a market economy is brought together through the system of pricing. It implies that the prices of goods and services harmonised with buyers and sellers operating at a place bring about a market. Costs of production comprises of the cost of using resource for an intended purpose and therefore unable to use it for another (opportunity cost), the cost

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to a worker who is working instead of taking a break and the cost of working on one project instead of another and these components are included in the prices for which products are sold. From management accounting viewpoint, the pricing decision is simpler and more practical oriented not as economic pricing that takes into consideration opportunity cost. The economic theory perspective states that pricing should consider demand and supply and cost functions (Sunarni & Ambarriani, 2019). A good price is an economical amount that covers all costs and generates acceptably profit to the business entity.

Economic theory asserts that an increase in price causes decrease in units demanded, therefore total revenue falls and decrease in price of a product causes units demanded of that product to increase thus rise in total revenue ceteris paribus (Heakal, 2015). When total units demanded falls then total revenue decreases. On the other hand, total revenue increases when unit demanded of a product increases all other things being equal. There are other factors that influence changes in revenue and they include price of related goods or services, tastes or preferences of consumers, income of buyers, customer's expectation and others. One determinant of demand that have direct influence on total revenue is the price of the good or service. Thus, the economic theory supports this research because as a firm adopts appropriate pricing strategy, there is a relation between that price and total revenue. In addition, as a firm adopts the cost-based pricing strategy or the others, these pricing strategies influence the relationship between cost control and growth.

The economic theory cannot be ignored in this discussion. This is because, in order to assess how pricing strategy moderates the connection

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between cost control and growth of manufacturing firms listed in Ghana, the separate effects of pricing strategy (its dimensions) on firm growth were determined. The issue of concerned of the economic theory is the forces of the market that normally determine the pricing strategy, and for that matter pricing strategy come into play to influence firm growth. Therefore, in relation to the study, appropriate pricing strategy/strategies is/are also required to ensure firm growth even though manufacturing firms may adapt policies to reduce unexpected losses.

Conceptual Review

The section reviews the various concepts in the context of this study. That is, it provides the operational meaning and application of the key variables in the study which are as follows:

Cost control

Cost control refers to the managerial routine effort to achieve cost goals in a production process that ensures elimination of wastage and achievement of efficiency in organisation (Barbole, Nalwade & Parakh, 2013). The measurement of cost control has to do with the changes in various components of cost. These costs include material cost, labour cost and factory overhead. These costs are directly attributable to the costing and pricing of a good or service. On the other hand, cost such as administrative costs and general overhead are not directly attributable to the pricing of a product (Drury, 2013).

Firm growth

The response variable in this study is firm growth. The measurement of firm growth, according to literature, were measured as level of sales, number

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of loyal customers (Wangui et al., 2018), profitability (Salman, 2019), dividend pay-out ratio, return on equity etc. (Musah et al., 2019). However, for the purpose of this study, firm growth is measured as the changes in total sales because of the internal and accounting nature of the study (McKelvie & Wiklund, 2010; Egbide et al., 2019) and return on equity (Hart, 2021; Salim & Yadav, 2012). McKelvie and Wiklund (2010) emphasised in firm growth research that most disscussion on firm growth indicates that sales growth is the most effective growth variable as it translates easily the industry context and thus the study adopt the changes in total sales and return on equity for growth.

Profit is more significant for business growth because no business corporation can remain in business for significant number of years without profit. Profitable growth according to Coad (2009) refers to the combination of profitability and growth, more precisely the combination of economic profitability and growth of free cash flows. Free cash flows in accounting refer to the access of profit after dividend that is the retained profit or the free cash flow in the business meant for investment purposes. Profitable growth emphasizes that profitability and growth should be attained simultaneously.

Coad (2009) stated that most shareholders or management of a highly profitable firms do resist investment in extra business opportunities and tried to limit growth opportunities in any event even when the firm was found as highly profitable company. For this situation, the stricter management decisions will cause firms with high-profit to disregard opportunities. These opportunities are rather undertaken by less profitable competitors. This means that, in instances like this, growth may be adversely identified with profit. For this inconsistency reason, this study employed the changes in total sales

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(ΔlnTS), i.e, sales growth and return on equity (lnROE) to measure for firm growth.

Pricing strategy

The research also employed pricing strategy to moderates the relationship between cost control and growth of listed manufacturing firms in Ghana. Pricing strategy measured as a dummy variable was classified into three main categories which are the cost-based pricing strategy, the competitive-based pricing strategy and the customer value-based pricing strategy.

Cost-based approach: From managerial accounting perspective, one of the approaches to set price is cost plus pricing or cost based pricing which is centred upon the estimated cost of production and a mark-up factor or percentage of the cost is considered (Weygandt, Kimmel, & Kieso, 2018). The implementation of cost-based pricing greatly depends on the exactness of cost calculation where a margin (percentage of selling price) or mark-up (percentage of production cost) for profit is added for the product's price to be set (Rapaccini, 2015). This pricing strategy is made up of break-even cosst pricing, flat pricing, target profit pricing, mark-up pricing, cost-plus pricing and user-based pricing.

Competition-based approach: This strategy expects that an item's cost should reflect clear value and picture the cost it set from consumer's point of view. A product keeps the price that has been given to it or set for it always unless it is changed by the forces of the market (Rapaccini, 2015; Sunarni & Ambarriani, 2018). The competitive-based pricing strategy comprises of skimming pricing, international prices, captive pricing, promotional pricing, penetration pricing

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and market spot prices, thus adoption of any of these pricing methods implies that competitive-based pricing strategy has been applied.

Consumer value-based approach: This strategy considers the customer valuation of the good or the service and that is dependent on the customer's view, an organization will evaluate how much a customer would pay (Amir, Auzair, Maelah, & Ahmad, 2016). Consumer value-based pricing strategy is made up of premium pricing, bundling low pricing, complementary pricing and experience-curve pricing. The study assigns one (1) for firm that has adapted customer value-based approach and zero (0) for otherwise.

Pricing situation in Ghana

Figure 1 depicts the trend of pricing strategy and situation in Ghana among the big manufacturing firms listed on the Ghana Stock Exchange.
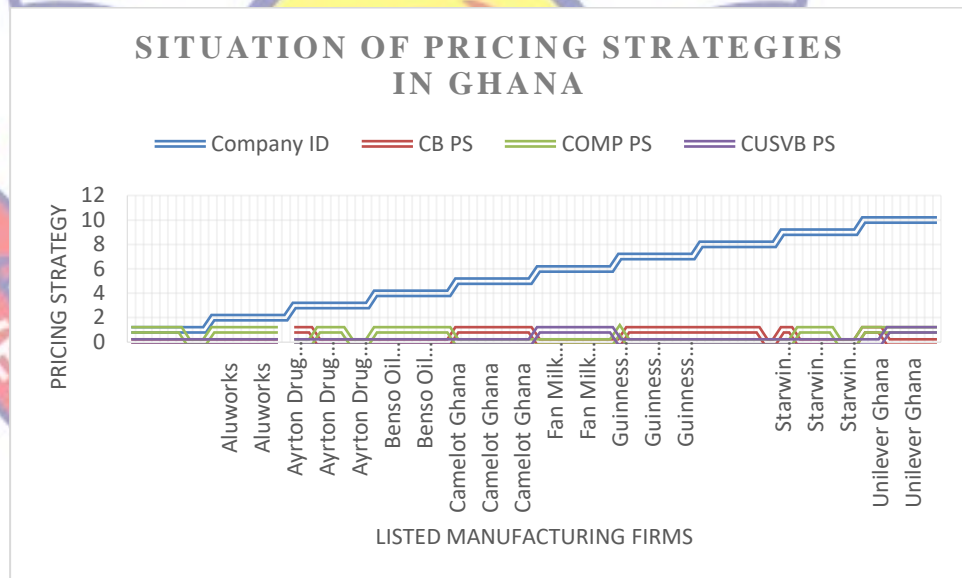
Figure 1: Pricing situation among the big manufacturing firms in Ghana
Source: Field data (2022)

From Figure 1, competitive based pricing strategy has been reigning among African Champions, Ayrton Drugs, Benso Oil Palm Plantation and Starwin Products. However, Ayrton Drugs at some point in time shift to cost-

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based pricing strategy, cost-based pricing strategy is highed used by Camelot Ghana, Guinness Ghana and PZ Cussons. The customer value-based pricing strategy is highly utilised by Fan Milk and Unilever Ghana. The pricing situation in Ghana indicates that the three main pricing strategies are being utilised by the big firms in Ghana as illustrated in Figure 1.

Firm characteristics

The research employed some firm characteristics to control for firm growth. The first was return on assets as a proxy for firm profitability to control for the empirical results. The other firm characteristics variables included firm size and firm age. Firm size was proxied as the natural log of firm's total assets (Velnampy & Niresh, 2014) and firm age measured as the natural log of the age of the firm taken as the difference between the year listed and the year of the study (Barba Navaretti, Castellani, & Pieri, 2014; Haykir & Çelik, 2018).

Empirical Review

This section deliberated on the various studies that have been done on the variables of the study and their relationship based on the study objectives. It begins with connections that exist in the variables found in the first objectives then through to the third objective. It then reviewed empirical evidences on the control variables and how they can influence the dependent variable or a related variable. Lastly, it brings out the proposed hypotheses in Chapter One through the comparison of the findings from these related studies.

Significant Difference in the Level of Groups

Gross, Rottler and Wallmeier (2021) examined the significant difference between prices paid against the control setting and thus determined the influence of external reference price practices. The study employed one-way ANOVA analytical design to examine the significant difference in reference prices in the non-profit organisation. The result indicated that the mean paid price in the high price group is significant higher than the control set mean price. The Levene's test showed significant difference mean of the maximum price from the internal reference price having a medium effect. However, the null hypothesis of Levene's test was accepted as the significant difference between the distances of the other treatment groups was statistical equal. The study used the sample T-test to gather results for the Levene's test but did not use behavioural data to determine and explain psychological aspects of individuals' behaviour on reference price.

Wadongo, Odhuno, Kambona and Othuon (2010) assessed the impact of hospitality managerial characteristics on indicators of performance. The study employed cross-sectional design to survey and gather primary data with questionnaires. A sample of 160 managers in the hospitality sector was selected through random sample method. Even though the study found out that Kenyan hospitality managers focused on results and financial measure of performance while ignoring the determinants and non-financial measures of performance, the study model violated variance homogeneity test. This is because from the Levene's test of homogeneity, there was significant difference in the groups of independents. Therefore, the study suggested that future study focus on performance measurement indicators in tourism.

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Azman, Abdul-Samad and Ismail (2013) researched on the accuracy of the cost estimations in the Public Construction Department in Malaysia. The study used sample of 83 projects for the purpose of the study, which is to find accurate estimate with regards to public project. The target groups were three, that is, lowest bid, accepted bid and the mean bid and data was collected from 344 respondents of the administered questionnaires. The regression results indicated that bidder's number, project size affect biasedness. The study employed the Levene's test of homogeneity of variance to test the consistency. It was found out that project contract period do not have equal variances when compared to other projects features. The study therefore hypothesised that:

$H_0 1$: There is no statistically significant difference in the level of cost control of listed manufacturing firms in Ghana.

Cost Control and Growth of Corporate Firms

There have been a number of studies conducted by numerous researchers across the world on effect of cost control practices and firm growth. This section reviewed relevant empirical studies on cost control and firm growth. This is to assist in bringing together the objectives of the study and provide the basis of comparison of the findings of this study.

Oyedokun, Tomomewo and Owolabi (2019) looked at cost control and growth of Nigerian manufacturing firms and employed simple regression for analysis. It resulted that cost control is a tool for growth (growth was proxied by profitability). The study developed five models and three of the models indicated positive relation, and the two turned a negative relation with growth of manufacturing companies for the period under investigation. The study outcome suggested that material cost control and selling and administration

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cost control have a negative relation with profitability whereas labour (wages and salaries), training and development had a positive relationship with profitability. Besides, profitability measure as profit before tax seems to be too raw measure as compared to other measurements such as return on total assets, return on capital employed and others.

The study by Akeem (2017) studied on the effect of cost control and cost reduction on firm performance in Nigeria. The study assumed the use of regression to find out if there exists any connection between the variables. It was found out that for an organisation to ensure profit growth, creation of quality goods and services with accessible assets on the ground, cost control and cost decline strategies seen to be fundamental to the growth and continuity of any company. The study concluded on both descriptive and regression and found a significant relationship between cost control and firm performance.

Siyanbola and Raji (2013) discovered that cost control positively affects business profit. In the study, the impact of cost control on manufacturing companies' profitability did not employ accounting measure of profitability in the study but used descriptive to analyse the responses from respondents/managers on whether they agree or disagree on the fact that cost control has impact on profitability. It is believed that there exist gap in literature since regression analysis is assumed appropriate for such study to determine the influence of the independent variable (cost control) on the dependent variable (profitability) with the use of any accounting measure of profitability.

Abdullah, Murad and Hason (2015) developed a decision dynamics model in order to analyse the relationship between corporate governance and

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cost control. The study based on the decision-dynamics model specified that a good corporate governance structure is necessary to control cost. The study concluded that corporate governance and cost control must operate in practical ways in order to enhance efficiency and boost abilities of the organisation for growth and to protect the interest of all the interested party.

Jayaraman (2016) discovered that reengineered medium of cost control worked well and profited better than expected. Jayaraman studied on project cost control as a means to control costs in large projects in India. The study ensured allocation of costs to packages which enabled review and change on a dynamic basis. The study employed dynamic modelling and concluded that project cost control is an innovation for management with the objectives to decrease cost of projects using scientific management techniques. Saini (2015) also studied on cost control and management in chemical manufacturing companies of India using data from administered questionnaires. The study concluded that in cost control of chemical manufacturing industry, higher wage rate does not directly reflect the higher cost because higher wage has a positive relationship with higher efficiency.

Etale and Bingila (2016) assessed the effect of inventory cost management on profitability. The study used raw materials cost, work in progress and finished goods cost to proxy inventory cost and used profitability (gross profit margin) to proxy sales growth. The investigation indicated that effective inventory cost management has a positive influence on sales growth (profitability) in the report. Although, the employment of one element of cost (material cost) in these studies do not bias parameters because of the scope of their study.

Prempeh and Peprah-Amankona (2019) using a cross sectional data of listed manufacturing companies in Ghana from 2004 to 2014 examined the impact of efficient inventory management on profitable growth of manufacturing firms. The finding was that, there exist significant and positive connection between raw material inventory management and profitability. Using one indicator of profitability does not bias parameters since the study was scoped to inventory management and its effect on profitability of manufacturing companies in Ghana. The current study reviewed Prempeh and Peprah-Amankona's study because efficient inventory management is related to direct material cost control. This study assumed that there exist gaps in literature because those studies have geographical difference, measurement techniques difference and methods concern. Some of the studies also analysed effect of material or wages (a component of cost) on profitability of corporate entities. Based on the drawbacks in literature, the second hypothesis is stated as follows:

$H_0$2: There is no statistically significant effect of cost control on growth of listed manufacturing firms in Ghana.

A number of studies have identified cost control as a means of improving upon companies' financial soundness, profitability and value and this thesis therefore seeks to investigate how cost control and pricing strategy can influence on the growth of manufacturing firms listed in Ghana

Pricing Strategy

This section sought to find out the relationship between pricing strategy and corporate entities growth. There are other related studies, which also indicate that pricing strategies influence growth of manufacturing

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companies, and thus in this research, pricing strategy is a stimulus variable (moderator) to influence the relationship between cost control and growth of listed manufacturing firms in Ghana.

Wangui, Kiragu and Wachira (2018) conducted research on effect of pricing strategy and growth of some selected hotels in Kenya (Nyeri County). The finding from Bivariate Linear Regression showed that pricing strategy had a significant and positive effect on growth of hotels in Nyeri County. The study used semi-structured questionnaire as the fundamental instrument for gathering essential data. There were 50 respondents out of 57 hotel managers in Nyeri County. The research recommended that hotels should outline their pricing strategies and devise ways to deal with these strategies and ensure that they offer different costs for their items subject to the nature of the items. These hotels should also ensure that value changes are delivered to potential customers even though such changes ought to be exceptional.

Lane and Durden (2015) looked at the role of cost and pricing decisions in tourism organisations in America using descriptive statistics. The study partially supported and recommended that the size of a business influences the significance set on the sorts of pricing data. Despite the fact that the data showed cost information progressively favoured by larger organizations and market information progressively favoured by smaller organizations, no measurably huge connections are distinguished. According to Lane and Durden, the finding supports the patterns in literature where full cost-pricing methods remains dominant, with variable expense and market-based strategies holding a moderately dynamic role in pricing decisions.

De Toni, Milan, Saciloto and Larentis (2017) analysed the impact of pricing strategies and levels on firm's profitability in Brazil using 150 companies in the mechanic (metal) industry. The study showed that the profitability and cost adequacy of the organizations are related to pricing strategy. They adopted multiple regression method and it was concluded that cost-based and competition-based pricing systems did not show critical difference with regard to the net incomes. Therefore, the results of their study concluded that companies which adopt customer-value based pricing technique set significant high prices, and do achieve more significant overall revenue. On the other hand, other company which adopted competitive-based pricing strategy and set lower costs do yield lower revenue.

Oke, Olarewaju and Ayooluwade, (2016) researched on the significance of pricing strategies on performances of corporations in Nigeria. This study was for period of 2005-2013. The research employed descriptive analysis as study design and used the secondary data from the industries. The study also employed panel regression technique to analysis the gathered dataset. The research found out that the survival of any firm is based upon its ability to generate a sales volume that yields acceptable profits. The study concluded that pricing strategy have strong influence on brewery's firms' performance. Based on the findings, the study revealed that 91 percent of the company's performance was explained by the pricing strategy, the current study draws from this study that pricing strategy/strategies adopted by firms could have direct effect on firm growth. In the same way, it is possible for pricing strategies to interact the relationship between cost control and growth.

The study by Rapaccini (2015) was conducted on pricing strategies of manufacturing companies offering service in Italy. The study contributed to the theory of servitization. They study was literature review study that reviewed literature on pricing. The study recommended that cost based, competition based and value-based pricing can exist together in servitised firms. The study adopted qualitative case-based multiple research method to discover the findings. The study used purposive sample of five huge manufacturing companies and concluded that for firms to change and improve in the adaptation of the pricing strategy, firms need to develop new competences.

In Ghana, Boateng (2019) found out that pricing had influence on customers' attitude. The study assessed the influence of pricing strategies on sales by hawkers. Boateng gathered data from sample of 198 traders and used structured interview as well. The findings of the research revealed that traders use psychological pricing strategies and product bundle pricing for pricing their products. The study recommended that traders should be given education on the available pricing strategies, how and when to use them. This is in collaboration with Hinterhuber (2008) who asserted that pricing has a massive impact on profitability. Pricing strategy influences firm growth in that it has an individual effect on sales growth when price affects consumers buying options, which intend affect profit (Deans & Watanabe, 2005).

Asare (2016) used 140 firms in the formal sector responses to assess the pricing methods used by medium and small-sized enterprises in the Cape Coast. The study was quantitative in nature and employed cross sectional design to analyse descriptive measures. The study pointed out that pricing

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decisions and strategies are important for almost every firm's profitability and long-term continuity. The study also specified that effective design and implementation of pricing strategies is subject to managers understanding of customer consciousness and logical method to setting pricing, adapting prices and varying prices. The study concluded that the firm's continuity, firm's sustainability and firm's growth of most business depend on its ability to generate sufficient revenue to cover its cost.

Based on these arguments, this study hypothesized that pricing strategy has statistically significant influence on growth of manufacturing listed firms in Ghana to test for the sensitivity relationship between pricing strategy and firm growth before pricing strategy could moderate the connection between cost control and growth of manufacturing firms listed in Ghana.

Pricing Strategy as a Moderator

In order to achieve firm growth, management of manufacturing firms are asserted with the responsibility towards surveying the market and choosing an appropriate pricing strategy for the firm's produces or services. In this instance, pricing strategy plays an essential role in assisting the cost accountant and management to assess the revenue structure of the firm for a period in time for the achievement of firm growth (changes in total revenue and changes in total assets). As opined by Clark (1908), economic theory asserts that profit is the result of dynamic difference between the price and the production cost of the good or service. The economic theory defines the necessity of pricing strategy as part of management policies. The study then looks at the moderating role of pricing in relationship between accessible variables to relate to the relationship between cost control and firm growth.

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A study by Khudhair, Jusoha, Mardania, Nora and Streimikieneb, (2019) employed price sensitivity to moderate the relationship between level of service and the level of passenger's satisfaction. Service quality was having three categories and all these categories had a significant effect on passenger satisfaction. The researchers found out that moderator, price sensitivity have significant influence in the relation between service quality and satisfaction level of passengers. Even though there was positive effect of the moderator in the relation between quality of service and customer's satisfaction level, the analytical techniques were not specified as well as the models for the estimations.

Sarkar and Khare (2017) studied the impact of customer's perception on price on the determinant of online shopping. The study adopted primary methods for collecting data from 300 online shoppers. The study then employed structural equation modelling to analyse the dataset. The study revealed from its finding that perceived risk and perceived usefulness influence online shoppers' attitude. However, price perception of customers with high value consciousness equally influences perceived usefulness towards online shopping. The measurement model for the study was estimated with a dynamic model that is, the structural equation model thus making substantial contribution to literature in online shopping whiles there was not recommendation for online marketers concerning how to engage in online marketing.

De Toni, Milan, Saciloto and Larentis (2017) discovered from their study that a more strategy process had to be considered for pricing to contribute in an aspect that cannot be ignored. The study used sample of 150

companies to integrate cost-based pricing strategy, competitive-based pricing strategy and customer value-based pricing strategy with price levels being low or high to determine firm performance with regards to profitability. The analysis of variance (ANOVA) was used to draw out clearly whether there was statistical difference between group's mean. The researcher also used the ordinary least square (OLS) to analyse the influence of pricing strategy on companies' performance. The findings indicated that the independent variables significantly affect profit margin. In addition, the interaction between the customer value-based pricing strategy and new product development also has significant influence on companies' performance measure as profit margin. Based on the above, the third proposition would be:

$H_0 3$: There is no statistically significant moderating effect of pricing strategy in the relationship between cost control and growth of listed manufacturing firms in Ghana.

Control Variables

The study employed some variables to control for firm growth comprising of firm age, firm size and firm profitability.

The manufacturing firms' age according to empirics could also affect the growth of manufacturing firms as indicated in studies that firms in operation for more years in the industry have an advantage in dealing with business affairs. Notwithstanding the impact the age of a firm can contribute to firm growth, empirical studies have inconsistent results. For instance, Coad, Segarra and Teruel (2013) and Kipesha (2013) identified significant positive relation between firm age and firm performance whereas Doğan (2013) found inverse connection between firm age and firm performance. Lastly, a study by

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Barba Navaretti, Castellani and Pieri (2014) found out that firm age had a negative influence on growth of manufacturing firms on their upsizing path.

Fiala and Hedija (2015) examined the connection between firm size and firm growth in Czech Republic and measured firm size with three indicators being, total assets, total revenues and the number of employees. The finding shows that small firms in profitable industries grow quicker than the larger firms in same industries. However, Velnampy and Niresh (2014) found no connection between firm size and profitability of manufacturing firms listed in Sri Lanka. The study used total asset as proxy for firm size which is consistent with the current study.

Jang and Park (2011) analysed the inter-connection between firm profitability and firm growth and found out that restaurant industry profit promote growth, that is, a significant effect of profitability on firm growth but firm growth rather hinders firm's profitability. The study employed the dynamic panel GMM estimator (system GMM) and identified a negative relationship between current and previous year's growth rates and profitability. In the study, profitability was measured net sales margin (net income out of net sales).

Coad (2007) using non-parametric plots revealed neutral relationship between profit rates and future growth rate. The study used the dynamic panel GMM estimator (system GMM) where regression results revealed positive relationship between profitability and future growth. The inter-connection between profitability and firm growth indicated equal influence of firm growth on profitability. The study measured firm size as valued added, employees and sales therefore assumed the differences of the logarithms of firm size as proxy

for firm growth. The study results were in graphs alone and based on that it's a bit confusing to understand but one of the exceptional studies among others.

Fuertes-Callén and Cuellar-Fernández (2019) discovered that in the midst of economic crisis, firm's profitability is attained indirectly through growth in sales and employees. The study analysed the dynamics of profitability and growth and measured profitability as return on assets (ROA). The study findings indicated that the influence of profit on firm growth is dependent on firm growth measurement used. However, the study showed positive effect of firm growth on firm profitability in the short run. The study thus suggested that profits does not play essential role in the sales growth determination while as employees growth involves prior year's profit.

Gaps in Existing Literature and their Contribution to the Study

This chapter reviewed relevant literature on cost control and growth of corporate entities and manufacturing firms. The chapter also reviewed literature on pricing strategy and growth or profitability of some corporate firms. Extant literature on cost control mostly makes indication of some practices that contribute to cost reduction for which analysis was conducted on the effect of cost control and growth of manufacturing firms listed in Ghana. Profitability in the context of study was measured as return on asset, but for the purpose of this study, firm growth is the response variable and it measured by changes in total sales (McKelvie & Wiklund, 2010; Egbide et al., 2019), return on equity (Hart, 2021; Lipson, Mortal & Schill, 2011; Salim & Yadav, 2012).

Pricing strategy, the moderator, refers to these three pricing strategy indicators from prospective of management accounting being cost-based

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pricing strategy, competitive-based pricing strategy and customer value-based pricing strategy. Research conducted on the relationship between pricing and firm growth, for instance, has firm growth measured as number of loyal customers and level of sales (Wangui, Kiragu, & Wachira, 2018).

Several studies on pricing strategy such as Rapaccini (2015), De Toni et al. (2017) and Wangui et al. (2018) were on selected firms and not necessarily panel data analysis. There exists gap in literature, as the researcher did not come across a study determining the effect cost control on growth of listed manufacturing firms moderated by pricing strategy. In addition, the researcher did not come across any study on cost control that employed the two-step system dynamic panel generalised method of moments (GMM) design to ensure the short term effect and long term (illustrated in the lagged form of the dependent variable) effect. This work therefore contributes much to literature by establishing the interacting role of pricing strategy in the relation between cost control and growth of manufacturing firms listed in Ghana. Moreover, in Ghana, aside the fact that only few works have been done to determine the effect of cost control on growth variables, those works offers little to the growth of Ghana's manufacturing industry. These evident gaps, which need attention, support this study's inclusion.

Conceptual Framework

Conceptual framework refers to the process of describing variables into forms that can be measured (Wangui et al., 2018). The discussion of the effect of cost control on growth of manufacturing firms listed in Ghana moderated by pricing strategy is illustrated in Figure 2. From the diagram, it has been inferred that cost control directly affect firm growth of listed

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manufacturing firms. Besides, from literature, pricing strategy also has a direct influence on growth of manufacturing firms in Ghana. Other variables were employed to control for firm growth which are also included in the framework.
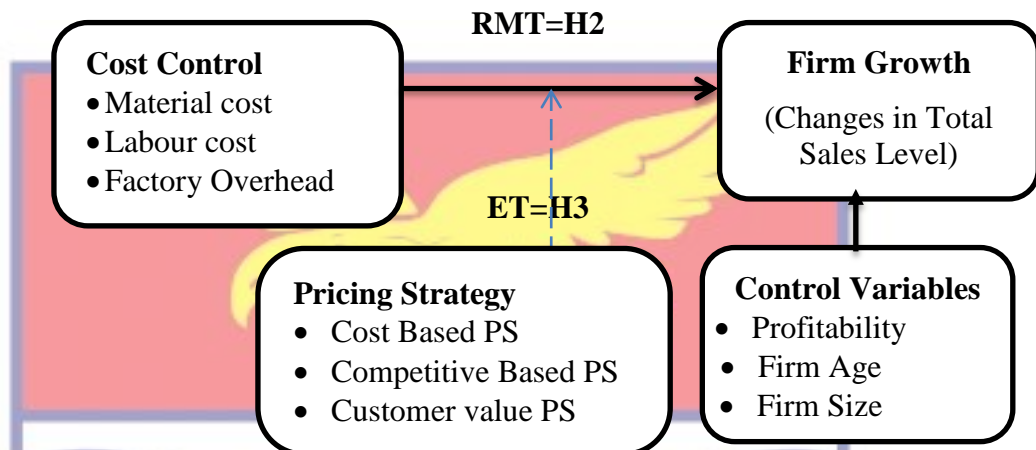
Figure 2: Conceptual Framework
Source: Author's construct (2022)

Main/Individual effect	———————————————➤
Interaction/Moderation effect	– – – – – – – – – – – – ➤
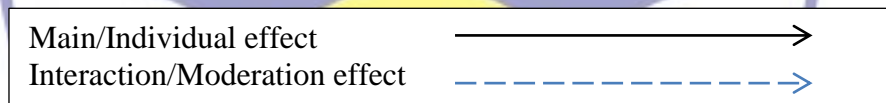
Chapter Summary

The chapter first revised theories employed in the current research. The section employed the profit maximization theory which explains that firms maximize profit when cost are at its minimum i.e., MC = MR and thus support the assumption of cost control. Therefore, the chapter also reviewed the economic theory which is a concept that explains how produce or goods move in the market as a result of the factors in the industry and the market, for instance, the force of demand and supply or competition which determines prices literally. The chapter then reviewed related studies on the influence of cost control on growth of manufacturing firms and other corporate firms. The chapter also reviewed literature on pricing strategy and firm growth and finally revealed some gaps that this research pursues to bridge.

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CHAPTER THREE

RESEARCH METHODS

Introduction

The chapter presents the systematic research methods employed in achieving the objectives of the study. The novelty of this study is to determine the effect of cost control on the growth of manufacturing firms in Ghana moderated by pricing strategy. This chapter reveals the research design employed for the study and provides a detailed description of the research paradigm, design and approach, unit of analysis, population, sampling procedure, data collection instruments and data collection procedures adopted for the purpose of analysis. Furthermore, the chapter presents the data analysis techniques employed in analyzing the moderating effect of pricing strategy in the relation between cost control and growth of listed manufacturing firms in Ghana.

Research Paradigm

This research adopted positivism philosophy because it is deductive in nature and because it involved the collection of data on cost control, pricing strategy and firm growth and analysis of the data to establish relationship by using statistically test of significance, correlation, regression and finally accepting or rejecting hypotheses to determine whether pricing strategy play a role in the relationship between cost control and growth of manufacturing firms listed in Ghana.

Research Design

Research design brings out procedures that connect the basics of the methods adopted for a study. According to Saunders, Lewis, Thornhill (2012),

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research design can be descriptive, explanatory or exploratory. Saunders et al. (2012) indicated that empirical works that establish cause and effect connection between variables may be referred to as explanatory. The research design for this study was explanatory design because it explains the moderating role of pricing strategy in the relationship between cost control and growth of manufacturing firms listed in Ghana.

Research Approach

Creswell (2014) indicated three main approaches to research which include the qualitative approach, quantitative approach and the mixed approach. The epistemology underlining a quantitative study postulates that there exist social and definable facts (Sekaran and Bougie, 2016). The research approach for this study is quantitative because quantitative study puts the social world into causality structure and nullifies the role of human effect through the use of quantitativ instrument such as multivariate statistical analysis on analysing data as used in this study. The study is deductive since it deduces from existing theory or existing theory supports the study.

Unit of Analysis

The research focuses on only listed manufacturing firms on the Ghana Stock Exchange. The manufacturing sector was selected because of its contribution to the total gross domestic products which triggers the caused by management accounting activities such as cost control and pricing techniques (Amenyo, 2016). This study considered all manufacturing firms listed on the Stock Exchange in Ghana. For the purpose of data collection for the observation and analysis of this study, this research used panel regression techniques to analyze the data gathered from audited annual report of

manufacturing firms under review of this study. The research analysis methods were Levene's statistics, correlation and regression.

Population

Population refers to a collection of every conceivable individual, articles or estimation that share at least one quality for all intents and purpose that are important to the researcher (Arthur, 2012). The population of this study refers to all of the manufacturing corporations listed on Ghana Stock Exchange (GSE) for period 2012-2021. The population from which the sample was drawn comprised all thirteen (16) manufacturing firms listed on the Ghana Stock Exchange (GSE).

Sampling Procedure

A sample of 12 out of the total of 16 manufacturing firm was taken due to the availability of data and year listed. The study adopted purposive sampling for this study for which the number of observations obtained from the data collected was 120, that is, 12 firms x 10 number of years. The study was a panel spanning the period 2012 – 2021. Furthermore, the study adopted three-point criteria in selecting the sample of 12 firms, that is, availability of most of the data for the years under review, date of listing, availability of information on cost components such as material cost, labour cost and factory overhead in the annual reports. Using date of listing criterion, two firms (Samba Foods and HORDS Ltd) were excluded from the observations because they were listed between the period 2011-2015, as well as Cocoa Processing Company which was also excluded because there was not enough data to analyzed. The sample of the 12 manufacturing firms involved in the research

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is illustrated in the Appendix B. These firms are numbered through the assigning of firm ID which is shown in Table 3-Table 6.

Data Collection Procedures and Source of Data

The study examined the relationships among cost control, prcing strategy and growth of manufacturing firms listed in Ghana. On the basis of the proposition, the study employed secondary data from the annual reports of the observed listed firms for the period 2012– 2021. The study obtained data from annual reports of the listed firms, that is, manufacturing corporations' annual reports-both financials and individual firm's website. The starting year of 2012 was chosen because the available annual reports for majority of the observed listed firms were for the year 2012. The year 2021 was selected as the cut-off year because 2021 as the most recent year since the study was completed before the end of 2022.

Description and Measurement of Variables

The study design as quantitative research design imputes numeric figures to variables in the research based on some specific computations. Thus, it is necessary to identify how all variables such as response variable, explanatory variables and moderating variables are measured. The contextual definitions of variables in the study are described as follows:

Response variable: Response variable is the response variable or a variable that becomes the outcome of the being of the explanatory variables (Setiyawati, Wahyudi, & Mawardi, 2017). It also called the dependent variable and, in this study, it is firm growth (FG) which is measured as changes in the natural log of total sales and natural log of return on equity.

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Explanatory variables: Explanatory variables also called the independent variable or variable that becomes the reason of the change or the occurrence of response variable (Setiyawati et al, 2017). The explanatory variables in this study included material cost control, labour cost control and factory overhead cost controls which are measured as changes in the natural logarithm of material cost, changes in the natural logarithm of labour cost and changes in the natural logarithm of factory overhead cost. These cost elements were obtained from the notes to the financial statements where components of cost of sales are indicated.

Moderator variable: This variable is the variable that influences the connection between the response variable and the explanatory variables. That is, it strengthens or weakens the connection between the independent variables and the dependent variable. This study used pricing strategy to interact the connection between cost control and firm growth. In this study the moderator has three dimensions comprising of cost-based, competitive-based and customer value-based pricing strategy which are measured as dummies. Each pricing strategy is obtained as it falls in the classification of pricing methods illustrated in appendix A.

Control variables: According to the focus of the study (objectives), the developed research models employed some variables to be controlled for and they comprised of:

Firm age

Firm age refers to the years of operations for listed manufacturing firms, which is the difference between year the company in question was listed and the year of the study. Firm age in this study was measured as the natural

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log of the difference between the year listed and the year of the study (Haykir & Çelik, 2018).

Firm size

Firm size in this study explains the size of manufacturing firms, measured as the natural logarithm of total assets (Velnampy and Niresh, 2014). The empirical work of Velnampy and Niresh (2014) adopted total sales and total asset as proxies for firm size but found no connection between firm size and profitability.

Firm profitability

The study controls for profitability measured as the natural log of return on assets. This is because return on assets (ROA) measured how effectively and efficiently business assets have generated profit or financial resources for the firm. In accounting return on assets (ROA) is measured as profit before interest and tax (PBIT) out of total asset multiplied by 100. The current study employed the proxy of firm profitability as the natural logarithm of return on assets, lnROA (Balezentis & Novickyte, 2018).

Summary of Variables

The Table 1 provided a summary of the variables employed in this study, the indicators, how they were measured, their source, and the empirical justification for their measurements.

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Table 1

List of Variables, Measurement and Source of Data

Variables	Indicators	Definition and/or Unit of Measurement	Data Source	Empirical Justification
Firm growth (FG)	Change in total sales ($\Delta lnTS_{it}$)	Change in the natural log of level of Total Sales ($\Delta lnTS_{it}$)	Annual Report	Egbide et al. (2019), McKelvie and Wiklund (2010
	Return on equity ($lnROE_{it}$)	Natural logarithm of return on equity ($lnROE_{it}$)	Annual Report	Hart (2021), Salim and Yadav (2012)
Cost control	Average Composite cost control ($\Delta lnCTC_{it}$)	Change in the natural logarithm of the average cost in Ghana Cedis (GH₵).	Annual Report	Egbide et al. (2019), Oyedokun et al. (2019).
	Material cost control ($\Delta lnMC_{it}$)	Change in the natural logarithm of the material cost in Ghana Cedis (GH₵).	Annual Report	Egbide et al. (2019), Oyedokun et al. (2019)
	Labour cost control ($\Delta lnLC_{it}$)	Change in the natural logarithm of the labour cost in Ghana Cedis (GH₵).	Annual Report	Egbide et al. (2019), Oyedokun et al. (2019)
	Factory overhead cost control ($\Delta lnFO_{it}$)	Change in the natural logarithm of the factory overhead cost in Ghana Cedis (GH₵).	Annual Report	Oyedokun et al. (2019), Egbide et al. (2019)
Pricing strategy	Cost based Pricing Strategy (CBPS)	Dummy variable measured as 1 for firms that adopt CBPS and 0 otherwise (0/1).	Companies' website	De Toni, et al. (2017), Rapaccini (2015)
	Competitive based Pricing Strategy (COMPPS)	Dummy variable measured as 1 for firms that adopt COMPPS and 0 otherwise (0/1).	Companies' website	De Toni et al. (2017), Rapaccini (2015)
	Customer value Pricing Strategy (CUSVBPS)	Dummy variable measured as 1 for firms that adopt CUSVBPS and 0 otherwise (0/1).	Companies' website	Codini, Saccani and Sicco (2012), De Toni et al. (2017)
Control variables	Firm age ($lnFA_{it}$)	Natural log of firm age from year listed to year of study.	Companies' Website	Barba Navaretti et al. (2014), Haykir and Çelik (2018).
	Profitability ($lnROA_{it}$)	Natural log of Operating profit before interest and tax /Total Asset ($lnROA$) for entity i in time t.	Annual Report	Fuertes-Callen, Cuellar-Fernandez, (2019), Jang and Park (2011)
	Firm size ($lnTA_{it}$)	Natural log of Total Asset ($lnTA$) for entity i in time t.	Companies' Website	Fiala and Hedija (2015), Fort et al. (2013)

Source: Field data (2022)

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Estimation Technique

The study applied econometric procedures such as correlation and two-step system general method of moments to assess the moderating effect of pricing strategy on cost control and growth of listed manufacturing firms in Ghana. The empirical procedures involved the following steps: first, the study investigated the significant difference in the level of cost control (average composite cost and all dimensions of cost control) by using the Levene's statistical test of variance. The correlation analysis was used to check the direction and association among explanatory variables. In the second test, it study tested multicollinearity using the variance inflation factor (VIF). Also, the binary logistics test was conducted using the two-step system dynamic GMM developed by Arellano and Bond (1991) to examine the influence of cost control on firm growth. Again, the validity and diagnostic test statistics of the two step system GMM models were assessed to ensure the validity and reliability of the models.

Model Specification

The study specified statistical models according to the objectives of the study. The first group of statistical regression models were specified to determine the effect of material cost control, labour cost control and factory overhead cost control on the growth of listed manufacturing firms in Ghana. The study sought the second batch of models to examine the sensitivity of pricing strategy influence on firm growth. This was necessary to enable moderator variable to interact the relation between material cost control, labour cost control and factory overhead control on firm growth. The study therefore employed a baseline model from literature by Egbide et al. (2019)

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with factors influencing manufacturing firms' growth comprising of material cost control, labour control cost and factory overhead control. Therefore, to analyse the effect of cost control on growth of listed manufacturing firms in Ghana based on the second objective the study developed models derived from econometric models.

However, the study determined the influence of cost control on firm growth of each cost element beginning from the average of the composite cost control. By taking firm growth (FG) with respect to all the defined explanatory variables of the current study, the study expressed the following batches of linear econometric models.

$$\Delta lnTS_{it} = \textrm{ß}_0 + \textrm{ß}_1 \Delta lnTS_{it-1} + \textrm{ß}_2 \Delta lnCTC_{it} + \textrm{ß}_3 lnROA_{it} + \textrm{ß}_4 lnFA_{it} + \mu_{it} \qquad (1a)$$

$$\Delta lnTS_{it} = \textrm{ϐ}_0 + \textrm{ϐ}_1 \Delta lnTS_{it-1} + \textrm{ϐ}_2 \Delta lnMC_{it} + \textrm{ϐ}_3 lnROA_{it} + \textrm{ϐ}_4 lnFA_{it} + \mu_{it} \qquad (1b)$$

$$\Delta lnTS_{it} = \lambda_0 + \lambda_1 \Delta lnTS_{it-1} + \lambda_2 \Delta lnLC_{it} + \lambda_3 lnROA_{it} + \lambda_4 lnFA_{it} + \mu_{it} \qquad (1c)$$

$$\Delta lnTS_{it} = \ddot{\Theta}_0 + \ddot{\Theta}_1 \Delta lnTS_{it-1} + \ddot{\Theta}_2 \Delta lnFO_{it} + \ddot{\Theta}_3 lnROA_{it} + \ddot{\Theta}_4 lnFA_{it} + \mu_{it} \qquad (1d)$$

The study also estimated short run (non-linear) models for firm growth (proxied as return on equity) relation with cost control dimensions having control variables (lnFA and lnTA) specified as follows:

$$lnROE_{it} = \Upsilon_0 + \Upsilon_1 lnROE_{it-1} + \Upsilon_2 \Delta lnCTC_{it} + \Upsilon_3 lnFA_{it} + \Upsilon_4 lnTA_{it} + \mu_{it} \qquad (1i)$$

$$lnROE_{it} = \vartheta_0 + \vartheta_1 lnROE_{it-1} + \vartheta_2 \Delta lnMC_{it} + \vartheta_3 lnFA_{it} + \vartheta_4 lnTA_{it} + \mu_{it} \qquad (1ii)$$

$$lnROE_{it} = \beta_0 + \beta_1 lnROE_{it-1} + \beta_2 \Delta lnLC_{it} + \beta_3 lnFA_{it} + \beta_4 lnTA_{it} +$$

$$\mu_{it} \hspace{6cm} (1iii)$$

$$lnROE_{it} = \Phi_0 + \Phi_1 lnROE_{it-1} + \Phi_2 \Delta lnFO_{it} + \Phi_3 lnFA_{it} + \Phi_4 lnTA_{it} +$$

$$\mu_{it} \hspace{6cm} (1iv)$$

To determine the moderating role played by pricing strategy in the relationship between cost control and growth of listed manufacturing firms in Ghana, the sensitivity of pricing strategy influence on firm growth needs to be examined. Therefore, the study analysed the direct effect of pricing strategy on growth of listed manufacturing firms. Two batches of models were developed on the basis of firm growth proxies. Firm growth proxied as changes in the natural log of total salesas follows:

Using Changes in Total sales as a proxy for firm Growth

$$\Delta lnTS_{it} = \delta_0 + \delta_1 \Delta lnTS_{it-1} + \delta_2 CBPS_{it} + \delta_3 lnROA_{it} + \delta_4 lnFA_{it} +$$

$$\mu_{it} \hspace{6cm} (2a)$$

$$\Delta lnTS_{it} = \chi_0 + \chi_1 \Delta lnTS_{it-1} + \chi_2 COMPPS_{it} + \chi_3 lnROA_{it} + \chi_4 lnFA_{it} +$$

$$\mu_{it} \hspace{6cm} (2b)$$

$$\Delta lnTS_{it} = y_0 + y_1 \Delta lnTS_{it-1} + y_2 CUSVBPS_{it} + y_3 lnROA_{it} + y_4 lnFA_{it} +$$

$$\mu_{it} \hspace{6cm} (2c)$$

Also, the short run firm growth model proxied by natural log of Return on Equity (lnROE) estimated for this study were specified as:

$$lnROE_{it} = \alpha_0 + \alpha_1 lnROE_{it-1} + \alpha_2 CBPS_{it} + \alpha_3 lnFA_{it} + \alpha_4 lnTA_{it} +$$

$$\mu_{it} \hspace{6cm} (2i)$$

$$lnROE_{it} = \beta_0 + \beta_1 lnROE_{it-1} + \beta_2 COMPPS_{it} + \beta_3 lnFA_{it} + \beta_4 lnTA_{it} +$$

$$\mu_{it} \hspace{6cm} (2ii)$$

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$$lnROE_{it} = \int_0 + \int_1 lnROE_{it-1} + \int_2 CUSVBPS_{it} + \int_3 lnFA_{it} + \int_4 lnTA_{it} +$$

$$\mu_{it} \qquad\qquad (2iii)$$

To achieve the main objective of the study, the interaction effect of pricing strategy in the relationship between cost control dimensions and growth of manufacturing firms, the study developed four models taking into consideration each pricing strategy. The following models were developed on the basis of the interaction effect of cost-based pricing strategy.

Using Changes in Total Sales as a Proxy for Firm Growth

$$\Delta lnTS_{it} = \delta_0 + \delta_1 \Delta lnTS_{it-1} + \delta_2 \Delta lnCTC_{it} + \delta_3 CBPS_{it} + \delta_4 \Delta lnCTC *$$

$$CBPS_{it} + \delta_5 lnROA_{it} + \delta_6 lnFA_{it} + \mu_{it} \qquad\qquad (3a)$$

$$\Delta lnTS_{it} = \upsilon_0 + \upsilon_1 \Delta lnTS_{it-1} + \upsilon_2 \Delta lnMC_{it} + \upsilon_3 CBPS_{it} + \Delta lnMC *$$

$$CBPS_{it} + \upsilon_5 lnROA_{it} + \upsilon_6 lnFA_{it} + \mu_{it} \qquad\qquad (3b)$$

$$\Delta lnTS_{it} = \dj_0 + \dj_1 \Delta lnTS_{it-1} + \dj_2 \Delta lnLC_{it} + \dj_3 CBPS_{it} + \dj_4 \Delta lnLC *$$

$$CBPS_{it} + \dj_5 lnROA_{it} + \dj_6 lnFA_{it} + \mu_{it} \qquad\qquad (3c)$$

$$\Delta lnTS_{it} = \textrm{\$}_0 + \textrm{\$}_1 \Delta lnTS_{it-1} + \textrm{\$}_2 \Delta lnFO_{it} + \textrm{\$}_3 CBPS_{it} + \textrm{\$}_4 \Delta lnFO *$$

$$CBPS_{it} + \textrm{\$}_5 lnROA_{it} + \textrm{\$}_6 lnFA_{it} + \mu_{it} \qquad\qquad (3d)$$

Also, the short run firm growth model proxied by natural log of Return on Equity (lnROE) estimated for this study were specified for the interaction role of pricing strategy in the relationship between cost control and firm growth. In these models, the control variables are firm age (lnFA) and firm size (lnTA) because profitability cannot control the models since the dependent variable is profitable growth measure (lnROE).

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Firm Growth Proxied by Return on Equity

$$lnROE_{it} = Z_0 + Z_1 lnROE_{it-1} + Z_2 \Delta lnCTC_{it} + Z_3 CBPS_{it} + Z_4 \Delta lnCTC *$$

$$CBPS_{it} + Z_5 lnFA_{it} + ZlnTA_{it} + \mu_{it} \qquad (3i)$$

$$lnROE_{it} = \check{a}_0 + \check{a}_1 lnROE_{it-1} + \check{a}_2 \Delta lnMC_{it} + \check{a}_3 CBPS_{it} + \Delta lnMC *$$

$$CBPS_{it} + \check{a}_5 lnFA_{it} + \check{a}_6 lnTA_{it} + \mu_{it} \qquad (3ii)$$

$$lnROE_{it} = ¥_0 + ¥_1 lnROE_{it-1} + ¥_2 \Delta lnLC_{it} + ¥ð_3 CBPS_{it} + ¥_4 \Delta lnLC *$$

$$CBPS_{it} + ¥lnFA_{it} + ¥_6 lnTA_{it} + \mu_{it} \qquad (3iii)$$

$$lnROE_{it} = ƌ_0 + ƌ_1 lnROE_{it-1} + ƌ_2 \Delta lnFO_{it} + ƌ_3 CBPS_{it} + ƌ_4 \Delta lnFO *$$

$$CBPS_{it} + ƌ_5 lnFA_{it} + ƌ_6 lnTA_{it} + \mu_{it} \qquad (3iv)$$

Description of Variables in the models:

B_0 = Constant

$\beta_1 - \beta_7$ = Regression coefficients

i = entity i

t = period t

ΔlnCTC = Change in the natural logarithm of average composite cost

ΔlnMC = Change in the natural logarithm of material cost

ΔlnLC = Change in the natural logarithm of labour cost

ΔlnFO = Change in the natural logarithm of factory overhead

Pricing Strategy dimensions includes:

CBPS= Cost-based pricing strategy

COMPPS= Competitive-based pricing strategy

CUSVBPS= Customer value-based pricing strategy

FG = Firm Growth

ΔlnCTC*CBPS = Interaction between lnCTC and CBPS etc.

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Panel Regression Techniques

The study employed panel regression techniques to determine the effect of cost control on growth of listed manufacturing firms in Ghana according to the second objective. The panel regression techniques then sought to analyze the moderating role of pricing strategy in the relation between cost control and growth of listed manufacturing firms in Ghana based on the final objective. Before the main objective of the research was obtained the significant relationship between pricing strategy and growth of listed manufacturing firms was examined as sensitivity regression test to qualify the moderator to interact the relationship. The study's estimation technique was in consistent with study design which is panel system dynamic generalized method of moments (GMM), an explanatory design for the estimations. GMM was used because of its generic method of estimating parameters of multi-dimensional data involving measurements over time.

Levene's Statistical Test of Variance

The test of homogeneity of variance was conducted to determine the significant difference in the level of cost control of listed manufacturing firms in Ghana according to the first objective. Levene's test is an inferential test that evaluates the equality of variances for one variable computed for two or more groups. In other words, the Levene's test determines the assumption of homogeneity. It is assumed that groups of unequal variances will increase the probability of committing error in hypothesis testing because unlike other statistical tests where the researcher often wants to reject the null hypothesis, in this particular test the researcher often looking for a proof of the assumption that there is equality in variance thus accepting the null hypothesis. The

Levene's test is used because it measures variance (average of the squared difference) of the various cost control dimensions from the control setting (level).

Generalized Method of Moments (GMM)

The generalized method of moments (GMM) is used for model regression estimations because it controls for endogeneity of the lagged of the response variable in the dynamic panel model (i.e., when there is correlation between the explanatory variables and the model's error term). As stated in the problem statement and literature review, most findings of related studies were inconsistent because of omitted variable bias, measurement errors, unobserved panel heterogeneity. These vary problems are what the generalized methods of moments controls for and thus makes is appropriate estimation technique for the current study. Also, the GMM estimations require number of cross sections to be greater than the time span for which the current study meets that requirement i.e., 12 firms against 10 years. The technique also uses instrumental estimations and requires the number of instruments to be lower or equal to the number if groups.

There are two types of GMM approach, the difference GMM and the system GMM. The difference GMM as well corrects endogeneity but has weakness in the first difference transformation thus magnifies gaps in an unbalanced panel. Based on this stated weakness of difference GMM, the study employed the system GMM for the unbalanced panel regression. The system GMM propounded by Arellano and Bover (1995) and Blundell and Bond (1998) also corrects endogeneity by introducing more instruments to enhance efficiency and transforms instruments to make them uncorrelated

(exogenous) with the fixed effects. System GMM uses orthogonal deviations that deals with gaps in the data set thus minimizes data loss.

Diagnostics for Levene's Test

The diagnostics of the Levene's statistical test provides values for the Levene's statistic centered at the mean, Levene's statistic focused at the median, Levene's statistic concentrated at 10% trimmed mean as well as the degree of freedom and p-values for each of these centered values. The statistics draws conclusions based on the Levene's test centered at the mean mostly for symmetric data but for asymmetric data, the Levene's test centered at the median is appropriate to give an accurate statistically significant difference (Conover, Johnson, and Johnson, 1981). However, unlike other statistical test diagnostics where the researcher will be looking forward to reject the null hypothesis, in the Levene's test statistics, the researcher is looking for evidence that the variances between the groups are significantly equal to each other. That is, acceptance of null hypothesis which is often illustrated by statistically insignificant p-value >0.05.

Generalized Methods of Moments Models Diagnostic Tests

The major assumptions of multiple regression tests were tested to determine whether any of the assumptions were violated and to help choose the appropriate regression models for the analysis. Among the diagnostic tests conducted were two tests for instruments validity, test for serial correlation/ autocorrelation of the error term, test of multicollinearity and test for heteroscedasticity. The diagnostics tests are explained as follows:

Tests for Validity of Instruments

There are two tests of validity of instruments comprising of the Hansen J test (1982) and the Sargan (1958) test of over-identifying restrictions are part of the diagnostics that needs to be examined. These are the tests for the null hypotheses of overall validity of the instrument used. The results of insignificant p-values indicate failure to reject these null hypotheses (for Hansen and Sargan) give support to the choice of instruments. Roodman (2009) specifics that there is the need to be suspicious of the Hansen statistic in testing for validity of over-identifying restrictions, thus because of risks, results revealing Hansen test p-value below 0.1 should not be taken, one should consider higher value such as 0.25 and above as potential signs of trouble.

Test for Serial Correlation or Autocorrelation of the Error Term

The tests of null hypothesis that the difference error term is first and second order serially correlated is examined according to Arellano and Bover (1995), the assertion is that the test ought to reveal insignificant p-value for both first and second order serial correlation. That is, failure to reject the null hypothesis most importantly the no-second-order serial correlation which implies that the original error term is serially uncorrelated moments conditions are specified correctly (i.e., the value of AR (2)>0.05).

Test of Multicollinearity

To test whether the explanatory variables correlate with themselves, the researcher chooses the pairwise correlation. In addition, another way of detecting multicollinearity was the use of the Variance Inflation Factor (VIF), which shows the extent to which an explanatory variable is explained by

another explanatory variable within a model. However, as a general rule of thumb, correlations greater than 0.7 and VIFs greater than 10 were deemed to suffer from the problem of multicollinearity for which the current study did employed the Variance Inflation Factor (VIF) to check the high correlation among the explanatory variables. For the purposes of this study, the pair wise correlation matrix was estimated to determine the extent to which one explanatory variable explains another. However, the current study taking the cut-off point of 0.9 by Adam (2015), if correlation coefficient between two explanatory variables is 0.9 and above there is multicollinearity. The Stata statistical tool used in the analyses of this study's dataset by employing System GMM automatically deals with the issue of multicollinearity and thus the problems of multicollinearity are solved in this study. The current study did not employ all explanatory variables in a model but each explanatory variable explains the dependent variable in a particular model.

Test of Heteroscedasticity

Heteroscedasticity actually refers to outliers' presence in a dataset. That is, in a data where the modification of the response variable is unequal across the range of explanatory variables, issue of heteroscedasticity is said to exist. However, to check for heteroscedasticity, Breusch-Pagan Test for heteroscedasticity is required but this study's estimation techniques have dealt with the issue of heteroscedasticity because the findings from GMM outputs even comes with values of robust F-statistics which means that the standard least square of deviation has first stage information (Andrews, 2018). It is assumed that the variance of error term is constant for all the explanatory variables, and errors in prediction of the response variable are expected to be

equal to 0 and constant. Therefore, if variance of errors depends on one or more of the explanatory variables there is an issue of heteroscedasticity.

Data Processing and Analysis

The data for the study was analysed using Stata Econometric Statistical Software 14 package. The study employed both descriptive and quantitative analysis. Tables were mainly employed to assist in the descriptive statistics. Correlation test and Levene's test were also carried out on the respective variables to ascertain their variance and association. Moreover, the study adopted the two-step system dynamic GMM econometric technique to regress (binary logistics) popularised by Arellano and Bond (1991) to obtain stort run estimates of variables involved.

Chapter Summary

This chapter involved discussion of the research approach adopted for the research as well as the research methods adopted in data collection and data analysis. Moreover, the chapter provided a comprehensive description of the population, sampling procedure, sources of data, description of variables and model specification. The study emplyed explanatory research design as it determins to ascertain the moderating effect of pricing strategy on cost control anf firm growth. Based on data available, panel data from 2012 to 2021 was used.

The research established three baseline models. The specification of the first class of models sought to establish connection between cost control (its dimensions) and growth of listed manufacturing firms in Ghana. The second batch of models were developed to determine the connection between pricing strategy and firm growth and finally the last models batch determined

the role played by pricing strategy in the relationship between cost control and growth of listed manufacturing firms in Ghana. The study mainly employed the system dynamic Generalized Method of Moments (specifically the two-step system GMM) technique for estimation of all the models as it known to controls for the problem of endogeneity.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter presents and discusses the results attained from the analysis of the empirical study. The chapter first presents the test of statistically significant difference in the level of cost control of the manufacturing firms listed on GSE. The chapter therefore presents the correlation matrix which assists to avoid the multicollinearity issues in the empirical work. Furthermore, the chapter presents regression analysis to determine the effect of cost control and its dimensions on firm growth and provided official deliberations on the various models in the research. The chapter finally presents empirical (sensitivity) analysis of the third model by determining the relationship between pricing strategy and firm growth as basis for pricing strategy to moderate the relationship between cost control and firm growth. The results of inferential statistics from the two-step system dynamic GMM of the relevant variables were presented and discussed in the order of the research hypothesis outlined in chapter one as follows;

$H_0 1$: There is no statistically significant difference in the level of cost control of listed manufacturing firms in Ghana.

$H_0 2$: There is no statistically significant effect of cost control on the growth of listed manufacturing firms in Ghana.

$H_0 3$: There is no statistically significant moderating effect of pricing strategy on the relationship between cost control and growth of listed manufacturing firms in Ghana.

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Descriptive Statistics

The descriptive statistics is presented in Table 2 on the sample of 12 manufacturing companies out of 16 manufacturing companies as a result of unavailability of data and year listed of some of the firms. The manufacturing firms sample list included in the study is illustrated in Appendix B. The descriptive statistics presented in this chapter include the measure of average, the standard deviation, the measure of variability degree, the minimum value and the maximum values for each variable, and the observations in addition.

Table 2

Descriptive Statistics of the Response and Explanatory Variables

Variable	Mean	Standard Deviation	Minimum	Maximum	Observations
ΔTS (FG)	.32	1.166	-.957	8.484	94
ROE (FG)	.016	.674	-4.123	2.302	107
ΔCTC	.385	1.178	-.669	9.688	89
ΔMC	.254	.884	-.807	6.235	93
ΔLC	.265	1.193	-.814	10.022	91
ΔFO	.672	2.986	-.971	26.446	94
CBPS	.495	.502	0	1	107
COMPPS	.439	.499	0	1	107
CUSVBPS	.159	.367	0	1	107
Fage	19.75	6.806	7	31	120
Fsize	6.412	1.057	4.375	8.381	106
ROA	.005	.645	-5.649	2.683	107

Note: FG refers to Firm Growth which is measured by change in total sales (ΔTS) and Return on Equity (ROE), ΔCTC represents the Average Composite Cost measured as change in average composite cost, ΔMC represents Material Cost Control measured as the changes in material cost. ΔLC refers to Labour Cost Control measured as the change in labour cost. ΔFO also represent Factory Cost Control measured as change in Factory Overhead. The three control variables including Profitability (ROA) measured as return on assets, Firm Size (Fsize) measured as the natural log of total asset and Firm Age (Fage) measured as firm age from year listed to the year of the study. The three Pricing Strategy dimensions include Cost-based pricing Strategy (CBPS) measured as dummy, Competitive-based Pricing Strategy (COMPPS) which is also dummy variable and Customer Value-based Pricing Strategy (CUSVBPS) measured as dummy.

Source: Field data (2022)

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From the descriptive statistics, an average sales level change was as low as 0.32 within the ranges of -0.957 and 8.484 and mean of 0.016 for ROE within the limits of -4.123 to 2.302. Though, the observations from 12 manufacturing firms in Ghana recorded a mean of average composite cost control (CTC) of 0.385 within the range of -0.669 and 9.688. This shows that most manufacturing firms have engaged in cost control on the average thus cost control is contributing a little towards firm growth. In regards to material cost control variable, it recorded an average of 0.254 within the limits of -0.807 and 6.235. This indicates that average material cost control in the manufacturing firms is weak then the average composite cost control, even the best performing manufacturing firm with regards to material cost control had an average of 0.254.

In other to have a comprehensive knowledge of the various dimensions of cost control in the manufacturing firms in Ghana, the study also presented descriptive statistics of each of the three dimensions of cost. Material cost control (ΔMC), labour cost control (ΔLC) and factory cost control (ΔFO), which recorded averages of 0.254, 0.265 and 0.672 within the limits of -0.807 and 6.235, -0.814 and 10.022 as well as -0.971 and 26.446 respectively. In total, these statistics on the various cost control dimensions show that in fact material cost control is the weakest elements among the elements of cost whereas labour cost control and factory overhead cost control is the strongest.

The cost-based pricing strategy (CBPS) variable recorded an average of 0.495 which is high as compared to competitive-based pricing strategy (COMPPS) with the mean of 0.439, it quite moderate among the three pricing strategy indicators whilst customer value-based pricing strategy (CUSVBPS)

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had the lowest average of 0.159 among the observation of 107 of 12 grouped firms. These three-pricing strategy had ranges from 0 to 1 because they are all dummy recorded variables. However, their variability from the mean is not much as in the case of cost-based pricing strategy that recorded a deviation from mean of 0.502 as the highest but variability from the mean for customer value-based pricing strategy variability of 0.499 compared to the mean of 0.397 for customer value-based pricing strategy.

Firm age (Fage) recorded an average of 19.75 within the range of 7 to 31. Firm size (Fsize) also recorded mean of 6.412 within the limits of 4.375 and 8.381. The firm profitability (ROA) variable recorded an average of 0.005 within the range of -5.649 and 2.683. This means that on the average, the well-to-do manufacturing firm generate profit before interest and tax on equity of 2.683 whiles the non-performing one incurs loss on equity of -5.649.

Test of Significant Difference in the Level of Cost Control

The study presented the results for the significant difference in the level of cost control (the individual dimensions of cost control) against the control settings, mean and median from Table 3, Table 4, Table 5 and Table 6. The Tables show the mean of the dimensions of cost control, the standard deviation in the particular cost control and the total frequency for all the 12 firms in the listed manufacturing industry. There is a medium effect in the significance difference in the level of the mean value which is computed as square root of the partial n^2 divided by 1—the partial n^2 (Cohen, 1988). The Table 3 helps in the comparison of the means of average composite cost control of the various firms in the treatment to the means of 0.128, the control setting (mean level).

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Table 3

Significant Difference in the Level of Average Composite Cost Control

Firm ID	Mean	Standard Deviation.	Frequency
1	0.008	0.248	6
2	0.116	0.113	8
3	-0.133	0.477	6
4	0.147	0.297	9
5	0.098	0.316	9
6	0.094	0.570	9
7	0.195	0.326	9
8	0.148	0.254	9
9	0.042	0.165	7
10	-0.231	0.715	8
11	-0.023	0.742	6
12	0.026	0.179	9
Total Control	0.051	0.400	95

Diagnostics
Levene's Test Centered at Mean (W0) = 1.6916901   df(11, 83)   Pr > F = 0.08947138
Levene's Test Centered at Median (W50) = 1.3924721   df(11, 83)   Pr > F = 0.19190131
Levene's Test Centered at 10% trim Mean,W10 = 1.6916901df(11, 83) Pr > F = 0.08947138
Source: Field data (2022)

Table 3 depicts the significant differences in the level of average composite cost control in relation to the individual firms against the control setting (level) of labour cost control as illustrated with the firm ID in its ranking. The study reports on the significant difference by comparing the means (Gross, Rottler, & Wallmeier, 2021) or standard deviations (Zach, 2020). For instance, the mean for firm ID (1) 0.008 is lower compared to the control setting mean of 0.051, and this diffferences exist among all the firms because of slight differences in their means but the Levene's test diagnostics provides proof for whether or not there is statistically significant difference in the average composite cost control for the listed firms in the manufacturing industry.

The Levene's test centered at the mean recorded a significant p-value of 0.0895 which maintains the null hypothesis. However, the study considers the Levene's test centered at the median to accurately determines the level of significant difference and that reported on a p-value of 0.1919 which also accepts the null hypothesis asserting that there is no statistically significant

difference in the level of average cost (that is, the average of the composite cost) of listed manufacturing firms in Ghana.

Table 4

Significant Difference in the Level of Material Cost Control

Firm ID	Mean	Standard Deviation	Frequency
1	-0.008	0.502	6
2	0.104	0.116	8
3	-0.163	0.336	6
4	0.117	0.303	9
5	0.114	0.318	9
6	0.235	0.826	9
7	0.252	0.499	9
8	0.190	0.486	9
9	0.058	0.167	7
10	-0.251	1.121	6
11	-0.059	0.850	6
12	0.128	0.224	9
Total Control	0.082	0.522	93

Diagnostics

Levene's Test Centered at Mean W0 = 3.3688343   df(11, 81)   Pr > F = 0.00072562
Levene's Test Centered at Median (W50) = 2.7936324   df(11, 81)   Pr > F = 0.00393748
Levene's Test Centered at 10% trim Mean, W10 = 3.3688343 df(11, 81) Pr > F = 0.00072562
Source: Field data (2022)

Significant Difference in the level of Cost Control (Material Cost Control) of listed Manufacturing Firms in Ghana

Table 4 depicts the significant differences in the level of material cost control with regards to the mean as well as the standard deviation of control setting of material cost control against the individual firms as illustrated with the firm ID i.e., it ranking. It was reported that the standard deviation in the material cost control among the firms presents differences in them, that is, standard deviation is higher for firm ID (10) 1.121 compared to control mean 0.522, and it varies across all the firms but the Levene's test diagnostics verifies whether or not there is significant difference in the material cost control for the firms in the manufacturing industry. The Levene's test centered at the mean had significant p-value of 0.00072 which indicates that the null hypothesis has been rejected. However, the nature of the data appears to be asymmetric so the Levene's test centered at the median is accurate in

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determining the level of statistically significant difference and that reported on a p-value 0.00394 which also rejects the null hypothesis therefore supports the alternative hypothesis that there is statistically significant difference in the level of material cost control of listed manufacturing firms in Ghana.

Table 5

Significant Difference in the Level of Labour Cost Control			
Firm ID	Mean	Standard Deviation	Frequency
1	0.143	0.527	6
2	0.183	0.425	8
3	-0.090	0.587	6
4	0.182	0.687	9
5	0.025	0.446	9
6	0.113	0.275	6
7	0.113	0.523	9
8	0.082	0.360	9
9	-0.015	1.332	6
10	-0.114	0.671	8
11	0.025	0.738	6
12	-0.185	0.582	9
Total Control	0.039	0.597	91

Diagnostics
Levene's Test Centered at Mean (W0) = 1.08452356   df(11, 79)   Pr > F = 0.38445041
Levene's Test Centered at Median (W50) = 0.74236352   df(11, 79)   Pr > F = 0.69490125
Levene's Test Centered at 10% trim Mean,W10 = 1.08452356 df(11, 79) Pr > F = 0.38445041
Source: Field data (2022)

Significant Difference in the level of Labour Cost Control of listed

Manufacturing Firms in Ghana

Table 5 shows the significant differences in the level of labour cost control with regard the individual firms against the control setting (level) of labour cost control as illustrated with the firm ID in its ranking. The study reports on the significant difference by comparing the means (Gross, Rottler, & Wallmeier, 2021) or standard deviations (Zach, 2020). The findings reported that in the midst of appropriate cost control practices, some firm means are significantly higher whereas other firms also depict mean far below the control setting. For instance, the mean is higher for firm ID (9) 1.332 compared to the control setting mean of 0.597, and this is true for all the firms because of huge differences in their means but the Levene's test diagnostics

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provides proof for whether or not there is statistically significant difference in the labour cost control for the firms in the manufacturing industry. The Levene's test centered at the mean recorded a significant p-value of 0.3845 which support the maintenance of the null hypothesis. However, the study considers the Levene's test centered at the median to accurately determines the level of significant difference and that reported on a p-value 0.6949 which accepts/supports the null hypothesis asserting that there is no statistically significant difference in the level of cost control (labour cost) of listed manufacturing firms in Ghana.

Table 6

Significant Difference in the Level of Factory Overhead Control

Firm ID	Mean	Standard Deviation	Frequency
1	-0.041	0.276	6
2	0.142	0.355	8
3	0.003	1.895	6
4	0.252	1.239	9
5	0.221	0.641	9
6	0.007	0.355	9
7	0.199	0.828	9
8	0.187	0.723	9
9	0.089	0.965	6
10	-0.209	1.455	8
11	0.067	0.671	6
12	-0.168	0.549	9
Total Control	0.069	0.878	94

Diagnostics
Levene's Test Centered at Mean (W0) = 1.8990474   df(11, 82)   Pr > F = 0.05116954
Levene's Test Centered at Median (W50) = 1.4212114   df(11, 82)   Pr > F = 0.17918099
Levene's Test Centered at 10% trim Mean, W10 = 1.8990474 df(11, 82) Pr > F = 0.05116954
Source: Field data (2022)

Significant Difference in the Level of Cost Control (Factory Overhead Control) of listed Manufacturing Firms in Ghana

Table 6 presents the significant differences in the mean control setting of factory overhead cost control against the individual firms as illustrated with the firm ID i.e., the ranking. It was reported that the standard deviation in the factory overhead cost control among the firms presents differences in them, that is, the standard deviation is higher for firm ID (3) 1.895 compared to

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control setting average deviation from the mean of 0.878. Considering the control setting standard deviation, firm ID 3, firm ID 4, and firm ID 10 which have the high deviations also report on huge differences across the mean and these differences cut across all listed manufacturing firms in the industry but the Levene's test diagnostics verifies whether or not there is significant difference in the factory cost control for the firms in the manufacturing industry. The Levene's test centered at the mean reported a significant p-value of = 0.051 which maintains the null hypothesis. However, the study focused on the Levene's test centered at the median with a p-value 0.179 which also maintains the null hypothesis thus concluding that there is no significant difference in the level of cost control (specifically, the factory cost control) of listed manufacturing firms in Ghana.

Finally, the Levene's test of significant difference in the level of cost control of listed manufacturing firms in Ghana found out that there is no statistically significant difference in the level of cost control (for average composite cost control, labour cost control and factory overhead cost control) of listed manufacturing firms in Ghana. That is, for two out of three dimensions of cost control to reveal no significant difference in the level of cost control in addition to the average composite cost control with the exception of material cost control (which revealed statistical significant difference in the level of cost control) of listed manufacturing firms in Ghana Therefore, objective one provides the conclusion that the null hypothesis has been maintained that there is no statistically significant difference in the level of cost control of listed manufacturing firms in Ghana.

Diagnostics Results on the Significance Difference in the Level of Cost Control of Listed Manufacturing Firms in Ghana.

According to Conover, Johnson and Johnson (1981) where data appears to be asymmetric data, the Levene's test centered at median tends to provide more accurate results due to irregularity or the noise in the data. They indicated that for regular or symmetric data can have both mean and median yielding similar results. However, due to the assymetric nature of the data of the current study, the study resort to the Levene's test centered at median with p-value of average composite cost control (0.1919), material cost control (0.0039), labour cost control (0.6949) and factory overhead control (0.1792) which still presents acceptance of the null hypothesis that there is no statistically significant difference in the level of average composite cost control, labour cost control and factory overhead control of listed manufacturing firms in Ghana.

Gastwirth, Gel and Miao (2009) opined that when group centers are known and all classified by scale, for which the study is no exception, the alternative hypothesis is appropriate for the subject matter. The p-values from Table 3 and Table 6 concluded that there is no statistically significant difference in the level of average composite cost control, labour cost control and factory overhead control but there is statistical significant difference in material cost control of listed manufacturing firms in Ghana. Therefore, the study based on the findings from Table 3 – Table 6 to states that there is no statistically significant difference in the level of cost control among listed manufacturing firms in Ghana.

Correlation Matrix

To test for the presence of multicollinearity among the explanatory variables which may affect the reliability of the results necessitated the matrix of correlation which was determined by the pairwise correlation analysis. From Table 7, the study adopted bench mark of 0.9 as the cut-off point according to Adam (2015), the results illustrated that multicollinearity issues among the explanatory variables are very low.

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Correlation Analysis

Table 7

Pairwise Correlations Matrix

Variables	ΔlnTS	lnROE	ΔlnCTC	ΔlnMC	ΔlnLC	ΔlnFO	CBPS	COMPPS	CUSVBPS	lnFA	lnTA	lnROA
ΔlnTS	1.000											
lnROE	0.065	1.000										
ΔlnCTC	0.257*	0.210*	1.000									
ΔlnMC	0.196	0.216*	0.861*	1.000								
ΔlnLC	0.155	0.033	0.401*	0.059	1.000							
lnFO	0.035	0.256*	0.574*	0.339*	0.142	1.000						
CBPS	-0.019	-0.007	-0.061	-0.016	-0.064	-0.008	1.000					
COMPPS	0.005	-0.024	-0.016	-0.056	0.020	-0.015	-0.764*	1.000				
CUSVBPS	0.026	-0.026	0.086	0.118	-0.041	-0.039	-0.431*	-0.024	1.000			
lnFA	0.012	-0.029	0.095	0.099	0.019	0.016	-0.050	-0.095	0.443*	1.000		
lnTA	0.049	-0.037	-0.072	-0.082	0.032	-0.026	0.190	-0.044	-0.439*	-0.022	1.000	
lnROA	0.097	0.027	0.059	-0.104	0.082	0.073	0.068	-0.117	0.096	-0.037	0.026	1.000

Note: FG is Firm Growth variable, ΔlnMC is Material Cost Control variable. ΔlnLC refers to Labour Cost Control variable. ΔlnFO also refers to Factory Cost Control. ΔlnCTC is Composite Cost Control variable: Profitability is represented by lnROS and lnROA, ie. the natural log of return on sales and the natural log of return on assets respectively and lnFA represents Firm Age, the natural log of firm age. The three Pricing Strategy dimensions CBPS, COMPPS and CUSVBPS measured as dummy variables. The matrix used * to represents significant level at 5%.

*** $p<0.01$, ** $p<0.05$, * $p<0.1$
Source: Field data (2022)

Table 7 shows the pairwise correlation matrix for all the variables employed in the empirical analysis. Certainly, the average composite cost (ΔlnCTC) presents a high correlation with each of the three cost control elements and this is because the average composite cost control variable is a simple average of the three cost control dimensions. It does not result in the issue of multicollinearity because the threshold for the study is 0.9 (Adam, 2015) and also the average composite cost control variable does not enter the same model with any of the variables. The Table 7 illustrates a strong association between these three explanatory variables with the composite cost control variable (ΔlnCTC) that is, ΔlnCTC with ΔlnMC and ΔlnFO having coefficient of 0.861 and 0.574 respectively according to Cohen (1988). Considering the strength and the direction of all explanatory variables with the response variables (FG i.e. ΔlnTS and lnROE), the Table 7 reported that ΔlnCTC, ΔlnMC and ΔlnLC had moderate associations (Cohen, 1988) in influencing the direction of growth (ΔlnTS) of manufacturing firms in Ghana. However, ΔlnLC, lnROA (firm profitability) had low association with growth (proxied by lnROE), the other explanatory variables have moderate association with firm growth (lnROE).

Moreover, cost-based pricing strategy (CBPS) had negative association with both firm growth measures (ΔlnTS and lnROE) and firm age (lnFA) also had significant negative association with firm growth (lnROE). There is low association between cost-based pricing strategy (CBPS), competitive-based pricing strategy (COMPPS) and customer value-based pricing strategy (CUSVBPS) and firm growth (ΔlnTS) of -0.019, 0.005, and 0.026 respectively

and negative association between these pricing strategies and firm growth (lnROE). Also, there is low association between firm size (lnTA) of 0.049, profitability (lnROA) of 0.097 and firm age (lnFA) of 0.012 and firm growth (ΔlnTS) of manufacturing firms. Even though their strength in influencing firm growth (FG) is low, in same manner the relationships are insignificant.

Variance Inflation Factor

The test for multicollinearity is important in any regression analysis to check there exist any issue of one explanatory variable having high correlation with another expalnatory variable, that is, high correlation among the explanatory variables. Eventhough, the correlation matrix presented moderate correlation among the explanatory variables, there is the tendercy that average of the composite cost control and material cost are highly correlated because of the the correlation coefficient of 0.861 which is above Cohen (1988) cut-off point of 0.7. Therefore, the study present variance inflation factor of the expalnatory variables employed in the study including control variables in Table 8-11.

Table 8

Variance Inflation Factor (Changes in Total Sales as proxy for Firm Growth)

	VIF	1/VIF
ΔlnCTC	15.089	.066
ΔlnMC	8.821	.113
ΔlnLC	2.527	.396
ΔlnFO	2.806	.356
CBPS	5.000	.200
COMPPS	3.893	.257
CUSVBPS	2.638	.379
lnFA	1.394	.718
lnROA	1.251	.799
Mean VIF	4.824	.

Source: Field data (2022)

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From Table 8, there seems an issue of multicollinearity existing among average composite cost and other explanatory variables because of the variance inflation factor of 15.089 which is more than 10 by Cohen (1988). In the correlation statistics, the correlation coefficient between average composite cost and material cost was as high as 0.861, above the cut-off point according to Cohen (1988). Based on the finding in Table 8, the average composite cost was eliminated to find the VIF among the other explanatory variables. Table 9 then shows variance inflation factor among the moderately correlated variables.

Table 9

Variance Inflation Factor (Firm Growth proxied as Changes in Total Sales)

	VIF	1/VIF
ΔlnMC	1.228	.814
ΔlnLC	1.057	.946
ΔlnFO	1.207	.829
CBPS	5.000	.200
COMPPS	3.890	.257
CUSVBPS	2.636	.379
lnFA	1.383	.723
lnROA	1.098	.911
Mean VIF	2.187	.

Source: Field data (2022)

Table 10 and 11 presents the variance inflation factor for the explanatory variables (both independents and controls variables) against return on equity (ROE) as dependent variable. In Table 10, the average composite cost control was with VIF of 13.237 which indicate that there was an issue of multicollinearity among average composite cost and other variables. However, upon the elimination of the average composite cost control (lnCTC), the Table 11 presents VIF among the explanatory variables enables the mean VIF to be 2.29 instead of average VIF of 4.531 in Table 10

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Table 10

Variance Inflation Factor (Return on Equity as a Proxy for Firm Growth)

	VIF	1/VIF
ΔlnCTC	13.237	.076
ΔlnMC	7.490	.134
ΔlnLC	2.421	.413
ΔlnFO	2.721	.368
CBPS	5.063	.198
COMPPS	3.934	.254
CUSVBPS	3.155	.317
lnFA	1.434	.697
lnTA	1.328	.753
Mean VIF	4.531	.

Source: Field data (2022)

Table 11

Variance Inflation Factor (Firm Growth proxied as Return on Equity)

	VIF	1/VIF
ΔlnMC	1.188	.841
ΔlnLC	1.046	.956
ΔlnFO	1.186	.843
CBPS	5.057	.198
COMPPS	3.931	.254
CUSVBPS	3.149	.318
lnFA	1.433	.698
lnTA	1.328	.753
Mean VIF	2.29	.

Source: Field data (2022)

From Table 9 and 11, it can be inferred that all the explanatory variables indicated have variance inflation factor in between 1 to 5 which means that there is moderate correlation among these variables. The presence of the average of composite cost control in the variables yielded VIF of greater than 10 that indicated the presence of multicollinearity. The study deals with the issue of multicollinearity by analysing each independent variable separately with the dependent variable.

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Discussion of Regression Results

The estimation results from the system dynamic GMM estimations are contained in Table 12 to 15, Table 8 and 9 contain the results for the effect of cost control and its various dimensions (average composite cost control, material cost control, labour cost control and factory overhead control) on firm growth (FG) (proxied by lnTS and lnROE) when the natural logarithms of these variables were used as the main explanatory variables. Table 9 reports the result from the sensitivity of pricing strategy to influence firm growth before regressing as moderator where pricing strategy dimensions were the main regressors. Finally, the Table 10 to 12 report the moderating role of each dimension of pricing strategy in the relationship between cost control and firm growth of listed manufacturing firms in Ghana.

Regression Results on the Effect of Cost Control on Growth of Manufacturing Firms Listed in Ghana

This subsection of the chapter presents and discusses the empirical results in accordance to the objective of the study. The regression results are shown in Table 12 to Table 13. Tables 12 and 13 present the results of the average cost composite and the separate dimensions effect of cost control on growth of listed manufacturing firms in Ghana (proxied by ΔlnTS and lnROE respectively). Table 14 presents the sensitivity of regression results determining the separate influence of pricing strategy on growth of listed manufacturing firms in Ghana. Table 15 to 20 presents the results for the interacting role played by pricing strategy on cost control and growth of listed manufacturing firms in Ghana.

Table 12

Cost Control and Firm Growth (Changes in Total Sales as proxy for Firm Growth)

	Model (1a) ΔlnTS	Model (1b) ΔlnTS	Model (1c) ΔlnTS	Model (1d) ΔlnTS
L.ΔlnTS	.38	.745**	-.608*	.285
	(.299)	(.303)	(.286)	(.17)
ΔlnCTC	-1.885***			
	(.481)			
ΔlnMC		-1.736**		
		(.659)		
ΔlnLC			-.856	
			(.48)	
ΔlnFO				-.488**
				(.204)
lnROA	.419**	.026	.528***	.904***
	(.137)	(.4)	(.158)	(.086)
lnFA	.31	.586	.258	.067
	(.309)	(.327)	(.216)	(.111)
_cons	-1.536	-1.658*	-1.547**	-1.734***
	(1.011)	(.89)	(.668)	(.42)
Diagnostics				
Fisher statistics	68.91***	43.58***	62.54***	148.58***
AR (1) [*p-value*]	0.021	0.030	0.204	0.036
AR (2) [*p-value*]	0.372	0.289	0.478	0.237
Hansen OIR	0.787	0.652	0.263	0.360
DHT for Instrument (a) GMM Inst levels				
H excluding group	0.962	0.746	0.102	0.117
Diff (Null, H = exo)	0.657	0.524	0.434	0.553
(b)IV (years, eq(diff)				
H excluding group	0.758	0.669	0.248	0.305
Diff (Null, H = exo)	0.458	0.331	0.300	0.420
Sargan OIR	0.80	0.97	3.32	5.26
P (Sargan Chi2)	0.977	0.965	0.651	0.385
Number of groups	12	12	12	12
Number of Instruments	10	10	10	10
Observations	82	81	78	81

Note: Dependent variable (FG) is Firm Growth proxied by Changes in Total Sales, ΔlnCTC is average composite cost control, ΔlnMC is material cost control, ΔlnLC is labour cost control, and ΔlnFO is factory overhead control. lnROA is the natural logarithm of return on asset and lnFA refers to firm age measured as the natural log of firm age from the year listed to the year of the study.

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1
Source: Field data (2022)

Table 13 depicts the effect of cost control (average composite cost and dimensions of cost control) on growth of listed manufacturing firms in Ghana (proxied by Return on Equity).

Table 13

Cost Control and Firm Growth (Return on Equity as a proxy for Firm Growth)

	Model (1i) lnROE	Model (1ii) lnROE	Model (1iii) lnROE	Model (1iv) lnROE
L.lnROE	.078	.224	1.352*	.012
	(.235)	(.297)	(.725)	(.459)
ΔlnCTC	.404**			
	(.168)			
ΔlnMC		.352***		
		(.052)		
ΔlnLC			.722**	
			(.31)	
ΔlnFO				.112
				(.11)
lnFA	-.066	.042	.117	-.026
	(.078)	(.103)	(.21)	(.058)
lnTA	-.017	-.042*	-.022	-.025
	(.021)	(.02)	(.092)	(.049)
_cons	1.898***	1.702**	-.654	2.015
	(.55)	(.755)	(2.354)	(1.377)
Diagnostics				
Fisher statistics	1909.08***	1473.92***	4706.97***	1431.68***
AR (1) [*p-value*]	0.114	0.048	0.000	0.189
AR (2) [*p-value*]	0.468	0.353	0.448	0.542
Hansen OIR	0.724	0.588	0.420	0.681
DHT for Instrument				
(a) GMM Inst levels				
H excluding group	0.670	0.666	0.792	0.676
Diff (Null, H = exo)	0.615	0.470	0.298	0.566
(b)IV (years, eq(diff)				
H excluding group	0.751	0.444	0.860	0.538
Diff (Null, H = exo)	0.336	0.933	0.056	0.946
Sargan OIR	3.79	1.34	3.18	3.51
P (Sargan Chi2)	0.581	0.930	0.672	0.607
Number of groups	12	12	12	12
Number of Instruments	10	10	10	10
Observations	95	93	91	94

Note: Dependent variable (FG) is Firm Growth proxied by Return on Equity, ΔlnCTC is average composite cost control, ΔlnMC is material cost control, ΔlnLC is labour cost control, and ΔlnFO is factory overhead cost control. Firm Size (lnTA) measured as the natural log of total asset and lnFA refers to firm age measured as the natural log of firm age from the year listed to the year of the study.

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1
Source: Field data (2022)

Cost Control and Growth of Listed Manufacturing Firms in Ghana

Models in Table 12 show the results on the relationship between average composite cost control, material cost control, labour cost control as well as factory overhead control and firm growth of listed manufacturing firms in Ghana. The result from model (1a) indicates that, at 1% significance level, average composite cost control has a significant negative effect on growth of listed manufacturing firms in the short run. The coefficient of -1.885 means that a percentage change in composite cost is associated with 1.885% inverse change in growth of listed manufacturing firms in Ghana ceteris paribus. Model (1b) depicts a negative significant relationship between material cost control and firm growth with a coefficient of –1.736 at 5% significant level. This means that a percentage change in material cost leads to 1.736% inverse change in the growth (proxied by changes in total sales) of listed manufacturing firms in Ghana.

Moreover, model (1d) showed a significant negative coefficient of -0.488 at 5% significant level. This means that, all other things being equal, a percentage change in factory overhead control leads to inverse change of 0.488% in growth (proxied by changes in total sales) of manufacturing firms listed in Ghana. Hence, there is an elastic relationship between average composite cost control, material cost control but inelastic relationship between factory overhead control and firm growth and thus the results reject the null hypothesis that states that there is no statistically significant relationship between cost control and growth of listed manufacturing firms in Ghana. This indicates that as the greater cost is control on

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the average; it tends to boost sales revenue for growth as well as total cost influences prices of commodities, which is a major determinant of demand.

Further, model (1i) and (1iii) in Table 13 also presents the results on the effects of the individuals' dimensions of cost control on growth (proxied by return on equity) of listed manufacturing firms in Ghana. Model (1i) and model (1iii) depicts that, at 5% significant level, average composite cost control, material cost control and labour cost control had significant positive influence on firm growth. The coefficient of 0.404 and 0.722 means that a percentage change in average composite cost control and labour cost control lead to 0.404% and 0.722% change in firm growth (proxied by return on equity) respectively on the average in the short run.

These relationships also indicate an inelastic relationship between average composite cost control, material cost control, labour cost control and firm growth when all other variables are held constant. However, material cost control also had an inelastic significant positive relationship with firm growth as 1% significant level as illustrated in model (1ii). This is because at 1% significant level, material cost control depicts the coefficient of 0.352 which means that a percentage change in material cost control is associated with 0.352% change in growth (proxied by return on equity) of listed manufacturing firms in Ghana.

Predictably, cost control and its dimensions are said to have statistically significant negative effects on growth (proxied by changes in total sales) and significant positive effects on growth (proxied by return on equity) of listed manufacturing firms in Ghana. However, ceteris paribus, the constant term

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depicts significant negative effect on firm growth in almost all the models in Table 12 and Table 13. This shows that when all other regressors are held constant, the constant autonomous term would influence growth of manufacturing firms in Ghana.

The findings are in consistent with the results in an empirical study by Egbide et al. (2019) which found out that control of material cost and wages and salaries have significant positive effect on firm growth. They explained the models of the study using OLS regression model where changes in material cost, changes in total assets were found to have significant positive relationship with firm growth. Therefore, the results of the current study reject the null hypothesis that asserts that there is no statistically significant effect of cost control (and its dimensions) on growth of listed manufacturing firms in Ghana. The findings then offer support for the assertion that the cost control and its dimensions have significant direct influence on growth of listed manufacturing firms in Ghana.

However, the study is also inconsistent with the work of Oyedokun, Tomomewo and Owolabi (2019) that revealed an inverse relationship between material cost control and profitability of manufacturing firms but identified significant positive relationship between labour cost and profitability of manufacturing firms. This contradicts the result revealed by the current study concerning the effect of material cost control and firm growth (proxied by return on equity in Table 13) but collaborate with the finding in Table 12, model (1b) where there was an inverse relationship between material cost control and firm growth (proxied by changes in total sales) with coefficient of -1.736.

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On the basis of the ongoing discussion, the study rejects the null hypothesis that there is no statistically significant effect of cost control on growth of listed manufacturing firms in Ghana for the study period under consideration and asserts in conclusion that there is a statistical significant effect of cost control on growth of listed manufacturing firms in Ghana.

Results of the control variables for the models assessing the separate effects of the cost control and its dimensions on growth of listed manufacturing firms in Ghana

From all the models in Table 12 (having changes in total sales as a proxy for firm growth), two control variables comprising of firm profitability (lnROA) and firm age (lnFA) were included in the estimations to control the models. Similarly, all the models in Table 13 (return on equity as a proxy for firm growth), also had firm age (lnFA) and firm size (lnTA) in the estimations to control the models. The control variables in model (1a) – (1d) which include profitability (lnROA) and firm age (lnFA) illustrated significant positive effect of profitability on growth of listed manufacturing firms in Ghana but firn age was insignificant. Thus, at 1% significance level a percentage change in firm profitability is directly associated with 0.528% and 0.904% change in firm growth as indicated in model (1c) and model (1d). At 5% significant level, lnROA had a significant relationship with firm growth with coefficient of 0.419 in model (1i). These results are essential as a result of the connection between profitability and growth of firms being it from both accounting perspective or finance perspective. In the same way, throughout the models (1i) to model (1iv) in Table 13, only firm

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age (lnFA) had insignificant effect on growth of listed manufacturing firms in Ghana. In model (1ii), firm size depict a negative significant relationship with firm growth at a coefficient of –0.042 which indicates that in the presence of material cost control, where return on equity is the proxy for firm growth, a percentage change in firm size leads to 0.042 inverse change in growth of listed manufacturing firms in Ghana. This means that as firm size grow, it sometimes results in retard growth.

The results from profitability (lnROA) among all the models in Table 12 were in line with the findings of Jang and Park (2011) who opined that profitability effect on growth depending on the growth measurement used and thus profit does not function as a major determinant of total sales growth. In model (1a) to model 1(d), profitability (lnROA) showed significant positive relationship with firm growth which implies that the measure of profitability in the current study (as operating profit before interest and tax out of total assets) is an appropriate measure. Again, firm size results (lnTA) in the models of Table 13 are in consistency with work of Rahman and Yilun (2021) who found out that firm size had significant influence on profitability however negative direction in the current study.

Diagnostics on the models determining the effect of cost control on growth of listed manufacturing firms in Ghana

The current study employed the two-step system dynamic GMM estimator to determine the effect of cost control (and its dimensions) on firm growth. This is because most studies such as Agyei, Isshaq, Frimpong, Adam, Bossman and

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Asiamah (2021), Khan, Teng, Khan and Khan (2019) and Abeka (2018) preferred the use of two system general method of moments estimator because it employs optimal weighting matrices. For robustness and unbiased estimations parameters, cross sectional dimension should be large. Thus, the current study used large cross section which prevents biased problems to exist in the estimations. According to Roodman (2009), instrumental variable dimensionality was shortened and this was illustrated in the number of groups being greater that number of instruments.

According to Khan et al. (2019), the reliability and consistency of the GMM methods depends on Sargan test of over-identifying restrictions and specification test. For Sargan OIR and Hansen OIR, the null hypothesis should be rejected which indicates that the model had been specified correctly and the instruments are valid. The results from Sargan OIR and Hansen OIR shows the validity of instruments used in the study. The numbers of observations, cross sections or groups compared to number of instruments indicate that instruments in the study have no problem of proliferation and were exogenous for all the models.

Mileva (2007) specified that the null hypothesis for the test of first-order and second-order autocorrelation should be rejected but most importantly the null hypothesis for AR (2) test in first differences should be rejected. The results from all the models in Table 12 and Table 13, at 5% significance level, have all the p-values of AR (2) illustrated rejection of the null hypothesis. This indicates that no problem of autocorrelation exists in all the models specified in Table 15 and 16. Again, all the probability of Fisher statistics was significant at 1% in all the models indicating that independent variables (cost control dimensions)

individually have significant effect on the dependent variable.

The Moderating Effect of Pricing Strategy on Cost Control and Growth of Listed Manufacturing Firms in Ghana

Tables 15 to 20 present the moderating role played by the indicators of pricing strategy on the average composite cost control, material cost control, labour cost control as well as factory overhead cost control and growth of listed manufacturing firms in Ghana. Before the moderating effect was estimated, the study first determined the relationship between the moderator(s) and the dependent variable (firm growth) due to empirical argument (Khudhair et al., 2019; Sarkar & Khare, 2017). Model (2a) to (2c) in Table 14 where firm growth is proxied by changes in total sales and model (2i) to model (2iii) (where firm growth was proxied by return on equity) shows the direct relationship between the various pricing strategy and growth of listed manufacturing firms in Ghana.

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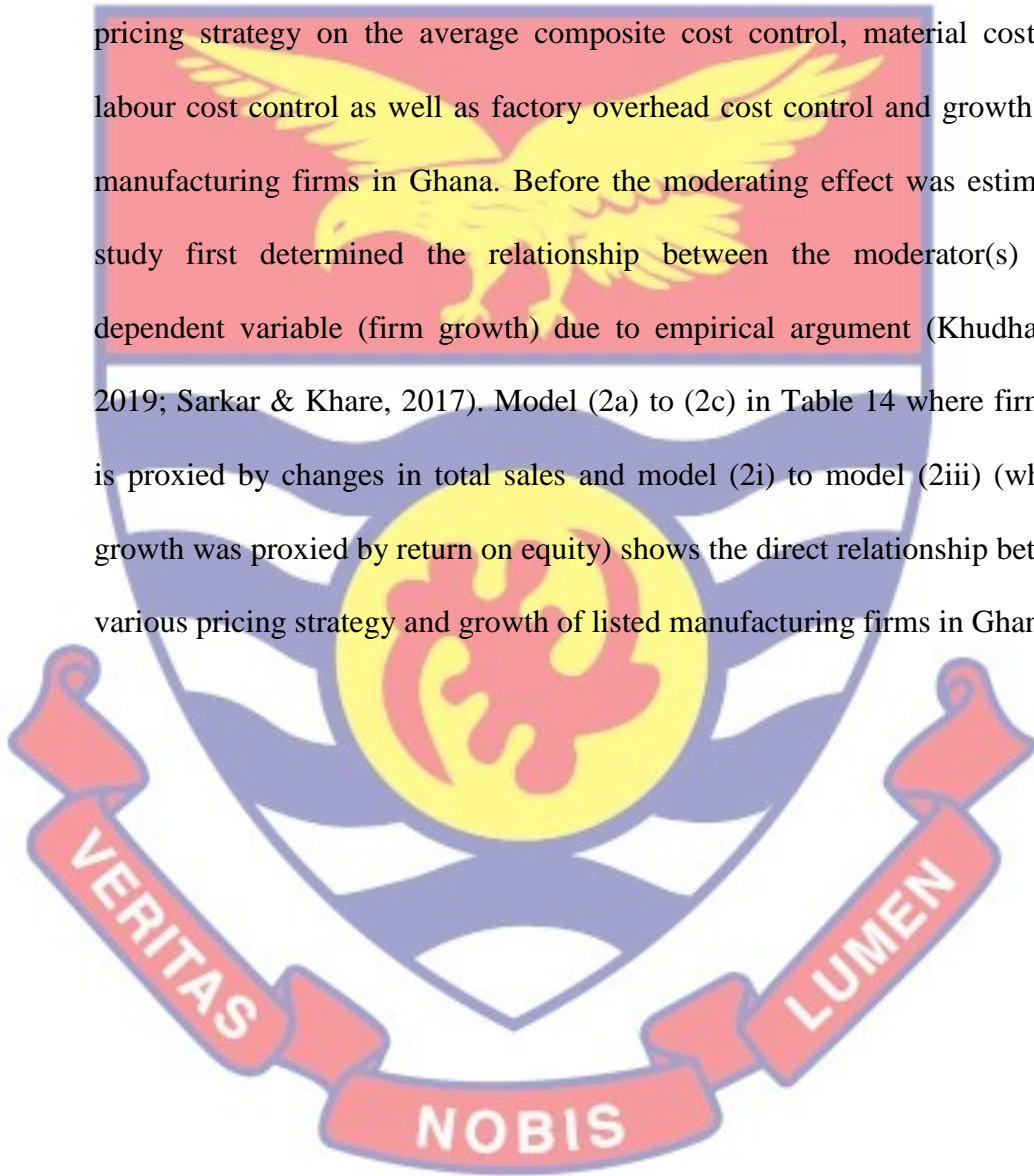
Table 14

Pricing Strategy and Growth of Listed Manufacturing Firms in Ghana (Changes in Total Sales and Return on Equity as proxies for Firm Growth)

	Model (2a) ΔlnTS	Model (2b) ΔlnTS	Model (2c) ΔlnTS		Model (2i) lnROE	Model (2ii) lnROE	Model (2iii) lnROE
L. ΔlnTS	.357* (.165)	.382* (.191)	.368 (.215)				
L.lnROE				L.lnROE	1.565*** (.504)	.97*** (.291)	1.929*** (.492)
CBPS	.166* (.08)			CBPS	.141 (.108)		
COMPPS		-.177 (.105)		COMPPS		-.006 (.105)	
CUSVBPS			.047 (.534)	CUSVBPS			.356* (.181)
lnROA	.4*** (.121)	.42*** (.107)	.43*** (.097)				
lnFA	-.03 (.157)	-.018 (.163)	.004 (.307)	lnFA	.028 (.197)	-.002 (.026)	-.151 (.102)
lnTA				lnTA	.116 (.078)	-.001 (.04)	.2 (.125)
_cons	-.695 (.421)	-.597 (.564)	-.761 (.8)	_cons	-2.774 (1.7)	.088 (.936)	-4.056 (2.408)
Diagnostics				**Diagnostics**			
F- statistics	19.79***	15.41***	37.09***	F- statistics	221.44***	2869.47***	484.01***
AR (1) [*p-value*]	0.079	0.088	0.086	AR (1) [*p-value*]	0.217	0.265	0.354
AR (2) [*p-value*]	0.419	0.467	0.488	AR (2) [*p-value*]	0.336	0.363	0.473
Hansen OIR	0.493	0.437	0.588	Hansen OIR	0.814	0.346	0.987
DHT for Instrument				DHT for Instrument			
(a) GMM Inst levels				(a) GMM Inst levels			
H excluding group	0.058	0.213	0.076	H excluding group	0.298	0.180	0.945
Diff (Null, H = exo)	0.936	0.513	0.963	Diff (Null, H = exo)	0.884	0.432	0.961

	Model (2a)	Model (2b)	Model (2c)		Model (2i)	Model (2ii)	Model (2iii)
	ΔlnTS	ΔlnTS	ΔlnTS		lnROE	lnROE	lnROE
(b)IV (years, eq (diff)				(b)IV (years, eq (diff)			
H excluding group	0.419	0.370	0.534	H excluding group	0.848	0.471	0.990
Diff (Null, H = exo)	0.481	0.456	0.441	Diff (Null, H = exo)	0.351	0.151	0.570
Sargan OIR	2.68	2.06	3.94	Sargan OIR	0.21	1.28	0.51
P (Sargan Chi2)	0.749	0.841	0.559	P (Sargan Chi2)	0.999	0.937	0.992
Number of groups	12	12	12	Number of groups	12	12	12
Number of Insts	10	10	10	Number of Insts	10	10	10
Observations	82	82	82	Observations	95	95	95

Note: Dependent variable (FG) is Firm Growth, proxied as changes in the natural log of total sales (ΔlnTS) and natural log of return on equity (lnROE), CBPS refers to Cost-based Pricing Strategy, COMPPS is Competitive-based Pricing Strategy and CUSVBPS is Customer Value-based Pricing Strategy. lnROA is firm profitability measured as natural logarithm of return on assets, lnTA is firm size measured as the natural log of total asset and lnFA refers to firm age measured as the natural log of firm age from the year listed to the year of the study.

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1
Source: Field data (2022)

Model 2(a) presents the results on the relationship between cost-based pricing strategy and growth of listed manufacturing firms in Ghana. The results in model 2(a) from Table 14 indicates that at 10% significant level, cost-based pricing strategy had a positive significant relationship with firm growth of listed manufacturing firms in Ghana by illustrating coefficient of 0.166. This is in support of the economic theory propounded by Smith (1776). Adam Smith explained that pricing as a determinant of demand can influence sales growth ceteris paribus. This is because prices set with the cost-based pricing strategy mostly have little mark-up or margin on it thus at most times less expensive because only production cost is of concern to the manufacturer than huge profit margins. For this reason, Appendix A shows details of methods of pricing embedded in cost-based pricing strategy.

However, model (2b) and (2c) reveals the effect of competitive-based pricing strategy and customer value-based pricing strategy respectively on growth of listed manufacturing firms in Ghana. Although these pricing strategies influence on firm growth are insignificant, it indicates that even if manufacturing firms adopt these strategies of pricing, they are weak in influencing sales growth due to factors at the industry level. Lag of firm growth in model (2a) and model (2b) in Table 14 indicated positive and significant relationship with firm growth (proxied by Changes in Total sales). This means that firm growth is a process and consistent, thus previous year's growth influence current year's growth.

Considering return on equity as a proxy for firm growth, model (2iii) is the only model that revealed a significant effect of pricing strategy (customer value-based) on growth of listed manufacturing firms in Ghana. That is, at

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10% significant level customer value-based pricing strategy had significant positive relation with growth of listed manufacturing firms in Ghana with a coefficient of 0.356. This finding also support the economic theory which asserts that the forces of demand of customers and supply influence profitable growth.

The results in Table 14 are inconsistent with the empirical study by De Toni et al. (2017) who were of the opined that cost-based pricing strategy at low-cost level had insignificant effect on sales margin. However, De Toni et al. study was consistent with customer value-based pricing at high level had significant influence on sales margin. Moreover, control variables such as profitability (lnROA) have significant influence on growth of listed manufacturing firms in Ghana throughout the three models (model 2a – 2c) in Table 14 but firm size (lnTA), firm age (lnFA) were not significant in all the models (2a) - 2(b) and model (2i) - (2iii).

Table 15

Moderating Effect of Cost-based Pricing Strategy on Cost Control and Firm Growth (Changes in Total Sales as a proxy for Firm Growth)

	Model (3a) ΔlnTS	Model (3b) ΔlnTS	Model (3c) ΔlnTS	Model (3d) ΔlnTS
L. ΔlnTS	.399** (.172)	.414 (.421)	-.178 (.312)	-1.43*** (.369)
ΔlnCTC	-2.116*** (.494)			
ΔlnMC		-1.924*** (.559)		
ΔlnLC			-1.648*** (.421)	
ΔlnFO				-.347 (.296)
CBPS	-.238 (.313)	-.495 (.676)	.376 (.558)	1.297 (1.522)
ΔlnCTC*CBPS	**3.507*** **(1.783)**			
ΔlnMC*CBPS		**2.202**** **(.84)**		
ΔlnLC*CBPS			**2.166*** **(1.148)**	
ΔlnFO*CBPS				**.275** **(.294)**

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	Model (3a) ΔlnTS	Model (3b) ΔlnTS	Model (3c) ΔlnTS	Model (3d) ΔlnTS
lnROA	.336***	-.317	.621**	6.092
	(.09)	(.219)	(.227)	(3.534)
lnFA	.08	.286	-.147	-2.443
	(.188)	(.37)	(.365)	(1.905)
_cons	-.619	.079	-.674	-3.871
	(.695)	(1.077)	(.814)	(7.824)
Diagnostics				
F- statistics	71.56***	16.65***	107.52***	9.29***
AR (1) [*p-value*]	0.016	0.075	0.062	0.061
AR (2) [*p-value*]	0.839	0.233	0.088	0.124
Hansen OIR	0.960	0.793	0.121	0.603
DHT for Instrument				
(a) GMM Inst levels				
H excluding group	0.977	0.620	0.491	0.431
Diff (Null, H = exo)	0.616	0.780	0.036	0.679
Sargan OIR	0.03	0.26	3.45	0.67
P (Sargan Chi2)	0.998	0.968	0.327	0.881
Number of groups	12	12	12	12
Number of Instruments	10	10	10	10
Observations	82	81	78	81

Note: Dependent variable (FG) is Firm Growth proxied by Changes in Total Sales (ΔlnTS), ΔlnCTC is average composite cost control, ΔlnMC is material cost control, ΔlnLC is labour cost control, ΔlnFO is factory overhead control and CBPS refers to Cost-based Pricing Strategy. ΔlnCTC*CBPS is the interaction variable between average composite cost control and cost- based pricing strategy ΔlnMC*CBPS is the interaction variable between material cost control and cost-based pricing strategy, ΔlnLC*CBPS is the interaction variable between labour cost control and cost-based pricing strategy. ΔlnFO*CBPS is the interaction variable between factory cost control and cost-based pricing strategy. lnROA is the natural logarithm of return on asset and lnFA refers to firm age measured as the natural log of firm age from the year listed to the year of the study.

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1
Source: Field data (2022)

Table 15 shows the moderating effect of cost-based pricing strategy in the relationship between separate dimensions of cost control on growth of listed manufacturing firms in Ghana. Model 3(a) to model 3(d) are the models which indicated the interaction effect of cost-based pricing strategy in the relationship between each dimension of cost control and growth (proxied as changes in total sales) of listed manufacturing firms in Ghana. Three models in Table 15 comprising of model (3a) to (3c) illustrated significant interacting role played by cost-based pricing strategy in the relationship between average composite cost control, material cost control, labour cost control and growth

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(proxied by changes in total sales) of listed manufacturing firms in Ghana.

Model (3a) in Table 15 reports interaction coefficient of 3.507 at significant level of 10%. The introduction of the interaction term causes average composite cost control to attain coefficient of -2.116 as compared to the coefficient in model (1a) of -1.885. However, the coefficient of average composite cost control obtained a negative coefficient -2.116 in model (3a) of Table 15 as compared to the lower negative coefficient in model (1a) in Table 12. This implies that the interaction variable demonstrates the real nature of cost-based pricing strategy in the growth (proxied by changes in total sales) of manufacturing firms in Ghana.

Thus, even though average composite cost control was strong in influencing firm growth inversely, cost-based pricing strategy complements average composite cost control to contribute better to growth of listed manufacturing firms in Ghana by ensuring reduction in cost to influence (increase) firm growth. Therefore, the net effect of average composite cost control on firm growth is estimated as -1.885 + -0.02116*CBPS, which is -1.895 (computed as -1.885 +- 0.02116*0. 495) as compared to the coefficient of -1.885 in model (1a). This explains that average composite cost control has an inverse effect on firm growth but this cannot be achieved in isolation unless appropriate pricing strategy as cost-based pricing strategy is adopted in place.

The introduction of interaction term of material cost control and cost-based pricing strategy causes material cost control to report a coefficient of -1.924 as illustrated in model (3b) as compared to the coefficient of -1.736 in model 1(a). The interaction term between material cost control and cost-based pricing strategy had a direct coefficient of 2.202 at 5% significant level. This

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finding illustrates that cost-based pricing strategy complement material cost control to influence firm growth in an appropriate direction i.e., an inverse relationship.

However, results from model (3d) presents the interaction role of factory overhead control and cost-based pricing strategy which was insignificant but the interaction of labour cost control and cost-based pricing strategy illustrated in model (3c) was significant in addition to the average composite cost control and material cost control interaction. Labour cost control interaction with cost-based pricing strategy in the relationship between labour cost control and firm growth was strong with coefficient of 2.166 at 10% significant level, cost-based pricing strategy complements average labour cost control to contribute better to growth of listed manufacturing firms in Ghana by ensuring reduction in cost to influence (increase) firm growth. Therefore, the net effect of labour cost control on firm growth is estimated as -0.856 + -0.01648*CBPS, which is -0.864 (computed as -0.856 +- 0.01648*0. 495) as compared to the coefficient of -0.865 in model (1a). This explains that average composite cost control has an inverse effect on firm growth (proxied by changes in firm growth) but this cannot be achieved in isolation unless appropriate pricing strategy as cost-based pricing strategy is adopted in place.

The results are consistent with Sunarni and Ambarriani (2019) study which explained that pricing strategy also influence firm growth even with the interaction of other variables. The introduction of the moderating role of factory cost control and cost-based pricing strategy causes factory cost control to achieve an insignificant coefficient of -0.347 as compared to significant coefficient of -0.488 in model (1d). The presence of the interaction term

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explains the cost structure of a firm where overhead cost do not directly affect

the level of output thus such costs are taken care of in its entirety.

Table 16

Moderating Effect of Cost-based Pricing Strategy on Cost Control and Firm Growth (Return on Equity as a proxy for Firm Growth)

	Model (3i) lnROE	Model (3ii) lnROE	Model (3iii) lnROE	Model (3iv) lnROE
L.lnROE	-.156 (.265)	-1.867* (.923)	-1.06*** (.149)	-.998** (.392)
ΔlnCTC	-.051 (.346)			
ΔlnMC		-.096 (.109)		
ΔlnLC			-.049 (.045)	
ΔlnFO				-.035** (.015)
CBPS	-.06 (.044)	-.577 (.416)	-.002 (.19)	-.34 (.3)
ΔlnCTC*CBPS	**.3 (.541)**			
ΔlnMC*CBPS		**.058 (.129)**		
ΔlnLC*CBPS			**-.027 (.135)**	
ΔlnFO*CBPS				**-.008 (.053)**
lnTA	-.028 (.037)	-.068 (.086)	-.068* (.033)	-.153* (.08)
lnFA	-.059 (.13)	-.27 (.412)	-.243 (.27)	-.159 (.173)
_cons	2.485** (1.125)	6.617** (2.707)	5.028*** (.873)	6.09*** (1.416)
Diagnostics				
F- statistics	1020.29***	479.20***	3608.12***	174.21***
AR (1) [*p-value*]	0.235	0.687	0.943	0.500
AR (2) [*p-value*]	0.739	0.138	0.260	0.023
Hansen OIR	0.744	0.634	0.874	0.807
DHT for Instrument				
(a) GMM Inst levels				
H excluding group	0.549	0.680	0.706	0.662
Diff (Null, H = exo)	0.850	0.331	0.962	0.696
Sargan OIR	1.29	3.77	0.20	0.60
P (Sargan Chi2)	0.731	0.287	0.978	0.896
Number of groups	12	12	12	12
Number of Instruments	10	10	10	10
Observations	95	93	91	94

Note: Dependent variable (FG) is Firm Growth proxied by Return on Equity (lnROE), ΔlnCTC is average composite cost control, ΔlnMC is material cost control, ΔlnLC is labour cost control, ΔlnFO is factory overhead control and CBPS refers to Cost-based Pricing Strategy. ΔlnCTC*CBPS is the interaction variable between average composite cost control and cost-based pricing strategy ΔlnMC*CBPS is the interaction variable between material cost control and cost-based pricing strategy, ΔlnLC*CBPS is the interaction variable between labour cost control and cost-based pricing strategy. ΔlnFO*CBPS is the interaction variable between factory cost control and cost-based pricing strategy. lnTA is firm size measured as

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the natural log of total asset and lnFA refers to firm age measured as the natural log of firm age from the year listed to the year of the study.

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1
Source: Field data (2022)

Results from model (3i) to model (3iv) in Table 16 present the interaction role of cost control dimensions and cost-based pricing strategy on cost control and growth (proxied by return on equity) of listed manufacturing companies in Ghana. The introduction of the interaction variables throughout all the models causes average composite cost control, material cost control, labour cost control and factory overhead to achieve insignificant coefficients compared to significant coefficients from the interaction variables in Table 15 (where changes in total sales was proxy for firm growth). This implies return on equity as proxy for firm growth may not be influenced by the interaction of cost control and cost-based pricing strategy.

The findings in Table 16 are consistent with Fuertes-Callén and Cuellar-Fernández (2019) study which found out that in periods of economic crisis, factors that influence of firm growth are determined by the measurement for firm growth. Therefore, from the empirical analysis of the current study, firm growth proxied as sales growth (changes in total sales) according to Mckelvie and Wiklund (2010) is evidenced as a measure that enable the interaction role of cost-based pricing strategy to influence the relationship between cost control and growth of manufacturing firms listed on the Ghana Stock Exchange.

Table 17

Moderating Role of Competitive-based Pricing Strategy on Cost Control and Firm Growth (Changes in Total Sales as a proxy for Firm Growth)

	Model (4a) ΔlnTS	Model (4b) ΔlnTS	Model (4c) ΔlnTS	Model (4d) ΔlnTS
L. ΔlnTS	.018	.159	-.803*	-.314
	(.217)	(.131)	(.39)	(.285)
ΔlnCTC	1.005***			
	(.272)			
ΔlnMC		.364***		
		(.102)		
ΔlnLC			-.176	
			(.806)	
ΔlnFO				-.173
				(.448)
COMPPS	.299	-.206	-.225	.603
	(.389)	(.276)	(.417)	(1.833)
ΔlnCTC*COMPPS	**-1.469**			
	(1.056)			
ΔlnMC*COMPPS		**-.764****		
		(.293)		
ΔlnLC*COMPPS			**.869**	
			(2.032)	
ΔlnFO*COMPPS				**.255**
				(.747)
lnROA	.188	-.554	.495**	.359**
	(.923)	(.437)	(.188)	(.153)
lnFA	.473**	.304	.128	.135
	(.215)	(.276)	(.641)	(.475)
_cons	-1.888	.209	-1.059	-1.244
	(1.471)	(.981)	(1.638)	(1.106)
Diagnostics				
F- statistics	50.95***	926.16***	7.93***	51.01***
AR (1) [*p-value*]	0.066	0.019	0.026	0.131
AR (2) [*p-value*]	0.269	0.719	0.328	0.435
Hansen OIR	0.281	0.748	0.246	0.220
DHT for Instrument				
(a) GMM Inst levels				
H excluding group	0.204	0.744	0.138	0.126
Diff (Null, H = exo)	0.421	0.428	0.246	0.602
Sargan OIR	3.23	1.67	11.37	8.90
P (Sargan Chi2)	0.358	0.643	0.010	0.031
Number of groups	12	12	12	12
Number of Instru	10	10	10	10
Observations	82	81	78	81

Note: Dependent variable (FG) is Firm Growth proxied by Changes in Total Sales(ΔlnTS), ΔlnCTC*COMPPS is the interaction variable between average composite cost control and competitive-based pricing strategy ΔlnMC*COMPPS is the interaction variable between material cost control and competitive- based pricing strategy, ΔlnLC*COMPPS is the interaction variable between labour cost control and competitive-based pricing strategy. ΔlnFO*COMPPS is the interaction variable between factory cost control and competitive-based pricing strategy.

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1
Source: Field data (2022)

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Table 17 shows the moderating effect of competitive-based pricing strategy in the relationship between average composite cost and the separate dimensions of cost control on growth of listed manufacturing firms in Ghana. Model (4a), model (4c) and model 4(d) are the models of Table 17 which indicate insignificant positive interaction effect of competitive-based pricing strategy in the relationship between average cost control, labour cost control and factory overhead control and growth of listed manufacturing firms in Ghana. The second model in Table 17, model (4b) illustrates the interacting role played by competitive-based pricing strategy in the relationship between material cost control and growth of listed manufacturing firms in Ghana.

The introduction of interaction term of material cost control and competitive-based pricing strategy causes material cost control to report a coefficient of 1.005 as illustrated in model (4b) as compared to the coefficient of -1.736 in model (1b). The interaction between material cost control and competitive-based pricing strategy had a direct coefficient of -0.764 at 5% significant level. This finding illustrates that competitve-based pricing strategy complement material cost control to influence firm growth in an appropriate direction i.e., an inverse relationship. Therefore, the net effect of material cost control on firm growth is estimated as -1.736 + -0.00764*COMPPS, which is -1.739 (computed as -1.736 +- 0.00764*0. 439) as compared to the coefficient of -1.736 in model (1b), this shows a difference of only -0.003. This explains that material cost control has an inverse effect on firm growth but this cannot be achieved in isolation unless appropriate pricing strategy as cost-based pricing strategy is adopted in place.

Model 4a, 4c and 4d in Table 17 report interaction coefficient of -

1.469, 0.869 and 0.255 respectively even though insignificant, the introduction of the interaction term causes average composite cost control and material cost control to attain significant coefficient of 1.005 and 0.354 at 1% significant level respectively. This implies that the interaction variable demonstrates the real nature of average composite cost control instead of competitive-based pricing strategy in the growth of manufacturing firms in Ghana. Thus, even though average composite cost control was strong in influencing firm growth positively, competitive-based pricing strategy complements average composite cost control in a statistically insignificant way to contribute better to growth of listed manufacturing firms in Ghana by ensuring that cost control influences firm growth. This explains that average composite cost control have significant positive effect on firm growth but this cannot be achieved in isolation unless competitive-based pricing strategy is adopted in place.

The results are consistent with De Toni et al. (2017) who found out that high level pricing complements corporate competitive pricing strategy to influence sales growth and firm profitability. Sunarni and Ambarriani (2019) also asserted that pricing strategy also interacts with other variables to influence firm growth. The introduction of the moderating role of average composite cost control and competitive-based pricing strategy causes average composit cost control to achieve an significant coefficient of 1.005 at 1% significant level as compared to -1.885 in model (1a). Also, the introduction of the moderating role of material cost control and competitive-based pricing strategy causes material cost control to achieve an significant coefficient of 0.364 at 1% significant level as compared to -1.736 in model (1b).

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Table 18

Moderating Role of Competitive-based Pricing Strategy Cost Control and Firm Growth (Return on Equity as a proxy for Firm Growth)

	Model (4i) lnROE	Model (4ii) lnROE	Model (4iii) lnROE	Model (4iv) lnROE
L.lnROE	.045 (.691)	.309 (.417)	1.558 (1.178)	-.709 (1.375)
ΔlnCTC	.902* (.437)			
ΔlnMC		.335** (.136)		
ΔlnLC			.791 (1.041)	
ΔlnFO				.985 (.675)
COMPPS	.287 (.321)	.157 (.159)	.106 (.277)	-.42 (.529)
ΔlnCTC*COMPPS	**-.044 (.849)**			
ΔlnMC*COMPPS		**.176 (.483)**		
ΔlnLC*COMPPS			**-.127 (.83)**	
ΔlnFO*COMPPS				**-.562 (1.077)**
lnTA	-.075 (.071)	-.048 (.035)	.031 (.145)	.006 (.194)
lnFA	-.053 (.162)	-.051 (.095)	-.12 (.387)	-.168 (.214)
_cons	2.601 (1.965)	1.849 (1.174)	-1.164 (3.377)	3.261 (4.949)
Diagnostics				
F- statistics	261.86***	2765.65***	280.96***	329.26***
AR (1) [*p-value*]	0.121	0.240	0.300	0.021
AR (2) [*p-value*]	0.242	-	0.532	0.224
Hansen OIR	0.819	0.607	0.586	0.936
DHT for Instrument				
(a) GMM Inst levels				
H excluding group	0.720	0.403	0.938	0.820
Diff (Null, H = exo)	0.603	0.886	0.179	0.882
Sargan OIR	0.83	1.27	0.79	0.33
P (Sargan Chi2)	0.842	0.735	0.852	0.954
Number of groups	12	12	12	12
Number of Instruments	10	10	10	10
Observations	95	93	91	94

Note: Dependent variable (FG) is Firm Growth proxied by Return on Equity. lnTA is firm size measured as the natural log of total asset and lnFA refers to firm age measured as the natural log of firm age from the year listed to the year of the study. ΔlnCTC*COMPPS is the interaction variable between average composite cost control and competitive-based pricing strategy ΔlnMC*COMPPS is the interaction variable between material cost control and competitive-based pricing strategy, ΔlnLC*COMPPS is the interaction variable between labour cost control and competitive-based pricing strategy. ΔlnFO*COMPPS is the interaction variable between factory cost control and competitive-based pricing strategy

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.
Source: Field data (2022)

Table 18 shows the moderating effect of competitive-based pricing strategy in the relationship between separate dimensions of cost control on growth of listed manufacturing firms in Ghana. Results from model (4i) to model (4iv) in Table 18 present the interaction role of cost control dimensions and competitive-based pricing strategy on cost control and growth (proxied by return on equity) of listed manufacturing firms in Ghana. The introduction of the interaction variables throughout all the models causes average composite cost control, material cost control, labour cost control and factory overhead to achieve insignificant coefficients compared to significant coefficients from the interaction of material cost control and competitive-based pricing strategy in Table 17, model (4ii) (where changes in total sales was proxy for firm growth). This implies return on equity as proxy for firm growth may not be influenced by the interaction of cost control and cost-based pricing strategy.

The findings in Table 18 are consistent with Fuertes-Callén and Cuellar-Fernández (2019) study which found out that in periods of economic crisis, factors that influence of firm growth are determined by the measurement for firm growth. Therefore, from the empirical analysis of the current study, firm growth proxied as sales growth (changes in total sales) according to Mckelvie and Wiklund (2010) is evidenced as a measure that enable the interaction role of cost-based pricing strategy to influence the relationship between cost control and growth of manufacturing firms listed on the Ghana Stock Exchange.

The results are contradict empirical study by De Toni et al. (2017) who found out that high level pricing complements pricing strategy to influence corporate competitive pricing strategy and firm profitability. Sunarni and

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Ambarriani (2019) also asserted that pricing strategy also interacts with other variables to influence firm growth The introduction of the moderating role of factory cost control and competitive-based pricing strategy causes cost control dimensions to achieve an insignificant coefficients.

Table 19

Moderating Effect of Customer Value-based Pricing Strategy on Cost Control and Firm Growth (Firm Growth proxied as Changes in Total Sales)

	Model (5a) ΔlnTS	Model (5b) ΔlnTS	Model (5c) ΔlnTS	Model (5d) ΔlnTS
L. ΔlnTS	.443	.802**	-.086	.381**
	(.465)	(.325)	(.318)	(.162)
ΔlnCTC	-2.122			
	(1.343)			
ΔlnMC		-.837		
		(.698)		
ΔlnLC			-1.633***	
			(.367)	
ΔlnFO				-1.002*
				(.52)
CUSVBPS	.264	1.096	-1.474*	-.27
	(1.232)	(1.278)	(.742)	(.486)
ΔlnCTC*CUSVBPS	**-.53**			
	(5.347)			
ΔlnMC*CUSVBPS		**-3.26**		
		(5.786)		
ΔlnLC*CUSVBPS			**1.445**	
			(1.236)	
ΔlnFO*CUSVBPS				**1.662**
				(1.755)
lnROA	.466*	-.027	.54***	.587***
	(.235)	(.307)	(.134)	(.141)
lnFA	.238	.096	.99***	.177
	(.493)	(.309)	(.223)	(.231)
_cons	-1.435	-.235	-3.454***	-1.365
	(1.27)	(.874)	(.635)	(.833)
Diagnostics				
F- statistics	66.16***	40.85***	365.18***	201.18***
AR (1) [*p-value*]	0.088	0.105	0.108	0.026
AR (2) [*p-value*]	0.479	0.365	0.794	0.645
Hansen OIR	0.519	0.673	0.247	0.227
DHT for Instrument (a) GMM Inst levels				
H excluding group	0.923	0.463	0.744	0.134
Diff (Null, H = exo)	0.147	0.955	0.060	0.566
Sargan OIR	0.32	0.40	1.97	2.65
P (Sargan Chi2)	0.957	0.941	0.578	0.449

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	Model (5a) ΔlnTS	Model (5b) ΔlnTS	Model (5c) ΔlnTS	Model (5d) ΔlnTS
Number of groups	12	12	12	12
Number of Instruments	10	10	10	10
Observations	82	81	78	81

Note: Dependent variable (FG) is Firm Growth proxied by Changes in Total Sales, ΔlnCTC is average composite cost control, ΔlnMC is material cost control, ΔlnLC is labour cost control, ΔlnFO is factory overhead cost control and CUSVBPS refers to Customer value-based Pricing Strategy. lnROA is the natural logarithm of return on asset and lnFA refers to firm age measured as the natural log of firm age from the year listed to the year of the study. ΔlnCTC*CUSVBPS is the interaction variable between average composite cost control and customer value-based pricing strategy ΔlnMC*CUSVBPS is the interaction variable between material cost control and customer value-based pricing strategy, ΔlnLC*CUSVBPS is the interaction variable between labour cost control and customer value-based pricing strategy. ΔlnFO*CUSVBPS is the interaction variable between factory cost control and customer value-based pricing strategy.

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1
Source: Field data (2022)

Table 19 shows the moderating effect of customer value-based pricing strategy in the relationship between separate dimensions of cost control on growth (proxied by changes in total sales) of listed manufacturing firms in Ghana. Model (5a) to model (5d) are the models of Table 19 which indicate the interaction effect of customer value-based pricing strategy in the relationship between average composite cost cost control, dimensions of cost control and growth of listed manufacturing firms in Ghana. All models in Table 19 illustrate the interacting role played by customer value-based pricing strategy in the relationship between average composite cost control (and it's dimensions) and growth of listed manufacturing firms in Ghana however, customer value-based pricing strategy is weak in influencing the interaction between cost control and growth (proxied by changes in total sales) across all the models in Table 19.

Below is Table 20 that depicts the interaction role of customer value-based pricing strategy on cost control and growth (proxied by return on equity).

Table 20

Moderating Effect of Customer Value-based Pricing Strategy on Cost Control and Firm Growth (Return on Equity as a proxy for Firm Growth)

	Model (5i) lnROE	Model (5ii) lnROE	Model (5iii) lnROE	Model (5iv) lnROE
L.lnROE	.275	.021	1.119	-1.185
	(.372)	(.506)	(.875)	(2.066)
ΔlnCTC	.439*			
	(.225)			
ΔlnMC		.243**		
		(.1)		
ΔlnLC			.463	
			(.351)	
ΔlnFO				.836
				(1.04)
CUSVBPS	-.301	-.224	-.26	1.017
	(.294)	(.318)	(.311)	(1.917)
ΔlnCTC*CUSVBPS	**.464**			
	(2.011)			
ΔlnMC*CUSVBPS		**-.068**		
		(.719)		
ΔlnLC*CUSVBPS			**.162**	
			(.809)	
ΔlnFO*CUSVBPS				**-.302**
				(.861)
lnTA	-.035	-.025	0	-.099
	(.045)	(.062)	(.103)	(.12)
lnFA	.034	.1	.126	-.548
	(.161)	(.137)	(.23)	(.832)
_cons	1.587	1.66	-.557	6.32
	(1.268)	(1.433)	(2.813)	(6.21)
Diagnostics				
F- statistics	1954.89***	1207.15***	830.69***	53.62***
AR (1) [*p-value*]	0.110	0.202	0.198	0.365
AR (2) [*p-value*]	0.269	0.817	0.580	0.615
Hansen OIR	0.824	0.601	0.579	0.990
DHT for Instrument				
(a) GMM Inst levels				
H excluding group	0.650	0.395	0.793	0.990
Diff (Null, H = exo)	0.831	0.928	0.220	0.755
Sargan OIR	0.59	1.00	2.37	0.06
P (Sargan Chi2)	0.899	0.801	0.500	0.997
Number of groups	12	12	12	12
Number of Instruments	10	10	10	10
Observations	95	93	91	94

Note: Dependent variable (FG) is Firm Growth proxied by Return on Equity, ΔlnCTC is average composite cost control, ΔlnMC is material cost control, ΔlnLC is labour cost control, ΔlnFO is factory overhead cost control and CUSVBPS refers to Customer value-based Pricing Strategy. lnTA is firm size measured as the natural log of total asset and lnFA refers to firm age measured as the natural log of firm age from the year listed to the year of the study. ΔlnCTC*CUSVBPS is the interaction variable between average composite cost control and customer value-based pricing strategy ΔlnMC*CUSVBPS is the interaction variable between material cost control and customer value-based pricing strategy, ΔlnLC*CUSVBPS is the interaction variable between labour cost control and customer value-based pricing strategy. ΔlnFO*CUSVBPS is the interaction variable between factory cost control and customer value-based pricing strategy

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1
Source: Field data (2022)

Table 19 and 20 show the moderating effect of customer value-based pricing strategy on cost control dimensions and growth of listed manufacturing firms in Ghana. Model (5a) to model 5(d) models of Table 19 which indicate the interaction effect of customer value-based pricing strategy in the relationship between each dimension of cost control and growth of listed manufacturing firms in Ghana. From the first model in Table 19 to the last model illustrated insignificant interacting role played by customer value-based pricing strategy in the relationship between all dimensions of cost control and growth (proxied by Changes in Total Sales) of listed manufacturing firms in Ghana.

Model (5i) to (5iv) in Table 20 present an interesting scenario in the report, that is, interaction of customer value-based pricing with cost control dimensions yield insignificant results even though customer value-based pricing was significant with firm growth (proxy as return on equity) at significant level of 1% in Table 13, model (1iv). The introduction of the interaction term causes average composite cost control and material cost control to attain positive significant coefficient of 0.439 and 0.243 at 10% and 5% significant level respectively. This implies that the interaction variable shows the actual behavior of customer value-based pricing strategy on cost control and growth of manufacturing firms in Ghana being proxied by changes in total sales and return on equity but insignificant as interaction variable.

Diagnostics tests on the models assessing the moderating role of pricing strategy in the relation between cost control and growth of listed manufacturing firms in Ghana

For all the models in Table 15 to Table 20, at 5 % significance level have their p-values of AR (1) revealed the acceptance of the null hypothesis whereas the p-values of the AR (2) presented that the null hypothesis is being rejected which indicate that there is no serial correlation in all the models. In addition, all the p-values of the Hansen J test of over-identifying restriction showed that the null hypotheses have been rejected and this implies that all the regressors sufficiently explain the response variable. Moreover, the p-values of the Sargan statistics showed acceptance of the null hypothesis in model (5a) to model 5(d) which indicated that the group of instruments are exogenous thus all the instruments used in each model are valid. Finally, the insignificance of the Sargan test in all the models from Table 12 to Table 20 showed that the instruments used in the GMM estimations have suitable exclusion restrictions. The study than based on the findings and its discussion to draw conclusion on the hypothesis as summarised in the Table 21.

Table 21

Summary of Findings on the Hypothesis

Hypotheses	Confirmation
$H_0 1$: There is no statistically significant difference in the level of cost control of listed manufacturing firms in Ghana.	Accepted
$H_0 2$: There is no statistically significant effect of cost control on growth of listed manufacturing firms in Ghana.	Rejected
$H_0 3$: There is no statistically significant moderating role of pricing strategy in the relationship between cost control and growth of listed manufacturing firms in Ghana.	Rejected

Source: Field data (2022)

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Table 21 presents the summary of the findings on the hypothesis in line with the objectives of the study. As the study based on the null hypothesis, the first objective focused on the significant p-value for average composite cost, labour cost control and factory overhead cost control which maintained the acceptance of the null hypothesis that there is no statistical significant difference in the level of cost control. However, only material cost control revealed rejection of the null hypothesis therefore the study based on the average composite cost control, labour cost control and factory overhead control to state that the null hypothesis has been maintained.

Secondly, on the basis of the second objective, average composite cost control, material cost control and factory overhead control were found to have significant negative effect on firm growth (proxied by changes in total sales) whileas where return on equity was proxy for firm growth, average cost control, material cost control and labour cost control also had significant positive effect on growth of listedd manufacturing firms in Ghana. Based on these findings the second null hypothesis which asserts that there is no statistically significant effect of cost control on firm growth is rejected and the study conclude that there is statistically significant effect of cost control on growth of listed manufacturing firms in Ghana.

Concerning the third objective, the study presented significant moderating role of cost-based pricing strategy on average composite cost control, material cost control and labour cost control on firm growth of listed manufacturing firms (proxied by changes in total sales). Return on equity as a proxy for firm growth also had the interaction of cost-based pricing strategy on cost control and firm growth to be statistically positive.

Assembling Effect in all the Models

The Generalised Method of Moments (GMM) considers the lagged form of the response variable and thus the lagged form of the response variable (firm growth) was included in all the models to allow for the fractional change of firm growth to its long-term symmetry effect. This is because firm growth is a process, and thus previous levels of firm growth could influence current growth levels. It can be seen from all the models discussed in Table 14 that the lagged form of firm growth had significant and positive effect on current firm growth whereas the models in Table 15 to Table 20 have the lagged form of firm growth being mostly significantly negative. The negative lagged firm growth variable coefficients means that growth of listed manufacturing firms in Ghana in previous periods do not contribute directly to that of the current periods even though significant. This is because most of the firms' growth over the period of this study have been poor due to prices hike and financial crisis as a result of recapitalization in the periods of 2007, 2012 and 2017-2020. The significance of the lagged firm growth variable indicates that the system GMM is a suitable estimator and the empirical findings can be inferred for future statistical study or discussion.

Sensitivity Analysis

The section elaborates on the findings from regression analysis of the pricing strategy influence on firm growth which has been discussed already. The sensitive test of analysis offers empirical view of the adequacy and strength of the main models assessed in the study. The sensitivity analysis employed played special role in the moderating effect between the relationship of cost control and growth of listed manufacturing firms in Ghana which is the

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main purpose of this study. The study employed changes in sales revenue, that is, the change in the natural logarithm of total sales and return on equity as proxies for firm growth.

Chapter Summary

The chapter presented on the descriptive statistics, test of significant difference in the level of cost control of listed manufacturing firms in Ghana and proof the acceptance of the null hypothesis for average composite cost control, labour cost control and factory overhead cost control, which states that there are no statistically significant differences in the level of cost control of listed manufacturing firms in Ghana. However, the same test of statistically significant difference indicated rejection of the null hypothesis for the level of material cost control thus conclusion drawn on the third hypothesis is that there is no statistically significant difference in the level of cost control of listed manufacturing firms in Ghana.

The chapter further discussed the separate effect of cost control dimensions on growth of listed manufacturing firms in Ghana. From the discussion, it is evident empirically that all dimensions of cost control are required to enhance firm growth. The chapter then discussed the moderating effect of the indicators of pricing strategy in the relationship between cost control elements and firm growth of listed manufacturing firms in Ghana. The discussion revealed that appropriate pricing strategy such as cost-based pricing strategy is required to enhance cost control to influence firm growth.

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CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

The study sought to examine the moderating effect of pricing strategy on cost control and growth of listed manufacturing firms in Ghana. In achieving this, the two-step system general method of moment (GMM) models were employed to examine the hypothesis stated below;

$H_0 1$: There is no statistically significant difference in the level of cost control of listed manufacturing firms in Ghana.

$H_0 2$: There is no statistically significant effect of cost control on the growth of listed manufacturing firms in Ghana.

$H_0 3$: There is no statistically significant moderating effect of pricing strategy on the relationship between cost control and growth of listed manufacturing firms in Ghana.

Summary of the Study

Manufacturing firms over the years have achieved a low level of growth as compared to other sectors of industrialization although there is a possibility for manufacturing sector to bridge gap in growth level. Studies from literature suggest that various factors that could shoot up firm growth. However, the chapter one draws focus on the role played by efficient cost control and effective pricing. The study then determined how appropriate pricing strategy can influence the connection between cost control and growth of listed manufacturing firms in Ghana. This is because the higher levels of cost control in all dimensions in the manufacturing firms in Ghana do not

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contribute much to the level of growth in the manufacturing sector as a result of weak pricing strategy adopted by these manufacturing firms in Ghana.

The reviewed literature provided backup theories as well as empirical studies on the relations among cost control and firm growth, pricing strategy in the context of manufacturing firms and other corporate entities. Precisely, the revenue maximization theories as well as the economic theory were used in the study. The empirical review posited that there is inconsistency of results on the connection between cost control and growth of listed manufacturing firms in Ghana. This is because the effects of cost control and pricing strategy on firm growth have primarily been analyzed separately in prior research. This study then found the interacting role of pricing strategy with cost control in its various dimensions to determine the impact on the growth of manufacturing firms listed in Ghana, to hypothesize that pricing strategy significantly moderates the connection between cost control and growth of listed manufacturing firms in Ghana.

This study focused on the quantitative approach and positivism research paradigm. The research also adopted the explanatory research design to estimate the various developed models. Moreover, the research included only 12 out of 16 manufacturing firms listed on the Ghana Stock Exchange based on data availability. In addition, the study developed three batches of models. The first batch determined the influence of cost control (its dimensions) on growth of listed manufacturing firm in Ghana. The second model established the connection between pricing strategy and growth of listed manufacturing firm in Ghana and finally the third models determined the interacting role of pricing strategy in the connection between cost control

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and growth of listed manufacturing firms in Ghana. The study employed the two-step system dynamic Generalized Method of Moments (GMM) estimation technique to estimate all the models.

Findings

Using the two-step system general method of moments (GMM) approach over the panel dataset from 2012 to 2021, the results of the study was presented in accordance of the hypothesis of the study. A number of significant and insightful findings that give good inferences evolved from the results of this research.

Significant Difference in the Level of Cost Control

From the result on the first objective, there was acceptance of the null hypothesis, thus there is no statistically significant difference in the level of cost control of listed manufacturing firms in Ghana since the average composite cost control and two cost control dimensions (labour cost control and factory overhead control) indicated no statistically significant difference in the level of cost control. It shows that taking the mean or standard deviation of any cost element and comparing it to the mean of the control setting shows no significant difference in them statistically. This implies that firms in the manufacturing industry are averagely controlling cost as compared with the mean of the control setting (and even the deviation from the control setting; that is, its standard deviation) for the various cost dimensions.

Cost Control and Growth of Manufacturing Firms Listed in Ghana

From the results on the second objective; there is strong evidence that cost control had a significant effect on growth of manufacturing firms listed on the Ghana Stock Exchange. Here, the empirical analysis revealed significant

negative relationship between cost control and firm growth (proxied as changes in total sales) and significant positive relation between cost control firm growth (proxied as return on equity). This implies that encouraging manufacturing firms in Ghana to control direct material cost, labour cost and direct factory overhead yields firm growth. Also, for the study to ensure whether cost control persistently influence firm growth in the presence of appropriate pricing strategy, sensitivity test of regression for objective three established that pricing have a statistically significant positive outcome on growth of manufacturing firms listed on the Ghana Stock Exchange. This suggests that maintaining appropriate pricing strategy is necessary for growth of listed manufacturing firms in Ghana.

Moderating Effect of Pricing Strategy on Cost Control and Firm Growth

Results on the third objective indicated that pricing strategy (especially, cost-based pricing strategy) gives support to cost control to contribute better towards growth (proxied as changes in total sales) of listed manufacturing firms in Ghana. This is because the introduction of the interaction term of average composite cost control, material cost control and labour cost control and cost-based pricing strategy in the model of the third objective causes various cost control dimensions to influence firm growth (proxied as changes in total sales).

The coefficient of the interaction term of average composite cost control, material cost control and labour cost control with competitive-based pricing strategy and value-based pricing strategy were found to be mostly insignificant. This means that precisely, competitive-based pricing and customer value-based pricing strategy do not strengthens the connection

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between cost control and growth of listed manufacturing firms in Ghana especially when return on equity was a proxy for firm growth. However, competitive-based pricing interaction with material cost influence firm growth (proxied as changes in total sales), the interaction of cost control dimensions with all indicators of pricing strategy to influence firm growth (proxied as return on equity) were abortively.

Conclusions

The study sought to examine the moderating effect of pricing strategy on cost control and growth of listed manufacturing firms in Ghana. Using the two-step system general method of moments (GMM) approach over the panel dataset from 2012 to 2021, the conclusions of the study were presented in accordance of the hypothesis of the study. A number of significant and insightful findings that give good inferences evolved from the results of this research.

On the basis on the findings, there was no statistically significant difference in the level of cost control of manufacturing firms listed in Ghana. Even though, there was rejection of null hypothesis for material cost control, there was acceptance of the null hypothesis based on the findings from average composite cost control, labour cost control and factory overhead control. Therefore, the study illustrated equality of variances in the level of cost control. The first objective thus maintains the null hypothesis which asserts that there is no statistically significant difference in the level of cost control of listed manufacturing firms in Ghana. The first objective has to conclude that cost control of the various cost dimensions' level of the listed manufacturing firms over the years of the study has been very good since they

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were meeting the control setting average thus costs need to be controlled continuously with appropriate policies, methods and strategies.

Based on the findings of the second objective, cost control on the average as well as it dimensions (material cost control, labour cost control and factory cost control) has statistically significant influence on growth of listed manufacturing firms in Ghana. The second hypothesis has the conclusion that cost control on the average of composite cost and its dimensions are required to improve the growth of listed manufacturing firms in Ghana because cost control had significant influence on firm growth.

Also, from the findings of the third hypothesis, competitive-based pricing strategy and customer value-based pricing strategy interaction with cost control dimensions were weak to influence cost control to affect growth of listed manufacturing firms in Ghana except in the case of interacting the relationship between material cost control and growth of listed manufacturing firms in Ghana. However, the interaction of cost-based pricing strategy enabled cost control to positively influence growth (proxied by changes in total sales) of listed manufacturing firms in Ghana. The conclusion on the third hypothesis is that appropriate pricing strategy is required to improve firm growth by overcoming some of the resistance posed by competitors in the manufacturing sector which hinder firm growth. Lastly, the third hypothesis has to conclude that adoption of cost-based pricing strategy is appropriate to enhance the relation between of cost control and growth (proxied by changes in total sales) of listed manufacturing firms in Ghana.

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Recommendations

In relation to the findings of the study, the following recommendations were drawn:

1. In relation to the first objective, it is recommended that manufacturing firms should continue to enforce measures such as budgeting and budgetary cost control, Kaizen costing, value analysis etc. to control for the level of cost in all dimensions so as to attain the control settings (level).

2. Also, the second objective recommends that manufacturing firms should institute strategies and policies such as budgeting and budgetary cost control, value analysis, target pricing etc. that enable various elements of cost to stay at its bearable level so as to enhance firm growth of listed manufacturing firms in Ghana.

3. In relation to the third objective, some efforts to control cost will yield much more firm growth if appropriate pricing strategy such as cost based pricing strategy is put in place to improve the quality of firms costing and pricing structure. Such strategies and policy decisions will be mostly needed in the various quarters of the year so as to enable pricing.

Finally, cost control can better enhance firm growth by implementing cost-based pricing strategy. Improvement in cost-based pricing will allow the local manufacturing firms being private or public to be more independent in formulating quality policies to temper interest group activities. Also, as an extra benefit, the improvements in pricing strategy on their own yields positive impact on growth of manufacturing firms in Ghana especially the cost-based

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pricing strategy in accordance with the Table 14 sensitivity regression for objective three estimations.

Suggestions for Further Research

Firstly, future research can extend this current research by determining the moderating effect of pricing strategy in the connection between cost control and growth of other developing economies or manufacturing firms in Africa. Also, future studies can determine the effect of cost control indicators (material cost control, labour cost control and factory overhead control) that influence firm growth and how they moderate with pricing strategy to influence firm growth in other sectors such as services, contruction etc. It is therefore recommended that further studies should employ these indicators from these other sources if possible.

Furthermore, there are several measures of firm growth, although change in total sales and return on equity were used and preferred because of the internal and accounting nature of the data thus other appropriate measures can be used to measure firm growth based on literature. It is therefore suggested that further research can employ dividend pay-out ratio, Tobin's q and others to measure firm growth. Lastly, future studies could use other estimation techniques than those used in this research. The findings of this report cannot be generalized to other industries due to the sample size. Therefore, future studies can examine the relationship between cost control and firm growth in agricultural, mining, and construction industries in Ghana. There might be inconsistency due to different level of industry demands, competition and concentration.

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APPENDICES

APPENDIX A

Classification of Pricing Methods in the 3 Main Pricing Strategies

Cost-based pricing strategy	Competitive-based pricing strategy	Consumer value-based pricing strategy
1. Cost –plus pricing	1. Penetration pricing	1. Bundling low pricing
2. Break-even cost ricing	2. Promotional pricing	2. Experience-curve pricing
3. Mark-up pricing	3. Captive pricing	3. Complementary pricing
4. Target profit pricing	4. Skimming pricing	4. Premium pricing
5. Flat pricing	5. International prices	
6. User-based pricing	6. Market spot prices	

Source: Field data (2022)

APPENDIX B

List of Manufacturing Companies Listed on Ghana Stock Exchange

No.	List of Companies	Year listed	No.	List of Companies	Year listed
1	Aluworks	1996	7	Fan Milk	1991
2	African Champion	1992	8	Guinness Ghana Breweries	1991
3	Ayrton Drug Manufacturing	2006	9	PZ Cussons Ghana	1991
4	Benso Oil Palm Plantation	2004	10	Sam-Wood	2002
5	Camelot Ghana	1999	11	Starwin Products	2004
6	Clydestone Ghana Limited	2004	12	Unilever Ghana	1991

Source: Field data (2022)