

**RELATIONSHIP BETWEEN COORDINATION COSTS  
AND FIRM GROWTH OF EDIBLE OIL  
MANUFACTURERS IN KENYA**

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**Relationship between Coordination Costs and Firm Growth of  
Edible Oil Manufacturers in Kenya**

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of Philosophy in Business Administration in the Jomo Kenyatta  
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## DECLARATION

This thesis is my original work and has not been presented for a degree in any other University.

Signature.....Date.....

**Susan Khasenye Wasike**

This thesis has been submitted for examination with our approval as the University Supervisors.

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## **DEDICATION**

This thesis is dedicated to my Son.

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## **LIST OF ABBREVIATIONS/ACRONYMS**

<b>CEO</b>	Chief Executive Officer
<b>EPZ</b>	Export Processing Zone
<b>HQ</b>	Headquarters
<b>ID</b>	Internal Diversification
<b>IT</b>	Information Technology
<b>KAM</b>	Kenya Association of Manufacturers
<b>KeNaDa</b>	Kenya National Data Archive
<b>RBV</b>	Resource Based Value
<b>SPSS</b>	Statistical Package for Social Sciences
<b>USDA</b>	United States Development Authority
<b>ROI</b>	Return on investment

## DEFINITION OF TERMS

<b>Complexity Costs-</b>	These are the segment pairs in an organizations unit/branch in firms and the cost of their interaction (interdependencies), (Lenox <i>et al.</i> , 2006)
<b>Coordination</b>	The link between tasks and their cost implications.(Thomas <i>et al.</i> , 2007).
<b>Coordination costs</b>	The costs of activities in terms of money, time and trouble of executing those activities (Genfke, 2000 and Kim, 2000).
<b>Decomposability Costs</b>	Distribution of system interdependencies (tasks) and the costs of executing those tasks (Guimera <i>et al.</i> , 2005)
<b>Diversification</b>	Creation of more branches, units, (Villalonga, 2004).
<b>Inter-unit dependencies Costs</b>	This is the interaction of supervisory levels in the organization and their cost implications (Lenox <i>et al.</i> , 2006)
<b>Modularity</b>	Number of units that do not have subordinate units in the organizational hierarchy (Baldwin & Clark, 2006).
<b>NP/NK Models</b>	These are models used in complex systems that reveals the whole and parts in a system can be

adjusted via changes in its two parameters N and K (Evans *et al.*, 2002).

**Organizational Hierarchy** Number of supervisory units/units with subordinate units (Dessein& Santos, 2006).

**Span of Control Costs-** This is the authority levels in the structure (Bloom *et al.*, 2011)

## **ABSTRACT**

Kenya is one of the great producers and manufacturers of edible oil, with the industry having capacity to meet the country's needs and those of her neighbours. This industry went through a very hard phase in the late 90s. Nevertheless, the industry has rejuvenated over the years. Today, estimation of production of edible oil is at 380,000 tones. This quantity constitutes about one-third of Kenya's annual demand, the rest being imported, and meaning that there is potential market for local firms in this industry. Therefore, edible oil market in Kenya is not yet exhausted. It is evident that firms in this industry have the potential to grow as they exhaust the market. Firms in Edible oil industry have varied growth levels and yet there is market for their products. Firms can experience growth if they utilise the coordination synergies to experience efficiencies in interaction of their activities. Coordination synergies are known to reduce coordination costs that may impede a firm to experience growth. Therefore, this study sought to find the relationship between coordination costs and firm growth of edible oil manufacturers in Kenya, with an objective to determine the level of organization decomposability, complexity, inter-branch/unit interdependencies and span of control in relation to coordination costs and how they affect firm growth. The argument here is that the problem is to contribute to the knowledge about the relative and combined effects of coordination costs on firm growth among edible oil manufacturers in Kenya, limiting the study to a more homogenous empirical context and generalizing only to that context. The thesis therefore sought to find out whether coordination costs could be a contributory factor in the varied growths of these firms. The study used a survey design with both quantitative and qualitative research approaches, based on purposive sampling for manufacturing firms and stratified sampling for the respondents. Primary data was collected by

use of questionnaires and yielded dichotomous answers by use of a Likert Scale. Secondary data was collected from the firm's annual financial statements, i.e. debt ratio, return on investment, profit retention ratio, and liquidity ratio, which formed the measurement for growth. These measurements were selected because they backtracked the proceedings of sales as the increase in sales necessitates increase in profits, return on investment, reduce debt ratio, on the basis of sales being a universal determinant of growth. The research analysis was mainly based on correlation analysis model, path coefficients, simple correlations, indirect effects, and total correlations for the study dataset. The study found that the departments were interdependent of each other, tasks were shared and there was a lot of interrelations among the departments within the firms. It was realized that the decomposability, complexity, inter-unit costs and span of control costs in the oil manufacturing were relatively low. The complexity and decomposability costs were insignificant in influencing the growth of the oil manufacturing companies whereas inter-unit and span of control costs were highly significant in influencing the growth of the oil manufacturing companies. The study recommends that managers should aim to minimize the coordination costs so as to increase profitability and growth. However, further study should be done in other companies other than oil manufacturers to compare the results and get more knowledge on the coordination costs and growth of companies.

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Background of the Study**

The report on Global Vegetable Oil Market(2009) defines and segments the global vegetable oil market with analysis and forecasting of the global volume and revenue for major vegetable oils in particular.

According to the report published by Markets and Markets(2009), vegetable oil market was valued at an estimated \$81.0 billion in 2012 which is expected to increase at 2.5% from 2012 to 2017. Asia-Pacific leads the global vegetable oil market with market share followed by Europe and North America in terms of consumption in 2011. The major drivers for vegetable oil global market growth are the ever-growing food sector, growing consumption in the Asian subcontinent, and the biofuel policies coupled with the biodiesel feedstock requirements. The increasing requirements of the biofuel industry, results in siphoning of the raw material away from the other food and industrial sectors. The resultant price hikes and working capital shortage can be seen as a restraint for vegetable oil market.

Asia-Pacific holds major market share in vegetable oil market. Europe is the second largest consumer. Research and development initiatives by companies and government has helped manufacturer to get the first mover advantage, on the basis of high yields during extraction and also the desired low trans-fat composition of the oil. The vegetable oil market by application is segmented in major three segments as Food, Non-food (industrial), and Biodiesel feed. Although, the food applications occupy a major share in the consumption market, the Biofuel segment, boosted by the biodiesel feedstock requirements, is expected to be the fastest growing segment.

Among the various types of vegetable oil commodities marketed, palm oils, soybean, rapeseed and sunflower oils occupy excess share of the market. The growth of edible oil

market in India is explained by the growing population and rise in income of the Indian people. The increasing awareness about health benefits is also a major growth driver. The challenges the players in the market are facing are rising edible oil prices hindering the market growth (Research and Markets, 2012).

In Kenya, there are edible oil manufacturers that have varied growth levels. Edible oil refineries in Kenya include firms such as Kapa Oil refineries, Bidco oil refineries, Menengai refineries and Unilever oil refineries, among others. These firms deal with production of cooking products, laundry soaps, detergents and personal care products. For example, Unilever sold its Kimbo Brand to Bidco Oil refineries. Bidco Oil refineries are the largest vegetable oil processing company (EPZ, 2005). Firm growth is a phenomenon where firms experience opening of new branches, departments, and increase in number of employees, high profit retention ratio and debt ratio. Market transaction costs limits growth to most firms thus suggesting that integration costs rise with firm size. This thesis intends to argue that coordination costs affect firm growth.

Coordination costs and organization structure creates a central emphasis on the differences between firms. The way each firm carries out its activity systems create different demand for coordination; thus, the difference in growth strategies and structures used by firms in the same industry. Studies conducted, Nelson *et al.*, (2011); Allen (2001) suggests differences in firm structures, strategies and performance. In this thesis, the premise is that value created when carrying out an activity in firm increase synergy or complementarities with the existing activities within the firm thus lowering coordination costs. Given this premise, firms must therefore coordinate activities to realize the value of synergies.

The study is keen to answer the following questions: (1) how do decomposability costs affect firm growth? (2) How do complexity costs affect firm growth? (3) How do inter-branch/unit interdependencies costs affect firm growth? (4) How does span of control costs affect firm growth?

Organization structure should be designed to reduce the complexity of coordination. If complexity of coordination is not managed, the costs of coordination will increase thus affecting firm growth. Coordination capacity for any firm is directly related to rational management where supervisors intervene in the activities of the subordinates selectively each time coordination benefits are gained (Cover & Permuter, 2007).

To achieve selective intervention, an organization structure helps to put together the selective intervention to know when and where to act and the mechanism of intervention. The intervention selected can be based on scheduling, performance measurement, incentive contracts, job assignment, and asset ownership. Information processing squarely relies on the organization structure (Cooper & Wolfe, 2005). The same goes for communication and joint making of decisions within firms. Supervising units are assigned authority and decision rights by the organization structure (Rue & Byars, 2005).

The authority rendered to supervising units enables them to set priorities to the subordinates when the subordinates think otherwise (Hart & Moore, 2005). With an organization structure present, multiple interdependent tasks can be grouped into divisions neutralizing the conflicting objectives within the divisions (Cover & Permuter, 2007).

An organization structure, especially hierarchical structure characterizes interdependence activities systems into complexity (degree of interdependencies) and composability (distribution pattern of interdependencies). The argument is that the relationship between modularity and complexity is curvilinear. When complexity is moderate, coordination benefits are realized because it allows for more comprehensive decisions, because the interaction terms are moderate.

However, when the system is complex, organizations have to modulate the activity system despite the possible interdependencies between units. The level of complexity determines the extent of decomposability. The more decomposed the activity system the

more modular the organization structure (Hart and Moore, 2005). The coordination of interdependencies between units is enhanced by hierarchical organization structure.

Therefore, the management of organizational structure and coordination should facilitate firm growth, yet still, firms in the same industry differ in growth (Townsent, 2010).

It is argued in strategy literature that firms are able to attain firm growth due to their resources and capabilities, which can be opportunistically used in new markets (Scott, 2007). Scholars have argued that firms that diversify into more related industries enjoy the benefits of synergies (Jacobides, 2005). This method directs a continuous growth for the firms until the benefits of efficient coordination diminish to zero. Firms can realize the potential efficient coordination if interdependences brought about by resource sharing between products are well managed. The resource sharing between products adds the need for more coordination. This may increase the marginal coordination costs which might outweigh marginal benefits. The firm will experience the impact of coordination costs if it has complex businesses. The relatedness of diversification in a complex business may cause the net benefit. Increasing costs of coordination can set a limit to firm growth (Friebel&Raith, 2006).

In addition to the diversification literature, this study relates to recent literature on limits to hierarchies relative to markets (Nickerson & Zenger, 2008). It emphasizes the comparison of transaction and integration costs at the firm level rather than the transaction level. It incorporates organizational costs into rational-choice models of firm scope, and emphasizes the cost of a boundedly rational decision-making process that influences firm choice and hence a firm's reaction to external opportunities (Amit & Schoemaker, 2010; Radner, 2009; Simon, 2011). In addition, the argument that complexity in a firm's business lines affects its future diversification choices implies that diversification and integration choices are both substitutive and path-dependent. Efforts to reduce coordination within existing activity systems through standardization and outsourcing will free up coordination capacity for other activities, such as horizontal diversification.

According to Teece (2011): “Diversification can represent a mechanism for capturing integration economies associated with the simultaneous supply of inputs common to a number of production processes geared to distinct final product markets.” These inputs are often indivisible and difficult to share between firms. For example, sharing common raw materials and machinery between multiple products gives rise to scope economy. But if these materials and machinery are specialized or require special knowledge to transform or operate, sharing them between different producers subjects the firms to hold-up and haggling over the synergistic surplus (Teece, 2011). These transaction hazards justify integration: Instead of sharing inputs with others, a firm leverages scope economy by diversifying into business lines that share similar inputs with its existing businesses.

However, diversification merely shifts transaction costs into the boundary of the firm, albeit in a slightly different form of coordination costs. Sharing common inputs creates interdependencies between business lines. It requires joint designing; joint scheduling, and mutual adjustments, as well as setting transfer prices and designing incentive schemes for cooperation. These interdependencies challenge three elements of coordination: communication, information processing, and joint decision-making (Marschak&Radner, 2010).

Interdependent business lines must engage in ongoing communication to understand the factors affecting each other’s decisions, and to track the decisions that are made, particularly when multiple equilibria exist (Arrow, 2012; Becker & Murphy, 2013). The high number of interactions between decisions also increases demand for information processing (Simon, 2009). Because of the increased workload of communication and information processing, there are more opportunities for decision errors (Levinthal, 2008; Sutherland, 2010) Even though at the transaction level the costs of managing interdependent activities within an integrated firm may be less than between two separate firms (Williamson, 2010), at the firm level such costs rise dramatically as the firm’s total coordination demand approaches its coordination capacity (Simon, 2009).

Therefore, to understand marginal coordination costs, we need to investigate all the integrated activities that influence a firm's prevailing coordination demand. For example, oil manufacturing demands a large number of supporting activities, such as manufacturing plastics and ingredients that are mixed to make the oil. Many of these components require subcomponents and provide support to each other: Indeed, the overall production process is basically a complex flow chart with input-output transfers between multiple business segments.

Changing an activity in one segment is likely to cause a ripple effect through the rest of the operation. The chart becomes even more complex when the oil company shares components and processes between different brands of oils.

To reduce transaction costs between firms, firm boundaries should be located such that interdependencies between integrated activities and outsourced activities are weak (Baldwin, 2008). But for a particular firm, what determines whether an interdependent relationship is too weak to be integrated or too strong to be left out? Why do some oil manufacturers produce other brands of oil and others don't? The answer lies in a firm's prevailing coordination demand: the greater it is, the less coordination capacity will be spared for a new activity, and the greater will be the marginal coordination cost if the new activity is integrated.

Interdependence can be treated as an inherent relationship between activities, dictated by nature rather than chosen by the firm, but the firm has a choice of whether to exploit a particular relationship between two activities (Lenox, Rockart, & Lewin, 2009; Siggelkow & Rivkin, 2005). In other words, there is the exogenous potential for interdependencies between activities, but a firm can affect interdependencies within its boundary by choice of activities. The firm can integrate and co-specialize two activities that are potentially interdependent, or it can integrate one activity and standardize and outsource the other.

By standardizing its requirements and becoming independent of the excluded activity, the firm lowers the overall complexity and coordination demand, leaving more

coordination capacity for new activities. For example, if an oil manufacturer standardizes and outsources the raw material, it will be able to spend more managerial resources coordinating input sharing between different brands of oils.

The modularity literature broadens the notion of transaction costs to include not only the transaction hazards among opportunistic agents, but also the “mundane” costs of defining, describing, measuring, adjusting, searching, and compensating for the transfer of material, information, and energy among agents with congruent interests (Baldwin, 2008).

Firm growth has been an area of study for many researchers. The study of literature on enterprise growth suggests that all enterprises go through different stages of growth, also commonly called as life cycles. Though the terms used by different authors may vary, the events through which each firm passes remain more or less the same. Most of the researchers suggest that each firm has to start, then grow while facing various challenges and crises, and finally mature and decline. There are many factors which will contribute to firm's success. There are many precursors also, which will allow a firm to move from one stage to another, (Davidson *et al.*, 2010).

History of the firm, entrepreneur's characteristics, different agencies (like market, government, etc.), and geography are some of the factors influencing a firm's growth. There are two sets of thought prevailing among researchers; some suggest that the growth path followed by the firm is linear or predictable, and others suggest that the growth is fairly opportunistic term or unpredictable, (Levie& Lichtenstein, 2010). Growth-oriented firms are a significant contributor in a nation's economic gain, but the concept of growth is different for different entrepreneurs. Growth can be defined in terms of revenue generation, value addition, and expansion in terms of volume of the business. It can also be measured in the form of qualitative features like market position, quality of product, and goodwill of the customers, (Lorunka, *et. al.*, 2011).

While studying the growth of a firm, it is essential to understand the concept of the firm also. The understanding of the growth of firm depends on the definition of what the firm

is, how much has it grown, and what it offers to the market? What assets it controls and what is its legal form.

It is critical to study how a firm manages its growth transitions and what pattern they follow. Most widely used framework for studying the growth of firm has been the life cycle analysis. In life cycle models, a firm's growth is considered as organic, and these assumed that this growth happens over a period of time in a linear phase. However, there are many researches suggesting that it may not be the case with every firm. Many firms do not take the linear path because it is not possible for each of those to progress through each stage. They can grow, stagnate, and decline in any order. Also, these things can happen more than once and there is a possibility to reverse their steps.

Firm growth can be identified in four theoretical perspectives: the resource-based perspective, the motivation perspective, the strategic adaptation perspective and the configuration perspective. Resource-based perspective focuses on the firm's resources like expansion of business activities, financial resources, educated staff, etc. Resource-based theory holds that there are unlimited sources of opportunities in the marketplace, (Morone&Testa, 2008). It is essential to manage transition (i.e., the point at which the resources are being reconfigured) by deploying firms' resources to identify and exploit the next growth opportunity. Hence, to determine successive phases of growth and development, resources need to be reconfigured during the transitions between stages.

As stated earlier, growth is a vital indicator of a flourishing enterprise. There are many factors like characteristics of the entrepreneur, access to resources like finance, and manpower which affect the growth of the firm and differentiate it from a non-growing firm. Muthaih and Venkatesh, (2012) suggested how and where questions are important in the context of the growth of the firm. It has been highlighted that growth is a function of the decisions an entrepreneur makes, like how to grow internally or externally and where to grow in domestic market or international market.

There are many different theories on identifying the main factors underlying the growth of the firm. One set of theories addressed the influence of firm size and age on growth

Morone and Testa (2008), and the second set deals with the influence of variables such as strategy, organization, and the characteristics of the firm's owners on growth of the firm. Mateev and Anastasov (2010) have found that a firm's growth is related to size as well as other specific characteristics like financial structure and productivity.

They further added that the total assets which is one of the measure of the enterprise size has a direct impact on the sales revenue, but the number of employees, investment in R & D, and other intangible assets have not much influence on the firm growth prospects. Lorunka *et al.* (2011) have found that the gender of the founder, the amount of capital required at the time of starting the business, and growth strategy of the firm are very important factors in predicting growth in firms. They have further highlighted that apart from human capital resources, the growth of a firm can be predicted on the basis of commitment of the human capital.

## **1.2 Statement of the Problem**

Coordination helps to improve the efficiency of operations by avoiding overlapping efforts and duplication of work. Coordination is a creative force, which makes possible a total result greater than the sum of individual achievements. This is the synergetic effect of coordination. Coordination enables an organisation to reap optimum use of its resources (Densan & Myatt, 2008). Firms can experience growth if they utilize the coordination synergies to experience efficiencies in interaction of their activities. Coordination synergies are known to reduce coordination costs that may impede growth of a firm.

The success of organized endeavour depends upon the quality of coordination. The quality of coordination is the crucial factor in the survival of an organisation and thus organizations need to benefit higher efficiency and economy from it (Blane *et al.*, 2007). A study conducted by Rawley, (2007) on "Diversification, Coordination Costs and Organizational Rigidity" established that coordination costs offset economies of scope while organizational rigidity increases coordination costs, further constraining

economies of scope. Rawley based the empirical tests of this proposition on identifying the effects of coordination and organizational rigidity costs on business-unit and firm productivity, using novel data from the Economic Census on taxi and limousine firms in the United States of America.

The results showed that coordination and organizational rigidity costs are economically and statistically significant, while organizational rigidity itself accounts for a 16% decrease in paid ride-miles per taxicab in incumbent diversifiers, controlling for the other costs and benefits of diversification and incumbency. The findings suggest that coordination costs, in general, and organizational rigidity costs, in particular, limit the scope of the firm. This empirical research relates to this study as it identifies coordination costs as having effects on economies of scope, thus affecting return on investment, debt ratio, profit retention ratio which translate into reduced profits which is the major element of re-investment as the organisation grows. This can explain case of this study, why edible oil manufacturers have varied growth. KNBS, (2013) data shows that edible oil manufacturers have varied growth levels as depicted in table 1.1

**Table 1.1: Edible oil manufacturers**

Firm Variables	Edible oil Manufacturers				
	A	B	C	D	Others
Firm Age	15 years +	15 years +	15 years +	15 years +	15 years -
Share of sales	30%	22%	15%	9%	14%
Number of employees	1,500	800	300	150	100
Number of branches	8	5	2	1	-

In Kenya, estimation of production of edible oils is at 380,000 tonnes (EPZ, 2005). Only about one-third of its annual demand, the rest is imported meaning that there is potential

in the market for local firms in this industry. The puzzle is that firms in this industry, operating in the same market environment have varied growth (KNBS, 2013). Could some of these firms that are recording low growth as shown in table 1.1 be experiencing the effects of coordination costs that hinder them to reap higher efficiency and economy?

### **1.3 Research Objectives**

The general objective of this study was to find out the relationship between coordination costs and firm growth.

The thesis specific objectives were to:

1. Determine decomposability costs and its effects on firm growth.
2. Examine complexity costs and its effects on firm growth.
3. Evaluate Inter-branch/unit interdependencies costs and its effects on firm growth.
4. Examine span of control costs and its effects on firm growth.

### **1.4 Research Questions**

1. How do decomposability costs affect firm growth?
2. How do complexity costs affect firm growth?
3. How do Inter-branch/ unit interdependencies costs affect firm growth?
4. How does span of control costs affect firm growth?

### **1.5 Hypotheses**

**H<sub>0</sub>**:-Decomposability costs do not affect firm growth

**H<sub>0</sub>**:- Complexity Costs do not affect firm growth

**H<sub>0</sub>**:-Inter-branch/unit interdependencies costs do not affect firm growth

**H<sub>0</sub>**:-Span of control costs does not affect firm growth

## 1.6 Justification of the Study

The main theoretical contribution of this study was to the development of a framework concerning intra-firm activities with firm growth by emphasizing the complex system of interdependence activities of the firm.

**Theory Contribution:** It will contribute to the theories of the firm and organization structure. This framework of theory is in line with existing theories of the firm by emphasizing that firm boundaries are determined by many choices regarding a variety of inter-related activities.

**Strategy Scholars and Practitioners:** To the strategy scholars and practitioners, the study has important implications. It raises salience of a balanced cost-benefit analysis for growth strategists.

**System Interdependencies:** The thesis contributes to empirical researches on coordination in interdependent systems.

## 1.7 Scope of the Study

The study's focus was on the edible oil manufacturers in Nairobi, Kenya mainly Bidco Oil, Unilever and Kapa oil refineries. It covered a period of 10 years, from 2003 to 2012. A related study by Zhou, (2008) was done on a data set of U.S. equipment manufacturers from 1993 to 2003 which was a period of ten (10) years thus informing this study that a period of ten (10) years can give researchable data set. The research found out the effects of coordination costs on firm growth. It is restricted to the coordination cost variables i.e. decomposability costs, complexity cost, inter-branch interdependence costs and span of control costs. The study has drawn its analysis from primary data that was collected through a questionnaire and secondary data which was mainly the financial annual reports of the targeted firms i.e. debt ratio, profits retention ratio, liquidity ratio and return on investment.

The study was limited to oil manufacturing companies only. Thus, the information collected revolves around same line in manufacturing industry. Therefore, the researcher cannot reliably generalise the findings to all firms because there could be differences in other companies.

The study was focussed on the effect of coordination costs and growth of firms. The knowledge about other equally important costs have been left out. The coordination costs focused on four variables i.e. Decomposability costs, Complexity costs, Inter-branch/ Unit interdependencies costs.

### **1.8. Limitations of the Study**

The main challenges that the study encountered was the time constraint in data collection. Most of the respondents especially the senior managers were busy and getting time to fill in the questionnaire was difficult. Interruptions when conducting interviews made this situation worse since longer time was taken in conducting interviews than was expected. This was solved through the idea of drop and pick method where the respondents were left with the questionnaires to fill at a time of their choosing that led to the study realizing a 85% response rate.

Data the study sought such as debt ratio, profit retention ratio, liquidity ratio, and return on investment from the respective firms participating in the research was classified as confidential in some instances especially for companies participating in the stock exchange. The researcher therefore had to seek data permissions from the firms management on the premise that the data will be treated with utmost confidentiality.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

In this chapter, the main focus of discussion is the review of theories that inform this study and their weaknesses. It also discusses coordination costs and how they emanate in systems of organizational activities. The literature discussed is out to emphasise on the coordination cost variables i.e. decomposability costs, complexity costs, inter-branch/unit costs and span of control costs and their mechanisms. The discussion tackles the arguments against for the coordination costs in relation to firm growth.

#### **2.2 Theoretical Framework**

This research takes multi-theoretical approach. The researcher used a combination of theories because none of these theories can comprehensively cover coordination costs in relation to firm growth. Secondly, some of these theories have their weaknesses. Neoclassical Economics theory posits that technological constraint is a limit to firm growth, the less technologically able a firm is, and the slower it will grow. Li and Wang (2007) posit that technology use in firms can reduce coordination costs. This argument relates to the focus of the thesis in that the way technology is looked at as a resource to enhance firm growth of which in this study, coordination is deemed as a resource to enhance firm growth or vice versa. Transaction costs economies discuss the activities being transacted but it does not explain the size of the firm. The bigger the firm the more complex the activities are bound to become thus affecting coordination costs (Argyres & Zenger, 2011).

Resource based value theory emphasizes on the experience of managers and their learning rather than coordination capacity. The level of resource deployment will determine the number of transactions that need to be done thus increasing the need for

efficient coordination (Malone & Crowstone 2001). With the weaknesses mentioned, the researcher will reunite these classic theories and emphasize on coordination costs and how they affect firm growth.

### **2.2.1 Neoclassical Economics Theory**

This is an economic theory that outlines an economic growth rate and how it will be accomplished. The ingredients that will enhance the growth being: labour, capital and technology (Mayer *et. al.*, 2007). The theory states that if the amount of labour and capital is varied in the production function, then an equilibrium state will be accomplished. The labour and capital also need to be adjusted to the new technology to maintain growth equilibrium. The emphasis of neoclassical economic theory is that technology change can have a major influence on economic growth. Technology changes happen by chance and therefore an organization need to adapt to the technological changes as they come to sustain economic growth. Technological changes enhance interaction between units/branches.

Branches/units can have access to all information without any costs and managers/agents should make decisions that are beneficial to the organization (Al-Zhrani, 2010). This theory is related to this study in a sense that it outlines the ingredients of growth which is the focus of the study, only that the ingredients are different i.e. coordination costs and firm growth.

### **2.2.2 Criticism of Neoclassical Economic Theory**

Neoclassical Economic Theory is rooted in individuals understanding their work at the individual level and synthesise information to understand the complex social environment, i.e. individualism, instrumentalism and equilibrium (Arnsperger & Varoufakis, 2005). It is argued that neoclassical economic theory has individualism methodology, which thus separates agency and structure, yet in an organization, they work hand in hand. Agency is a creature of her social context. A structure facilitates the skeleton and agency facilitates the action thus enabling

coordination efficiency. Thus, structure and agency are intertwined. It is also based on preference of the agents and yet an organization requires that an agent make a rational decision for the purposes of fulfilling the goals of an organization not basing it on preference. In this theory, the agents' preference is not linked to structure of the interaction in which they are involved. Neoclassical economic theory also talks about equilibrium behaviour of agents in that solid predictions can be expected (Mayer, *et. al.*, 2007). In this instance, the behaviour has to be regulated, specifying their constraints, stating their information and belief (Li & Wang, 2007).

Therefore, what behaviour is expected in equilibrium, how does it materialise, how likely is it? The neoclassicism cannot demonstrate that equilibrium would emerge as a natural consequence of agents' instrumentality on rational choices. Thus, neoclassical theorists use assumptions that behaviour will attain equilibrium to stabilise the system (Densan & Myatt, 2008).

### **2.2.3 Transaction Costs Economics Theory**

Transaction Costs Economics Theory can be described as a unit of activity – a transaction, with its participants (Argyres & Zenger, 2011). A transaction is an alienation and acquisition, between individuals, of the rights of property and liberty created by society, which therefore must be negotiated between the people concerned before labour can produce, consumers can consume or physically exchange (Williamson, 2008).

Firm boundaries are not defined by technologies or make or buy decision of one activity but are a result of multiple choices regarding a variety of inter-related activities, (Williamson, 2008). This theory relates to the thesis in the sense that coordination involves a lot of interdependencies of activities in an organization thus making this theory relevant to this study.

The transaction costs are as a result of difficulties or easiness in coordination; will either increase costs or reduce costs. At this level, integrated branches/units are believed to be more efficient in coordinating interdependent as opposed to autonomous

branches/units(Baldwin &Clark, 2006).The integration depends on the demand for coordination of the tasks in those units thus forming the link between this theory and the topic under study.

#### **2.2.4 Criticism of Transaction Costs Theory**

Transactional costs theory basically is based on the net benefits or organizational and governance alternatives that must proceed in terms of comparative analysis of the costs of transacting under relevant alternatives (Abel, *et al.*, 2008). This translates into utilizing an opportunity as it arises. The frequency with which opportunistic action can be observed is very low as most organization take long-term and short-term strategies. Scoot (2007) contribute to this argument by saying that it is all about the treatment of motivation to employees which is looked at from the internal aspect of the company when it can actually be external aspects that can motivate employees (Patacconi, 2005). Transaction costs theory is concerned with bounded rationality. This has a focus on transaction cost economising having no room for the process aspects introduced by more comprehensive notions of bounded rationality (Marengo &Dosi, 2005).

Management scholars have argued that differential capabilities give rise to different production costs thus such costs may influence bounded rationality, make or buy decision. Thus, firms internalise activities because they carry out these activities in a more production not transaction cost-efficient way (Abel, *et al.*, 2008). They argue that a firm can be explained in knowledge-based terms and without making use of the assumption of opportunism (Cremer, 2007). It is argued that transaction theory seeks to explain the governance of individual transactions without identifying how the governance of a particular transaction may depend on how previous transactions were governed. They term this historical dependency, (Mayer, *et al.*, 2007).

#### **2.2.5 Resource-Based Value Theory**

Resource-based Value Theory is the application of the valuable interchangeable, intangible, and tangible resources at the firm's disposal for the basis of sustainable

competitive advantage. The resources should be neither perfectly imitable nor substitutable without much effort. The resources will thus determine the firms above average returns which translates into growth (Chadwick & Dubu, 2009). This theory emphasizes on growth of a firm as a result of deployment of resources. These resources need to be deployed in an efficient manner translating into efficient coordination. The link to the research is that RBV is concerned with internal activities of a firm whose interdependencies must be coordinated effectively to manage coordination costs that could affect firm growth thus being relevant to this study.

### **2.2.6 Criticism of Resource-Based Value Theory**

Resource based value theory is basically concerned with external factors like markets, customers and technology. In a case where customer preferences are volatile, how will it serve the purpose? At the same time, technologies serving the customers' requirements are continually evolving and therefore an extremely externally focused orientation does not provide a secure foundation for formulating long-term strategy (Bowman & Swart, 2007).

Coordination is a major resource in any given organization and in this instance; resource-based value theory does not mention it as a resource. A company cannot easily develop the capabilities required for serving customer requirements without proper coordination. Companies that clearly define internal capabilities can easily adapt to adjusting to and exploiting external change (Chadwick & Dabu, 2009). The finding that competitive advantage rather than external environments attention is the primary source of inter-firm profit differentials between firms that focus attention upon the sources of competitive advantage.

The resource based value theory concerns itself with financial resources, physical resources, human resources, technological resources, reputation and organizational resources. The accountants do not extend the boundaries of corporate balance sheet beyond tangible assets, which partly reflects difficulties in evaluation. Coordination is

intangible resource that needs to be explored by accountants. A good example is the collective learning in the organization, especially how to coordinate diverse resources and integrate multiple streams of technology (Cooper & Wolfe, 2005). How to integrate computer and telecommunications technology, if not coordinated well, it can cost a firm. Organizational routines are regular and predictable patterns of activity which are made up of a sequence of coordinated actions by individuals thus a capability is in essence, a routine, or a number of interacting routines.

### **2.2.7 Modularity Theory**

Modularity theory emphasizes on organizational systems, when they can be decomposed into a number of components that can be mixed and matched in a number of configurations to create an interrelation fit for the best performance. In modularity, components should be able to connect, interact or exchange resources in some way by adhering to a standardized interface (Melissa, 2008). The systems are “loosely coupled” (Baldwin & Clark, 2006). Organizational systems become increasingly modular when they are in a loosely coupled form as opposed to tightly integrated, hierarchical structures. Loosely coupled form means that the flexibility is enhanced when it comes to activity switch. A good example is a manufacturing organization using a component such as contract manufacturing rather than in-house manufacturing. This means that the firm can switch between the contractors that perform different functions. The firm can contract specialized firms (modular) to undertake different functions (Argres & Zenger, 2011).

Modularization in firms leads to the disaggregation of the hierarchical structure of governance. The firm is decomposed into small individual units (modules) to reduce complexity. Modularization generates a structure which modules strongly integrate interdependent tasks. These efforts involve a strong process-orientation whereby a complete service-provision process of a firm is split up into partial processes, which can be handled individually by cross-functional teams in the organizational units or modules (Argres & Zender, 2011). The link is that the dissertation seeks to find out the coordination

involved in complexities and decomposability of firm activities, which are the main components of the theory.

### **2.2.8 Criticism of Modularity Theory**

Modularity theory is basically based on the assumption that modular systems must have access to narrow set of inputs that entail automatically as a defining property of a module, initially based on the functioning of human mind (Densan&Myatt, 2008). A given system accepts or is specialised to operate on only specific classes of information (Agres&Zender, 2011). Given information of a system should not be influenced by processes or information other than their proper bottom-up inputs (Barret, 2005). He further argues that information accessibility can be wide but narrow processing thus modularity creating some ambiguity. What is important is to specify how information is accessed and how it is processed, including the input criteria that must be met for processing to occur.

A good example is when one can have central modules that have access to large information stores but process information in specialised ways (Batesman& Scott, 2007). Thus, information or activities integration is vital of which modularity does not consider. Activities in an organization cannot be isolated (Scot, 2007). They are advantageous given the functional demands on central system. They result into making decisions basing on the current happenings i.e. assessment etc. Systems are expected to change according to changing features in the global environment. Modularity scholars have often been equated inflexibility and plasticity (Blane, *et. al.*, 2007).

### **2.2.9 Enterprise Growth Theory**

#### **Enterprise Growth**

The enterprise growth is used to describe a development process of a firm from small to big and from weak to strong. The meanings of development exceeds the meanings of growth, and it includes not only the growth process of things, but the generation stage growing out of nothing before growth and the periodic process of the stage, i.e. the cycle

process going round and round, (Li, 2008). However, the firm growth is a complex adjustment process which is different to the simple scale extension. It takes the balance adjustments of various relations in the interior and the exterior of the enterprise as the essential character, and it is the process of balanced development from unbalance to balance, and from lower balance to higher balance.

Therefore, the meanings of firm growth is the development process that a firm keeps the tendencies of balanced and stable growth of total performance level (including output, sales volume, profit and asset gross) or keeps realizing the large enhancement of total performance and the stage spanning of development quality and level (Sun, 2010). In the meanings of enterprise growth, following three connotations are contained.

*The time property of firm growth.* The premise to analyze the growth of a firm is long period in which the long-term development tendency and process of a firm are observed, and it is not the status of a firm in certain time point.

*The dynamic property of firm growth.* The growth of a firm is not a stable process without troubles. In the growth process, firms always transit from balance to unbalance, and the result is to transit from unbalance to balance and from lower balance to higher balance through unbalance (Tang, 2010). The firm growth is the unification of quantity and quality. The increase of quantity is embodied in the extension of enterprise scale such as the increases of sales volume, market share, production value, profit and employee. And the growth of quality is embodied in the enhancement of enterprise quality, which includes the technological innovation ability from immature to mature production technology, the optimal efficiency of investment and output, the organizational innovation and reform.

#### **2.2.10 Enterprise Growthiness**

The growthiness of enterprise means the ability of firm to grow continually, quickly and healthily. Concretely speaking, the enterprise growthiness is the value-added

ability obtained by the enterprise through the optimization of the change speed between production factor and production result in the development process, which is represented by that the enterprise and the relative industry have the development property, the product foreground is wide, the enterprise scale is extending year by year, and the management benefit increases continually (Yang, 2011).

The research of enterprise growthiness should centralize in the growth ability of a firm, and this ability should include practical development ability and growth potential. High growth rate is only the exterior representation of the enterprise with high growth character, and the firm with high growth rate in some aspects uncertainly has high growthiness. Furthermore, the growth speed is only one aspect to measure the enterprise growthiness, and the enterprise growthiness should also be analyzed completely, systematically and comprehensively from others angles such as efficiency and competition advantage.

The enterprise growthiness includes two aspects. The first one is the survival ability of enterprise. In the intensive market competition, the base of sustainable growth for enterprise is the survival ability of enterprise, and the generation of survival ability depends on the new technology, new product and new originality possessed by the enterprise when it is founded, which can make the enterprise to possess future wider space the competition advantage (Xu, & Zhen, 2009). The second one is the sustainable development ability of enterprise.

After the generation period, the enterprise survives in the market in virtue of its special survival ability, and whether the enterprise faces favourable circumstance or adversity, it can possess the sustainable development ability to exceed itself and keep developing. Therefore, the enterprise growthiness should be considered from multiple angles and layers, and it cannot be simply concluded as the character in certain one aspect in the development process of enterprise (Yang, 2011).

### **2.2.11. Criticism of Enterprise Growth Theory**

British management professor, Penrose's Enterprises Growth Theories published in 1959 established the base of the firm growth theory. Thereafter, the firm growth theory has been concerned by the economics and the management theory. Up to now, three theoretical opinions have been formed in foreign researchers about the firm growth theory, i.e. the growth theory based on the scale boundary theory, the growth theory based on the lifecycle, and the growth theory based on generic combination.

**The firm growth theory based on the scale boundary theory.** In these researches about the firm growth theory, the scale boundary theory is very important. The firm growth theory includes multiple analysis angles and concept systems. First, various researches hold different concepts of growth, so the diversification of analysing growth status scale is generated. Second, there are many opinions to describe the curve and growth rate of the growth status. Third, the opinions about the growth mechanism including the growth drive and reason of enterprise are also different.

In addition, most above growth theories review the firm growth from the economic view. The enterprise growth theory based on the scale boundary is based on transaction cost theory, (Gilbert, *et, al.*, 2006. He posits that the marketable character of enterprise is the substitute of the price mechanism. He utilized the concept of transaction cost to explain the reason of enterprise generation and define the scale. His opinion when discussing the enterprise scale was that when the added transaction was organized by the enterprise, the scale of the enterprise would be extended, and it was organized by another enterprise or the market, the scale of the enterprise did not need to be changed, and when the scale of the enterprise is extended, the added transaction cost in the enterprise equalled the cost to accomplish this transaction in the market or the cost of the added transaction organized by another enterprise.

**The enterprise growth theory based on the lifecycle theory.** In the late of 1980s, some foreign monographs begun to review the enterprise growth from the survival and development view of the living enterprise, which regarded the enterprise as a life body to dynamically evaluate the characters and countermeasures in various stages of

enterprise growth. In the “Enterprise Life Cycle”, the enterprise was assimilated to the life body, and the life cycle theory thought that as the life body would go through the life course from born, growth to death, the enterprise would also experience the process from generation, growth, aging and death.

As the flexibility of enterprise gradually decreases and the controllability of enterprise gradually increases and decreases, the enterprise growth can be divided into the growth stage, the regeneration and mature stage, and the aging stage, (Gilbert, *et al.*, 2006). The growth stage includes gestation stage, infant stage and step-learning stage. The regeneration and mature stage includes youth stage and prime stage. The aging and death stage includes stabilization stage, noble stage, early bureaucracy stage, bureaucracy stage and death. The character changes of various stages in the lifecycle of enterprise essentially reflect the change of enterprise culture, and to keep lively enterprise culture and flexible organization structure is very important in this theory.

**The enterprise growth theory based on the gene combination theory.** The enterprise was regarded as the organism, and various influencing factors on the enterprise were looked upon genes and chromosomes, which presented a special view. The concept of “Biological Corporation” was proposed and the eternal life of the life body, “Biological Corporation”, rested with that whether it had the ability to drive all systems to transform synchronously, and describe these systems (Greiner, 2009).

**Chinese relative theory researches about enterprise growth.** Yang Du (2011) developed Penrose’s enterprise growth theory, started from the concept of management resource, and induced “the general rule of the enterprise growth irrelative with nationality” through analysing the quantity, extension, structure and dominant subject of the management resource (Yang, 2011).

Based on Yang Du’s 2D enterprise growth mode theoretical model, Li (2008) absorbed the research results of modern competitive theory, and established the 3D enterprise growth theoretical model. DiaoZhaofeng (2009) put forward the concept of “enterprise growth force” (Li, 2008). They thought that the enterprise growth force means the

enterprise's ability and potential to realize the extension of "quantity" and enhance the "quality" in future period, and it decided the probability and development degree of enterprise development. Xu & Xu (2009) analyzed several kinds of foreign and domestic enterprise growth theory research results based on the view of resource base, discussed five important parts including heterogenic hypothesis, comprehensive knowledge accumulation growth, dynamic competitive advantage of resource, industrial analysis route, and behavior and learning of the modern enterprise growth theory, and analyzed the practical meanings of the theory (Xu, 2009).

Tang (2010) analyzed the development course of relative enterprise growth theories from three aspects including scale, knowledge and system, and effectively classified the relative enterprise growth theory (Tang, 2010). They pointed out that the enterprise growth was an interactive process with scale extension, knowledge accumulation and system construction.

Starting from the enterprise growth system theory, it was pointed out that there are three enterprise growth mechanisms existed in the practice, i.e. the interior growth mechanism, the merger growth mechanism and the network growth mechanism, and analyzed the strategic ideas of three growth mechanisms. In various western theories and opinions about the enterprise growth theory, to analyze the enterprise growth from the scale boundary angle takes mutual substitution theory of enterprise and market as the start, and the focus is to review the exterior boundary of the enterprise, and to analyze the enterprise growth from the life cycle angle takes the disharmony of the organizational scale extension and the enterprise culture as the start, and the focus is to review the dynamic growth view of the enterprise, and to analyse the enterprise growth from the gene combination angle takes the mutual relation theory of the interior management process and management function as the start, and the focus is to review the interior micro operation mechanism of the enterprise.

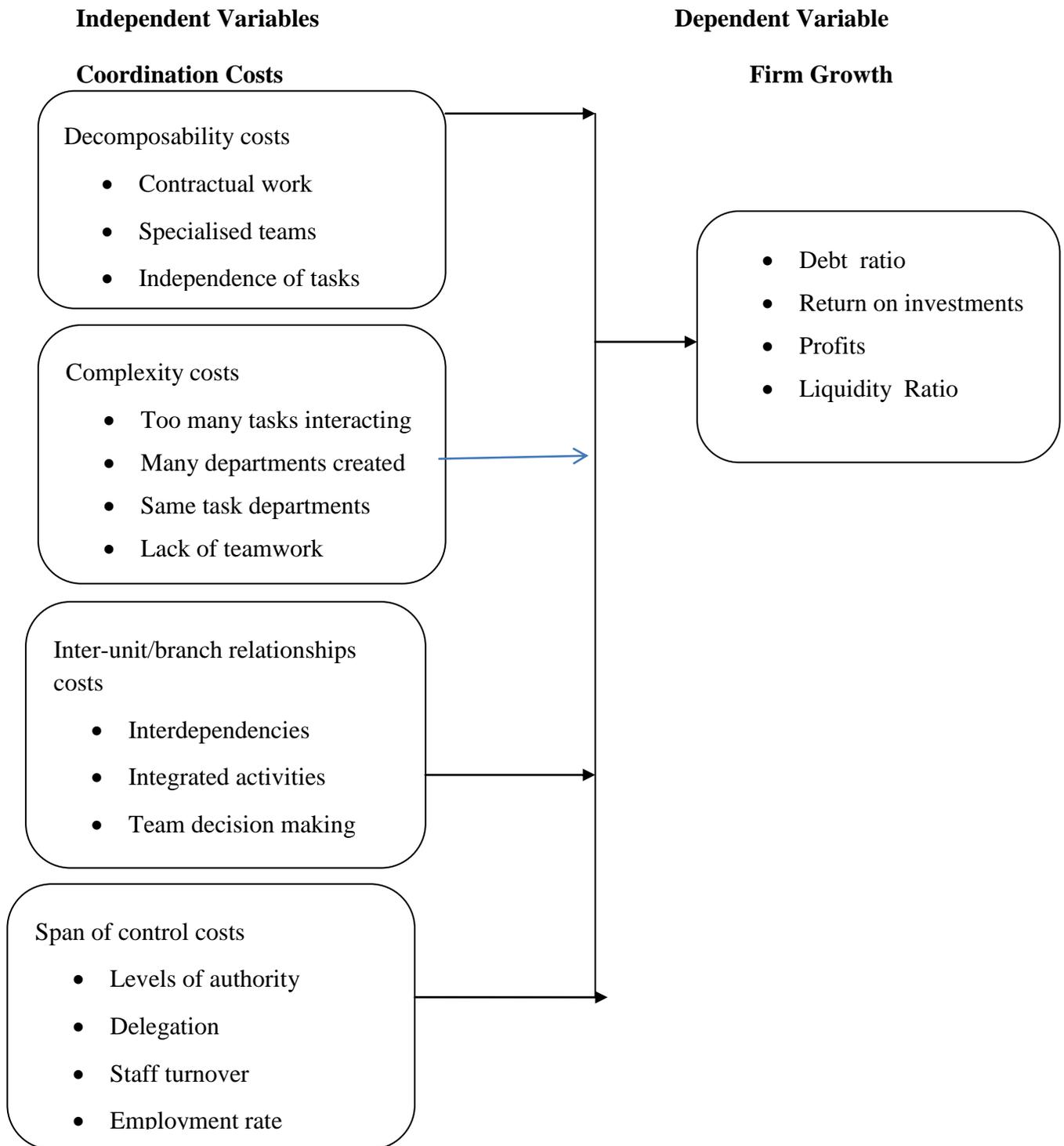
The domestic researches of the enterprise growth theory experienced initially learning, understanding and present enriching and developing, and one of most prominent

characters is that the researchers always use western enterprise growth theories for references and consciously persist in the combination of theoretical research and Chinese practice, so the research direction is more and more clear and the research idea is wider and wider. Based on the enterprise growth theory, it should discuss the enterprise growthiness from multiple aspects and angles, which can comprehensively evaluate the growthiness of the growth-type enterprise.

The theories discussed are linked to this study in that the resources with which a particular firm is accustomed to working will shape the productive services its management is capable of rendering. The experience of management will affect the productive services that all its other resources are capable of rendering. As management tries to make the best use of the resources available, a 'dynamic' interacting process occurs which encourages growth but may limit the rate of growth.

#### **2.2.12 Conceptual Framework**

In this research, firm growth was the dependent variable. The research intended to investigate on the effect of coordination costs on firm growth. Thus, coordination costs become the independent variable as illustrated in figure 2.1.



**Figure 2.1: Conceptual Framework**

**Table 2.1: Measurement of independent variables**

<b>Independent Variables</b>	<b>Measures</b>
<b>Decomposability Costs</b> – The distribution pattern of system interdependencies	The number of distributed tasks into coupled tasks (modules) through decomposing tasks. Subramanian (2011). The number of units/branches that are parallel to the organization system.
<b>Complexity Costs</b> – level of networks in the system that depends on each other.	Input and Output tables describe the interrelationships between tasks/activities (similarity of resources). The firm’s portfolios that provide inputs to one another Ernest, (2005); Villalonga (2004).
<b>Inter-unit/branch relationships costs</b> -this is the interrelation of supervisory levels in the organization.	The prevalence of interactions among decisions and technology sharing, based on structure matrices, Baldwin & Clark, 2000; NK Models such as Rivkin, (2000).
<b>Span of Control costs</b> – This is the authority levels in the structure.	Human capital and Technology, Benhabibi and Spiege (2002)

**Source: Researcher, 2015**

### **2.2.12. Independent variables**

**Decomposability Costs** – the distribution pattern of system interdependencies and that the less they are, the more decomposability costs will be experienced (Villalonga, 2004). This will affect firm growth in that high costs will reduce the retained profit ratio, which is used for re-investment thus affecting firm growth. The measure for this variable took the number of distributed tasks into coupled tasks (modules) through decomposing tasks as described in table 2.1.

**Complexity Costs** –the level of networks in the system that depend on each other. Low interdependencies increase complexity costs (Ernest, 2005). This translates into every activity being carried out individually and thus increasing the number of transactions that occur with a cost thus increasing complexity costs. Table 2.1 clearly shows that similarity of resources could reduce complexity costs. Activities sharing resources are able to reduce on complexity costs. These costs will affect return on investment which would have been used for re-investment. The measure used the interrelationships between tasks/activities.

**Inter-unit/branch relationships Costs** – this is the interrelation of supervisory levels in the organization. This was measured based on the prevalence of interactions among decisions and technology sharing, based on structure matrices as indicated in table 2.1. Low interrelation along supervisory levels increase inter-unit/branch relationship costs which affects the liquidity ratio. This effect will have a multiplier effect in that if an organization has liquidity problems, then re-investment becomes impossible (Baldwin & Clark, 2000; Rivkin, 2000).

**Span of control Costs** – the more the authority levels in the structure the higher the span of control costs. The focus here is the human capital as shown in table 2.1. This means that the organization will spend so much on human resource salaries which will in turn affect profit retention ratio, debt ratio, return on investment and liquidity ratio. Any organization for investment purposes need to have high profit retention ratio, low debt ratio, high return on investment and high liquidity ratio. The measure was based on Human capital and technology (Benhabibi&Spiege, 2002).

### 2.2.13. Dependent Variable

**Table 2.2: Measurement of Dependent Variable**

<b>Dependent Variable</b>	<b>Measure</b>
Firm Growth – This	Number of new units created as a way of reinvestment which

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is the expansion of will depend on , increasing returns on investment, high liquidity  
the firm in different ratio, low debt-equity ratio, high profit retention ratio  
levels contributing to the growth of capital which is achieved through  
reduction of coordination costs for re-investment purposes

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### **Firm Growth**

These was measured in regard to new created units/branches as a way of re-investment by way of having increased returns on investment, high liquidity ratio, low debt-equity ratio, high profits retention ratio contributing to the growth of capital which is achieved through reduction of coordination costs. Growth should be viewed in terms of expansion of the firm through newly created units as shown in table 2.1.

#### **2.2.14 Empirical Review**

Bryman and Cramer (2000) used path analysis and gives a clear example using four variables from a job survey: age, income, autonomy and job satisfaction. They propose that age has a direct effect on job satisfaction. However, indirect effects of age on job satisfaction are also suggested; age affects income, which in turn affects satisfaction, age affects autonomy, which in turn affects satisfaction, and age affects autonomy, which affects income, which in turn affects satisfaction. Autonomy and income have direct effects on satisfaction. Path analysis has also been used in Agricultural (Answarmaliket *al.*, 2007) and in Medicinal studies (Dalkani, 2011).

Path analysis was also used in structured testing methodology for software testing and related software complexity analysis in computer systems technology. It was found that the most notable feature of the data is the robustness of structured testing with respect to test set minimization. Only 1% of the error detection effectiveness of structured testing was lost when considering only tests that increased coverage, whereas the number of tests required was reduced by 75%. This indicates that the effectiveness of structured

testing is due to the criterion itself rather than just the number of tests required to satisfy it (White, 2010).

A study conducted by (Rawley, 2007) on “Diversification, Coordination Costs and Organizational Rigidity” established that coordination costs offset economies of scope, while organizational rigidity increases coordination costs, further constraining economies of scope. Rawley based the empirical tests of this proposition on identifying the effects of coordination and organizational rigidity costs on business-unit and firm productivity, using novel data from the Economic Census on taxi and limousine firms in the United States of America. The results showed that coordination and organizational rigidity costs are economically and statistically significant, while organizational rigidity itself accounts for a 16% decrease in paid ride-miles per taxicab in incumbent diversifiers, controlling for the other costs and benefits of diversification and incumbency. The findings suggest that coordination costs, in general, and organizational rigidity costs, in particular, limit the scope of the firm. This empirical research relates to this study as it identifies coordination costs as having effects on economies of scope, which may explain in this case, why edible oil manufacturers have varied growth levels.

A study conducted by Zhou(2008), on “Coordination costs, Organization Structure and Firm Growth on Metal Equipment Manufacturers in the United States of America,” concluded that the common thread that connects coordination costs and firm growth is that firms can be viewed as a system of interdependent activities, and firm’s growth options and organization structure can be effected by the degree and distribution of the interrelations between its existing activities. She asserts that the cost of coordination can affect the synergy of diversification in any given firm. The organization structure plays a role in the enhancement of coordination capacity.

Penrose (2010) has suggested that firms are a bundle of internal and external resources, which helps a firm to achieve competitive advantage. She further adds that in the long run, there can be a limit to the growth of a firm, but not to the size. Growth of a firm is determined by the rate at which experienced managerial staff can plan and implement

this plan. She has further explained that the external environment of an enterprise is an image in the mind of the entrepreneur. Enterprise activities are governed by productive opportunities which are actually a dynamic interaction between the internal and the external environments. This interaction includes all the productive possibilities that the entrepreneur can see and take advantage of. The author also mentioned that growth often is natural and normal, a process that will occur whenever conditions are favorable. The size of the enterprise is incidental to the growth process, and 'a firm is a coherent administrative unit that provides administration coordination and authoritative communication'.

She proposed that the growth of the firm is limited by the scope of managerial resources, specially the ability to coordinate capabilities and introduce new people into the enterprise.

Greiner (2009) did the foundational work on the theory of firm development. Based on his theoretical review of growing firms, concluded that firms move through five distinguishable stages of growth. Each phase contains a relatively calm period of growth that ends with a management crisis. These five phases and crises of growth are creativity, direction, delegation, coordination, and collaboration. He suggests that a firm goes through evolution and revolution crises. These crises can be solved by introducing new structures and programs that will help employees to revitalize them. Greiner's phenomena of evolution and revolution became the basis of many studies on enterprise life cycle.

Another significant contributor in this field argues that the attitude and style of a manager has a lot of influence on the life and effectiveness of an enterprise (Masarel & Montfort 2009). He pointed out that reinforcement skills, self-commitment, risk taking capacity, vision, and administrative mastery are required in the first few stages of a firm development. Once a firm reaches its prime stage, the manager needs to be result-oriented and should show proper planning and coordination skills. At the maturity stage, the firm should be backed by systems to achieve the target.

Levie and Lichtenstein (2010) have suggested that the stages model and life cycle theories of entrepreneurial growth do not provide ample evidences of the firm growth and development. Further, they have pointed out that previous researches lack proper evidences on what is the path of progress from one stage to another and the reasons behind the shift. They have suggested a new dynamic stage theory which argues that firms are not like organisms, and their growth can be co-created with the help of shifting of internal as well as external environment. Dynamic states offer that a firm can survive and maintain itself by being flexible and by adapting continuous changes in the environment. Leitch *et al.* (2010) also suggest that there is a need to understand the growth phenomenon and its importance to conceptualize the phenomenon properly. There is a lack of shared understanding on the causes, effects, and the process of growth. Growth is a social construct (Majumdar, 2009); hence, there is lot of diversity in it.

## **2.3 Critique of the Existing Literature**

### **2.3.1 Coordination Costs among interdependencies.**

Coordination among firm's branches/units is the basis on collaborations excel. Bolton and Dewatripont (2011) posit that collaborations are conveyer belts that firms use to put together their branches/units in a joint effort to co-produce goods and services through effective use of specialized assets. Barricket *al.*, (2007) define coordination as how firm's branches/units identify interdependent activities and how they will be carried out to accomplish the objectives laid out at the inception of diversifying. In other words, coordination can be the alignment of action individuals, branches, units which undertake different activities, minimizing the cost of division of labour (Thomessen *et al.*, 2011).

Coordination in firms is a result of interdependence that is brought about by firms creation of branches/units. The alignment of actions is brought about by the identification of one's units competencies that have potential value when applied interdependently. We can collaborate the idea of opportunism which are the costs that result from choices regarding how collaborating branches/units need to work together to execute an interdependent activity. Working together is the key to coordination costs.

New branches/units typically will have more transaction costs associated with them due to the opportunism that exist at branches/units outset. This can cause vulnerability costs (Townsent, 2010), which will be low if the choices of collaboration are less. The costs can decrease over time if the branches/units build trust (Subramanian, 2011). If the branches/units do not behave opportunistically as they increase, the lack of trust develops which implies a costly or negative outcome of interdependent activities (Thomassen, 2010).

### **2.3.2 Coordination Costs in Organizations**

Competition in the business world is a reality and manufacturing firms need to put their acts together to achieve growth. Every activity that a firm does will determine what they stand for in the market, coordination being one of the internal activities that limit or enhance growth. Coordination is a phenomenon that evolves over time and the costs connected with it should be based on the dynamic condition of the mechanism that has been put in place for coordination between branches/units of the firm. The Organizational routines determine the essence of coordination (Solnesset. *al.*, 2012). The evolving nature of operating mechanisms form the basis which coordination between branches/units of the firm occurs and thus is the focal point of theoretical views of coordination costs in branches/units of a firm. This argument may be true, but Bolton and Dewatripont (2011) says that coordination costs depend on the interaction level between branches/units of the firm. Lesser interaction may lead to lower coordination costs, as supported by White (2010) who posits that it is more efficient in terms of coordination costs to limit the need for interaction between two or more units involved in a joint task because it reduces the costs associated with inter-organizational coordination mechanisms.

The assertion here is that some benefits i.e. learning and transfer of knowledge may require more interaction and reducing the level could affect the efficiency even while reducing costs. Consider the impact of information Technology (IT) on coordination mechanisms and costs (Li & Wang, 2007). IT use in firms that have branches can reduce

coordination costs even if this calls for more complex coordination mechanisms between the branches/units (Bolton & Dewatripont, 2011)). This is an attempt to demonstrate that coordination costs could affect the growth of firms. This could form the basis for the engagement of more complex coordination mechanisms, which may increase interactions. Increased interaction will create the necessary experience-base, comfort level and trust among branches/units (Blane, *et.al.*, 2007). Thus, the way for examining the empirical studies that leads to identification of knowledge gaps.

Coordination costs emanate from interdependent activities among units/branches in a firm. According to Bowman and Swart (2007), these coordination costs result from coordination problems which increase in level if the activities performed across the collaborating units/branches are complex and interdependent. The complexity of the interdependent activities is costly in terms of money, time, and trouble thus giving rise to coordination costs. Balwin (2008) assert that coordination costs can also be as a result of transaction costs which are the costs of achieving coordination and the opportunity costs resulting from coordination. Coordination costs are costs of setting up a relationship and this involves the structure for communication and authority for production, service provision, task performance using technology as a resource in task performance (Bloom *et al.*, 2011).

### **2.3.3 The Evolution of Coordination Costs**

The interdependent of units/and branches will increase coordination costs as coordination of tasks and decisions increase (Bolton & Dewatripont, 2011). Firms with units/branches that have active managers who are trustworthy are able to manage coordination costs effectively (in that, coordination costs will be lower in such instances as compared to units/branches that have managers with less mutual trust). However, more than selection criteria and the firm's ability to choose a trustworthy manager, coordination has evolutionary forces (Nelson *et al.*, 2011)) that drive coordination costs between units/branches.

It becomes difficult to choose a trustworthy manager as asserted by (Bersonet *al.*, 2008) due to opportunism; each individual is gearing for the opportunity that is present. The firm needs to put in place procedures at the units/branches level even before the new manager is hired for the purposes of taking the collaboration positively forward. It is important for unit/branch managers to be trustworthy and transparent in their behavioural intentions towards the head office and each other (Bowles & Gintis, 2009). Bolton and Dewatripont (2011), pointed out in their work done in alliance research focuses on coordination costs and governance preconditions necessary for trustworthy based coordination.

The coordination will mature after repeated tasks thus building social trust that can reduce the coordination costs. The evolution of trust in collaboration emanates from the fact that units/branches open up channels of communication and interaction with each other because of successful previous transactions (Thomassenet *al.*, 2010).

I therefore can argue that interdependence between units and branches is as a result of the kind of tasks that will be shared and the division of labour associated with it ((Bolton & Dewatripont, 2011). The coordination costs will go up with the anticipated level of interaction between branches/units especially if there has to be joint decision making process. The degree of interdependence between branches/units increases the need for more information processing (Weber, 2010). The processing of more information will raise the coordination costs. The use of IT in branches/unit coordination may reduce coordination costs. We should also note that increased interdependence is an evolution in coordination activity in the network structure, which will result from a more efficient governance mechanism as branches/units may use formal and informal control mechanism.

#### **2.3.4 Structure based coordination in product development**

When organizations are implementing a chosen strategy, they have variety of structural forms to choose from (Scoot, 2007). In this instance, research means how the organization has structured its roles and administrative mechanisms to integrate and

control decision-making, resource flows and work activities in the organization. The coordination between autonomous functional units, to facilitate coordination of functional decisions, work and resources, organizations require lateral linkage or structural coordination mechanisms (Scott & Davis, 2007). Most contemporary organizations divide work according to functional specialties which could be branches/units. There are several kinds of lateral linkage mechanisms that firms use for the purposes of coordinating inter-functional tasks across firms' activities as identified by (Hazard *et al.*, 2006).

### **2.3.5 Individual Liaisons:**

In this structure of coordination, there is individual communication within one or many functional departments because of the assignment delegated to them thus evading some of the vertical communication characterized by bureaucracy. The communication is for resolving the inter-functional conflicts thus they do not carry any formal authority (Scott & Davis, 2007). Informal influence is common by virtue of some individuals being at the center within communication networks that cut cross-functional boundaries.

### **2.3.6 Temporary Task Forces**

This is a repetitive task interaction among individuals. It is common in project context. This is a more participative and less formalized coordination mechanism task force individuals stand for various functions and interact directly. In this structure of coordination, high level managers still retain authority by assigning tasks, giving directives and solving conflicts among the members (Armstrong & Hucks, 2010).

### **2.3.7 Coordination Mechanisms and Coordination Costs**

Making a choice between which coordination mechanism to use may increase or reduce coordination costs. We have the hierarchical, mechanistic, and tightly coupled structures (bureaucratic control and a decision attitude) to participative, organic, and loosely coupled structures (Scott and Davis, 2007). Whenever an organization move from

bureaucratic control to more participative and organic structures, the complexity of the mechanisms increases. Many dimensions serve to define organizational branches/units and authority with multiple superiors. Specialists can be assigned to different teams. The objective is to find the best coordination mechanisms possible.

### **2.3.8 Coordination Capacity, Interdependencies and Coordination Costs**

Theoretical literature suggests that managers who have limited capacity to coordinate may be the cause of decreasing returns to scale (Marengo & Dosi, 2005). Coordination capacity according to Cover and Permuter (2007) is closely related to the capacity of a rational management to choose when to intervene in subordinates' activities especially where coordination yields net gains. In the same view, a single firm having hierarchical coordination should be on the same standing as many other firms that choose to coordinate through price mechanism. The inability to intervene where necessary limits the firms' capacity to coordinate and ultimately their growth.

When branches/units have interdependencies, the need for coordination or determined intervention will not be avoided. Interdependence of activities is experienced when performance of one activity affect the marginal returns of other activities (Cooper, 2005). Coordination costs come into play only when agents perform interdependent activities.

Coordination is affected by the capacity of the managers to make decisions. In that view, we have costly rationality and truly bounded rationality (Ellison 2005). A rational decision can only be made if the decision maker has the cognitive capacity to do so. If not, it will mean the task to be divided among many individuals. This kind of situation is called costly rationality. Scholars who have written on team theory suggest that coordination can be divided into three: processing of information, communicating the information and making a decision basing it on the information (Hall, 2008). Information processing includes independent computation, which can be done by front units, and aggregation, which can be done by the supervisors. The cost in this sense is determined by observation, memory, and computation, which is reflected in the time it

will take for these tasks to be performed and the labour input. Cost of decision-making includes time and effort involved, and decision errors due to miss-information or obsolete information.

Information processing cost can be lowered by decentralization or specialization. This allows for parallel information processing (both independent aggregation and computation). Specialization causes delays in decision making thus being a cost to the organization, especially when the information needs to be shared for decision-making (Koh, 2005). Decentralization can reduce the communication cost delay in decision making although the effectiveness of decentralized decision-making may be limited. The interdependent level of decision variables in a decentralized environment implies that decisions will be based on information available in a particular unit/branch. This is partial information and may not be wholly optimal especially in branches that are in different environments (Berend& Sapir, 2007).

There are certain complex problems that no one decision maker or teams of decision makers have the capacity to find a solution. This makes coordination difficult due to interdependencies. The concept is explicitly explained in the concept of NP-or NK models developed in computer Science (Hall, 2008). The coordination difficulty can also be traced to evolutionary biology (Futuyama, 2008), which was again introduced literature of management (Hall,2008). NK models are used to show the complexity managers face when making decisions, including the imitation of, search for an adaptation to some practical solutions.

In these models, N is the level of decisions to be made (number), like the many dimensions that managers for practical strategic choices. K is the number of interdependent decisions. As an organization grows, both N and K increase. When an organization raises its production, it may need to purchase raw materials from many more suppliers, to meet the need for more customers. The interrelationship among the N decisions will reduce the feasibility that managers must divide among themselves the problems and each one of them to search for an optimal solution along a certain

dimension. Together they will find a wholesome optimal solution for the entire problem set. When N decisions are interdependent, i.e.  $K > 0$ , the search for solutions became more complicated, (Hall, 2008).

Interdependencies for firms have challenges that have been studied by scholars at many different levels. They complicate the innovation and product design process at the project level (Berson, *et.al.*, 2008), they prevent the evolutionary direction firms take to search or understand best practices (Hall 2008), thus subjecting organizations to more decision mistakes (Scott, 2007). The challenges also reduce the essence/value of operational practices. They have to be implemented with their complementary parts. A good example is innovative human resource practices (e.g., teams, high-power incentive pay, employment security, training and flexible job assignments) achieve higher levels of productivity (Rue & Byars, 2005). Interdependencies at industry level lead to structures with persistent commonality performance across units/branches (Lenox, Rockart, and Lewin, 2006).

These studies on challenges of interdependencies broaden the idea of transaction costs to encompass transaction hazards among opportunistic agents (Cover & Permuter, 2007), obvious costs of defining, describing, adjusting, measuring, searching and compensating for the movement of material, information, and energy among agents with same interests (Townsent, 2010). Transaction hazards make it difficult in making joint effort, and the obvious transaction costs, exacerbated by interdependencies, make joint decisions challenging.

Firms can cut transaction hazards by employing joint effort through particular governance tools: low-power incentives and security of employment be efficient in handling the obvious transaction costs (Baldwin, 2008). Internal information infrastructure and firm-specific language can be used to facilitate communication and information processing. These infrastructures enable the division of communication and processing of tasks and integration of information for joint decision making (Jacobides,

2005). Firm-specific language improves communication and interpretation because it includes meanings, codes, and routines (Cremer, Garicano, & Prat, 2007).

Communication load, information processing, and calculation in firms can be reduced through authority, rules, identity, and routines. Supervisors can be given authority. They will set priorities for the use of joint assets, thus the opinion of the subordinates will not matter (Hart & Moore, 2005). Supervisors thus will resolve conflicts when the subordinates have different opinion over joint efforts, (Darrington & Brower, 2012). The employees will internalize the rules and routines of firm to consistency and stability in expectation of other's behaviour, (Akerlof & Kranton, 2005); (Townsent, 2010).

Some scholars have observed that firm's vertical hierarchy changes dynamically as transaction costs reduce in comparison to coordination costs. This could be caused by technological changes that reduce communication and information-processing costs (Townsent, 2010). The transaction costs in comparison to coordination costs can also be reduced by product standardization and component modularization they lower the level of interdependencies thus encouraging the need for joint decision making among branches/units of a firm (Armstrong & Huck, 2010).

The determining factor results from multiple choices in relation to a variety of interrelated activities. An outsourced function will affect the integration calculation for the acquisition of interdependent functions (Balwin, 2008).

### **2.3.9 Diversification, Firm growth and Coordination Costs**

Diversification is a recipe for firm growth as firms deploy excess resources to external and internal new market opportunities (Rue, 2005). Expansion of any firm should go hand in hand with diversification. Firms can still grow with their core competency but diversification fastens the level of growth. There are firms who pursue diversification as a permanent strategy rather than a transitory one (Lenox, *et al.*, 2006). Diversification is an efficient growth strategy based on firms capabilities. In diversification, a firm can match the industry to diversify in with their industry-specific capabilities. Growth can

also be experienced when a firm is undergoing decreasing returns to scale and they take on a diversification strategy in whichever industry they choose with respect to their capabilities (Marengo, 2005). Leveraging firm's capabilities in coordinating a variety of product lines may be the cause of diversity (Nocke&Yeaple, 2006).

In models of heterogeneous coordination capability, homogeneity across product lines and branches provide production capabilities. This means that the marginal production is constant and same at the product/unit level. This shows that diversification is an efficient way of gaining optimal profit for firms that use greater coordination capacity (or "firms capabilities) at the firm level (Armstrong and Huck, 2010). The level of diversification for each unit/branch should be done in such a way that profit of the marginal product/unit equals the negative effects of the product line exerted on profits so that equilibrium can be reached.

Coordination capacity will determine coordination costs thus affect the diversity in that firms with greater coordination capacity tend to diversify more. The equilibrium experienced between the profit of marginal product line and negative effects of the product line exerts on profits means that firm growth is increasing with the firm's coordination capacity (Goodwin &Mestelman, 2010). This model shows the important relationship between coordination capacity and firm growth by use of diversification strategy. At the same time, the model does not explain why coordination costs increase when firms grow and neither does it explain the issue of interdependencies.

## **2.4 Summary**

Coordination is a phenomenon that evolves over time and the costs connected with it should be based on the dynamic condition of the mechanism that has been put in place for coordination between branches/units, decomposability, complexity and span of control of the firm. Organization routines determine the essence of coordination (Zhou, 2008). The interaction between units and whether they are decomposed or complex will determine the coordination costs involved (White, 2010). The more the interaction need is limited the lower the coordination costs. Coordination costs emanate from

interdependent activities among units/branches in a firm. According to Melissa (2008), these coordination costs result from coordination problems, which increase in level if the activities performed across the collaborating units/branches are complex and interdependent. Interdependent activities are costly in terms of money, time, and trouble thus giving coordination costs. Interdependence of activities are experienced when performance of one activity affect the marginal returns of other activities (Inderst *et al.*, 2005). It is therefore agreeable with the study done by Rawley (2007) which established that coordination costs offset economies of scope and rigidity increases coordination costs further constraining economies of scope. Zhou (2008) in her study on coordination costs concluded that coordination costs can be a liability or an asset to a given firm in its strategies of growth. It can therefore be argued that it is a high time coordination costs were itemised in the books of accounts as either a liability or an asset in relation to firm growth.

## **2.5 Research Gap**

A study conducted by (Rawley, 2007) on “Diversification, Coordination Costs and Organizational Rigidity” established that coordination costs offset economies of scope, while organizational rigidity increases coordination costs, further constraining economies of scope. Rawley based the empirical tests of this proposition on identifying the effects of coordination and organizational rigidity costs on business-unit and firm productivity, using novel data from the Economic Census on taxi and limousine firms in the United States of America.

The results showed that coordination and organizational rigidity costs are economically and statistically significant, while organizational rigidity itself accounts for a 16% decrease in paid ride-miles per taxicab in incumbent diversifiers, controlling for the other costs and benefits of diversification and incumbency. The findings suggest that coordination costs, in general, and organizational rigidity costs, in particular, limit the scope of the firm. This empirical research relates to this study as it identifies

coordination costs as having effects on economies of scope, which may explain in this case, why edible oil manufactures have varied growth levels.

A study conducted by Zhou (2008) on “Coordination costs, Organization Structure and Firm Growth on Metal Equipment Manufacturers in the United States of America” concluded that the common thread that connects coordination costs and firm growth is that firms can be viewed as a system of interdependent activities, and that firm’s growth options and organization structure can be affected by the degree of and distribution of the interrelations between its existing activities. She asserts that the cost of coordination can affect the synergy of diversification in any given firm. The organization structure plays a role in the enhancement of coordination capacity. A study of firm growth models summarises the literature review on firm growth and asserts that growth of a firm is the increase in scope and the process of gaining that change and mention various growths are based on ability, need and opportunity (Wiklund&Shepherd, 2009).

In the study conducted by (Rawley, 2007) the variables used were diversification, Coordination costs and Organizational Rigidity while this study focuses on Coordination costs and firm growth. Rawley’s study focused on the transport industry while this study’s focus is on oil manufacturing industry. The model used in Rawley’s study was Chi square testing while this study used correlation analysis model, path coefficients, indirect effects and total correlations.

Another study by Zhou (2008) used Coordination costs, organization structure and firm growth (three variables) in a Metal Equipment Manufacturers in the United states while this study used two variables, coordination costs and firm growth in edible oil manufacturing companies in Kenya. Zhou used different mathematical models to test each variable while this study focused purely on correlations.

A study by Gilbert et al., (2006) focused on growth models and how they can be used to enhance growth of a given firm of which he concluded that growth is based on ability, need and opportunity while this study took a different approach to determine if coordination costs could have an effect on growth of edible oil manufacturing firms.

The research gap that this thesis is bound to contribute is the variables used, industry in which the study was conducted, method of analysis used, the approach of the study to determine what could affect firm growth and the location of the study. The above mentioned are unique to this study thus creating the knowledge gap.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter explain the research methodology adopted in the study. This research thesis may seem to have a finance orientation but in essence it is strategic management study. This is so because strategic management covers all areas of organizational operations (finance, IT, marketing, production, procurement, human resource etc.) as all these areas require strategies to experience growth of a given firm. It is important to offer a review of the research method in order to ensure that the methodology adopted is sound and befits the study. Bryman and Bell (2007), define research methodology as a scientific system that consists of explicit rules and procedures upon which research is based and against which claims of knowledge are evaluated.

This chapter explains the research design, target population, sampling frame, data collection procedures, data processing and analysis, and ethical issues that will guide this research process.

#### **3.2 Research Design**

Research design is the plan and structure of investigation that enables the researchertoobtain answers to the research question (Guba&Lincolin, 2005). The choice of a research design is guided by the purpose of the study, the type of investigation, the extent of researcher involvement, the stage of knowledge in the field, the time period over which the data is to be collected and the type of analysis to be carried out, that is, whether quantitative or qualitative (Mugenda&Mugenda, 2005). This is a procedural plan a researcher employs to collect less biased data that will adequately address the research problem (Churchill &Iacobucci, 2009).Bryman (2008) posits that a good research design has to elaborate the methods the researcher uses to collect the desired data without contradicting the design chosen. The study covered a period of 10 years, from the year

2003 -2012. This period was ideal because it had been used in a similar research (Zhou, 2008).

Survey research design was used and a case-series study was employed as it compares cases of subjects with a particular attribute.

A survey design informs case series study in that it helps the researcher to compare the attitude of different populations as well as look for changes in attitudes over time. Both qualitative and quantitative research approaches were used. Qualitative research was ideal for this study because it enables the researcher to conduct formal interviews for Senior Management and analysis since data involved includes expressions and opinions.

The advantage of this method was that it allowed greater adaptation of the interaction between the researcher and the study participant. This method involves open ended questions commonly asked which gave different wording from the participant, which makes the responses more complex than simply “yes” (1) or “no”(0), which gave dichotomous answers. The participants had the opportunity to respond more elaborately and in greater detail than in the case of quantitative methods (Mugenda&Mugenda, 2005).The disadvantage with qualitative method i.e. surveys and questionnaires which this thesis was characterized with, was that it asked all participants identical questions in the same order. The response categories from which participants chose from were “closed ended” or fixed. At the same time, this inflexibility has an advantage. It allows for meaningful comparison of responses across participants and study sites.

Quantitative research was also used so as to determine the relationship between coordination costs and firm growth. In this particular context, the quantitative research approach opted for was for measurement of numerical data which was only measured once, as the data was not manipulated i.e. financial reports of the said companies, i.e. high profit retention ratio, debt ratio, liquidity ratio, return on investment that characterise growth. The measurement was for the sole purpose of establishing associations between independent and dependent variables.

This was a case-series study that compares cases of subjects with a particular attribute. In this thesis, the attributes in question were edible oil manufacturers that were of a certain age, size, and produced similar products as shown in the target population (Bryman & Bell, 2007). This enabled the researcher to consider what is unique and what is common across cases in relation to coordination costs that has effects on firm growth which promoted theoretical reflection on the findings. Purposive sampling was used to select firms for study because the researcher conducted the study on the manufacturers that deal with Fats, margarine, oils, industrial bulk oils. The intention was to highlight the companies that manufacture same products, had the same market and yet their growth levels vary. Purposive sampling was chosen because it ensured the presence of key cases that could be represented equally or proportionately within the sample.

In determining the relationship between coordination costs and firm growth, the interdependencies of systems were based on the flow of intermediate inputs between business units of individual cases. Firms' portfolios were represented as networks of interrelated units. The two constructs of measurement reflected the level of system interdependencies (complexity costs) and the allocation of interdependencies in the system (decomposability costs), within a given structure. The structure was included in the methodology because it was a moderating variable and therefore could not be avoided. The measures were similar to the theoretical definitions of system interdependencies Townsend (2010) in modularity literature based on task structure matrices (activity interdependency) or NK models for system performance based on contribution from each component, depending on the state of the component and its interaction with its neighbours.

The measure for decomposability costs, complexity costs, inter-branch/unit relationships costs and span of control costs depended on comprehensive reporting linkages in firms. These measures enabled consistent analyses in the selected firms over a period of time.

Firm growth was based on return on assets, equity ratio, profit retention ratio, debt ratio etc. The measurement used for growth were selected because they backtracked the

proceedings of sales as the increase in sales necessitates increases in profits, employees, reduce debt ratio and determine return on investment; as sales in this perspective is deemed as universally applicable growth indicator (Bloom, et. al., 2011). Criticism have been documented in regard to this assumption that established firm can still grow without necessarily having an increase in sales, majorly due to their financial base accumulated over time (Chadwick & Dubu, 2009). A database of firms' internal activities and organization structures will be generated with data from firms under study through the questionnaire. Secondary data was sourced from financial reports of the respected firms. Zhou (2008) used this type of data in a related study on U.S. equipment Manufacturers from 1993 to 2003.

### **3.3 Target Population**

The target population consisted of all edible Oil Manufacturers, Senior and middle level management from the industry in Kenya. This means that the workforce in the edible oil manufacturers that would serve a purpose for this study are the senior and middle level management the reason being they are the one's who facilitate coordination in those organizations. They were edible oil processors, millers and refiners whose products varied. Purposive sampling was used to select firms with certain major characteristic i.e. age of the firm, size, and products they manufacture. The sampling technique was ideal because it enabled the researcher to choose the population that fitted the interest of the research and exclude those who did not suit the purpose. These groups of manufacturers had the same products, been in operation for more than fifteen years, in the same environment thus appropriate to compare their growth level as affected by coordination costs (EPZ, 2005). The targeted manufacturers are located in Nairobi, Kenya. The target population in this group are three firms, i.e. Bidco Oil refineries ltd, Kapa Oil Refineries and Unilever Millers and refiners.

### **3.4 Sampling Frame**

The sampling frame for this study included a register of all edible oil manufacturers EPZ (2013) (see appendix C), because the study focus was on the industry. Senior

Management and Middle level management formed the target population. These are the people who form the structure of an organization and are the same people who participate in the coordination of activities in the organization thus ensuring that their views of the form of coordination in the organization are not lopsided. Subordinate employees were excluded from the staff sample because their role in the coordination procedures is not vital; they are more of recipients of tasks than initiators.

The first of the two-stage selection of the sample involved determining the firms which would participate in the study. Since it was not possible in terms of time and cost to survey all the firms, purposive sampling procedure was employed to select three firms. Operation life, products manufactured and size were used as the basis for selection of the firms for study. These factors were important because some firms' level of growth are low as compared to their counterparts yet they had been in existence for a period of ten years plus (EPZ, 2005). The products they manufactured were also an important factor because the product gave the firms a fair ground for comparison considering that the products they manufacture are the same.

The three firms selected were established more than fifteen years ago and had larger number of units/departments that brought out the purpose of the study in terms of coordination costs and its effects on firm growth. These firms are based in Nairobi; namely Bidco Oil Refineries, Kapa Oil Refineries and Unilever Millers and Refiners.

### **3.5 Sample and Sampling Technique**

Sampling from the population is an important process in research because it can be impracticable to survey the entire population of edible oil manufacturers (*see appendix C*) in Kenya (Saunders *et al.*, 2007). A sample of three (3) companies from the existing nineteen (19) and their senior management and middle level management were selected. Purposive sampling was used to select the three (3) companies on the basis of their age (over 15 years), size (number of branches) and products manufactured (fats, margarine oils, industrial bulk oils, (*refer to appendix C*)). This enabled the researcher to consider what was unique and what was common across the three cases on how

coordination costs affect firm growth. The cases were a good representation because their similarity in nature.

Stratified random sampling was used in the selection of respondent's i.e. senior managers and middle level managers. Within each stratum, simple random sampling, method was engaged where each case was selected randomly thus giving a chance for every member of the stratum to be selected. This was considered the best method for reducing sampling bias and achieving a high level of representation (Saunders *et al.*, 2007). With approval from the General Manager in charge of Administration of each of the firms in the study, the researcher identified the respondents with the help of Human Resource Managers of each firm. Table 3.1 shows the target populations and sample sizes from each company and occupational group. Sampling is a technique of selecting a part of the population on which research is to be conducted.

The sample size of the study was calculated using a formula as recommended by Mugenda and Mugenda (2003) as follows:

$$n_f = \frac{n}{1 + n/N}$$

Where:

$n_f$  = sample size (when the population is less than 10,000)

$n$  = sample size (when the population is more than 10,000) 384

$N$  = Estimate of the population size; 200

Therefore the sample size of the study was therefore 100

$$n_f = \frac{384}{1 + 384/200}$$

Desired sample size comprised of 100 respondents.

**Table 3.1: Target Population and Sample Size.**

Category	Target Population	Sample Size
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Senior Management	50	25
Middle Level	150	75
<b>Total</b>	<b>200</b>	<b>100</b>

A sample size of 50% was preferred because it enhanced the representation of the sample of the target population. A sample size of 30% and above gives a good representation of the target population (Bryman, 2008).

Sample selection procedure enabled the study find out (edible oil manufacturers), the manufacturers that dealt with Fats, margarine, oils, industrial bulk oils. The researcher highlighted these companies that manufactured same products, had the same market and their growth level was different (KAM, 2005). Purposive sampling was preferred because it ensured the presence of key cases that could be represented equally or proportionately within the sample. Stratified random sampling was used in the selection of respondents in order to get adequate representations of groups that were relevant for the study. The groups of interest were senior managers and middle level managers. Within each stratum, simple random sampling method was engaged to select the respondents to achieve the number required. This was considered the best method for reducing sampling bias and achieving a high level of representation (Saunders *et al.*, 2007).

### **3.6 Research Instruments**

Analysis of annual financial reports of sampled edible oil manufacturers and a questionnaire was used as research instruments (*see appendix A*) that was administered to the top management and middle level management of the population to establish the coordination of activities within a given structure. The questionnaire used a 5-point Likert Scale where (5-Almost Always, 4-Often, 3-Occasionally, 2-Rarely, and 1-Never). 2 and 1 represented (0=No) while 3-5 represented (1-Yes).

### **3.7 Data Collection Procedure**

This study employed questionnaire administration through drop and pick methods and guided interviews procedures in data collection for the qualitative data. According to Mugenda and Mugenda (2005), questionnaires give a detailed answer to complex problems. Questionnaires were therefore chosen because of their objectivity. Interview guide was used since it generally yields highest cooperation and lowest refusal rates, offers high response quality and takes advantage of interviewer presence and it is a multi-method data collection that it combines questioning, cross-examination, probing techniques (Bryman, 2008). The quantitative data was collected through requesting the companies under study to provide their annual reports of return on investments, profit retention ratio, debt ratio and liquidity ratio for the past 10 years.

### **3.8 Pilot Test**

Pre-testing of the research instruments is one way to confirm that respondents are able to understand the questions being asked, that questions are understood in the same way by all respondents. Cognitive interviewing was used to pre-test the questionnaire. It involves interviewers asking survey respondents to think out loud as they go through a survey questionnaire and give their opinion. This was the sole purpose of understanding of the questionnaire from the respondents' perspective rather than that of the researchers and that respondents were willing and able to answer such questions (Bryman, 2008). It is important to pilot test the instrument to ensure that the questions are understood by the respondents and there are no problems with the wording or measurement. Pilot testing involves the use of a small number of respondents to test the appropriateness of the questions and their comprehension. Usually, the draft questionnaire is tried out on a group that is selected on a convenience and that is similar in makeup to the one that ultimately will be sampled. Making a mistake with 5 or so subjects can avert the disaster of administering an invalid questionnaire to a hundred individuals as is in the case of this study. Hence the main purpose of pilot testing is to identify potential problems with the methods, logistics, and the questionnaire. The researcher involved 5 managers from each

of the three oil companies who never took part in the study. Bryman (2008) posits that having a pilot test of at least ten (10) questionnaires gives a valid measure of the reliability of the instrument.

In ensuring reliability of the instruments, Split half method was employed. A total score for the odd number questions was correlated with a total score for the even number questions. This is often used with dichotomous variables that are scored 0 for incorrect and 1 for correct (Churchill & Iacobucci 2009). The Spearman-Brown prophecy formula was applied to the correlation to determine the reliability. The results of the Spearman-Brown prophecy were 0.81 translated into 81% thus showing that the instruments were reliable 81% with an error of 19%.

Reliability of an instrument reflects its stability and internal consistency within a given context and the degree to which the instrument provokes consistent responses. The questionnaire and the secondary data can be said to have been stable as the secondary data report was not manipulated, whereas the questionnaire could provide for the internal consistency because there were closed ended questions thus restricting the respondent to give “yes” or “no” answers only. Validity and reliability are two statistical properties used to evaluate the quality of research instruments (Mugenda & Mugenda, 2005).

Validity of research instrument in a research study is a device used to measure the concept of interest in a research project. It is used to measure a concept of interest.

A measuring instrument that is ideal is one which results in measures that are accurate, relevant, objective, efficient and sensitive (Sollner & Leimeister, 2010). Instruments used were questionnaires and annual financial reports of the sampled firms.

The instrument is said to be valid only to the extent of the specific purpose with a specific group of people due to its appropriateness of the interpretations that need to be made. In this thesis, the researcher used secondary data from annual financial reports of sampled oil manufacturers which gave concurrent performance. The secondary data had

been used in other studies (Zhou, 2008). The questionnaire had been used in survey studies (Mugenda&Mugenda, 2005). The questionnaire collected information that could be generalized to the larger population.

Validity in relation to research is a judgment regarding the degree to which the components of the research reflect the theory, concept, or variable under study, Bryman (2007), of which the secondary data and questionnaire items have captured the above mentioned. The questionnaire and the secondary data captured the content validity through the questionnaire items, predictive validity through the generalization to the larger population, concurrent validity due to the observation of the secondary data and construct validity due to the theoretical construct of the questionnaires.

### **3.9 Data Analysis and Presentation**

The data gathered from annual reports of the vegetable oil manufacturers was analysed by regressing the path analysis equation to establish path coefficients, simple correlations, indirect effects, and total correlations for a set of data (Cyprien&Kumar, 2011). The structured questions assumed a Likert scale whereby 1-2 = (No, 0) while 3-5 = (Yes, 1). The unstructured questions were analysed according to the respondent's opinions about coordination costs and its effects on growth. In qualitative analysis data collected by use of questionnaires was coded and an input was entered in the computer. By use of SPSS version 21, a descriptive analysis was done. Quantitative analysis was done first by calculating the growth index of each dependent operationalised variables for a year.

The four dependent variables, i.e. debt ratio, return on investments, profits and liquidity ratio were determined through calculation of growth index before inferential statistics could be applied. The qualitative data (which had been transformed in dichotomous answers) was then subjected to a regression against the quantitative data (after the growth index was calculated) to enable the Chi square, Anova and correlation coefficients to determine the significance level of the independent variable on the

dependent variable. The study therefore used both descriptive i.e. percentages, tabulations, pie charts and graphs and inferential statistical analysis i.e. path coefficients, simple correlations, indirect effects and total correlations.

### **3.8.1 Model Specification: Path Analysis**

Path analysis' aim is to provide estimates of the magnitude and significance of hypothesized causal connections between sets of variables.

Path analysis indicates that variables are merely correlated; no causal relations are assumed. The independent (X) variables are called exogenous variables. The dependent (Y) variables are called endogenous variables. A *path coefficient* indicates the direct effect of a variable assumed to be a cause on another variable assumed to be an effect (Cyprien&Kumar, 2011).

Path analysis can be represented in two ways: as an equation or in diagrammatic form. For the purpose of this study, an equation was used referred to as a structured equation, which was typically stated in its standardized form as follows:

Growth =f (Decomposability, Complexity, Unite/branch interrelations, span of control).  
This can be represented in an equation as follows.

$$Z=f(P_{41} Z_1+ P_{42}Z_2 +P_{43}Z_3)$$

**Where:**

Level of Decomposability be denoted by	1
Complexity be denoted by	2
Inter unit relationships be denoted by	3
Span of control be denoted by	4
Growth be denoted by	Z
Stray causes be denoted by	e
Path be denoted by	P

From the above growth function, the resulting model specification was developed.

$$Z=P_{41} Z_1+ P_{42}Z_2 +P_{43}Z_3+e$$

In the above structural equation, the direct causal effects were represented by the P coefficients, often called path coefficients or structural coefficients. These coefficients are analogous to standardized regression coefficients,  $\beta$ , resulting from multiple regression analysis (Anwarmaliket *al.*,2007) and their interpretation is similar. They are interpreted as the estimated change in dependent variable, expressed in standard deviation units, associated with one standard deviation change in each independent variable holding the other independent variables constant. Therefore, this study used multiple linear regression to determine the relationship of the variables.

$$Z=P_{41} Z_1+ P_{42}Z_2 +P_{43}Z_3+e$$

The subscript that accompany the path coefficients indicate the direction of causation with the first subscript indicating the variable being determined and the second indicating the direct cause (Dalkaniet *al.*, 2011). The Z's indicate the standardized raw

score value on each variable. The residual term  $e_i$ , called the disturbance term in causal modeling represents the imposite effect of any other direct determinants of Z, which have not been included into the causal model, plus any measurements error in Z (Anwamalik, 2007).The coefficient of determination ( $R^2$ ) for the structured equation, and the associated significance was required to determine the causal effect. In the analysis, since  $R^2$  indicates how well data fits the statistical model of the study, the  $R^2$  value of more than 0.05 and a p-value, which measures statistical significance of the variables, that is less than 0.05,were acceptable in the measurement of how the independent variablesrelate to the dependent variable.

Growth index was used to measure growth. This enabled the researcher to use the model specified above through regression.Simple correlations determine relationships between independent factors and regression on dependent factor is used to obtain the direct effects in the form of partial regression coefficients (path coefficients), (Cyprien& Kumar, 2011).

Path analysis has its strength in the fact that errors associated with any single observation on the dependent variable are independent (i.e. not correlate with) errors associated with any other observation on the dependent variable. The independent variables are fixed (i.e. the same values of the independent variables would have to be used if the study were to be replicated. The independent variables are measured without error. The errors are not correlated with the independent variable and it is most suited for activities, which are interdependent. The criticism of path analysis is that the variance of the residuals across all values of the independent variables is constant (i.e the variance of the residuals is homoscedastic).The valid causal inference requires a correct specification of the structural equation for the causal effects to be accurate and unbiased.

In reference to the above, it is evident that path analysis is the most appropriate model that fits in this study as it does not emphasize on a particular factor but it can demonstrate the causal effects between independent and dependent variables, which are

represented by the  $p$  coefficients. Path analysis is also suited in interdependent activities of which this study is about.

Anwarmalik, et al., (2000) used path analysis and gives a clear example using four variables from a job survey: age, income, autonomy and job satisfaction. They propose that age has a direct effect on job satisfaction. However, indirect effects of age on job satisfaction are also suggested; age affects income, which in turn affects satisfaction, age affects autonomy, which in turn affects satisfaction, and age affects autonomy, which affects income, which affects satisfaction. Autonomy and income have direct effects on satisfaction. Path analysis has also been used in Agricultural (Answarmaliket al., 2007) and in Medicinal studies (Dalkani, 2011). Path analysis was also used in structured testing methodology for software testing and related software complexity analysis in computer systems technology. It was found that the most notable feature of the data is the robustness/flexibility of structured testing with respect to test set minimization. Only 1% of the error detection effectiveness of structured testing was lost when considering only tests that increased coverage, whereas the number of tests required was reduced by 75%. This indicates that the effectiveness of structured testing is due to the criterion itself rather than just the number of tests required to satisfy it (Answarmaliket al., 2007).

The model ( $Z = P_{41} Z_1 + P_{42} Z_2 + P_{43} Z_3 + e$ ) was used in this study to establish the relationships between variables. It can also test the complexities experienced in systems. This study was out to establish if there is a relationship between coordination costs and firm growth and thus this model fits well in this study.

Growth index was calculated to enable the researcher to regress firm growth against coordination costs. Index numbers characterize the magnitude of economic changes over time. They describe trends in a change of any economic data such as retail prices, an employment rate, a company revenue or Gross Domestic Product. Index numbers are always calculated with respect to a base period: a year, a month or a quarter. In this study, the researcher used economic data to measure growth and therefore, index

numbers for each growth variable for each year under study were calculated. For example, the value for the base period will be obtained as follows.

Company profits =Kshs.2,500,000 in 2005.(base year)

Revenue of the same company became Kshs.3,600,000 in 2008

The number from Step 2 will be divided by the base period value, and the quotient multiplied by 100 to calculate the index number.

Index number = (Kshs.3,600,000 / Kshs.2,500,000) x 100 = 144

Since 100 is the full amount of the base period (or 100%), 100 will be subtracted from the answer.144-100=44%

After the index numbers are obtained for each individual variable, the researcher will use simple price weight calculation by (Davidson &Wakilud, 2010). He first calculated average by adding up the prices of 12 well-known stocks. As stock prices move up and down, the simple price weighted index is calculated by adding together the current stock prices. This will facilitate regression of coordination costs variablesagainstgrowth.

### **3.8.2 Hypothesis Testing**

The intent of hypothesis testing is formally to examine twoopposing ( $H_0$ : and  $H_1$ :)hypotheses.These two hypotheses are mutually exclusive andexhaustive so that one is true to the exclusion of theother. Evidence wasaccumulatedthrough collection and analysis of sampleinformation for the purpose of determining which ofthe two hypotheses was true and which of the twohypotheses was false. This study used the chi square tests to test the hypothesis of the study.

The chi square statisticprovided the coefficient of determination and P-value calculatedusing SPSS, which was used to make decisions on the null and alternative hypothesis. The following criterion was used in testing hypothesis using the P-value.

$P\text{-value} \leq \alpha \Rightarrow$  Reject  $H_0$ : at level  $\alpha$

$P\text{-value} > \alpha \Rightarrow$ Do not reject  $H_0$ : at level  $\alpha$

The confidence level of the study was 95%, thus the level of significance ( $\alpha$ ) was 0.05. A P-value of less than 0.05 ensured a rejection of the null hypothesis and confirms the alternative hypothesis while a p-value greater than 0.05 ensured that the null hypothesis is not rejected while alternative hypothesis is not confirmed. On the other hand,  $R^2$  was considered to determine how well the data was able to explain the statistical model. An  $R^2$  value of less than 0.5 (50% ability to explain the statistical model) would make a variable to be struck off the model, while those with more than 0.5 were considered as significant in the study. A hypothesis with a p-value of less than 0.05 has therefore to have a more than 0.5  $R^2$  value in order for the null hypothesis to be justifiably considered significant in the study.

### 3.8.3 Measurement of variables

**Table 3.3: Measurement of independent variables**

<b>Independent Variables</b>	<b>Measures</b>
<b>Decomposability Costs</b> – The distribution pattern of system interdependencies	The number of distributed tasks into coupled tasks (modules) through decomposing tasks. Subramanian (2011). The number of units/branches that are parallel to the organization system.
<b>Complexity Costs</b> – level of networks in the system that depend on each other.	Input and Output tables describe the interrelationships between tasks/activities (similarity of resources). The firm’s portfolios that provide inputs to one another Ernest, (2005)
<b>Inter-unit/branch relationships costs</b> -this is the interrelation of supervisory levels in the organization.	The prevalence of interactions among decisions and technology sharing, based on structure matrices, (Townsent, 2010)
<b>Span of Control costs</b> – This is the authority levels in the structure.	Human capital and Technology, Sollness and Leimeister (2012)

#### **Independent Variables:**

**Decomposability Costs:** This is the task network as presented in the module system operations. The number of distributed tasks into coupled tasks (modules) through decomposing tasks and their related costs(Melissa, 2008). The number of units/branches that were parallel to the organization system determined the costs involved. This measure was computed using Guimeraprogramme based on algorithm of simulated

annealing (Guimera *et al.*, 2005a; 2005b). The expected links were computed from a non-modular network where links were likely to be within and between units.

**Complexity Costs**-this is the number of unit pairs in firm's area of growth in year t-1 that supplied big amount of production inputs to each other and the costs that were incurred. This was operationalized as the interdependent number of production actions (tasks) in work inputs (Singgelkow, 2006). This measure was similar to density measure where system of tasks supplying inputs to each other were viewed as portfolios and thus the more complex they were the more costly they became. Complexity had been defined in modularity literature as task based structure matrices or NK models (Townsent, 2010). The prevalence of interactions among tasks was captured to determine their costs.

**Unit/branch interrelations Costs**:-this is a measure of the degree of branches/departments share the inputs of production. Scott (2007) calculated the correlation coefficients of various departments and branches between the amounts of intermediated inputs. In the same way, the coefficients were used on the assumption that production processes determines the manufacturing firms resources of which costs can be reduced or escalated. Therefore, the more similar the inputs for production of different units/branches in a firm, the higher the chances of sharing resources and joint production and thus reducing on costs. There are prior studies of growth that have used such measures (Alfaro & Charlton, 2007). These measures give the study a closed-up nature that has a rich image especially when assessing organizational complexity costs along several dimensions of growth, which is a major characteristic of this study (Davidsson & Wiklund, 2010).

**Span of Control Costs.** Human capital has been used as an inter-unit/branch input similarity (Armstrong & Huck, 2010). These are the employees in a department/unit or employees in a branch under various departments. These pairs the units/departments area of growth year t-1 that increased number of employees or departments determined the span of control costs. In theory, the span of control increases the interdependency in

activities thus complexities of coordination as a, multiplier effect increase costs which in turn affect profits and firm growth (Bernard & Schoff, 2006).

### **Dependent Variable**

**Table 3.4: Measurement of Dependent Variable**

<b>Dependent Variable</b>	<b>Measure</b>
Firm Growth – This is the expansion of the firm in different levels	Number of new units created as a way of reinvestment which will depend on , increasing returns on investment, high liquidity ratio, low debt-equity ratio, high profit retention ratio contributing to the growth of capital which is achieved through reduction of coordination costs Townsend(2010) for re-investment purposes

### **Firm Growth**

In theory, the complexities of production process impose coordination demand on managers and as a multiplier effect, affect profits of the firm and industry dynamics, (Lenox *et al.*, 2006; Lenox, Rockart&Lewin, 2007). Firm growth can thus be measured by number of new units created, increasing returns on investment, high liquidity ratio, low debt-equity ratio, high profit retention ratio contributing to the growth of capital which is achieved through reduction of coordination costs (Gilbert *et al.*, 2006)).

#### **3.8.4 Control Variables**

Many other factors costs are bound to affect a firm’s growth such as alternative technology, firm characteristics, and accumulated physical and financial resources among others. These factors were controlled following Armstrong and Huck (2010). Number of employees, number of portfolios (diversification), geographic expansion, and age of the firm.

## **CHAPTER 4**

### **FINDINGS AND DISCUSSION**

#### **4.1 Introduction**

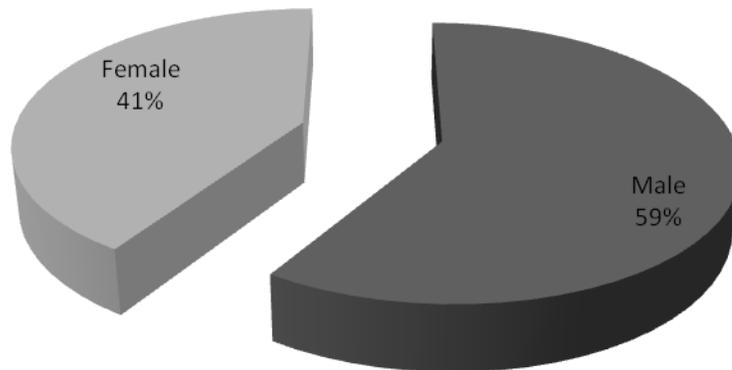
This chapter presents the analysis and presentation of the results on the demographic information of the respondents, information on the coordination costs in the manufacturing companies, the performance of the manufacturing companies and the relationship between the costs and the performance of the manufacturing companies.

#### **4.2 Demographic information**

This section discusses the demographic information of the respondents who took part in this study.

##### **4.2.1 Gender**

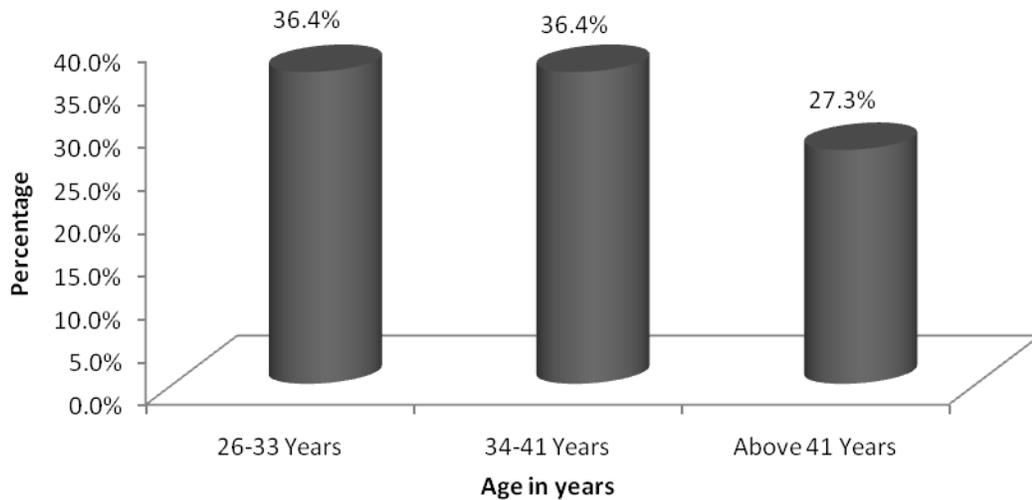
The information presented in figure 4.1 shows the gender representation of the respondents who took part in this study. According to the study, majority of the respondents were males (59%). This indicates that most of the top managers and middle level managers in the selected oil-manufacturing companies were males. This is important to establish how companies are practicing the third gender rule in management.



**Figure 4.1: Gender of the respondents**

#### **4.2.2 Age Group**

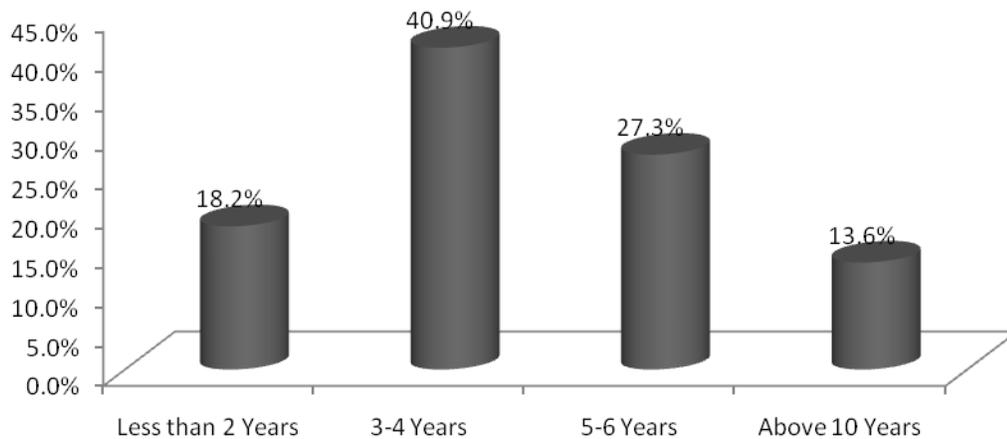
The information contained in figure 4.2 shows the ages of the respondents in years. From the findings, majority of the respondents (73%) were below 41 years where 37% were aged between 26-33 years and the other 37% between 34-41 years. Only a small portion of 27% of the respondents were above 41 years. This indicates that the top and middle management of the oil manufacturing companies are made of young and youthful workforce.



**Figure 4.2: Age Group**

#### 4.2.3 Number of years worked

The information provided in figure 4.3 shows the years the respondents had worked with their companies. According to the findings shown, most of the respondents (41%) had a work experience of between 3-4 years, 27% had a work experience of between 5-6 years and 18% had a work experience of less than 2 years.



**Figure 4.3: Number of years worked**

### 4.3 Decomposability Costs

The data on decomposed or distributed tasks in the companies was used to indicate the costs incurred as a result of the interdependencies of the systems of the companies.

**Table 4.1: Decomposability Costs**

	Yes	No
Is the governance structure top bottom delegation?	77.3%	22.7%
Do individuals from different departments consult each other for advice in performing tasks?	72.7%	27.3%
Do departments consult each other in performance of tasks?	68.2%	31.8%
Do activity decisions come from the top management?	63.6%	36.4%
Are tasks done by specialized teams?	59.1%	40.9%
Are departments independent in performing their tasks	59.1%	40.95
Does the organization undertake contractual work in different tasks?	54.5%	45.5%
Are related tasks performed in one department even if tasks are of different departments?	31.8%	68.2%

According to the findings shown in table 4.1, 77% of the respondents indicated that their companies used top bottom delegation government structure, 72% indicated that their departments consulted other departments for advice and made consultations when performing tasks (68%). The findings shows that 64% of the companies make decisions from the top management, 59% do tasks through specialised teams and 59% of the departments are independent in performing their tasks. Further the findings shows that the more companies (55%) took contractual works to do some tasks. Also the findings indicate that related tasks are not done in one department if they are from another department. This shows that the company systems were highly independent.

### 4.4 Complexity Costs

This section presents findings on the complexity costs of the oil manufacturing companies. The data was analysed using percentages. The findings are shown in table 4.2.

**Table 4.2: Complexity Costs**

	Yes	No
The structure in this organization is horizontal. Each individuals has a contribution to make	68.2%	31.8%
New employees are hired each time a new department is created	45.5%	54.5%
Organizational tasks are too many thus not completed on time	40.9%	59.1%
One supervisor has 10-25 people under him/her	40.9%	59.1%
Many departments perform the same tasks	36.4%	63.6%
Tasks in the organization are performed by individuals and not teamwork.	27.3%	72.7%

The findings in table 4.2 shows respondents 68% agreed that their companies' structure was horizontal and each individual has a contribution to make. According to the findings respondents disagreed that new employees were hired each time, a new department was created (55%). Also 59% of the respondents disagreed that organizational tasks could not be completed in time because they were too many. A proportion of 59% disagreed that one supervisor had 10-25 people under him and that many departments had the same tasks. A further 73% of the respondents further disagreed that tasks in their organization were performed by individuals without teamwork. These findings indicate that there is high interdependencies among the departments which relatively reduces the complexity costs of the companies.

#### **4.5 Inter-unit Costs**

This section provides information on the costs incurred as a result of the inter-relations among units and branches. The findings are presented in table 4.3.

**Table 4.3: Inter-unit Costs**

	Yes	No
Tasks operate on standardized procedures	100%	0%

Tasks in one department has an effect on other departments	72.7%	27.3%
Departments perform their tasks independently	63.6%	36.4%
Organizational structure is horizontal	63.6%	36.4%
Tasks are performed by individuals not teams	63.6%	36.4%
Decisions made are decentralized	50.0%	50.0%
Organizational equipment is shared between departments	50.0%	50.0%
Decision are made by individuals not teams	31.8%	68.2%
Departments share responsibilities	18.2%	81.8%

The findings show that all respondents (100%) agreed that their companies operate on standardized procedures. Also 73% of the respondents agreed that tasks in one department had effect on other departments, majority (64%) agreed that departments performed different tasks independently and that their organizational structures was horizontal (64%). Majority of the employees working with the oil companies also agreed that tasks are performed by individuals and not teams (64%) and 50% agreed that decisions made are decentralized. In addition, 50% of the respondents agreed that organizational equipment was shared between departments. Also 68% of the respondents disagreed that decisions were made by individuals and not teams in their companies and approximately 81% disagreeing that their departments shared responsibilities.

#### 4.6 Span of Control Costs

This section presents the information on the span of control related costs in the oil manufacturing companies.

**Table 4.4: Span of Control Costs**

	Yes	No
Managers delegate tasks to their juniors	68.2%	31.8%
There are very few levels of authority	50.0%	50.0%

Every new department formed gets employees hired	40.9%	59.1%
There are many managers in position of authority	18.2%	81.8%

Majority of the respondents (68%) agreed that managers in their companies delegated tasks to their juniors. Half of the respondents 50% agreed that they were very few levels of authority in their organizations. However, the respondents disagreed that every new department formed attracted new employees into the organization (59%) and that there were many managers in position of authority as indicated in table 4.4.

#### **4.7 The performance of the oil manufacturing companies between 2003 -2012**

The researcher collected data on the parameters used to measure performance of the Oil manufacturing companies. The parameters used include profits, debt ratio and return on investment.

##### **4.7.1 Profits**

This section provides the profits of the three Oil manufacturing companies in Kenya from the year 2003 up to 2012 as shown in table 4.5.

**Table 4.5: Profits**

<b>Year</b>	<b>Company A profits (000Ksh.)</b>	<b>Company B profits (000Ksh.)</b>	<b>Company C profits (000Ksh.)</b>
2003	11,795	1,153,000	97,106,000
2004	83,733	1,901,000	116,718,000
2005	73,767	2,155,000	199,504,000
2006	133,051	2,799,000	264,557.00
2007	191,597	3,810,000	421,659,000
2008	210,672	2,870,000	503,454,000
2009	290,525	5,900,000	645,774,000
2010	302,685	4,678,000	1,075,268,000
2011	340,434	5,815,000	1,150,498,000

2012	370,782	10,712,000	1,245,638,000
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The profits of the three companies since 2003 to the year 2012 are presented in table 4.5. From the figures, Company A profits have been growing since 2003 at Ksh. 11. 795 Million to Ksh. 370.782 Million. Company B profits grew from Ksh. 1.153 billion in 2003 to Ksh. 10.712 Billion in 2012. Company C had a profit of Ksh. 97.106 billion by the year 2003 and grew to Ksh. 1.245 trillion by 2012. The figures indicate that all the three oil-manufacturing companies have had increasing trend of profits growth.

#### 4.7.2 Debt ratio

The data on the debt ratio of the three companies is as shown in table 4.6. The figures were collected since the year 2003 to the year 2012 for the three oil manufacturing companies which are under review by the study.

**Table 4.6:Debt ratio**

Year	Company A (000Ksh.)	Company B (000Ksh.)	Company C (000Ksh.)
2003	670,662	2,366,000	309,715
2004	683,200	2,348,000	332,147
2005	540,036	2,230,000	1,508,320
2006	660,449	2,319,000	1,798.14
2007	677,843	2,422,000	1,666,345
2008	690,425	6,170,000	2,382,004
2009	705,534	6,227,000	4,658,399
2010	722,435	4,216,000	8,431,581
2011	740,786	4,231,000	9,993,361
2012	760,971	5,166,000	13,329,740

The debt ratios of the three companies seem to have increased over the study period. The Company A debt ratio grew from Ksh. 670.662 million to Ksh. 760.971 million, Company B debt ratio grew from Ksh. 2.366 billion to Ksh. 5.166 billion while that of Company C grew from Ksh. 309.715 million to Ksh. 13.329 trillion. This shows that as the profits increased the companies become more financially vulnerable.

#### 4.7.3 Return on investment

This section presents the data collected from the year 2003 to the year 2012. The values given are in millions Kenya Shillings. The data is as shown in table 4.7.

**Table 4.7: Return on investment**

<b>YEAR</b>	<b>Company A (Million Ksh.)</b>	<b>Company B (Million Ksh.)</b>	<b>Company C (Million Ksh.)</b>
2003	85.61	38.28	13.7
2004	90.49	35.36	14.75
2005	73.99	37.22	29.23
2006	86.92	44.23	34.11
2007	99.17	48.21	34.71
2008	102.26	77.74	45.53
2009	115.72	88.47	88.71
2010	125.46	91.76	134.86
2011	138.35	92.3	162.49
2012	120.4	118.58	41.29

The findings of the return on investment for the three oil manufacturing companies has assumed an upward trend. Company A ROI rose from Ksh. 85.61 million in 2003 to Ksh. 138 million in the year 2011 before dropping to Ksh. 120.4 Million in the year 2012. Company B ROI rose from Ksh. 38.28 million in the year 2003 to Ksh. 118.58 million in the year 2012. Company C ROI rose from Ksh. 13.7 million in the year 2003 to Ksh. 162.49 million in the year 2011 before dropping to Ksh. 41.29 million in 2012.

## 4.8 Relationships between costs and the performance of the oil manufacturing companies

### 4.8.3 Correlations.

To assess the relationship of the variables, the researcher performed a Pearson correlation. The findings are shown in table 4.8.

**Table 4.8: Correlations**

		Growth	Coordination costs
Growth	Pearson Correlation	1	-.675
	P- Value Sig. (2-tailed)		.032
Coordinationcosts	Pearson Correlation	-.675	1
	P- Value Sig. (2-tailed)	.032	

The data findings shown in table 4.8 shows the correlation between growth and coordination costs. According to the findings, the Pearson correlation coefficient between coordination costs and growth has a strong negative correlation ( $r = -0.675$ ,  $t = 0.032$ ). This shows that an increase in coordination costs was accompanied by a corresponding decrease in growth and vice versa.

### 4.8.4 Regression

The researcher conducted a regression analysis to ascertain the effect of the coordination costs on the growth of the oil companies. The study used the following multiple linear regression model.

$$Z = P_0 + P_1 Z_1 + P_2 Z_2 + P_3 Z_3 + P_4 Z_4 + e_4$$

Where:

1 - Level of Decomposability is denoted by

2 - Complexity is denoted by

3 - Inter unit relationships is denoted by

4 - Span of control is denoted by

Z - Growth is denoted by

e - Stray causes is denoted by

p - Path is denoted by

The researcher also assessed the goodness of correlation coefficient of the study and the following was realized from the assessment in table 4.9.

**Table 4.9: Correlation Coefficient**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.800 <sup>a</sup>	.640	.353	1.260E8

The value of R square for the correlation coefficient was 0.64. This indicates that the independent variables explain 64% of the variations in the growth of the companies. The rest 26% is explained by other variables. The ANOVA test carried out on the correlation coefficient revealed the scenario as at table 4.10.

**Table 4.10: ANOVA**

	Sum of Squares	df	Mean Square	F	P Value Sig.
Regression	4.938	4	1.234	10.099	.003
Residual	.489	4	.122		
Total	5.427	8			

The value of the p in the table shows the level of significance of the independent variables on the dependent variable. According to table 4:10, the value of p was 0.003 ( $P < 0.05$ ) indicating that the predictors were statistically significant in influencing the behavior of the growth of the oil manufacturing companies.

The regression analysis carried out in the study brought out the relationship between dependent and independent variables providing the coefficients for each that leads to the following scenario observed as presented in table 4.11.

**Table 4.11: Coefficients**

	Unstandardized		Standardized		P - Value Sig.
	B	Std. Error	Beta	t stat.	
(Constant)	5.375	.524		10.259	.001
Decomposability costs	.145	1.044	.024	.139	.896
Complexity cost	1.464	.815	.304	1.798	.147
Inter-unit cost	-7.803	2.009	-.711	-3.883	.018
Span of control cost	-3.435	.723	-.775	-4.750	.009

According to the findings, inter-unit cost ( $p = 0.018$ ) and span of control costs ( $p = 0.009$ ) were statistically significant in influencing the growth of the oil manufacturing

companies. The decomposability costs ( $p=0.896$ ) and complexity costs ( $p=0.147$ ) were not significant in predicting the growth of the oil manufacturing companies.

Since the decomposability costs and complexity costs were insignificant in predicting the outcome of the growth of the oil refineries, they were dropped from the model. The resultant model became:

$$\text{Growth} = 5.375 - 0.711 \text{ IUC} - 0.775 \text{ SPC}$$

This indicates that when all the factors are held constant, the growth (profits) of the oil manufacturing companies increased by 5.375 units. When all factors were held constant, a unit increase on inter-units costs decreased the profits by 0.711 units. In addition, when all the factors were held constant, a unit increase in the span of control costs decreased the growth (profits) of the oil manufacturing companies by 0.775 units. This indicates that increase in the coordination costs decrease the growth of the oil manufacturing companies and vice versa.

#### **4.8.5 Hypothesis testing**

##### **Hypothesis one**

**H<sub>0</sub>:** Decomposability costs do not affect organizational growth

The chi-square test was done to test hypothesis one and the following was observed as presented in table 4.12.

**Table 4.12: Chi-square test between growth and decomposability cost**

	Value	df	Sig.(2-sided)
Pearson Chi-Square	50.000	45	.281
Likelihood Ratio	34.961	45	.859
Linear-by-Linear Association	1.734	1	.188

Chi-square test was used to assess whether growth and decomposability costs were dependent. The chi-square p-value was 0.281 ( $p > 0.05$ ). This shows that there was no significant statistical relationship between decomposability costs and the growth of the oil manufacturing companies. Therefore, the researcher failed to reject the null hypothesis. This shows that there is no direct proportionality in that a given change in decomposability will produce a corresponding change in firm growth. For that matter, there is no linear association.

### **Hypothesis two**

**H<sub>0</sub>:** Complexity Costs do not affect Organizational growth

A chi-square test was also done to test hypothesis two and the following outcomes were recorded in the study as presented in table 4.13.

**Table 4.13: Chi-square test between growth and complexity cost**

	Value	df	Sig. (2-sided)
Pearson Chi-Square	40.000	36	.297
Likelihood Ratio	27.185	36	.855
Linear-by-Linear Association	.376	1	.540

A chi-square test was done to assess whether growth and complexity costs had any significant relationship. The p-value obtained was 0.297 ( $P > 0.05$ ). This shows that there was no significant relationship between growth and complexity cost. Therefore, the researcher failed to reject the null hypothesis that complexity costs do not affect organizational growth. This shows that there is no direct proportionality in that a given

change in complexity will produce a corresponding change in firm growth. For that matter, there is no linear association.

### **Hypothesis three**

**H<sub>0</sub>** : Inter-branch/unit interdependencies costs do not affect organizational growth

Chi-square test done on hypothesis three shows the following outcomes presented in table 4.14.

**Table 4.14:Chi-square test between growth and Inter-branch/unit cost**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.000 <sup>a</sup>	18	.033
Likelihood Ratio	20.593	18	.300
Linear-by-Linear Association	3.791	1	.052

The researcher conducted a chi-square test to determine whether there was a significance relationship between growth and the inter-unit costs. The chi-square p=value was 0.033 ( $p < 0.05$ ),. This shows that inter-unit costs and growth had significant relationship. Therefore, the researcher accepted the alternative hypothesis that inter-unit costs affect organizational growth.This shows that there is direct proportionality in that a given change in Inter-branch/unit costs will produce a corresponding change in firm growth. For that matter, there is linear association.

### **Hypothesis four**

**H<sub>0</sub>**:- Span of control costs do not affect organizational growth

Chi-square test done on hypothesis four shows the following outcomes presented in table 4.15.

**Table 4.15: Chi-square test between growth and span of control costs**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	30.000 <sup>a</sup>	27	.031
Likelihood Ratio	23.871	27	.637
Linear-by-Linear Association	1.467	1	.226

The researcher conducted a chi-square to test the interdependence of growth and span of control costs. From the findings, the chi-square p-value was 0.031. This indicates that growth and span of control costs had significance statistical relationship. Thus, the researcher accepted the alternative hypothesis that span of control costs affect the firm growth of a company. This shows that there is direct proportionality in that a given change in span of control will produce a corresponding change in firm growth. For that matter, there is linear association.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.0: Introduction**

This chapter presents the discussion of key data findings, conclusion drawn from the findings highlighted and recommendation and policy implication made there-to. The conclusions and recommendations drawn were focused on addressing the research questions of the study. The researcher answered the following questions: how do decomposability costs affect firm growth and how do complexity costs affect firm growth?; how do inter-branch/unit interdependencies costs affect firm growth?; and how does span of control costs affect firm growth? Finally, what policy implications to be adopted to enhance firm growth in relation to coordination costs.

#### **5.1 Summary of the study**

The study was motivated by the need to establish the relationship between coordination costs and the growth of the oil manufacturing companies. To achieve the main objective of the study, the researcher determined how complexity, decomposability, inter unit and span of control related costs affect the growth of the oil manufacturing companies in Kenya.

A thorough review was done in chapter two on the theoretical foundation and empirical studies done on coordination costs and growth. A case series approach was used to guide data collection and analysis. The findings are presented in chapter four. This chapter presents the discussion of the findings, conclusions of the study and recommendations of the study. There is also a small section on suggested areas of further research.

### **5.1.1 Decomposability costs and organizational growth**

The study conducted various arithmetic tests to evaluate the decomposability costs incurred in companies and how they relate with the firm growth of the oil manufacturing companies. From the findings, the decomposability costs of the oil manufacturing companies include subcontracting other firms to do their tasks and independence of their departments.

However, the decomposing costs in most of the oil manufacturing companies were not high since departments consulted each other and even individuals from different departments used to consult each other when performing the company's tasks. Also the study found that in most of the companies the tasks are shared, organizations have small departments and have adopted a government like structure with top bottom delegation. This high dependence eliminates the extra costs incurred when separating duties. Cover and Permuter (2007) argued that in an organization structure multiple interdependent tasks can be grouped into divisions neutralizing the conflicting objectives within the divisions.

The study found that decomposability cost is inversely related with growth of the oil manufacturing companies. This indicates that when the costs were high, the growth of the oil manufacturing companies declined and vice versa. Decomposability costs also increase with increase in inter-unit and span of control costs but decrease with increase in complexity costs. This agrees with Barrie, et al., (2007) argument that the level of complexity determines the extent of decomposability. The more decomposed the activity system the more modular the organization structure.

The regression results shows that decomposability costs is insignificant in influencing the growth of the oil manufacturing companies since the t statistics was found to be very insignificant at 0.896. Therefore, the influence of the decomposability costs on the profits is negligible. This is further shown by the hypothesis testing results which produced chi square value of  $p > 0.05$  showing no statistical significance between growth

and decomposability costs. Therefore, the decomposability costs influence the growth of oil making companies to a low extent.

### **5.1.2 Complexity costs and organizational growth**

The complexity costs of a company are brought about by the highcomplex functions or levels or processes within a company. The study found that most of the oil manufacturing companies had low complexity costs due to interdependence of their functions and processes. Although the companies had low number of tasks and could be completed in time, newly created departments did not mandatory result to employment of new employees since the departments were highly inter-dependent thus decreasing complexity costs. This agrees with Ernest (2005) view that low interdependencies increase complexity costs of a company.

In addition, the companies had less number of supervisors since one supervisor could over see many employees. The departments in the oil manufacturing companies completed their tasks through inter-dependence and supplied inputs to one another. The finding also shows that most of the companies worked as a team and one entity. However, the study found that most of the companies had horizontal organizational structure where each individual had a chance to make a decision concerning the company. This increases the time taken to agree on a particular decision since the number of decision makers was many and their decisions and ideas were varied.

The complexity costs of the oil manufacturing companies are inversely related ( $r=0.062$ ) with the firm growthof the companies. Thus, the growth of the companies declined when the complexity costs increased and increased when complexity costs declined. Complexity costs were also inversely related with decomposability costs thus when complexity costs were increasing decomposability costs were decreasing. This could be due to the complementary nature of the two costs. The findings further shows that complexity cost was directly related with inter-unit and span of control costs indicating that all the three costs increased at the same time.

The regression analysis found that complexity costs had low influence on the growth of the oil manufacturing companies. The significance of the influence was found to be negligible and very insignificant. This was also confirmed by the chi square which tested the significance of the relationship and found no significance relationship between the growth of the oil manufacturing companies and complexity costs.

### **5.1.3 Inter-branch/unit interdependencies costs and organizational growth**

The study used different and complex arithmetic manipulations of the data to estimate the inter-branch/unit costs and their relationship with the growth of the oil companies. The findings indicate that unit costs are high since most of the tasks done in the departments are independent, operate on standardized procedures and the tasks done in one department affect the other departments. This has made the inter-unit costs to be high among the oil manufacturing companies due to the relationships within and between groups. According to Townsend (2010), coordination costs result from coordination problems, which increase in level if the activities performed across the collaborating units/branches are complex and interdependent.

Further findings show that decision-making has been decentralised and organizational structures is horizontal, which increases the inter-unit costs. The tasks and equipment are shared among the departments of the companies. Further, the decisions are not made by individuals but by teams in the oil making companies. Garben and Evet (2005) argued that complexities of the interdependent activities are costly in terms of money and time.

The inter-unit cost had an inverse relationship with the growth of the oil manufacturing companies ( $r = -0.55$ ) implying that when the inter-branch costs increased the growth of the oil companies declined and vice versa. The inter-units cost was directly related with decomposability costs and complexity costs. However, the inter-unit costs were inversely related with the span of control costs.

The regression results show that inter-unit costs are highly significant in influencing the growth of the oil manufacturing companies. The results indicate that one unit increase in inter-unit costs decreases the growth (profits) of the oil companies by 7.803 units when other factors are working normally. The chi-square further shows that there exists a statistically significant relationship between the growth of the oil companies and the inter-branch costs. This underscores the fact that inter-unit costs are an important component in management of organizations. The findings agree with Bolton and Dewatripont, (2011) views that interdependent of units/and branches increase coordination costs as coordination of tasks and decisions increases.

#### **5.1.4 Span of control costs and organizational growth**

The four objective of this study was to assess the span of control costs and their effects on organizational growth. According to the findings, the costs associated with span of control were very low because of low levels of authorities; there is high level of delegation of duties by the management, there are low numbers of managers in the companies which has reduced the points of commands and costs associated with them.

The span of control costs relates to the costs incurred due to the varying levels of authorities and processes and even areas which require control. The study found that span of control costs are inversely related with the growth of the oil companies. Therefore when such costs increase the profits of the companies declined. The span of control costs were directly related with decomposability costs ( $r=0.286$ ) and complexity costs. Thus, when the companies incurred high decomposability costs or complexity costs, the span of control costs were also increasing. However, the span of control costs was inversely related with inter-unit costs.

The span of control costs were found to be significant in affecting the growth of the oil manufacturing companies. The increase in span of control costs by one unit increase decreases the profits by 3.435 units. The chi square further shows that span of control costs and the growth of the oil manufacturing companies have got a significant

relationship. This indicates that span of control costs are important components of costs which management should look into and address.

## **5.2 Conclusions**

### **5.2.1. Decomposability Costs**

The study concludes that in most of the oil manufacturing companies, the decomposability costs were very minimal and low. This is because in most of the companies departments work as a team and consult each other. The tasks are shared and the departments are small in numbers. The companies have also top bottom structure and high level of delegation of duties.

The study notes that decomposability costs are negatively related with the profits (growth) of the oil making companies. Decomposability costs increase with increase in inter-unit costs and span of control costs and decrease when complexity costs increases in the oil manufacturing companies.

The decomposability costs negligibly affect the profits of the oil manufacturing companies. Although they are thought to negatively affect the growth of the companies. The amount of effect on the growth is so negligible and insignificant.

### **5.2.2. Complexity Costs**

The study notes that complexity costs were very low in the oil manufacturing companies. This was due to the fact that they had low numbers of tasks, timely completion of tasks, use of existing employees and low duplication costs.

The complexity costs are negatively related with the profits of the companies, inter-unit costs and span of control costs implying that when any of the costs went up, the complexity costs were also high. This means that there is high dependence of the costs.

The study found that complexity costs affect profits insignificantly. Although the correlations were inverse, the study findings from the regression and chi square implies that they do not affect the profitability of the oil manufacturing companies significantly.

### **5.2.3: Inter-Unit/Branch interdependencies**

The study notes that inter-unit costs in the oil manufacturing companies are due to independence of the departments, use of standardised procedures autonomy of the departments among others.

The study concludes that inter-branch costs affect the profitability of the oil manufacturing companies significantly. A unit increase in inter-unit costs decreases the profits of the companies. Thus, there are to be treated seriously as a potential set back of a company's success.

### **5.2.4: Span of Control costs**

The span of control costs are low in most of the companies because they have low levels of authorities, high level of delegation and low number of managers which consume less financial obligations.

The study notes that span of control costs significantly reduce the profits of oil manufacturing companies. They have negative influence on the growth of such companies and should be well addressed to curb company financial stagnation.

The study findings inform the theories of growth in business strategic literature that it is a high time coordination was viewed as an intangible resource and taken into consideration especially when annual accounts reports of firms are being drawn so that its liability or otherwise can be ascertained. This could be due to its synergetic impact on efficiencies which as a multiplier effect enhance growth.

## **5.3Recommendations**

The study found that decomposability, complexity, inter-unit and span of control costs affect the profitability of the oil manufacturing costs significantly through reduction. It is recommended that managers take measures, which minimise these coordinating costs so as to increase their profitability.

Although the study found that complexity cost affects the profitability of the companies negligibly, they do not contribute anything positive to the companies. It is therefore recommended that they be minimised considerably by adoption of technologies, which simplify company operations and reduce such costs.

The study found that inter-branch costs negatively affect the growth of the oil manufacturing companies by reducing the level of profits. This affects the financial amounts set for other investments. Therefore, the study recommends that management teams in companies develop measures to handle inter-branch costs. The study found that inter-branch costs retard the growth of the companies. The study recommends that management of companies coordinate tasks such that they do not duplicate tasks or even overlap tasks of different departments so as to minimise the costs which could otherwise lower the profitability.

The study found that span of control costs negatively affects the profitability of the oil manufacturing companies in Kenya. The study recommends units of command be minimised and related tasks be put under one unit of command to reduce the span of control costs.

This thesis has three managerial implications. First, it suggests that, in making growth choices, a firm needs to balance the potential synergy with the associated coordination costs and evaluate in particular the impact of decomposability, complexity, inter-branch/unit interdependencies and span of control. All else equal, a firm's performance will suffer if it grows in a highly related industry when its existing business lines have coordination related intricacies, or if it grows into unrelated industries when its existing

business lines are well coordinated (thereby forgoing synergy and saving little in coordination costs).

Second, the thesis suggests that because a firm's overall coordination capacity is limited, its scope choices may be substitutive: A firm may not expand into all markets where it can apply excess resources since doing so will impose coordination burden on the company. Likewise, standardizing components and outsourcing existing activities along the vertical value chain may free up coordination capacity for horizontal growth. Therefore, in making integration and growth decisions, the firm needs to be aware of the potential constraints in terms of coordination capacity these decisions will impose on its future integration and growth choices.

Third, the observed heterogeneity across firms in their scope of integration and growth suggests that firm-specific organizational capabilities may offset some limitations of coordination costs. Firms may obtain such organizational capabilities through acquisition of managerial expertise (Capron, Dussauge, and Mitchell, 2010), development of knowledge and routines (Nelson and Quick, 2010).

### **5.3.1 Suggestions for Further Studies**

The study collected information on the growth and coordinating costs in the three oil manufacturing companies for the period between 2003 and 2012. However, the findings could be different in other companies. It is recommended that a similar study be done in other companies to compare the results and get more knowledge on the coordinating costs and growth of the companies.

The study collected information on coordinating costs. However, there is little known about the effects of other costs on the growth of the oil manufacturing costs. It is recommended that other studies be done on other types of costs incurred by the companies in the course of their operations to know more on how they affect the growth of the companies.

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## APPENDICES

### Appendix A: Self-Administered Questionnaire

#### Introduction

I am Susan Khasenye Wasike, a PhD student at Jomo Kenyatta University of Agriculture and Technology undertaking a study on relationship between Coordination Costs and Firm Growth. A survey of Edible Oil Manufacturers in Kenya. The study is purely academic and the information gathered by this questionnaire will be kept confidential. This questionnaire targets top and middle level management in organizations. This questionnaire targets top level management and middle level management in the specific organization.

#### Respondents Profiles:

1. Please indicate your designation \_\_\_\_\_

2. Gender      Male               Female

3. Age Group: (Please Tick where applicable)

Bellow 18 Years     

18-25 Years     

26-33 Years     

34-41 Years     

Above 41 Years     

4. How long have you worked for this Organization?

Less than 2 years     

3-4 Years     

5-6 Years

7-8 Years

9-10Years

Above 10 Years

### **PART A: DECOMPOSABILITY COSTS**

The questions below seek to examine decomposability and its conduct on coordination costs.

**(Key: 5-Almost Always, 4-Often, 3-Occasionally, 2- Rarely, 1- Never)**

**(1-2=No (0))                      (3-5=Yes (1))**

*Please tick the Box Yes or No to express your opinion.*

<b>S.No</b>	<b>Questions</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>1</b>	Departments share tasks most of the time					
<b>2</b>	This organization undertakes a lot of contractual work in different tasks.					
<b>3</b>	This organization has small department/units.					
<b>4</b>	The governance structure is top bottom delegation.					
<b>5</b>	Related tasks are performed in one department even if the tasks are for different departments.					
<b>6</b>	Departments/units/branches consult each other in performance of tasks.					
<b>7</b>	Activity decisions come from the top management.					

<b>8</b>	Individual from different departments consult each other for advice when it comes to performing tasks.					
<b>9</b>	Tasks are done by specialised teams.					
<b>10</b>	Departments are quite independent in performing their tasks.					

**PART C: COMPLEXITY COSTS**

The questions below seek to examine complexity and its conduct on coordination costs.

**(Key: 5-Almost Always, 4-Often, 3-Occasionally, 2- Rarely, 1- Never)**

**(1-2=No (0)                      (3-5=Yes (1))**

**Please tick the Box Yes or No to express your opinion.**

<b>S. No.</b>	<b>Questions</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>11</b>	Tasks in this organization are too many and one cannot complete within the given time.					
<b>12</b>	New employees are hired each time a new department/unit is created.					
<b>13</b>	There are very many units/departments/branches that perform the same tasks.					
<b>14</b>	One supervisor/manager has 10-25 people under him or her.					
<b>15</b>	Departments are complete in themselves, they do not supply inputs to one another.					

<b>16</b>	The structure in this organization is horizontal. Each individual has something to contribute.					
<b>17</b>	Tasks in this organization are performed by individuals and no teamwork.					

**PART D: INTER-UNIT/BRANCH RELATIONSHIPS COSTS**

The questions below seek to examine Inter-unit/branch relationship and its conduct on coordination costs.

**(Key: 5-Almost Always, 4-Often, 3-Occasionally, 2- Rarely, 1- Never)**

**(1-2=No (0)                      (3-5=Yes (1))**

**Please tick the Box Yes or No to express your opinion.**

<b>S. No.</b>	<b>Questions</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>18</b>	Departments perform their tasks independently.					
<b>19</b>	Tasks in this organization operate on standardized operating procedures.					
<b>20</b>	Tasks in one department usually has an effect on other departments.					
<b>21</b>	Decisions in this organization are made by individuals and not teams.					
<b>22</b>	Decisions in this organization are decentralized.					
<b>23</b>	The structure in this organization is horizontal. Each individual has something to contribute.					
<b>24</b>	Tasks in this organization are performed by individuals and no teamwork.					

25	Units/departments/branches share responsibilities						
26	Most equipment in this organization are shared.						

**PART E: SPAN OF CONTROL COSTS**

The questions below seek to examine span of control and its conduct on coordination costs.

**(Key: 5-Almost Always, 4-Often, 3-Occasionally, 2- Rarely, 1- Never)**

**(1-2=No (0)                    (3-5=Yes (1))**

**Please tick the Box Yes or No to express your opinion.**

S. No.	Questions	1	2	3	4	5
27	This organization has very few levels of authority.					
28	There are very many managers in positions authority.					
29	Most of the time managers delegate tasks to their juniors					
30	Each time a new department is formed, more employees are hired.					
31	Employees are hardly hired					
32	Staff turnover is very high					

**THANK YOU FOR YOUR COOPERATION**

**Appendix B: Interview Guide**

Thank you for agreeing to participate in this study. Our goal is to learn more about how coordination costs affect firm growth in Edible Oil Manufacturers in Kenya. My questions are designed to get a sense of how you think about coordination costs and their effects on firm growth. Coordination costs in this context means the costs of activities in terms of money, time and trouble of executing those activities.

1. Before we start, could you just remind me again

(a) How long you have worked with this organization?

.....  
...

(b) What position you hold in this organization?

.....  
...

(c) Which department/unit you head?

.....

(d) How long you have been at this position?

.....

(e) What is your area of specialization?

.....

2. Now, I would like you to tell me about your own experience as you carry out tasks in your daily work.

(a). Are work tasks in your unit/branch restricted to the unit/branch?

.....  
.....  
.....  
.....

(b). Do the tasks in your unit/branch depend on tasks from other units/branches?

.....  
.....  
.....

(c) Have you ever had cause to wait because the other unit/branch has delayed in processing a task that you are supposed to work on?

.....  
.....  
.....  
.....

(d) Could you please give us an example of such a task?

.....  
.....  
.....  
.....

(e) Has any unit/branch that you work closely with not agreed with a task you have initiated?

.....  
.....  
.....  
.....

(f) A task that you perform jointly with other units/branches and the one you perform in your department, which one gets done faster?

.....  
.....  
.....  
.....

(g) Would you prefer concentrating tasks in your units/branches or working jointly with other units/branches? If yes/No, why is that?

.....  
.....  
.....  
.....

3. Now, I would like you to think back over the last three weeks and recall a particular task you were especially pleased with.

(a). What happened that day that made you satisfied with the task?

.....  
.....  
.....  
.....  
.....

(b). If I had been observing that activity, what would I have seen?

.....  
.....  
.....  
.....

(c). What did the person undertaking that task do?

.....  
.....  
.....  
.....

(d). What do you think the value of this activity was for the organization?

.....  
.....  
.....  
.....

4. Now, try to recall a task that you were especially disappointed with.

(a). What happened that day that disappointed you?

.....  
.....  
.....  
.....

(b). If I had observing that activity, what would I have seen?

.....  
.....  
.....  
.....

(c). What do you think would have been an alternative way of doing that task?

.....  
.....

.....  
.....

5. Suppose you were in the middle of performing a task in your unit/branch and your immediate superior tells you to stop indicating that the task is not necessary,

(a). How would you respond?

.....  
.....  
.....  
.....

6. Now, imagine that at the beginning of the year, your C.E.O call all unit/branch heads to inform them of what the organizations goals are for the year.

(a). What would you tell your C.E.O about your unit/branch goals

.....  
.....  
.....  
.....

(b). What role to other units/branches play that is likely to contribute to the attainment of your unit/branch goals?

.....  
.....  
.....  
.....

7. Now, I would like you to imagine that you are the C.E.O of an organization and a situation of executing a task has occurred as follows:

*(This excerpt will be given to the interviewee to read)*

“There is an organization with branches in different locations and each unit/branch is headed by an executive officer. The procurement procedure for this organization is that before anything is procured, the procurement committee must meet and deliberate on it and the concerned party must attend. In this scenario, one of the unit/branch executive officer required brooms for her unit/branch which is 300 km away from the head office. Therefore the executive officer from the unit/branch was required to attend the procurement committee meeting as required by the procedure at the head office to justify his case. The cost of the brooms were Kshs.500. The expenditure the executive officer incurred was:

Out of station allowance	Kshs.4000 per day (3 days)
Travelling by air	Kshs.6000 (return ticket)
Food and Accommodation	<u>Kshs.5,000 per day (3 days)</u>
<b>Total Cost</b>	<b>Kshs.33,000.00</b>

(a). What do you think about this kind situation?

.....  
.....  
.....  
.....

(b). How differently would you have handled this situation. Why?

.....  
.....  
.....  
.....

## Appendix C: Empirical Framework

**Table V: Empirical Framework**

Author	Topic	Findings	Period	Variables	Method
Rawley Evans, (2007)	Diversification, Coordination costs and Organizational Rigidity	Coordination costs offset economies of scope, while organizational rigidity increases coordination costs, further constraining economies of scope.	2001- 2003	Organization interdependencies, complexities	A regression equation to calculate total factor productivity
Yue Maggie, (2008)	Coordination costs, organization structure and firm growth	Coordination costs affect the synergy of diversification.	1995- 2005	Firm Interdependencies and interrelations	Logistic Regression model
Lucia Naldi (2005)	Small Firm Growth	Growth is based on ability, need and opportunity	2000- 2003	Diversification, sales, accumulation of employees and assets, organization complexities	Stage or life cycle growth models i.e. Greiner's Model

**AppendixD: Vegetable Oil Manufacturersin Kenya**

**Table 3: Vegetable Oil Manufacturersin Kenya**

<b>Company Name</b>	<b>Location</b>	<b>Activity Category</b>	<b>Products</b>
Abdrdare Oil Millers	Nyeri	Millers	Edible Oils and fats
Afya Cooking Oil Manufacturers	Kakamega	Refiners	Sunflower, Soya, bean oil
Arkay Manufacturing Plant	Eldoret	Buyers of Raw Products	Sunflower, Soya and Bean Oil
Bidco Oil Refineries	Nairobi	Refiners	Fats, Margarine oils, industrial bulk oils
Corn Products Ltd	Nairobi	Millers	Corn Cyrops, corn Germ, Gluten feed meal dextrose, dextrin
Kapa Oil Refineries	Nairobi	Refiners	Fats, margarine, oils, industrial bulk oils

Kenya Nut company	Thika	Processor	Edible Oil
Mumias Sugar Company	Nakuru	Grower	Palm oil
Nakuru Oil Mills	Nakuru	Miller	Edible Oils
Oil Crop Development Ltd	Nakuru	Processors	Maize Seed, Vegetable Oils
Oil Extraction ltd	Nakuru	Oil Extractors	Edible Oils
Palmac oil Extraction	Nakuru	Refiners	Fats, Margarine, oils, Industrial bulk oils
Premier Oil Products	Nairobi	Extractors	
Pwani Oil Products	Mombasa	Refiners	Fats, margarine, oils Industrial bulk oils
Rift Valley product ltd	Nakuru	Processors	Crude palm oil, sunflower oil, plant extract
Sansora Oil Mill	Kisii	Millers and refiners	Grains
Unilever	Nairobi	Millers and refiners	Fats, margarine, oils industrial bulk oils
Voi Industries	Nakuru	Processors	Cotton, sunflower seeds
Western Seed and grain co.	Kitale	Processors	Seeds and Grains

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*Source:* EPZ, 2013

**Appendix E: Participants Consent Form**

Susan KhasenyeWasike  
Jomo Kenyatta University of  
Agriculture and Technology  
P. O. Box 64145 – 00618  
Nairobi

Date.....

I the undersigned do hereby agree to participate in the study. An assessment of the relationship between coordination costs and Firm growth in edible oil manufacturers in Kenya

I understand that the information for this study is for purposes of research only and I agree to participate in this research process. In addition, I understand that my responses will be treated confidentially that the information will be treated respecting anonymity upon transcription of the interview and the open-ended responses including any published results of the study.

I agree that my participation in this research process is voluntary and that there is no penalty whatsoever for participating in this study. I am also aware that I may withdraw from the research process at any time by just notifying the researcher, I further agree that was not coerced in any way to sign this consent form.

**Signature**

**(Participant).....Date:.....**

**Signature**

**(Researcher).....Date.....**

## **Appendix F: Permission to Conduct Research**

Susan KhasenyeWaike  
Jomo Kenyatta University of  
Agriculture and Technology  
P. O. Box 64145 – 00618  
Nairobi

The Ministry of Higher Education, Science and Technology  
Utalli House  
Nairobi

Dear Sir/Madam

### **PERMISSION TO CONDUCT RESEARCH**

I am currently studying for a PhD degree in Business Management, Strategic Option at the Jomo Kenyatta University of Agriculture and Technology. Part of the requirements for graduation is to conduct a research. I have, thus, undertaken to research on the relationship between coordination costs and firm growth in edible oil manufacturers in Kenya. This will require the top and middle level management team of the organizations under study to provide data to assist in giving answers to the research questions.

The data obtained will be used for the study only and I promise that neither the organizations as well as the individual participants will be known as sources of the information. The organizations as well as the individual participants will be given pseudo-names to conceal their identity.

I therefore, seek your approval to conduct research in 30 edible oil manufacturers in Kenya. I hope that this request will be given the due consideration.

Yours faithfully

**Susan KhasenyeWasike**  
**(Student Researcher)**

## **Appendix G: Permission to collect data from Middle Management Team**

Susan KhasenyeWasike  
Jomo Kenyatta University of  
Agriculture and Technology  
P. O. Box 62145 – 00618  
Nairobi

Date.....

Dear Sir/Madam

I am a PhD student at the Jomo Kenyatta University of Agriculture and Technology. I am currently carrying out a study on the relationship between coordination costs, and firm growth in edible oil manufacturers in Kenya. Your organization, is among the selected organizations for study. You are, therefore, kindly requested to complete the following questionnaire to assist in the research process. I assure you of anonymity and confidentiality and that the information obtained will be used only for the purpose of this study. As you complete this questionnaire, be reminded of the following:

- Do not write your name on the questionnaire – it remains anonymous
- Please, endeavour to respond to all the questions
- There are no correct or incorrect answers; we just want your objective opinion
- Please return this questionnaire to the researcher immediately after completing it.

Your freedom to consent to and participate in this study is highly appreciated. In case you have any concerns regarding this study, please, do not hesitate to contact my supervisors, **Prof. Luke Oyugi** and **Dr. Walter Okibo Bichanga** of Jomo Kenyatta University of Agriculture and Technology.

I am very grateful to you for sparing your valuable time to complete this survey. Thank you very much.

Yours faithfully

**Susan KhasenyeWasike**  
(HD-422-C002-2255-2011/2012)  
Cell Phone: 0714-811-353, e-mail: [swasike@cuea.edu](mailto:swasike@cuea.edu)

## **Appendix H:Permission to Interview Top Management Team**

Susan KhasenyeWasike  
Jomo Kenyatta University of  
Agriculture and Technology  
P. O. Box 64145 – 00618  
Nairobi

Date:.....

Dear Sir/Madam

I am a PhD student at Jomo Kenyatta University of Agriculture and Technology. I am currently carrying out a study on relationship between coordination costs, organization structure and firm growth of edible oil manufacturers in Kenya. Your organization has been selected as part of the sample. You are kindly invited to take part in an interview to assist in responding to the research questions. I assure you of anonymity and confidentiality and that the information obtained will be used only for the purpose of this study.

Your freedom to consent to and participate in this study is highly appreciated. In case you have any concerns regarding this study, please do not hesitate to contact my supervisors, **Dr. Walter OkiboBichanga** and **Prof.LukeOyugi**, of Jomo Kenyatta University of Agriculture and Technology. They will readily and willingly assist you on any issues that you may have. Thank you very much and may God richly bless your every endeavour.

Yours faithfully

**Susan KhasenyeWasike**

**(HD-422-C002-2255-2011/2012**  
**Cell Phone: 0714-811-353, swasike@cuea.edu**