

**EFFECT OF OUTSOURCING SERVICES ON EFFICIENCY OF VALUE CHAIN OF
MILK FIRMS IN MURANG'A COUNTY IN KENYA**

BY

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MASTER OF BUSINESS ADMINISTRATION (CORPORATE MANAGEMENT)

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BY

**A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE
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DECLARATION

I declare that this dissertation is my original work and has not been previously published or submitted elsewhere for award of a degree. I also declare that this work contains no material written or published by other people except where due reference is made and author duly acknowledged.

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I do hereby confirm that I have examined the master’s dissertation of

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And have certified that all revisions that the dissertation panel and examiners recommended have been adequately addressed.

Sign:.....

Date:.....

Dr. Edward Owino

Dissertation Supervisor

DEDICATION

This dissertation is dedicated to my family for the encouragement, persevering the long night hours and support during the period of my study.

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ABBREVIATIONS AND ACRONYMS

KCC - Kenya Cooperative Creameries

MoA - Ministry of Agriculture

KARI - Kenya Agricultural Research Institute

ILRI - International Livestock Research Institute

USDA - United States Department of Agriculture

OPERATIONAL DEFINITION OF TERMS

Outsourcing: Outsourcing is the process of deliberating non-core activities or operations from internal production within a business to an external entity that specializes in that particular operation. In general, outsourcing can be referred to as make or buy decisions on intermediate goods, to the hiring of temporary labor and to the use of external services (Kennedy, Holt, Ward, and Rehg, 2002).

Value Chain: A value is a continuum of value adding actions which in their normal task of deriving outputs from inputs aid the firm's bottom-line and help in creation of competitive advantage (Lacity et al, 2011).

Small Scale Dairy Farming: A mode of farming conducted largely by subsistence farmers. These farmers sell their surplus milk after meeting their domestic needs (Malcom, 2001)

Milk Collection: This is the process of collecting raw milk from dairy farms and/or collection centers for processing (Asher and Nandy, 2007)

Milk Processing: Milk processing is the process of deriving pasteurised milk and other dairy products, such as ghee, cheese, yoghurt, from raw milk (Diao, 2007)

Milk Products Distribution: This term refers to the post-production process of transporting milk and milk products from packaging to the eventual consumer (Diao, 2007).

ABSTRACT

The outsourcing concept has gained widespread attention in the recent past. As benefits of outsourcing non-core functions of a firm get apparent, it has become necessary to investigate various industries to evaluate whether these gains apply across the board. The research was guided by two theories, the transactional cost theory which posits that cost in a great extent guides the decision to produce goods and services in-house or to acquire them in the open market and the resource based theory which views firms as bundles of assets and resources. The nature within which firms deploy these assets and resources distinctively offers avenues for gaining competitive advantages giving them desirable edges in the markets. The research focused on all the milk firms in Murang'a County where the sampling frame comprised employees in procurement, production, marketing departments that primarily deal with collection, processing and distribution of milk. Since the sampling size was small, the researcher followed the census sampling design capturing the entire population of the study. Questionnaires were structured to cover all the research questions, pretested and administered to the population of study with a response rate of 82%. This study evaluated the effect of outsourcing on the efficiency of dairy value chain, with a specific focus on four milk firms that operate in Murang'a County, Kenya. The study particularly investigated the effect of outsourcing of milk collection, milk processing, and distribution on the value chains of the sampled firms. The research used regression analysis to investigate the relationship between the three independent variables and the dependent variable. The results showed the relationship between outsourcing of milk collection, outsourcing of milk production and outsourcing of milk distribution on value chain to be positive and significant. A unit increase in outsourcing of milk collection would increase value chain efficiency by 0.359 units while a unit increase in outsourcing of milk processing would increase value chain efficiency of milk firms by 0.181 units. Finally, a unit increment in outsourcing of milk distribution resulted in an increment of 0.162 in value chain efficiency. The study therefore recommends that firms should embrace the concept of outsourcing since it is beneficial in enhancing the efficiency of their value chains.

Keywords: Outsourcing, Efficiency, Value Chain, Milk Firms, Murang'a County

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

In the recent two decades, the dairy industry has experienced profound changes marked by globalization of the external business environment, increased competition and changing consumption patterns amongst consumers (Kleinert, 2003). Developments in information and communication technologies have facilitated the ability of organizations to globalize production and access new markets (McIvor, 2006). Globalization of markets and improved communication technologies together necessitate a need for a redesigned value adding chain. To cope with the changes in market demand and maintain their competitive advantage, forward-thinking companies try to find new ways of working together with partners to provide customers with a range of services that knot together so seamlessly that they amount to more than the sum of their parts. As a consequence, businesses increasingly integrate their value chains by redesigning their structures to move from hierarchical structures focused on management control to horizontal structures built around business processes, teamwork and empowerment.

Bengtsson et al. (2005) demonstrated that one way to take advantage of opportunities in other locations is to redesign the value adding chain by outsourcing parts of the production process to suppliers. In today's business environment, it is evidently common to outsource activities traditionally performed internally by firms to third party's. This is unlike in the past when outsourcing was primarily relegated to the procurement of the firms' non-core activities. However, today outsourcing has expanded to include virtually every activity of a firm; both core and non-core activities, business processes, information technology processes, manufacturing and distribution activities, and customer service activities (Kroes, 2007; Holcomb & Hitt, 2007).

The impetus of outsourcing in today's business environment include constant change due to the technological advancement, market unpredictability, pressure to reduce costs and cycle times and globalization (Kroes, 2007). In the past decades dairy farmers and the industry as a whole around the world have been looking to increase productivity and performance. The dairy industry has experienced a drastic transformation in terms of technologies in production and processing of milk. The rapid changes that have been taking place in the industry have been occasioned by the need to consolidate the actors in the industry together for efficiency. However, no one player can lay claim to the ownership of all processes from the production, to the collection, storage, processing, distribution and retailing herein known as the value chain. Value chains do not exist in the sense of their having a tangible reality: they are indeed a framework for trying to understand how the world works. According to Kaplinsky and Morris (2001), a value chain is the entire range of action required to bring a product through its various phases in the development process, implying from conception to final delivery to consumers

1.1.1 The Concept of Outsourcing

Outsourcing is the act of one company contracting another company to provide services that might otherwise be performed by in-house employees. Outsourcing is defined as a contract service agreement in which an organization hires out all or part of its operations to an external company. The recipients for outsourced activities are generally in the same country. When a company on another continent for instance if company based in Kenya outsources from India, the correct term to use is offshore outsourcing. Near shore outsourcing refers to outsourced projects that are outside the country, but on the same continent for instance a US company outsourcing activities to a company in Canada would be called near shore outsourcing.

Feenstra (2005) described outsourcing as “disintegration of production” or a “super specialization”. Dutta and Roy (2005) mentioned a phenomenon called “vertical fragmentations”. Lacey and Blumberg (2005) stated that outsourcing is the corporate decision to utilize external partners in undertaking tasks within the value chain which would ordinarily be undertaken by internal entities. Outsourcing is the process of deliberating non-core activities or operations from internal production within a business to an external entity that specializes in that particular operation. In general, outsourcing can be referred to as make or buy decisions on intermediate goods, to the hiring of temporary labor and to the use of external services. (Kennedy, Holt, Ward, and Rehg, 2002).

According to Beaumont, (2006) outsourcing can be said to be one sub-type of distributed work. It is the delegation of task or job from internal production to external entity, such as a sub-contractor. Smith (2007) defined outsourcing as turning over to a supplier those activities outside the organization’s chosen core competencies. Quinn and Hilmer (2004) posit that outsourcing has been increasingly utilized around the globe to ensure enhanced business performance around the world. In most cases, the non-core tasks of the firm, such as maintenance and call centers are the ones which are ceded to outsourcing firms. Outsourcing should not however be construed to imply that the outsourced functions are less important (Holcomb & Hitt, 2007; Lacity, Solomon, Yan & Willcocks 2011). In fact, outsourcing is said to help firms to perform better in their core competencies and mitigate shortage of skill or expertise in the areas where they want to outsource. More recent trends show firms outsourcing core business processes and in some cases even the actual production or parts of it are bought from outside service providers (Kakabadse & Kakabadse 2005).

1.1.2 The Value Chain

Lacity et al, (2011) view the value chain as a continuum of value adding actions which in their normal task of deriving outputs from inputs aid the firm's bottom-line and help in creation of competitive advantage. The agricultural value chain can therefore be viewed as consisting of several partners, key of which include producers, processors, distributors, brokers, wholesalers, retailers and consumers. Supply chain partners act in synergy, with synchronized aims and aspirations (Bammann, 2007). Value chains tend to have three broad categories of participants: First, the value chain actors directly handle the products, in terms of; they produce, trade, process, or even own them. Second, Value chain supporters provide support services which add value to the product but do not deal directly with the product. Finally, value chain influencers provide infrastructure, regulatory frameworks, and policy (Bammann, 2007).

The value chain identifies a firm as a link within a chain that enables a product to move from pre-production to final consumption. A typical value chain will contain input providers, producers, processors, packagers, suppliers and retailers. In this sense, the concept of the value chain is relational. It promotes the perspective of a market participant embedded in a network of meaningful relationships, which can only be understood relative to the value chain in which the market participant operates. The value chain concept has been instrumental in facilitating the development of strategy to enhance rural areas advancement as a function of agricultural advancement. This approach takes into account the value which added to the product, from initial input all the way to final delivery to the consumer. Additionally, it considers that the role of each participant in value creation. Diao and Dorosch (2007) notes that agricultural value chain analysis has for long been focused on the supply side but contemporary studies have paid attention to the demand side too.

1.1.3 Kenya Dairy Value Chain

Dairy farming in Kenya is dominated by smallholders who are estimated to contribute approximately 56% and 70% of total and marketed milk production (Peeler and Omore, 2007). These are farmers who, besides growing crops for subsistence and for sale, mostly keep 2 to 3 cows and own land sizes typically of about 1 ha. in the intensively farmed areas and about 2.5 ha. in the extensively farmed areas (Staal et al., 2008; MoA/KARI/ILRI, 2008). The estimated total population of 2.5 million of dairy cattle in approx. 625,000 smallholdings (MoA, 2006; Peeler and Omore, 2007) suggests that this sub-sector employs many Kenyans who derive a regular source of cash income and balanced nutrition.

Before market liberalization in the early 1990s, there was an organized milk collection and bulking system in the formal market, with two types of milk delivery to Kenya Co-operative Creameries Ltd. (KCC) facilities: by individual dairy farmers; or by dairy cooperative societies. With liberalization and collapse of KCC, the collection and bulking system also collapsed. Currently, collection and bulking is a complex of different systems depending on processors, intermediaries, the road network, milk sheds and many other factors. The transportation of milk depends on the amount and the buyer. Major processors have their own collection, bulking and transportation systems. Stainless steel (seamless) cans, and occasionally plastic cans, are used for bulking milk from individual suppliers and delivering it to processors' collection, bulking and cooling centers, from where it is transported in cans or by refrigerated tanks to the main processing plants (Peeler and Omore, 2007).

1.2 Statement of the Problem

Milk firms operating in Kenya have outsourced some of their business activities such as transportation, processing, distribution and bulking among others (Muriuki, 2003). However, they have not fully realized the full benefit of outsourcing. For example, there are persistent complaints from the public regarding services the industry provides, such as inconsistency in the collection of raw milk from the farmers, lack of proper storage facilities, fluctuations in the prices of milk and milk glut in certain instances (Muriuki, 2001). This is despite the fact that previous studies on the effect of outsourcing on the organization have shown positive effects on their performances. Previous studies have provided mixed results on the benefits of outsourcing of business processes in the world. Shock (2004) for instance demonstrated that outsourcing reduces costs associated with provision of services, while Digby (2006) observed that outsourced employees may not have the same understanding and passion for an organization as a regular employee. There is the potential that an outsourced employee will come in contact with customers and not be as knowledgeable of the organization, resulting in a negative customer experience.

Chakrabarty and Green, (2007) in their study of the relationship between service quality and IT outsourcing pointed out that quality improvement affects many aspects of operations performance in the various ways such as increasing revenue, reducing cost and improve productivity. In Kenya, Kinyua (2000) did a survey of outsourcing of selected financial activities by publicly quoted companies in Kenya. Kirui (2001) did a study on competitive advantage through outsourcing of non-core logistics activities within the supply chain of British American Tobacco Kenya.

In particular, he investigated the effect of outsourcing the inbound logistics function (of raw tobacco leaves) and found it to have a beneficial impact on the firm's bottomline. Nevertheless, he didn't focus on the effect of outsourcing on other functions such as engaging tobacco outgrowers and the supply chain of finished cigarettes and other tobacco products. Serem (2002) did a survey of the outsourcing of human resource services by banks in Nairobi and Kipsang (2003) carried out a survey of outsourcing information technology services by commercial banks in Kenya and found out that most banks were outsourcing part of their IT services. The most common functions that were outsourced were management of HR records for noncore staff and facilitation of intercontinental wire transfer services. The study didn't focus on outsourcing of non IT services such as security and janitorial duties. While these studies are beneficial to the researcher, there is little empirical evidence of the effect of outsourcing on the effectiveness of the dairy industry value chain in Kenya, hence a knowledge gap. In view of this gap, the study sought to examine the possible effect of outsourcing on the value chain of milk firms in Kenya.

1.3 Objectives of the Study

The general objective of the study was to determine the effect of outsourcing on the efficiency of milk firms' value chains in Kenya, using the case study of milk firms in Murang'a County. The specific objectives of the study were:

1. To establish the effect of outsourcing of milk collection on the efficiency of milk firms' value chains.
2. To determine the effect of outsourcing of milk processing on the efficiency of milk firms' value chains.
3. To establish the effect of outsourcing of distribution of milk and milk products on the efficiency of milk firms' value chains.

1.4 Research Questions

The study sought to answer the following research questions:

1. What is the effect of outsourcing of milk collection on the efficiency of milk firms' value chains?
2. What is the effect of outsourcing of milk processing on the efficiency of milk firms' value chain?
3. What is the effect of outsourcing of distribution of milk and milk products on the efficiency of milk firms' value chain?

1.5 Significance of the Study

The study findings will help to inform the stakeholders in the dairy industry on the effect of outsourcing on the value chain in the industry that could be used to turn around the industry. The study findings will also help policymakers in the Ministry of Agriculture and Livestock Production by availing them with information that they may use to make decisions that are more informed, as far as outsourcing is concerned. Finally, the findings will be of great use to the academia, especially those who may wish to carry out further research on outsourcing and its effect on the value chain. It may build on the existing body of literature and knowledge.

1.6 Scope of the Study

Primarily, the study intended to assess the effect of outsourcing on the value chain in the dairy industry in Kenya. However, due to financial and time constraints, it limited its investigation to Murang'a County, and as such, the study focused on the effect of outsourcing of milk collection, processing and distribution on the value chain of milk firms in Murang'a county.

CHAPTER TWO LITERATURE REVIEW

2.1 Introduction

In this section the researcher reviewed related literature on the effect of outsourcing on the dairy value chain. The theories that mark the foundation of the study are covered followed by an empirical review on the relationship between outsourcing and the value chain. Also presented is a conceptual framework and the study variables are operationalized.

2.2 Theoretical Review

This study was guided by two theories namely the Transaction Cost Theory and the Resource based theory.

2.2.1 Transaction Cost Theory

This theory posits that costs guide, to a great extent, the decision on whether to produce products or services in-house or to acquire them in the open market. This means that if the cost of procuring a product from the market is lower than the cost which would be incurred to produce the product internally, then it should be acquired from the open market (Hatonen & Eriksson, 2009). Transactions tend to be characterized by can be characterized with the degree of asset specificity, the complexity of the transactional relationship and the frequency of the transaction (Greenberg, Greenberg & Antonucci, 2008). This implies that transaction costs have three key drivers: The transaction itself, the prevailing business environment and the parties to the transaction. Transaction costs include the costs of selecting suppliers, negotiating prices, writing contracts, monitoring the performance, as well as the potential for opportunism from suppliers (Grover & Malhotra, 2003).

The potential for opportunism increases if investments have to be made which are specific to a particular relationship. The transaction cost theory implies that if firms' transactions have similar characteristics and the market has set the same conditions for them, they will tend to make similar decisions on whether to buy or produce non-core goods and services Holcomb and Hitt (2007). Inasmuch as short term savings guide outsourcing decisions, there are other motivations for outsourcing. A firm might for instance want to acquire noncore superior goods and services from suppliers who treat production of these products as core Digby (2006). This theory is beneficial to the study as the researcher seeks to determine how the decision to outsource besides minimizing the cost of doing business will affect the dairy value chain.

2.2.2 Resource-based Theory

This theory posits that the firm as is a set of bundled assets and resources. As such, these it can be possible to create competitive advantage if management deploys these resources in a distinctive manner. The gist of this theory is that firms should make perpetual efforts to acquire or otherwise gain control of desirable resources which would give it an edge in the market (Lonsdale 2009; Harland et al. 2005; Handley & Benton 2012). Holcomb & Hitt (2007) view the resource based theory of the firm as more superior to the transaction cost theory since it views creation of the competitive edge through additional dimensions, rather than cost only.

With respect to outsourcing, this theory views market linkages with outsourcing partners, especially those who have a comparative advantage in production of the pertinent product, as strategic resources which can give a firm an edge over competition. This is because the firm will be able to access the best non core products and services at a lower cost than it would incur if it were to undertake the production itself (Logan 2000; Hätönen & Eriksson 2009).

Dyer and Singh (2008) on the other hand criticize the resource-based view of the firm theory as too simplistic to explain the more complex realities on the ground. They argue that there might be an inability to leverage strategic resources due to industry/firm specific factors and the stage of the firm life cycle that the firm is currently in.

2.3 Empirical Review

This section presents an empirical review on the relationship between outsourcing of milk collection, processing and distribution and the value chain.

2.3.1 Outsourcing of Collection of Milk and the Value Chain

A wealth of literature has addressed the dilemma on whether firms should outsource collection or they should have their own collection fleet (Coase 2007, Williamson 2005, Grossman and Hart 2006, Grossman 2002). Vertical coordination in agribusiness firms has also received significant attention (Barry 2002, Hobbs 2007). Gillespie (2007) posits that that less work, however, has been devoted to understanding vertical coordination in dairy production than in other agribusiness sectors. Sumner and Wolf (2002) found significant relationships between dairy farm size, vertical integration, specialization, diversification, and region using 1993-2001 USDA Farm Costs and Returns Survey data.

Williamson (2005) and Grossman and Hart (2006) emphasize the roles of outsourcing costs in determining whether a firm should own the inbound logistics function or it or outsource it to outside service providers. They argue that lack of high quality providers of outsourcing services or high agency costs, driven by market concentration tends to encourage milk firms to build well-defined inbound logistics functions thereby making them more vertically integrated.

Grossman and Helpman (2002) expand the economic theory of the firm's "own-the-function or outsource" decision, citing the roles of transaction costs, competition, and the holdup problem. They conclude that in highly competitive markets, outsourcing must lead to a significant cost advantage to offset the transaction costs associated with searching for a reliable input source and the costs associated with holdup. With milk production, the large number of firms producing the commodity is indicative of a competitive market, suggesting that the magnitude of transaction and holdup costs is particularly important in the decision.

Grossman and Helpman (2002) further suggest that in cases where outsourcing costs are highly sensitive to specific characteristics of milk (such as specific density), the viability of outsourcing will be reduced. Barry (2002) argue that in countries with well-developed outsourcing markets for inbound logistics, the long-run cost associated with outsourcing the milk collection function might be expected to be competitive with the cost of owning it, including a charge for the additional employees' labor. The cost of the outsourcing arrangement would be determined by the market price for milk, milk production costs, farm gate quality of milk, and adjustments for quality. Whether to own the collection function or outsource it would depend primarily upon managerial factors such as the benefits associated with special requirements, such as collection of milk by its various grades of quality, i.e. without mixing the various grades first and debt concerns.

Summer and Wolf (2002) note that Outsourcing the milk collection function allows the milk firm to develop expertise by concentrating effort on core features of the enterprise. Furthermore, reduced pressure on the limited firm resources would allow the company to allow the firm to devote resources to producing thereby causing the gains of economies of scale and, hence, lower cost per unit produced.

Another incentive for milk producers to outsource milk collection is the lower initial investment associated with the outsourcing relative to acquisition of a collection fleet. Vehicle and equipment purchases associated with collection, cooling, and pre-processing require substantial start-up costs, perhaps requiring credit. Barry, Sonka, and Lajili (2002) cite financial constraints as a reason for milk firms to enter outsourcing contracts with outsourcing firms as opposed to vertically integrating. This may be particularly important for new firms that are credit-constrained and/or desire to limit debt. Before market liberalization in the early 1990s, there was an organized milk collection and bulking system in the formal market, with two types of milk delivery to KCC facilities: by individual dairy farmers; or by dairy cooperative societies. With liberalization and the collapse of KCC, the collection and bulking system also collapsed. At present, collection and bulking is a complex of different systems depending on processors, intermediaries, the road network, milk sheds and many other factors (Muriuki, 2011).

The transportation of milk depends on the amount and the buyer. Major processors have their own collection, bulking and transportation systems. Stainless steel (seamless) cans, and occasionally plastic cans, are used for bulking milk from individual suppliers and delivering it to processors' collection, bulking and cooling centers, from where it is transported in cans or by refrigerated tanks to the main processing plants. In some areas, powerful milk intermediaries (traders) have positioned themselves between the market and the milk producers. Their presence complicates the traceability of milk and brings a risk of cross-contamination and microbial overload (Muriuki, 2011). In view of the reviewed literature, the study hypothesized as follows:

H₀₁: Outsourcing of milk collection has no significant effect on the efficiency of milk firms' value chains

2.3.2 Outsourcing of Milk Processing and the Value Chain

Gillespie (2007) notes that the Indian milk market is characterized by a high demand for processed milk, a poor milk processing capacity, and a strong competition for raw milk supplies. Additionally, he notes that milk firms would dramatically improve their output of milk supply if they engaged independent milk processors to transform their raw milk into processed milk and by products of milk production. Hobbs (2007) investigated the dairy industry of Southwest China. He noticed that demand for end products of milk processing, in particular Ultra Heat Treated (UHT) milk and Cheese, was growing in the vast metropolis regions of Shanghai, Beijing, and Guangzhou. He attributed the ability of dairy firms to fulfill the surge in demand to their ability to outsource processing of raw milk. This enabled firms to grow their sales outreach without necessarily having to increase the size of their balance sheets.

In a study of the Belgian dairy industry, Coase (2007) noted that the industry is characterized by several small scale milk firms that seemed to share common processors. The firms had vigorously embraced outsourcing of milk collection and processing while maintaining control of distribution, and sales & marketing. The study mainly cited risk management and financial constraints as the main reasons for outsourcing both collection and processing functions. Sumner and Wolf (2002) notes that outsourcing of milk processing makes milk firms more responsive to swift changes in market demand. Firms that have outsourced processing are able to fulfill block orders and go back to their normal operations if the demand was temporary. This is because in times of increasing demand, they simply request their contractors for an increased supply of processed milk or engage more processors if necessary. Williamson (2005) points out that there exists a disconnect between the ability of farmers to produce milk and ability of milk firms to process all received milk.

This is mainly driven by lack of sufficient installed capacities for milk processing in the local milk firms. Additionally, not many firms offer contracted milk processing services in a market. This has therefore led to a situation that during the rainy season, a milk glut kicks in and often raw milk has to be discarded after going bad before processing due to insufficient cooling and processing infrastructure. The most frequently mentioned benefit of outsourcing milk processing is the reduction of the firm's logistics costs (Browne & Allen 2001). Further, In house inefficiencies are exposed and eliminated. This has the consequential effect of lowering the cost of production and perpetuating economies of scale as volumes increase (Wallenburg, 2004). Richardson (2000) points out that outsourcing helps free assets and investments which are tied to non – core functions. These assets can then be deployed in key operational areas of the firm, thereby contributing to higher business output and general performance.

As a result of outsourcing, the expertise, technology, and infrastructure for milk processing can be utilized (Browne & Allen 2001). Lalonde and Maltz (2002) identify higher quality, better service, optimized asset use, and increased flexibility. Multiple authors go into further detail, such as Richardson (2000) who mentions faster transit times, less damage, and improved on-time delivery. The increased flexibility is a major benefit for firms. It allows firms to become more responsive as the needs of the market or customers change (Browne & Allen 2001). Furthermore, outsourcing reduces both the strategic and the operative risk of the firm. The strategic risk in the form of investment decisions in assets is outsourced, as well as operative risks, e.g. missed deadlines, unexpectedly surging costs or quality problems in the dairy processing processes. Another factor whose importance varies according to the corporate context and the business environment is mentioned by Lynch (2000) who points out that labor considerations must not be neglected when making the outsourcing decision.

Problems with the workforce, originating from a high rate of unionization (USA) or particular labor agreements concerning wages. In view of the foregoing, the study therefore hypothesized that:

H₀₂: Outsourcing of milk processing has no significant effect on the on the efficiency of milk firms' value chains

2.3.3 Outsourcing of Milk Distribution and the Value Chain

Muriuki (2003) opines that the Kenyan dairy industry is heavily fragmented – a factor that tends to put a break on efficiency improvement in the dairy sector. In such a context, dairy processors can play a crucial role in consolidating their distribution function through engagement of a common distribution fleet owned by independent contractors. This, they argue, would enhance harmony in the market and make the processors more robust in dealing with unforeseen shocks in their market. On the other hand, Omore et al (2001) points out that the dairy industry in Kenya is quite concentrated, with over half of the market share going to the largest four milk firms. In order to gain the economies of scale that the large firms enjoy, he argues that small firms should integrate their supply chains to give them market power. However, he warns, conscious effort should be undertaken to avoid brand dilution in such an integrated approach. Maintaining a distinct uniqueness by each firm is also important.

According to Lieb (2003), the post processing supply chain of milk firms in Eastern Europe is currently overcrowded. There are too many intermediaries from processor to consumer and this creates a duo fold problem: first, the margins for all players are extremely constricted. Additionally, the quality of milk deteriorates due to excessive time spent in the supply chain, given that it's a perishable product.

This study suggests that some members of the supply chain are redundant and should be dropped to enhance the efficiency of the same. Lynch (2000) argues that cost control is at the heart of any agribusiness firm. The perishability of the primary product, coupled with the above average volatility of returns in this industry implies that players in this industry should opt for certainty at any point in which it can be assured. He additionally states that shortening the outbound logistics supply chain ensures that issues such as fluctuations in delivery costs and dealing with returns of spoilt goods are shifted away to the contractor leaving the firms with fewer primary issues to deal with.

This is supplemented by Logan (2000) who states that specialist logistics firms have tools that agribusiness firms would ordinarily not have access to. Such tools, such as ultra modern distribution fleets, refrigerated trucks, fleet management systems, route management systems, and customer management portals are core to their business. Through outsourcing, agribusiness firms would therefore access premium facilities that they do not have to commit capital to. This would have a beneficial impact on their market proposition without impacting their cash flows negatively. Milk reaches consumers through many channels. Large processors have more elaborate distribution and retail systems. In rural and suburban areas of Kenya, consumers buy mostly unprocessed milk directly from producers, kiosks, neighbourhood shops and hotels. In urban centers, unprocessed and processed milk compete, using more or less the same retail outlets, although some, such as supermarkets, do not sell raw milk. Shops and kiosks near residential areas retail both processed (packaged) and unprocessed milk.

The issue of outsourcing of distribution services (logistic services) and its effect on the overall value chain has received reasonable attention in the recent past (Razzaque & Sheng 2008; Cooper 2003; Virum 2003).

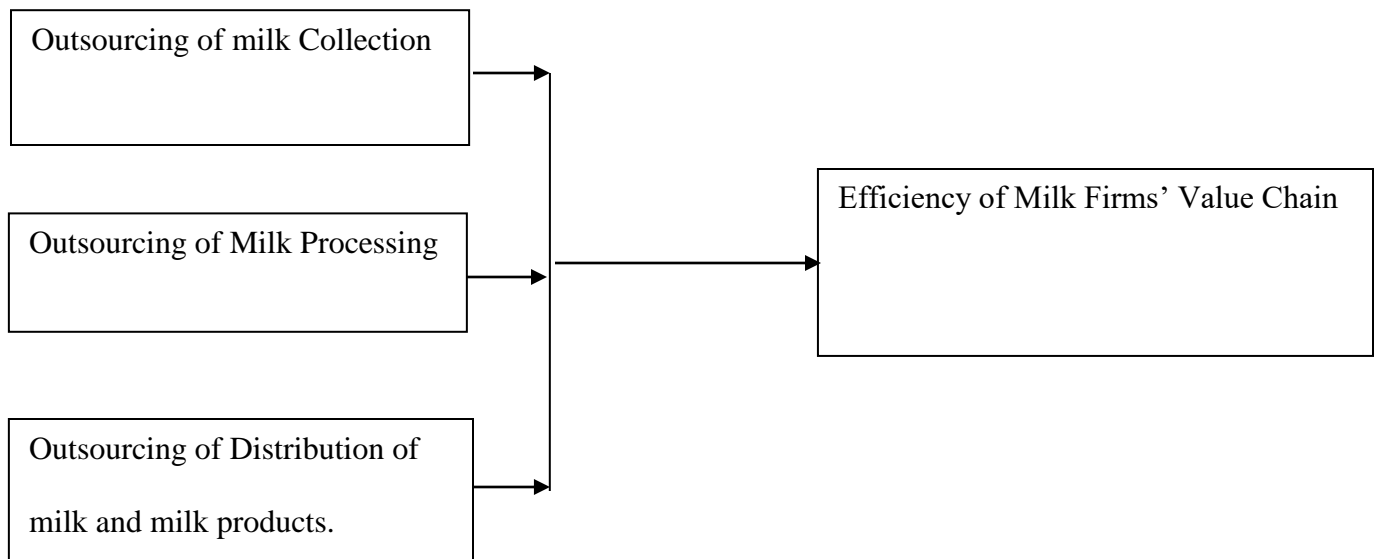
Bradley (2004) suggests that the most effective model is where a service provider offers at least two bundled and related services, with a single communication interface with the client. Such an interface should be supported by appropriate information management and dissemination systems. This reduces cluttering of the value chain as well as perpetuating deeper relationships between supply chain partners. Taking the literature review into account, this study consecutively hypothesizes that:

H₀₃: Outsourcing of milk distribution has no significant effect on the on the efficiency of milk firms' value chains

2.4 Conceptual Framework

Conceptual frame work presents interrelated variables in a study. It shows links between independent and dependent variables (Kombo & Tromp, 2006). In this study, the framework in Figure 1 shows three independent variables; collection of milk, dairy processing and distribution of dairy and one dependent variable-effectiveness of value chain. This study is anchored on the framework that the outsourcing of the collection of milk, the dairy product processing and the dairy distribution will enhance the effectiveness of the value chain.

FIGURE 1
Conceptual Framework



Source Author (2016)

2.5 Operationalization of Variables

Table 1 below shows the presentation of the Operationalization of the variables and how they map on the research objectives. It also indicates how the body of the questions in the questionnaire were structured for each variable.

TABLE 1
Operationalization of Variables

Variable	Variable Type	Indicators	Measurement scale	Section in Questionnaire
Outsourcing of milk collection	Independent	<p>Level of timeliness of delivery after outsourcing of collection.</p> <p>Extent of reduction of spoilage and adulteration cases after outsourcing of collection.</p> <p>Ability of management to redirect its efforts on more key issues after outsourcing of collection.</p> <p>Level of aptness in processing of farmers' payments after outsourcing of collection.</p>	Interval/ Ordinal	SECTION B
Outsourcing of milk processing	Independent	<p>Extent in reduction of downtimes after outsourcing of processing.</p> <p>Ability of the firm's staff to acquire technical expertise from the contracted firms' staff on best practices in milk processing.</p> <p>Level of improvement in the quality of finished products after outsourcing of the milk processing function.</p> <p>Extent of reduction of production overhead costs after outsourcing of milk processing.</p>	Interval/ Ordinal	SECTION C
Outsourcing of distribution of finished products	Independent	<p>Extent to which outsourcing of products distribution has reduced customers' lead times.</p> <p>Level of expansion of the products' geographical reach after outsourcing of products distribution.</p> <p>Ease of validation of spoiled products returns, thereby reducing fraud, after outsourcing of products distribution.</p> <p>Level of reduction of fleet acquisition and maintenance costs, thereby enabling the firm to incur capital and recurrent costs with a more strategic intent.</p>	Interval/ Ordinal	SECTION D
Efficiency of Milk Firms' Value Chain	Dependent	<p>Perceived effect of outsourcing of milk collection on value chain efficiency.</p> <p>Perceived effect of outsourcing of milk processing on value chain efficiency.</p> <p>Perceived effect of outsourcing of distribution of finished products on value chain efficiency.</p> <p>Perceived combined effect of Outsourcing of milk collection, processing, and distribution of finished products on the firm and its value chain</p>	Interval	SECTION E

Source Author (2016)

2.6 Research Hypothesis

The researcher tested the following null hypotheses to evaluate the significance of the coefficients of this study's regression equation.

H₀₁: Outsourcing of milk collection has no significant effect on the efficiency of milk firms' value chains

H₀₂: Outsourcing of milk processing has no significant effect on the on the efficiency of milk firms' value chains

H₀₃: Outsourcing of milk distribution has no significant effect on the on the efficiency of milk firms' value chains

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methodology applied in the study in terms of research design, population, sampling technique, research instruments, data collection and data analysis.

3.2 Research Design

The study will use a cross sectional descriptive research design. Descriptive research design determines and reports the way things are (Mugenda & Mugenda, 2003). According to Cooper and Schindler (2000), a descriptive research design is concerned with finding out the; who, what, where, when and how much. This approach will be preferred because; it allows for a detailed description of the characteristics of the players in the dairy industry, large amounts of data can be collected as it permits the use of questionnaires in field work, the data collected can be analyzed in an objective and quantitative manner. The method of data collection (questionnaire) was tested for validity and reliability, conditions which according to Kothari, (2006) must be present in descriptive studies. The findings from the study can be generalized for all dairy players in Kenya. Last, descriptive research provides a detailed insight into life experiences of the dairy sector players in a way that other research methods may not be capable of (Swindells, 2004).

3.3 Population

The target Population is defined as the collection of elements or objects that possess the information sought by the researcher and about which inferences are to be made (Malhotra, 2006). The population of interest in this research was all milk firms in Murang'a County.

According to the Kenya Dairy Board (2015) there are four dairy processing firms in Murang'a. These are: Murang'a County creameries, New KCC, Brookside Dairies, and Aspendos Dairy. These four firms have completely outsourced milk collection and milk distribution. Milk processing is not fully outsourced though. The four companies have all partly outsourced milk processing to a Swedish firm known as Tetra Pak Limited. The sampling frame comprised the employees in the procurement department, production department, and marketing departments from each of the firms. These three departments deal with milk collection, processing, and distribution respectively. Their staff were best positioned to provide the information needed for this research. Table 2 below shows the target population.

TABLE 2
Target Population

Firm	No of Procurement Dept Staff	No of Production Dept Staff	No of Marketing Dept Staff	TOTAL
Murang'a County creameries	35	17	34	86
New KCC	23	32	45	100
Brookside	41	38	59	138
Aspendos Dairy	18	22	32	72
TOTAL	117	109	170	396

Source: Firms' Human Resource Departments

3.4 Sample Size and Sampling Procedure

Sampling is the process of selecting from a population a small group of elements that basically have the same average attributes as the population for participation in a study. Sampling is done because data collection from the entire population can be too tedious, expensive, time consuming, or simply impractical (Wrenn, Stevens, & Loudon, 2006).

Since the target sample is small, the researcher followed the census sampling design. Kothari (2006) notes that a census approach should be utilized if data can be collected realistically from all elements of the sampling frame. Consequently, the population of this study was also its sample. This is shown in table 3 below.

TABLE 3
Study Sample

Firm	No of Procurement Dept Staff	No of Production Dept Staff	No of Marketing Dept Staff	TOTAL
Murang'a County creameries	35	17	34	86
New KCC	23	32	45	100
Brookside	41	38	59	138
Aspendos Dairy	18	22	32	72
TOTAL	117	109	170	396

Source: Firms' Human Resource Departments.

3.5 Research Instruments

A structured questionnaire was developed for collection of quantitative data (Appendix 1). The questionnaire was preferred as the most suitable instruments for the data collection because it allowed the researcher to reach many respondents (or large samples) within limited time (Mugenda & Mugenda, 2003). It also ensures confidentiality and thus helps gather more candid and objective answers. Kothari (2003) observed that questionnaires enable the person administering them to explain the purpose of the study and to give meaning of the items that may not be clear. Mugenda and Mugenda (2003) argue that, questionnaires are used to obtain important information about the population.

3.5.1 Study Variables

In this section, the researcher articulated the results of the analysis of questions that were pertinent to the study variables. A five point Likert scale (1=strongly disagree, 2=disagree, 3=uncertain, 4=agree, 5=strongly agree) was used to collect information on the constructs of each of the four variables. The questionnaire was divided into four sections that address the objectives of the study. The first section sought demographic information; the second section was on outsourcing milk collection, the third section was on outsourcing milk processing, the fourth section on outsourcing of milk distribution and the fifth on relationship of outsourcing and value chain.

3.5.2 Validity and Reliability

The research instrument can be deemed as having face validity since the researcher calibrated the research instrument on the basis of his supervisor's suggestions and results of the test-retest procedure. Additionally, construct validity can be inferred from the fact that all variables of the study were positive and significant, showing a correct formulation of this study's constructs. The overall regression, as can be noticed in the ANOVA table was also significant.

To measure the reliability of the data collection instruments an internal consistency coefficient, Cronbach's alpha, was computed using SPSS. The questionnaire was subjected to a face validity test by pilot testing it. This validity test shows the extent to which a measure or a set of measures correctly represents the concept of the study (Coopers and Schindler, 2003). According to Mugenda and Mugenda (2003), the pre- test sample should range from 1% - 10% depending on the sample size. Fifteen questionnaires were pretested amongst fifty employees of Githunguri Dairy Farmers Cooperative Society in Kiambu County.

The aim of the face validity test was to ascertain and correctness of the questions, weaknesses in the questionnaire structuring, clarity of questions and the relevance of the questions. After pre-testing, improvements were done on the questionnaire based on the feedback received from the pre-testing exercise.

The questionnaire was also subjected to a reliability test. When used in the context of research, the term “reliability” is used to describe the "repeatability" or "consistency" of the measure (Hinton et al., 2004.) The Cronbach’s alpha (α) test of reliability was adopted in providing a pretest of the reliability of the instrument and a post test of the internal validity of the findings resulting from the adoption of this instrument. Generally, a Cronbach’s alpha ≥ 0.7 would be interpreted to mean that the instrument is reliable (Ariola, et al., 2006). All data obtained from the independent variables was subjected to the Cronbach’s alpha test, Outsourcing of milk Collection had 0.9, Outsourcing of milk processing had 0.7 and outsourcing of milk distribution had a Cronbach alpha of 0.9. Since the independent variables had a Cronbach alpha ≥ 0.7 , then the research instrument was reliable.

3.6 Data Collection Techniques

Prior to actual data collection the researcher secured a letter of introduction from the School of Graduate Studies and Research that stated the purpose of the study. The researcher administered each of the instruments personally to the respondents. This method assisted the researcher not only to introduce the survey to the respondents but also to develop rapport with them. The researcher was present as the questionnaires were completed to clarify any questions and to validate the authenticity of the responses.

3.7 Data analysis

The data was cleaned, entered into a computer, coded and analyzed using the version of statistical package for social sciences (SPSS) version 21. The results are presented descriptively and inferentially using frequency distributions, percentages and measures of central tendency. Frequency tables, cross tabulation, bar charts, and histograms were used in data presentations. The study used regression analysis to establish the relationship between outsourcing of milk collection, processing and distribution on the efficiency of the value chain. The regression model was:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon_i \dots\dots\dots (i)$$

Where:

- Y = Value Chain Efficiency
- α = Constant, showing the effectiveness of value chain when there is no outsourcing
- X₁ = Outsourcing of milk collection
- X₂ = Outsourcing of milk processing
- X₃ = Outsourcing of milk distribution
- β_1, β_2 & β_3 = Coefficients of the independent variables X₁, X₂ and X₃ respectively
- ϵ_i = error term associated with the regression model.

CHAPTER FOUR

DATA ANALYSIS AND RESEARCH FINDINGS

4.1 Introduction

This chapter presents analysis and interpretation of the findings of the study. The first section of the chapter presents the results on the analysis of the general characteristics of the respondents' firms such as age, ownership structure, and the number of employees while the second part analyses the study as per study objectives. In the last part, the results of regression analysis are presented.

4.2 Response Rate

The target sample for the study was 396 respondents. The research resulted in a response of 81.82% where 324 out of 396 respondents filled and returned the questionnaires administered to them. This is shown in table 4 below.

TABLE 4
Response Rate

Firm	Questionnaires issued	Returned Questionnaires	Unreturned Questionnaires
Murang'a County Creameries	86	70	16
New KCC	100	83	17
Brookside	138	113	25
Aspendos Dairy	72	58	14
TOTAL	396	324	72
PERCENTAGE	100%	81.82%	18.18%

Source Author, 2016

According to Mugenda and Mugenda (2003) a 50% response rate is adequate, 60% good and above 70% rated very well. Kothari (2004) also asserts that a response rate of 50% is adequate, while a response rate greater than 70% is very good. As such, the response rate of this study was deemed sufficient for the study.

4.3 Internal Consistency Test

The key variables in the study were subjected to internal consistency test to check their reliability. Table 5 below indicates that the research instrument was reliable since data obtained from all independent variables had a Cronbach’s alpha of greater than 0.7.

TABLE 5
Internal Consistency Test

Variable	Cronbach’s Alpha	Comments
Outsourcing of milk collection	0.883	Acceptable
Outsourcing of milk processing	0.709	Acceptable
Outsourcing of milk distribution	0.927	Acceptable

Source Author, 2016

4.4 Background Information

To form the basis under which the researcher could rightly articulate the respondents’ views, it was important for the study to establish some background information about their respective firms. This information included age of firm, ownership structure and number of employees as explained below.

4.4.1 Firm Age

The study queried the respondents of the number of years that their employer has been in existence. The results are as per table 6 below.

TABLE 6
Firm Age

Firm Age	Frequency	Percent
Less than 10 years	70	21.06%
10 – 15 years	58	17.90%
16 – 20 years	0	0.00%
21 – 25 years	113	34.88%
Over 25 years	83	25.62%
Total	324	100.00%

Source Author, 2016

From the table 6, it was established that 21% respondents, stated that their employer had been in existence for less than 10 years while 17% respondents mentioned that their employer had existed for between 10 and 15 years. None of the sampled firms was in the 16 to 20 years bracket but 35% respondents said that their firm had been in existence for between 21 and 25 years. Finally, 26% respondents indicated that their employer had existed for over 25 years. This meant that the study reflected the effects of liberalization of the dairy industry in the 90s that led to influx of more milk firms. It also aligns with the economic slowdown of Kenya by late 90s and early 2000.

4.4.2 Ownership Structure

This study sought to establish the ownership structure of the firms. The results in the table 7 below show that 53% of the respondents were limited Liability companies, followed by 26% respondents who indicated that their employer is a government Parastatal, and finally, 22% respondents indicated that their employer is a cooperative society. An indication that private entities are dominating the dairy industry due to the incentives that it provides when markets are opened up and globalization offers new market frontiers. It is also easier to make management decisions on outsourcing in the private sector than in public and cooperative societies which have bureaucratic policies and had been mismanage.

TABLE 7
Ownership Structure

Ownership Structure	Frequency	Percent
Limited Liability Company	171	52.78%
Cooperative Society	70	21.60%
Government Parastatal	83	25.62%
Total	324	100.00%

Source Author, 2016

4.4.3 Number of Employees

In order to envisage the relative sizes of the sampled firms, the respondents were asked to choose a class in which the number of employees in their organization could fall into. The results of this query are in table 8 below.

TABLE 8
Number of Employees

Number of Employees	Frequency	Percent
Less than 50	70	21.60%
50 – 100	58	17.90%
101 – 200	0	0.00%
Over 200	196	60.49%
Total	324	100.00%

Source Author, 2016

It is evident that majority of the respondents (61%) indicated that their employers have over 200 members of staff. These were closely followed by 22% people who said that their firm employs less than 50 people. Finally, 18% respondents said that their employer has between 50 and 100 members of staff. There were no responses for the 101 - 200 class. This was interpreted to mean that the milk industry is being dominated by major players.

4.5 Outsourcing of milk collection and Value Chain Efficiency

The researcher wanted to find out the effects of outsourcing of milk collection on the efficiency of the value chain. The results of the analysis of data that was collected on this variable are as per table 9 below.

TABLE 9
Outsourcing of Milk Collection

	SD	D	U	A	SA	Mean	Std. D
Outsourcing of raw milk collection has led to timeliness in delivery.	4.8%	1.6%	11.3%	33.9%	48.4%	4.195	1.03763
By contracting out the milk cooling and quality assurance processes, spoilage and adulteration cases have reduced thereby increasing the quality of final products.	3.5%	8.1%	6.5%	41.4%	40.5%	4.073	0.8896
Outsourcing of raw milk collection has helped management to redirect its efforts on more key issues of the firm.	4.8%	3.2%	11.3%	25.9%	54.8%	4.227	1.09274
After outsourcing of milk collection, processing of farmers' payments has become timelier, thereby improving their relations with the firm.	1.6%	4.8%	12.9%	41.9%	38.8%	4.115	0.92515

Source Author, 2016

The respondents strongly felt that outsourcing of collection of raw milk had lead to timeliness in delivery: 33.9% of the respondents agreed with this statement and 48.4% strongly agreed. Only 6.4% had some level of disagreement. The mean response for this statement was 4.195. Additionally, there was consensus that outsourcing after outsourcing of milk cooling and quality assurance processes, spoilage and adulteration cases were reduced thereby increasing the quality of final products. This was evidenced by the fact that 81.9% of the respondents either agreed or strongly agreed with this statement and that the mean response was 4.073. More than half (54.8%) of the respondents strongly agreed with the opinion that outsourcing of raw milk collection had helped management to redirect its efforts on more key issues of the firm (mean = 4,227).

The benefits of outsourcing to farmers also became apparent since 41.9% of the respondents agreed and 38.8% strongly agreed that after outsourcing of milk collection, processing of farmers' payments has become timelier, thereby improving their relations with the firm. The mean response for this statement was 4.115

4.6 Outsourcing of Milk Processing and Value Chain Efficiency

This part sought to establish the relationship between outsourcing of milk processing and value chain efficiency. The respondents were asked to indicate their views on the Likert scale queries of this variable and the results were presented in the table 10 below.

TABLE 10
Outsourcing of Milk Processing

	SD	D	U	A	SA	Mean	Std. Deviation
Outsourcing milk processing reduces plant downtime. This minimizes stock outs and increases a firm's reliability in the market.	8.7%	3.2%	14.5%	43.5%	30.7%	3.861	0.80009
The technical expertise of the contractor's staff enhances our understanding of best practices in milk processing.	1.6%	11.3%	12.9%	40.3%	33.9%	3.936	1.03814
The quality of our products has increased tremendously since the time we part-outsourced milk processing.	1.6%	3.2%	24.2%	41.9%	29.1%	3.937	0.90302
Outsourcing of milk processing has eliminates costs related to production staff & fixed assets, thereby boosting profitability.	1.6%	11.3%	22.6%	37.1%	27.4%	3.774	1.03098

Source Author, 2016

Most (74.2%) of the respondents strongly alluded that outsourcing milk processing reduces plant downtime, minimizes stock outs and increases a firm's reliability in the market. The mean response for this statement was 3.861. With a mean response of 3.936, and 33.9% strong agreement, and 40.3% agreement, the respondents endorsed the notion that technical expertise of the contractor's staff enhances their own understanding of best practices in milk processing. There was strong consensus that studied firms had witnessed a tremendous increase in quality after partly outsourcing milk processing. 41.9% of the respondents agreed with this statement and 29.1% strongly agreed. Finally, the respondents were queried on the financial implications of outsourcing. There was a mean response of 3.774, 37.1% level of agreement, and 27.4% strong agreement with the statement that Outsourcing of milk processing had eliminated costs related to production staff & fixed assets, thereby boosting profitability.

4.7 Outsourcing of Distribution of Processed Milk & Milk Products and Value Chain Efficiency

This part sought to establish the respondents' views on the effect of outsourcing of the distribution of processed milk and by products of processing (e.g. cheese, ghee, butter, and cream) on their respective firms' value chain efficiency. The results were presented in the table 11 below.

TABLE 11
Outsourcing of Milk Distribution

	SD	D	U	A	SA	Mean	Std. Deviation
Outsourcing of products distribution has reduced our customers' lead times.	8.1%	4.8%	22.6%	35.5%	29.0%	3.725	1.17584
The reach of our products has widened since when we the outsourced our distribution.	5.6%	19.4%	22.6%	27.4%	25.6%	3.498	1.11014
Validation of spoilt products returns has improved after outsourcing of distribution thereby reducing fraud.	6.5%	11.3%	21.0%	33.9%	27.3%	3.642	1.1887
Outsourcing of distribution has reduced the firm's fleet acquisition and maintenance costs, thereby enabling the firm to incur capital and recurrent costs with a more strategic intent.	1.6%	17.7%	19.4%	38.7%	22.6%	3.63	1.07481

Source Author, 2016

The respondents generally felt that outsourcing of products distribution had reduced their customers' lead times. This was evidenced by a 35.5% level of agreement, 29.0% level of strong agreement, and a mean response of 3.725. The level of dissent was only 12.9%. They also endorse the notion that outsourcing of distribution had expanded the reach of their products beyond the areas that they served when they were using their own distribution fleet. 27.4% of respondents agreed and 25.6% strongly agreed with this statement. Additionally, 33.9% of the respondents agreed and 27.3% strongly agreed that outsourcing of distribution had made it easy to validate returns of spoilt milk and other products thus helping in reduction of fraud which was previously perpetuated through filing of false spoilage claims by clients, working in cahoots with the firms' drivers and loaders. The mean response to this statement was 3.642.

Finally, the respondents strongly concurred that outsourcing had reduced the firms' fleet acquisition and maintenance costs thereby helping the firms in restructuring their balance sheets through acquisition of more strategic assets. The mean response to this query was 3.63 while the levels of strong agreement and agreement were 38.7% and 22.6% respectively.

4.8 Value Chain Efficiency

Value chain efficiency was the dependent variable in this study. The researcher queried the respondents on several aspects on the efficiency of their firms' value chains. The results of this query are outlined in table 12 below.

TABLE 12
Value Chain Efficiency

	SD	D	U	A	SA	Mean	Std. Deviation
Outsourcing of milk collection has affected the efficiency of our value chain positively.	5.3%	11.6%	19.3%	31.4%	32.4%	3.74	1.09216
The efficiency of our value chain has improved after part-outsourcing of milk processing.	4.3%	14.5%	17.4%	30.9%	32.9%	3.736	1.07286
Outsourcing of distribution of finished products has impacted our value chain in a good way.	6.3%	13.0%	16.4%	35.7%	28.6%	3.673	1.09621
The combined effect of Outsourcing of milk collection, processing, and distribution of finished products is advantageous to our value chain and to our firm at large.	2.9%	24.2%	7.2%	41.5%	24.2%	3.599	0.94107

Source Author, 2016

With a mean response of 3.74, 31.4% level of agreement and 32.4% level of strong agreement, the respondents concurred that outsourcing of milk collection has affected the efficiency of our value chain positively.

They further endorsed outsourcing of milk processing with 30.9% of respondents agreeing and 32.9% strongly agreeing that the efficiency of their value chain improved after partly outsourcing their milk processing function. This statement had a mean response of 3.736. Additionally, the respondents expressed good support for the statement that outsourcing of distribution of finished products had impacted our value chain in a good way. The mean response to this query was 3.673. 35.7% of the respondents were in strong agreement with the statement while 28.6% strongly agreed with the statement. Only 19.3% of the respondent expressed some level of dissent. Finally, the researcher queried the perceived attitude toward the combined effect of outsourcing of milk collection, processing, and distribution of finished products on the value chain. The mean response to the statement “The combined effect of Outsourcing of milk collection, processing, and distribution of finished products is advantageous to our value chain and to our firm at large” was 3.599. 65.7% of the respondents either strongly agreed or disagreed with this statement while 27.1% either disagreed or strongly agreed with it.

4.9 Diagnostic Testing

Prior to the regression analysis, the data was subjected to diagnostic tests to evaluate its conformance with the underlying assumptions of regression analysis. The classic linear regression model assumes that no independent variable can be expressed as a linear combination of another independent variable (no multicollinearity), the error terms do not follow an autoregressive process (no serial correlation), the error terms have a constant variance (no heteroscedasticity), and the error terms are normally distributed with a mean of zero and a constant variance (normality of residuals).

The researcher used a correlation matrix to evaluate the collinearity of independent variables, the Durbin Watson test to test for autocorrelation, and the white test to test for heteroscedasticity and normality of residuals since heteroscedastic error terms cannot be normally distributed as they violate the requirement of constant variance.

4.9.1 Testing for Multicollinearity

Multicollinearity occurs when two or more independent variables in a dataset are highly correlated such that they can be expressed as linear combinations of each other. It reduces the robustness of regression analysis by making the model to be highly sensitive to small changes in data. In order to explore multicollinearity in the dataset, the researcher created a correlation matrix of all three independent variables to bring out the correlation coefficients between each pair of variables.

TABLE 13
Correlation Matrix

	Outsourcing of milk collection	Outsourcing of milk processing	Outsourcing of milk distribution
Outsourcing of milk collection	1		
Outsourcing of milk processing	.151**	1	
Outsourcing of milk distribution	-.280**	-.253**	1
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Author (2016)

According to Scott (2008), Pearson correlation coefficients whose absolute values exceed 0.8 indicate the existence of multicollinearity between the pertinent variables. As evident in table 13 above, all correlation coefficients had absolute values that were less than 0.8. We can safely deduce therefore that there was no multicollinearity in the dataset.

4.9.2 Testing for Serial Correlation

The Durbin Watson d-statistic test was used to test the data for serial correlation

FIGURE 2
Durbin Watson d-statistic Test for Autocorrelation

```
. estat dwatson  
  
Durbin-Watson d-statistic( 4, 324) = 1.431383
```

Source: Author (2016)

Since the d statistic was less than 2, it can be inferred that there was no serial correlation in the dataset.

4.9.3 Testing for Heteroscedasticity and Normality

Heteroscedasticity is a condition which arises when the variance of the error term is not constant. This results in estimators which are no longer BLUE (Best Linear Unbiased) estimators. A common consequence of heteroscedasticity is biased standard errors; which might further lead to making wrong inferences on data due to biased parameter estimates and p values. The white test was used to test the research data for heteroscedasticity and normality. The results of this test are shown in figure 4.2 below:

FIGURE 3

White test for Heteroscedasticity and Normality

```
. estat imtest, white

White's test for Ho: homoskedasticity
  against Ha: unrestricted heteroskedasticity

      chi2(9)      =      7.41
      Prob > chi2  =      0.5944

Cameron & Trivedi's decomposition of IM-test
```

Source	chi2	df	p
Heteroskedasticity	7.41	9	0.5944
Skewness	32.69	3	0.0000
Kurtosis	17.96	1	0.0000
Total	58.05	13	0.0000

Source: Author (2016)

The decision criterion of the white test is that the null hypothesis of constant variance should be rejected when the p value is less than 0.05. Since the p value of the test is larger than 0.05, we accept the null hypothesis and conclude that the data doesn't have heteroscedasticity. By extension, we can conclude that the error terms had a normal distribution. From the results, the null hypotheses of excess kurtosis and of skewness were also rejected (p value was 0.0000 in both cases). This further confirms the normality of error terms.

4.10 Effect of Outsourcing services on efficiency of value chain

The study employed regression analysis to establish the statistical relationship between outsourcing of milk collection (X_1), outsourcing of milk processing (X_2), and outsourcing of milk distribution (X_3) and the dependent variable, Value Chain Efficiency (Y). In interpreting the

results of multiple regression analysis, three major aspects of the results were considered. These are the coefficient of determination (R^2), the overall significance (ANOVA Test), and the significance (p values) & of the regression coefficients. These elements and the results of multiple regression analysis were presented in tables 4.10, 4.11 and 4.12.

4.10.1 Model summary of Outsourcing of Services

From the findings of the study, the regression model coefficient of determination (R^2) was 0.62172 at 0.05 significance level. This is an indication that 62.17% of variability in Value Chain Efficiency can be attributed to variability in outsourcing of milk collection, outsourcing of milk processing, and outsourcing of milk distribution. This meant that the model provided a moderately good fit.

TABLE 14
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.78849	0.62172	0.4934	0.79285
a. Predictors: (Constant), Outsourcing of milk collection, Outsourcing of milk processing, Outsourcing of milk distribution				

Source Author, 2016

4.10.2 Analysis of Variance of outsourcing of services

The study utilized a one way Analysis of Variance (ANOVA) to test the significance of the overall regression model. Since the p value is actually 0.00 which is less than 5% level of significance, we can infer that the overall regression was statistically significant. The results of this test are outlined in table 15 below.

TABLE 15**Analysis of Variance**

ANOVA ^b						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	94.571	3	31.5236667	63.0930758	.000 ^a
	Residual	159.884	320	0.4996375		
	Total	422.657	323			
a. Predictors: (Constant), Outsourcing of milk collection, Outsourcing of milk processing, Outsourcing of milk distribution						
b. Dependent Variable: Value Chain Efficiency						

Source Author, 2016

4.10.3 Coefficients of outsourcing of services

The researcher carried out a multiple regression analysis to determine the effect of the independent variables on the dependent variable. The results of the regression analysis are outlined in table 16.

TABLE 16

Coefficients of outsourcing of services

Coefficients^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.725	.274		2.650	.008
	Outsourcing of milk collection	.359	.044	.416	8.165	.000
	Outsourcing of milk processing	.181	.036	.256	5.056	.000
	Outsourcing of milk distribution	.162	.060	.140	2.682	.008

a. Dependent Variable: Value Chain Efficiency

Source: Author (2016)

The table 16 above shows that all regressors have a positive and significant influence on the dependent variable. The results show that taking all other independent variables at zero, a unit increase in outsourcing of milk collection would lead to an increase in the level of value chain efficiency by 35.9%. Further, a unit increase in outsourcing of milk processing would lead to a 18.1% increase in value chain efficiency. Finally, outsourcing of milk distribution would lead to a 16.2% increase in value chain efficiency. The constant (0.725) indicates the level of value chain efficiency in the absence of the independent variables.

The regression equation can therefore be rewritten as:

$$Y = 0.725 + 0.359 X_1 + 0.181 X_2 + 0.162X_3 \dots\dots\dots(i)$$

Where:

Y = Dependent Variable (Value Chain Efficiency)

0.75 = Constant (Level of Value Chain Efficiency when all independent variables are at zero)

0.359 = Coefficient of X₁ (change in the dependent variable due to a unit change in X₁)

X₁ = Outsourcing of milk collection

0.181 = Coefficient of X₂ (change in the dependent variable due to a unit change in X₂)

X₂ = Outsourcing of milk processing

0.162 = Coefficient of X₃ (change in the dependent variable due to a unit change in X₃)

X₃ = Outsourcing of milk distribution

4.11 Hypothesis testing

The hypotheses of this study were framed in the null as follows:

H₀₁: Outsourcing of milk collection has no significant effect on value chain efficiency of milk firms

H₀₂: Outsourcing of milk processing has no significant effect on the value chain efficiency of milk firms

H₀₃: Outsourcing of milk distribution has no significant effect on the value chain efficiency of milk firms

Going by the values and levels of significance of the regression coefficients, we reject the null hypothesis in all three cases. The conclusion therefore is that outsourcing of milk collection, milk processing, and distribution of processed milk & other milk products has a significant effect on the efficiency of milk firms' value chains.

CHAPTER FIVE CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter depicts the discussions of the data findings on effect of outsourcing on efficiency of milk firms' value chain in Kenya, while contextualizing the study with empirical literature.

5.2 Summary of Findings

This section presents a summary of the findings for each research objectives; effect of outsourcing of milk collection on the effectiveness of value chain of the small Scale dairy farmers in Kenya, effect of outsourcing of milk processing on the value chain of the small Scale dairy farmers in Kenya and effect of outsourcing of the distribution of milk on the value chain of the small Scale dairy farmers in Kenya.

5.2.1 Outsourcing of Milk Collection and Efficiency of Milk Firms' Value Chain.

The first research objective sought to determine the effect of outsourcing of milk collection on efficiency of value chain. This study established that outsourcing of milk collection had a positive effect on value chain. It was observed that a unit change in outsourcing of milk collection resulted in a 35.9% change on value chain efficiency. The respondents generally agreed that outsourcing of raw milk collection had led to timeliness in milk delivery, since the mean response was 3.08. They also expressed strongly agreement (with a mean response of 3.43) with the statement that contracting out milk cooling and quality assurance processes had reduced cases of spoilage and adulteration cases thereby increasing the quality of final products.

The respondents also expressed very strong consensus that outsourcing had helped management to redirect their efforts to more key issues of the firm (mean response was 3.61) and that under the outsourcing agreements, farmers' payments were timelier and this improved their relations with the firm.

Regression analysis showed that a unit increase in outsourcing of milk collection would improve the efficiency of milk firms' value chains by 35.9%. This is in line with Lynch (2000) who pointed out that outsourcing of inward logistics by agribusiness firms in the US States of Nebraska, Illinois, Kansas and Indiana had helped them to reduce the size of noncurrent assets in their balance sheets by as much as 20%. This, they argued, helped the study firms to streamline their value chains by avoiding attendant costs and to redirect their capital and human resources to more strategic aspects like creating market linkages and research and development.

This is consistent with a study by Lonsdale (2009) who concluded that outsourcing of milk collection would have a tremendous effect on the efficiency of dairy firms' value chains and profitability, In particular, this study found outsourcing of milk collection to reduce the duration of the production cycle by 18%, and this led to an increase in return on sales by at least 8%. Additionally, they stated that when considered on a standalone basis, the in-house inbound logistics function was a cost center with a Return of Investment (ROI) of -23% but after outsourcing, the ROI was found to improve to -15%.

5.2.2: Findings on Outsourcing of Milk processing and Efficiency of Milk Firms' Value Chains.

The study found that most of the respondents had a favorable opinion on outsourcing of milk processing and its relationship with the efficiency of dairy firms' value chains.

They either agreed or strongly agreed with the statements that were posed in this section. After regression analysis, the results opined that a unit increase in outsourcing of milk processing would lead to an increase in the efficiency of the value chain by 0.181 units.

These results were supported by several previous authors' findings from the literature. Kim (2003) conducted a study of the relationship between outsourcing of milk processing and profitability of dairy firms in South Africa. The study yielded a positive and significant link between outsourcing of processing and profitability. According to Razzaque (2008), outsourcing of the processing function by agribusiness firms helps them tap into accumulated competencies of the contracted firms, since such firms specialize in this particular aspect of the production cycle. According to Malcom (2009), the milk processing outsourcing industry is very concentrated. In this industry, over 40% of the global market share is held by Tetra Pak, a Swedish company. The study notes that Tetra Pak has accomplished this rate of success due to vertical integration of its operations and seamless operations across market. Sheffi (2000) notes that agribusiness firms that outsource their processing function eliminates a great deal of operational risk. In getting specialist firms to process their products, they are assured of conformance with regulatory requirements, quality assurance specifications, and reduction of operational costs. This increases the products' chances of success at the market place and a more efficient value chain.

5.2.3 Outsourcing of Milk distribution and Efficiency of Milk Firms' Value Chain

Pertaining to the objective of outsourcing of milk distribution, the respondents were generally in agreement that outsourcing of milk distribution indeed does have a positive impact on the efficiency of organizations' value chains.

In regression equation, a unit increase in outsourcing of milk distribution was found to lead to a 16.2% increase in value chain efficiency. Outsourcing of milk distribution results in reduction of the size of the distribution fleet and the attendant cost of maintenance by ceding the function to firms whose core business is transportation of goods and logistics management. This leaves the milk firm with a leaner balance sheet and reduced asset financing requirements. Several studies in the literature support the notion of outsourcing distribution services by agribusiness firms (which milk firms are part of).

Handley & Benton (2012) carried out a study on the effects of balance sheet realignment on the financial performance of dairy firms in New Zealand. Using a panel of 67 dairy firms and annual financial data collected over the 1991 to 2011 period, this study found a unit outsourcing of milk products distribution to increase return on assets by an average of 12%. According to Henriksen et al (2010), when dairy firms outsource the outbound logistics function and sell off their distribution fleet, they release funds held in long term assets for financing of more strategic causes such as product development and marketing.

5.3 Conclusion

This study validated the link between outsourcing of milk collection, outsourcing of milk processing, and outsourcing of milk distribution (as aspects of outsourcing) and efficiency of milk firms' value chains. All the independent variables were found to have a positive and significant relationship with efficiency of milk firms' value chains: outsourcing of milk collection was found to have the largest effect on value chain efficiency. Outsourcing of milk processing had the second largest effect on value chain efficiency while outsourcing of milk distribution had the least effect on value chain efficiency.

5.4 Recommendations

Based on the study findings, the following recommendations were made;

On outsourcing of milk collection, the study recommends that milk firms should embrace this concept since it helps to a great extent in managing the traditional constraints associated with management of the inbound logistics function. This in turn would reduce the time it takes to collect milk and to process farmer's payments. An additional benefit would be reduction of milk spoilage since milk is perishable and its freshness is time dependent.

The study also recommends that firms should be open to the idea of outsourcing of milk processing since it allows avoidance of huge capital costs that could be incurred if processing equipment were to be purchased. This lowers the barriers to entry it easier while enabling them to take advantage of the competencies of the contracted processor. Other problems, such as downtime of production due to technical hitches would also be reduced and the cumulative result would be a more efficient value chain.

Finally, the research recommends that milk firms should adopt outsourcing of the outbound logistics function of their firms since it will help them have leaner balance sheets, and ability to tap into the competencies that specialist logistics firms have acquired in the FMCG distribution market.

5.5 Recommendations for Further study

This study investigated the effect of outsourcing on value chain efficiency with a specific focus on milk firms in Kenya. The study suggests that further research to be done on the influence of outsourcing on other functions of agribusiness firms that are not part of the value chain. Future research can also delve into the effect of outsourcing on firms in other industries in manufacturing and services.

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APPENDICES

APPENDIX I: QUESTIONNAIRE

SECTION I: DEMOGRAPHIC INFORMATION

1. What is the name of your firm? _____
2. For how long has your firm been in existence?
 - Less than 10 years []
 - 10 – 15 years []
 - 16 – 20 years []
 - 21 – 25 years []
 - Over 25 years []
3. Who owns the firm?
 - Limited Liability Company []
 - Cooperative Society []
 - Government Parastatal []
4. Approximately, how many employees does the firm have?
 - Less than 50 []
 - 50 – 100 []
 - 101 – 200 []
 - Over 200 []

SECTION B: OUTSOURCING OF MILK COLLECTION

5. To what extent do you agree with the following statements with regard to outsourcing of the milk collection and its effect on the value chain on scale of 1 – 5 where 1 represents strongly disagree, 2 represents disagree, 3 represents neither agree nor disagree, 4 represents agree and 5 represents strongly agree?

	1	2	3	4	5
Outsourcing of raw milk collection has led to timeliness in delivery.					
By contracting out the milk cooling and quality assurance processes, spoilage and adulteration cases have reduced thereby increasing the quality of final products.					
Outsourcing of raw milk collection has helped management to redirect its efforts on more key issues of the firm.					
After outsourcing of milk collection, processing of farmers' payments has become timelier, thereby improving their relations with the firm.					

SECTION C: OUTSOURCING OF MILK PROCESSING

6. To what extent do you agree with the following statements with regard to outsourcing of the milk processing and its effect on the value chain on scale of 1 – 5 where 1 represents strongly disagree, 2 represents disagree, 3 represents neither agree nor disagree, 4 represents agree and 5 represents strongly agree?

	1	2	3	4	5
Outsourcing milk processing reduces plant downtime. This minimizes stock outs and increases a firm’s reliability in the market.					
The technical expertise of the contractor’s staff enhances our understanding of best practices in milk processing.					
The quality of our products has increased tremendously since the time we part-outsourced milk processing.					
Outsourcing of milk processing eliminates costs related to production staff & fixed assets, thereby boosting profitability.					

SECTION D: OUTSOURCING ON MILK DISTRIBUTION

7. To what extent do you agree with the following statements with regard to outsourcing of the milk distribution and its effect on the value chain on scale of 1 – 5 where 1 represents strongly disagree, 2 represents disagree, 3 represents neither agree nor disagree, 4 represents agree and 5 represents strongly agree?

	1	2	3	4	5
Outsourcing of products distribution has reduced our customers’ lead times.					
The reach of our products has widened since when we the outsourced our distribution.					
Validation of spoilt products returns has improved after outsourcing of distribution thereby reducing fraud.					
Outsourcing of distribution has reduced the firm’s fleet acquisition and maintenance costs, thereby enabling the firm to incur capital and recurrent costs with a more strategic intent.					

SECTION E: OUTSOURCING AND THE VALUE CHAIN

8. To what extent do you agree with the following statements with regard to the value chain of dairy products on scale of 1 – 5 where 1 represents strongly disagree, 2 represents disagree, 3 represents neither agree nor disagree, 4 represents agree and 5 represents strongly agree?

	1	2	3	4	5
Outsourcing of milk collection has affected the efficiency of our value chain positively.					
The efficiency of our value chain has improved after part-outsourcing of milk processing.					
Outsourcing of distribution of finished products has impacted our value chain in a good way.					
The combined effect of Outsourcing of milk collection, processing, and distribution of finished products is advantageous to our value chain and to our firm at large.					

~ THE END ~