LEAGILE MANUFACTURING PRACTICES AND SUPPLY CHAIN PERFORMANCE OF FOOD AND BEVERAGE MANUFACTURING COMPANIES IN KENYA

BY

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DECLARATION

This research project is my original work and to the best of my knowledge has not been presented for the award of a degree in any other university.

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This research project has been submitted for the award of degree of master of business administration with my approval as the University Supervisor.

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DEDICATION

This work is dedicated to my beloved family members and wish them the blessings of God.

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ABBREVIATIONS AND ACRONYMS

ANOVA:	Analysis of Variance
DV:	Dependent Variable
FBMCs:	Food and Beverage Manufacturing Companies
GDP:	Gross Domestic Product
IV:	Independent Variable
KAM:	Kenya Association of Manufacturers
NSE:	Nairobi Securities Exchange
SCP:	Supply Chain Performance
SPSS:	Statistical product for social scientists
TOC:	Theory of Constraints
VIF:	Variance Inflation Factor

ABSTRACT

Leagile manufacturing focuses on minimizing the inventories to a lower level as possible and improve supply chain performance through quick response to variations of the client's demand and successful ways of reducing cost. The study aimed at establishing the effect of leagile manufacturing practices on supply chain performance of food and beverage manufacturing sector in Kenya. Descriptive cross-sectional survey design was used. This study targeted all firms that manufacture food and beverages in Kenya. The sample size comprised of twenty (20) companies in Mombasa and sixty-four (64) companies from Nairobi. Where primary data gathered. The data collected was taken through a cleaning, validation, and editing process to assert that they are accurate, uniform, consistent and complete. SPSS was then be used to generate inferential and descriptive statistics. It was observed that the firms implemented leagile manufacturing practices including continuous improvement, waste management, supply chain information sharing and postponement practices to a greater extent (M=4.58, SD=.298), (M=4.50, SD=.220), (M=4.45, SD=.381) and (M=4.48, SD=.339) respectively. The study also found out that 23.4% of variations in supply chain performance is explained by variations in continuous improvement, waste management, supply chain information and postponement. It was also established that there is a significant relationship between leagile manufacturing practices and supply chain performance at 0.043 ($p<0.05$). Based on the research objectives, the study concluded that leagile manufacturing practices affect supply chain performance of the food and beverage manufacturing companies in Kenya. Based on the findings, the study recommends that managers of FBMCs should find mechanisms of improving the adoption and implementation of the leagile manufacturing practices since they have a significant effect on supply chain performance. The study also recommend that management in FBMCs should exploit supply chain management indicators to help remain competitive in the market that will translate to attaining a superior firm performance.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Companies in recent times faced increased challenges with regard to having products and services reach the expected destination when required at acceptable price. This has forced companies to focus on the entire supply chain instead of improving internal efficiencies to achieve and sustain superior positions within the industry (Li, Ragu-Nathan, Ragu-Nathan & Rao, 2006). Leagile manufacturing means operational aspects about manufacturing firms that seeks to be capable of producing personalized goods at wholesale production rates and with effective lead times (Al Samman, 2014). In a manufacturing process, agile implies fast thinking leading to high levels of flexibility and dynamism of organizational operations while leanness involves the elimination of waste (Miah, Roy, Saha, Parvez, Alom & Dhar, 2013).

The study was anchored on theory of constraints, stakeholder theory, resource based view (RBV) and resource dependency theory. According to the theory of constraints, the interconnectedness of components working together helps in transforming input resources to output effects according to the goals of the system (Rudnicki, 2011). Stakeholder theory emphasizes on legitimacy and validity stakeholders' interests. The argument is that when the interest of all stakeholders are adequately integrated, supply chain performance improves (Freeman, 1984). Resource based view on the other posit that firms should position themselves and their resources in the market for competitive advantage (Crook, Ketchen, Combs & Todd, 2008). Finally, Ulrich and Barney (1984) assert that resource dependency theory implies achievement of high performance and competitive advantage through depending and collaborating with others.

The economy of Kenya largely depends on the activities of manufacturing companies to drive the economy to the next level of performance towards achievement of industrialization. Accordingly, the manufacturing sector is among the pillars that the nation looks up to in realizing vision 2030 which ensures that the country is placed among the middle level income countries ahead of the year 2030. The companies that manufacture food and beverages occupy large percentage of the manufacturing sector and forms nearly 22% of Kenya Association of Manufacturers (KAM) membership (KAM, 2019). The firms that manufacture food and beverages experiences a number of obstacles that requires the need to realign their operations and be more efficient and sustainable. The main issues include the green revolution whereby contemporary consumers demand business operations that are environment friendly while retailers continue to push the business practices to ensure reduced costs and increased product availability (Li et al, 2006). Leagile manufacturing practices would help the companies to respond to constant changing demands while providing a level schedule upstream from market place.

1.1.1 Leagile Manufacturing Practices

The concept of leagile is a composite of lean and agile system. Lean focuses on the identification of the worth in particular products, singles out the value stream of the identified product, enhances the flow of value, enables clients draw value from the manufacturers, and seeks for excellence. The agile aspect on the other hand focuses on achievement of flexibility and efficiency in responding to unique customer demand (Ramana, Kumar & Rao, 2013). Leagile involves engaging the lean and agile paradigms to identify and establish effective flow of materials so that businesses can respond to constant changing demands (Naylor, Naim and Berry, 1999). Mason-Jones, Naylor and

Towill (2000) defines leagility as involving leanness and agility in the manufacturing supply chains.

The study by Al Samman (2014) posit that leagile manufacturing practices include continuous improvement, waste management, supply chain information sharing and postponement. Continuous improvement is achieved through lean engineering and 6 sigma initiatives. Chandra and Grabis (2007) posit that lean organizations put efforts to eliminate waste and non-value activities by means of reengineering key business processes. Regarding supply chain information sharing, Kembro, Naslund and Olhager (2017) assert that the extent and the nature of information shared as well as the stakeholders to whom the information is shared improves supply chain integration and performance. Rahimnia and Moghadasian (2010) posit that to postpone means to delay operational activities to the point where clients' orders are obtained instead of accomplishing operations before hand and looking up to requisition by clients. The leagile manufacturing practices of continuous improvement, waste management, supply chain information sharing and postponement are considered relevant for this study since they fit within the sectoral practices of food and beverage manufacturing companies.

1.1.2 Supply Chain Performance

Banihashemi (2011) assert that supply chain comprises of people charged with the duty of meeting the clients' requests directly or indirectly. The implication is that there is a link ranging from producers and suppliers that extends to those involved in transport, warehousing retailers, and the clients included. Generally, the supply chain activities include all activities comprising of obtaining and satisfying clients requests such as coming up with new products, creating customer awareness of the products and the care and promotional services to clients. In supply chain performance, an estimation is

undertaken to establish the extent of customer satisfaction through integration of activities that helps to meet time and place utility in addition to appropriate price and quantities (Genovese, Acquaye, Figueroa & Koh, 2017).

The concept of supply network extends to necessary materials, constituents, subsystems and final products, and the transfer following available channels towards the end users of products and services. It is an extension of supply chain's operations in realizing the final needs of the customer including making the product available on a timely basis without any compromise on quality (Neely, Gregory & Platts, 2005). There are many supply chain catalysts that have led to its popularity among stakeholders. These comprise of worldwide sourcing and paying special attention to duration and standard on the basis of competition and their individual contributions to the risks presented in the business world (Tarofder, Marthandan & Haque, 2010). The emphasis is that the clients' specifications should be met with efficiency operationally.

According to Blecken and Hellingrath (2008), a framework should exist to help in the assessment on how effective and efficient the structures of the company are, their operations and general well-being. According to Ganga and Carpinetti (2011), reliability, responsiveness, flexibility and cost effectiveness indicates improved supply chain performance. This can be achieved when effective plans exist in place for reliable procurement of needed materials and the accounting process. The study by El Sayed (2013) established that supply chain performance indicators include unsystematic Under/Over forecasting, synchronization between functions on lead times and freeze points, better capacity planning, reduced inventory levels, stable production rates, high level of customer service, shorten customer lead times, transparent organization and improved profitability. The current study focuses on better capacity planning, reduced

inventory levels, shorter lead time and system reliability. The achievement of better capacity planning is indicated by collaboration with suppliers and customers, the use of advanced production planning systems and existence of entreprise resource planning system (Gunasekaran, Patel & Tirtiroglu, 2001) while the achievement of reduced inventory levels is indicated by the use of vendor-managed inventory, collaboration with suppliers and the use of quick response codes to manage inventory (Lee, 2002). Harland, Telgen, Knight, Callendar and Thai (2009) posit that the indicators of shorter lead time include the use of domestic suppliers, consolidation of suppliers and increased collaboration. Finally, system reliability means the use of internal crosss functional teams, product life cycle management and collaboration with suppliers and customers (Taghizadeh & Hafezi, 2012).

1.1.3 Leagile Manufacturing and Supply Chain Performance

Manufacturing firms strive to come up with a strategy which is operationally efficient and fulfills customer preferences amidst knowledge of constraints in the market (Chan, Kumar & Tiwari, 2009). Lean and agile systems complement each other such that leanness regards maximizing on the little available resources whereas agility means that operations are sensitive to changes in the industry with processes being adequately integrated. Bruce, Daly and Towers (2004) posit that the logistics network built on leagility helps to position the point of disconnect closer to the final users of the goods rather than the suppliers in order to minimize average time it takes to fulfill an order of a customer. Equally, it helps to create certainty and make the entire process flexible even as the company ensure that the final product is made according to customers' specification.

Kant, Pandey and Pattanaik (2015) stated that leagile makes use of leanness by excluding non-productive time and agility through lowering the value-added time by means of advanced production technology. This makes the supply network to be efficient and the company to remain productive. In another study, Kumar, Garg and Agarwal (2019) established that the combined approach of lean and agile inventory attributes helps to effectively reduce total cost and improve the service level. This has resulted in increases in information, level of integration, reduced production time and transportation as well as inventory level.

1.1.4 Food and Beverage Manufacturing Sector in Kenya

Manufacturing sub-sectors has various participant that function countrywide ranging from small, medium to large businesses with a number of them being informal (KAM, 2018). In addition, the major categories of firms under this sub-sector belong to individual citizens rather than the state. The contribution of approximately 3.5% of the GDP in 2017 by the sector was in form of exported products with the value being Ksh 254,686 million. The sector is therefore key as it is perceived that it's growth can pave way to tremendous improvement to the entire economy (KAM, 2018)

To realize this growth, leagile patterns applied in logistics network have led to a shift in focus by several manufacturing firms today especially those aiming at improving on their productivity (Banihashemi, 2011). An increment or a reduction in the supply of these outputs would hence have positive effects for the sector. FBMCs also face the challenges of increased use of being environmentally compliant by adopting green practices and this puts pressure on the companies. This is coupled with the retailers continued push on the business practices to ensure reduced costs and increased product availability (Smith & Perks, 2010). Leagile manufacturing practices would help the companies to respond to

constant changing demands while providing a level schedule upstream from market place.

1.2 Research Problem

Leagile is a hybrid term for lean and agile. Leanness focuses on making use of limited resources for greater achievements while agility focuses on process integration and sensitivity to market dynamics. Saha (2018) posit that leagile manufacturing concept has a big obligation in defining whether firms will be financially successful or not. It focuses on minimizing the inventories to a lower level as possible. Leagile manufacturing equally improve supply chain performance through quick response to variations of the client's demand and successful ways of reducing cost (Olhager, 2010). The implication therefore is that leagile manufacturing gives a firm a competitive advantage and helps to sustain operations in a rapidly changing business environment through enhanced supply chain performance. Generally, the focus is for the companies to remain competitive and achieve sustainable operations.

In the manufacturing process, the amount of waste affects the profits and prolonged success of firms. There is equally increased scope of challenges arising from competition and inadequate inputs. Manufacturing firms must therefore focus on the entire supply chain instead of improving internal efficiencies to achieve and remain competitive (Kariithi & Kihara, 2017). Generally, these companies experience the growing consumer demand for environmentally sound business practices while retailers continue to push the business practices to ensure reduced costs and increased product availability. Leagile manufacturing practices would help the companies to ensure that growth in this sector is achieved due to its robustness. The firms in this sector are faced by lack of sustainable energy, poor management of solid and liquid wastes, use of obsolete technologies and

skills and inadequate compliance with environmental regulations (KAM, 2018). Leagile manufacturing practices would help in addressing these challenges.

Regarding the concept of leagile manufacturing practices, many relevant research has been conducted. Paul and Eleni (2015) revealed that leagile concept can be used to radically shift the economics of scales of production such as lower volume production, postponement and mass customizations. The study by Izunildo (2012) identified that LARG (lean, agile, resilience and green) practices do not make supply networks competitive. Banihashemi (2011) established that leagile logistics network effectively enhance achievement in unstable market. Monsur and Yoshi (2018) also found out that leagile system positively influences industrial up-gradation. Locally, a study by Okello and Were (2014) established that the activities of developing products, managing inventory, being innovative and sensitivity towards reliability in order delivery significantly affect how listed food processing firms in Kenya perform. Based on the aforementioned studies, a contextual gap exists because the Kenyan manufacturing industry has experienced a number of growth-related challenges. The current study therefore aims to answer the question "what is the effect of leagile manufacturing practices on supply chain performance of food and beverage manufacturing sector in Kenya?"

1.3 Research Objectives

The general objective was to establish the effect of leagile manufacturing practices on supply chain performance of food and beverage manufacturing sector in Kenya. The specific objectives were:

i. To determine the extent to which leagile manufacturing practices have been adopted by the food and beverage manufacturing companies in Kenya.

ii. To establish the relationship between leagile manufacturing practices and supply chain performance of food and beverage manufacturing companies in Kenya.

1.4 Value of the Study

These outcome add value with respect to practice, theory and policy formulation. In practice, the outcome of this study would enable company administrators, academicians and those in management practice to come up with lean and agile operational practices that can add value to companies and the field of operational management. Specifically, it will enable managers of different manufacturing companies to understand how adoption of lean and agile operations would improve strategic decisions. the research outcome would also help to advice on the implementation of effective and efficient supply chains that will enhance cost savings and respond to the unpredictable demands of unstable environments.

Regarding theory, researchers and scholars alike can use these findings to pave way for more study especially in the emerging areas of lean and agile systems. The research outcome would also give managers of supply networks a basis to design more responsive supply chains. It will therefore provide more insight to cover up the informational needs especially the need for leagile operations and operational efficiency. The findings of the research form a good basis for academicians in empirical analysis for further research.

The research would help formulate regulations regarding logistics as well as management of supply networks. Specifically, this would help in approaching the Government and other stakeholders to formulate policies with respect to physical and communication infrastructure which can enhance leagile supply chain activities. The

government will get to benefit in this study by requiring its relevant agencies to oversee the use of such systems to help in achieving the vision 2030.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This part reviews the similar works regarding leagile operations and performance of supply networks. It also includes an analysis of theories on the proposed relationship. It also recarps the discrepancies in knowledge and finally, the conceptual framework showing a thematic relationship between the variables.

2.2 Theoretical Foundation of the Study

This study found its basis in four theories namely; Theory of constraints, Stakeholder theory, RBV and Resource dependence theory.

2.2.1 Theory of Constraints

This was put forth by Eliyahu Goldratt in the 1970's is a method for singling out the very obstacles or constraints hindering the achievement of objectives by procedurally working on the challenge until it is transformed into a positive element (Goldratt, 1990). It follows scientific procedures in advancement and assumes that every complex system consists of multiple linked activities, one of which is a constraint to the whole system. To aid in achievement of system goals the theory of constraints provides a methodology for identifying and removing obstacles, systems for assessing and coming up with solutions to challenges and a way of estimating performance and directing decisions undertaken by executives (Goldratt,1990).

This theory treats logistics network as a system of interconnected components working together in transforming input resources to output according to the goals of the system. It provides useful tools which can be easily applied to supply chains to make them more effective (Rudnicki, 2011). Lean supports capitalizing on available resources, which is

the underlying concept of exploiting constraints such as time, capacity and inventory. Leagile tools can be applied to the greatest advantage in organizations to eliminate waste, reduce costs shorten lead times, increase capacity, improve flexibility and responsiveness. This definitely will improve organizational performance by ensuring optimum utilization of resources, time and expenditure targets. Theory of constraints (TOC) emphasizes on enhancing throughput through singling out obstacles on production. Gupta and Boyd (2008) posit that TOC does not address medium-term capacity issues directly. It recognizes that some non-critical machines or production facilities will not be used to capacity.

2.2.2 Stakeholders Theory

The theory was propounded by (Freeman, 1984). Underlying it is the basis of existence of a business which is to accomplish it duties to all stakeholdres. A stakeholder is any person or persons that have influence on successful attainment of company goals (Freeman, 1984). Stakeholder theory elucidate that firms give rise to externalities which have impacts on persons from within and outside it. In light of this, stakeholders are forced to put more tension on firms to improve on the desirable contributions while at the same time reducing the negative ones (Mitchell, Agle & Wood, 1997). The main shareholders always assess the short- and long-term risks and favorable situations originating from the business circumstances hence the need for firms to give a good reason for their operations. Many stakeholders require firms to be accountable for their actions especially those that affect operational efficiency and subsequently survival.

The requirement is that companies must design the right supply chain that meets and exceeds stakeholder's expectations. The genuine and valid stakeholders' needs should be recognized and their ability to define the course of action of others mapped in order to

assess their likely impact on the supply chain can be better comprehended. This improves organizational performance. Soltana and Mostafa (2015) posit that subjective measures of supply chain performance use stakeholders' opinions and personal judgment. Using this theory, stakeholders need to be appropriately integrated through effective communication platform. This would help acquire feedback on market changes and trends for quality and reliability sustainability.

2.2.3 Resource-Based View

It was introduced by Barney (1991) to cater for the shortcomings of environmental models of competitive advantage. The theory posit that companies that identify and posses unique internal capabilities tend to remain superior in competition and relaize improoved performance levels overtime. The basis is that with unique resources, a company becomes superior in terms of competition (Crook, Ketchen, Combs & Todd, 2008). This advantage becomes tangibble if the resources and capabilities are of value, special and unmatched leading to sustainable competitive advantage. Based on the theory, companies try to to ensure value maximization by executing activities using the special and unmatched resources and capabilities (Sirmon, Hitt & Ireland, 2007).

In applying the theory, ability to effectively manage supply networks can be considered a vital resource as it enables the procurement of strategic resources and involves processes such as linkages which can enable a company to experience better operational achievement and sustainable competitive ability. Supply chain linkages can also become a method of acquiring new resources and capabilities, and even knowledge sharing or cooperative product development (Carter, Kosmol & Kaufmann, 2017). The argument is that enterprise resources carefully managed have the capacity to give the company an

upper hand, ultimately leading to excellent supply chain performance (Miller & Ross, 2003). These resources are human, physical, organizational, financial and intangible.

2.2.4 Resource Dependence Theory

The was propounded by Pfeffer & Salancik (1978). It emphasizes on the need for firms to be dependent on any production or service process and work together to achieve long-term performance gains. Companies depend on a strong market network that enables them to access capabilities that they need for sustainable performance (Pfeffer & Salancik, 1978). The theory states that effective supply chain performance is realized when companies improve and ensure quality dependance on other resourceful entities and individuals. Companies in most cases rely on a properly constituted board as a mechanism of accessing reliable resources and capabilities (Heide, 1994).

Companies that do not have enough assets can only relaize sustainable operations when they create strong links and partnerships with other like-minded market players through strategic partnerships. These partners can include end users of the products as well as those that supply inputs for the company (Carter & Rogers, 2008). The emphasis is to make operational activities more predictable and improve the general performance of the company. In some cases, when companies practice the act of sharing resources, it may help achieve environmental objectives and sustainable operations (Zhu, Sarkis & Lai, 2008).

2.3 Components of Leagile Manufacturing

Leagile manufacturing helps industries to remove all different types of wastes and at the same time concurrently meet the changing needs of customers (Kumar, Garg & Agarwal, 2019). This further facilitates the achievement of better customer satisfaction and

possibly competitive advantage. Leagile manufacturing practices include continuous improvement, waste management, supply chain information sharing and postponement (Al Samman, 2014).

2.3.1 Continuous Improvement

Jørgensen, Boer, and Gertsen (2003) stated that continuous improvement involves planning and organizing mechanisms that can sustain the adoption and application of new approaches and enhancing existing ones to improve business performance. Chen, Li and Shady (2010) on the other hand, state that it is the continuous identification and disposal of waste and a series of small, strategic improvements. As a result, companies involved in continuous improvement are active and constantly seek and solve problems. To achieve the goals of continuous improvement, the organization must be committed to learning. Sanchez and Blanco (2013) therefore stated that in order for improvements to be continuous at the organizational level, improvement efforts cannot be independent.

Continuous improvement enables organizational learning, which enables companies to reinvent themselves. Its focus is on improvement initiatives in relation to organizational goal achievement suitable to the external environment (Green, 2006). Continuous improvement can be considered both intentional when it is motivated by the need to achieve certain goals, objectives, or strategies; or emergent and more inductive, as emphasized in minor circuits and data driven initiatives (Köksa, Batmaz & Testik, 2011). The rationale is that the need to focus on business process improvement is at the core of today's business, as access to capital has diminished while responding to wordwide financial problems, accelerating market dictates the need for companies to continually adapt, and globalization calls for increased productivity to sustain wealth creation (Lee, Swink & Pandejpong, 2011).

2.3.2 Waste Management

The focus of insensitivity can be seen in the removal of waste (Licker, 2004). The emphasis is on eliminating all types of waste and non-value additional activities. Philips and Nystuen (2002) stated that there are seven types of waste that need to be removed, including overproduction, transport waste, improper handling, waste of waiting time, stock waste, unnecessary movements and product defects.

According to Chandran and Grabis (2007), lean organizations seek to eliminate waste and worthless activities through key business processes. Lean operations are pulled instead of demand according to a forecast production schedule, resulting in increased product customization and customer choice. Waste disposal practices generally stimulate and enhance organizational decision-making (Lyons, Vidamour, Jain & Sutherland, 2013). Specific waste management practices include the use of six sigma and quality systems to prevent failures, as well as more tactical actions such as reducing process structure and implementing visual control (Haque & James-Moore, 2004).

2.3.3 Supply Chain Information Sharing

This involves the exchange of information which significantly help to co-ordinate the activities in the supply network. This is because it helps to reduce inventory levels leading to efficient production operations (Kembro, Naslund & Olhager, 2017). The emphasis is tthat knowledge and information is a strategic resource that when put to good use, would give a company competive advantage. It helps to create strategic partnerships that not only add value but create sustainable operations. When informmation about the supply network is shared with the right persons, it would help to timely address the needs of end users as well as remain in constant touch with the suppliers for needed input.

According to Lee and Whang (2000) knowledge is the basis upon which supply chain controls are made. The argument is that organization must strategically diffuse and acquire information with respect to relevant stakeholders at different levels of the supply chain (Fawcett, Wallin, Allred & Magnan, 2009). The information exchange between organizations therefore helps to know the different roles those organizations play and their significance in the supply network (Yigit-basioglu, 2010). Both the senior and middle level management uses timely information to help in efficient application of policies regarding end user requirements facilitation (Mentzer, 2004).

2.3.4 Postponement

It refers to delays in logistics operations awaiting receipt of orders of customers to customize them instead of anticipating future orders. The emphasis is that producing goods as per customer demand makes the goods more specific and reduces unnecessary inventory (Ernst & Kamrad, 2000). Florian and Brad (2015) provides a general framework for achieving a hybrid system that benefits all stakeholders without associated costs. They argue that deferral means carrying out activities as late as possible, either within the organization or within the supply chain, which is ultimately an expanded organization. The transition allows for economies of scale, risk reduction and responsiveness (Constangioara, 2008).

Postponement is implemented through the planning of different supply chains. This helps to achieve low volatility, high volumes and thus high efficiency upwards. Downwards, there is high sensitivity to the market and high responsiveness (Lu, 2011). The postponement argument is that companies can postpone distribution, packaging, assembly, production or even purchase until they receive accurate customer orders. Mikkola (2007) argues that companies tend to implement deferrals to increase both

efficiency and responsiveness at the operational level. The reason for postponement is to increase security of supply, improve delivery speed, improve inventory cycle time, reduce logistics costs, reduce the risk of obsolescence, and improve product customization.

2.4 Empirical Review

There are several research work done on leagile manufacturing and supply chain performance. Monsur and Yoshi (2012) studied the impact of leagile manufacturing system on the industrial rise of the garment industry in Bangladesh. The study used a descriptive model. They conducted a survey of 180 Bangladeshi apparel companies and used structural equation modeling. The study concluded that, while not all features of a sensitive system will unilaterally affect industrial growth, a leagile system would positively affect the industrial performance. The gap is that this study focused on industrial improvement as a dependent concept, focusing on the situation of the garment industry in Bangladesh. This study focuses on food and beverage manufacturers in the situation in Kenya.

Aravind, Jayakrishna and Vimal (2018) focused on the effects of agility and leanness on supply network performance. It was based on a criteria to assess the performance of suuply chain. The study laid emphasis on the need to adopt leagile systems based on the findings to achieve higher performance. The gap to be addressed here is contextual since the research was conducted in Japan. The study also used models and networks to relate and evaluate the variables. The current study focused on survey results through the use of a questionnaire with a contextual target of FBMCs in Kenya.

Paul and Eleni (2015) conducted a study on lean sustainable system and overproduction in automotive business and business manufacturing models by considering the case of Morgan Motor Company. The study adopted a qualitative approach. The literature of leagile concept established the fact that leagility of an assembly line would help the vehicle assembly companies to avoid execess production and encourage sustainability and proper use of resources. The research is limited by focusing on motor vehicle company with an emphasis on the concept of lean and not leagile.

Locally, Okello and Were (2014) conducted a study focusing on how the activities in the supply network influence the achievement of food manufacturing companies in Nairobi Kenya. Ninety (90) junior staff members were sampled randomly and the information gathered was analyzed qquantitatively and qualitatively. Regression analysis was employed. The research concluded that supply chain practices improves achievement of company objectives. These practices include developing products and processes, managing inventory and innovation performance. The research however presents a conceptual and contextual gap. The focus was in Nairobi County while conceptual emphasis was supply chain practices and not leagile practices.

In another study, Mogaka and Odari (2018) established how supply network affect achievement of performance objectives of SMEs. The research adopted a descriptive design. The study sampled 130 respondents. The study concluded that supply network improves organizational achievement. There is a gap since the study focused only on Isinya Feeds Limited. Conceptiually, the study made emphasis on supply network unlike the current study' focus on the hybrid leagile operations.

2.5 Summary and Knowledge Gap

The reviewed literature indicates that the variables under study have been used in various other studies. Despite the usage of the same variables, conceptual and contextual gaps still exist that the current study intends to address. Conceptually, the variables relate differently in the different studies while contextual gap explains the different study areas. Some studies are done in Kenya while others are in other countries. At the same time, studies done within Kenya varies depending on the sector or company under study. The analysis is given in the Table 2.1.

Table 2.1: Summary of the Knowledge Gaps

Study by	Study Focus	Methodology	Study Results	Knowledge Gap	The Current Study Focus
Monsur and Yoshi (2012)	Leagile manufacturing system and industrial up-gradation	Descriptive survey was used. The study surveyed 180 apparel firms The study used structural equation modeling	Leagile positively influence industrial up-gradation.	The study focused on Bangladesh. The sector of focus was apparels.	Kenyan Context Food and beverage sector.
Aravind, Jayakrishna and Vimal (2018)	Lean, agile and leagile in the supply chain strategy	The study used analytical network process to compute supply chain performance weight index for three paradigms. It also used a multi-grade fuzzy approach	Leagile was found to be the best supply chain strategy. Adoption of leagile system improves supply chain performance.	The study was conducted in Japan. The study used models and networks to relate and evaluate the variables.	This study focused on survey results through the use of a questionnaire. The focus will be FBMCs.
Paul and Eleni (2015)	Lean sustainable system and overproduction	The study adopted a qualitative approach	The use of lean suitable system leads to overproduction.	It focused on motor vehicle company. The study emphasized on the concept of lean and not leagile.	The study focused on the hybrid concept of leagile system.

Study by	Study Focus	Methodology	Study Results	Knowledge Gap	The Current Study Focus
Okello and Were (2014)	Supply chain practices and performance	The study employed a descriptive survey research design. Simple random sampling procedure was used.	Supply chain network activities significantly affect performance of SMEs.	The focus was on FBMCs in Nairobi Kenya. The concept of focus was supply chain practices.	The concept of focus was hybrid leagile.
Mogaka and Odari (2018)	Supply chain operations and performance	The study adopted a descriptive study design.	Logistics operations improves pefomanance of firms in a positive and significant way.	There is contextual gap. The study focused Isinya Feeds Limited. It focused on the concept of supply chain operations.	Focus was FBMCs The concepts of study leagile practices and supply chain performance.

Source: Researcher (2019)

2.6 Conceptual Framework

This model conceptualizes how leagile manufacturing practices relate with supply chain performance. Leagile manufacturing practices represents the IV while supply chain performance will be the DV. The framework proposes that the use of leagile manufacturing practices influences supply chain performance. The framework indicates that leagile manufacturing practices is influenced by continuous improvement, waste management, sharing of logistics intelligence and postponement. The framework is as given in Figure 2.1 as follows:

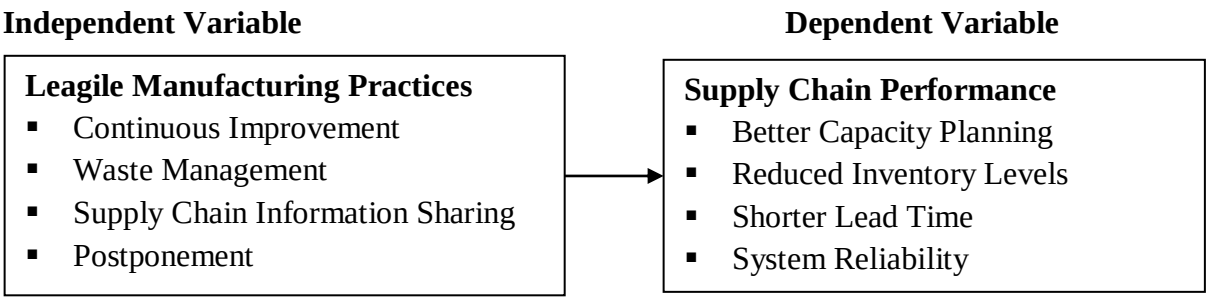

Figure 2.1: Conceptual Framework

Source: Researcher (2019)

From Figure 2.1, it is evident that leagile manufacturing practices are hypothesized to affect the SCP of the FBMCs.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The section gives an overwiew of the approach adopted in this the research. It particularly explains the design, targeted participants, sample technique and an outline of how the data that was collected, how the concepts was operationalized and analyzed.

3.2 Research Design

The study used descriptive cross-sectional survey design. The appropriateness of this approach is because it aims at assessing the link between variables and data was drawn from many firms at a specific time. A descriptive survey involves gathering of data so as to verify the hypothesized relationship and to generate solutions to research questions relevant to the present status of the phenomena under study (Mugenda & Mugenda, 2003).

Through cross sectional studies it was possible to assess the existence of significant associations among constructs at a specific period (Cooper & Schindler, 2006). Particularly it aided in assessing how leagility in manufacturing activities influences the achievement of supply network activities. The design enabled the researchers to analyze, interpret and report findings as they existed without any manipulation and hence the generalization of the research outcomes (Sekaran, 2006).

3.3 Population of the Study

This study targeted all firms that manufacture food and beverages in Kenya. There are one hundred and thirty-five (135) FBMCs according to Kenya Association of Manufacturers directory (KAM, 2019).

3.4 Sample and Sampling Technique

The study adopted stratified random sampling. This sample design is to achieve representativeness and to enhance inference of the results. Using this technique, the researcher divides the companies into regions, each region forming a stratum. Accordingly, a random sample was used for selection as per the stratum. The formular below was hence used (Brown, 2007).

$$n = \frac{N}{1 + N(e)^2}$$

Where n = sample size

N = population size.

E = the level of precision.

The accepted P value on the basis of this formula is P = 0.05. This gave a sample size of eighty four (84) companies. The study then focuses on companies in Mombasa and Nairobi County because of their concentration in the two regions. The specific sample size comprised of twenty (20) companies in Mombasa and sixty four (64) companies from Nairobi.

3.4 Data Collection

Primary data was obtainined using a semi structured questionnaire. It comprised of three parts. Part A of the questionnaire contained data on the organization; section B covered issues of leagile manufacturing practices and section C sought data on supply chain performance. The questionnaire was administered by the researcher through dropping them in respective companies and picking them later. An introductory letter from the university was used as part of enhancing acceptance by the organization while providing an explanation on the need to carry out the study.

The respondent was informed of the need to participate in the intended study and the objectives to be achieved. A follow up was done after issuing the questionnaires through the use of messages, phone calls and making visits to increase response rate. The participation in the study was out of personal choice. The data was collected from one representative of the management team preferably the operations manager. The operations manager was included as participant in the study because of his/her knowledge of the company's use of leagile manufacturing practices given his/her position in the firm. The total number of respondents was eighty-four (84).

3.5 Operationalization of Study Variables

This process helps to reduce the abstractness of the variables under study into observable and measurable characteristics and to facilitate the determination of any relationship among them. The variables for this study included leagile manufacturing practices that represented predictor variable and supply chain performance representing predicted variable. The constructs were operationalized as can be observed on Table 3.1.

Table 3.1: Operationalization of Study Variables

Variable	Sub Variables	Indicators	Source
Independent variable **Leagile Manufacturing Practices**	Continuous Improvement	▪ Feedback loop exists. ▪ Quality circle being used. ▪ Production start checklist. ▪ Quality checklist exist in each production line.	Chen, Li and Shady (2010)
	Waste Management	▪ Recycling of waste. ▪ Inspection of quality from the start. ▪ Keeping optimal inventory level. ▪ Waste reduced at source.	Haque and James-Moore (2004)
	Supply Chain Information Sharing	▪ Supplier involvement at every critical stage. ▪ Data and information sharing. ▪ Integrated information platform connecting all suppliers. ▪ New technology on information sharing.	Fawcett, Wallin, Allred and Magnan (2009)
	Postponement	▪ Customer request analysis before manufacturing. ▪ Reduced order lead time. ▪ Production scheduling done. ▪ Demand projections for product groups.	Mikkola (2007)
Supply Chain Performance **Dependent Variable**	Better Capacity Planning	▪ There is collaboration with suppliers and customers. ▪ There are advanced production planning systems ▪ There is entreprise resource planning system.	Gunasekaran, Patel and Tirtiroglu (2001)
	Reduced Inventory Levels	▪ The use of vendor-managed inventory for effectiveness. ▪ Collaboration with suppliers and customers for smooth inventory flow. ▪ Existence of Quick Response codes to manage inventory.	Lee (2002)
	Shorter Lead Time	▪ Emphasis on domestic suppliers. ▪ Consolidation of suppliers. ▪ Collaboration and communication system with suppliers exist.	Harland, Telgen, Knight, Callendar and Thai (2009)
	System Reliability	▪ Existence of internal cross functional teams. ▪ Plans exist for effective product life cycle management. ▪ Collaboration with customers and suppiers.	Taghizadeh and Hafezi (2012)

Source: Researcher (2019)

3.6 Diagnostic Tests

Normality was tested using the Shapiro-wilk Test with accepted value being above 0.05. Multicollinearity was assessed using VIF. Values of 10 is recommended as the maximum acceptable value. To test for heteroscedasticity, this study used the Koenker test with accepted value being above 0.05. Autocorrelation was tested using Durbin-Watson test which was used to ascertain whether the adjacent residuals are correlated. Lack of serial correlation would be indicated by a Durbin-Watson statistic of around 2. Linearity test was used to establish whether the relationship between the constructs is linear or not acceptable values bein greater than 0.05.

3.7 Data Analysis

Cleaning, validation and editing of collected data was done to assert that they are accurate, uniform, consistent and complete. Statistical product for social scientists (SPSS) was then used to generate inferential and descriptive statistics. Descriptives provided details of the respondents. Multiple regression analysis was used to examine the kind and extent of the association between constructs.

To help in the determination of the effect of leagile manufacturing practices on supply chain performance, the model in Table 3.2 was used.The t-test and p-values was employed to help in the determination of how significant each variable under study is while an F-test and p-values helped to test the suitability of the regression model. Computation of Pearson correlation coefficient, R^2, beta coefficients, and p values was also done. A summary of statistical tests of hypotheses is shown in Table 3.2.

Table 3.2: Analytical Model of Data

Objectives	Hypotheses	Analytical Model	Interpretation of Results
To establish the effect of leagile manufacturing practices on supply chain performance of food and beverage manufacturing sector in Kenya.	$\mathbf{H_1}$: Leagile manufacturing practices have a significant positive effect on supply chain performance.	Multiple Linear Regression Analysis. $\mathbf{Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon}$ **Where:** Y = Supply Chain Performance a = Constant β= Coefficient of Independent variables X_1= Continuous Improvement X_2= Waste Management X_3 = Supply Chain Information Sharing X_4 = Postponement ε = Error term.	Hypothesis is supported if the P- value of the beta coefficient is less than 0.05; a significant change in Supply Chain Performance due to the influence Leagile manufacturing practices confirms the relationship. The model fitness is confirmed if the F-ratio is significant (P< 0.05); the significance of the relationship among the variables is confirmed if t -statistics is significant.

Source: Researcher (2019)

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND DISCUSSION

4.1 Introduction

In this part, an explanation on how the data was analyzed, the results and their interpretation is included. The structure of the analysis is such that it starts with various tests for instance, a normality test to assess the suitability of the data collected. It was the followed by a descriptives of the bio data and that of the constructs dealt with. The study targeted eighty-four (84) respondents out of which forty-one (41) questionnaires were returned. This represented 48.8% of the respondents. According to Saunders, Lewis and Thornhill (2017), a response rate of between 30-40% is considered appropriate in a descriptive survey.

4.2 Demographics of the Companies

This included length of continuous service, rank of the informants in the firm, size of the firm, the level of schooling of the respondents and the duration of operation of the firm.

4.2.1 Length of Continuous Service

The research findings indicate that 46.3% of the informants had served in their positions for between 10-15 years, a given 24.4% for between 5-10 years and 22% of the them for over 15 years. The least number of the respondents representing 7.3% had served for less than 5 years. The analysis is given in the Table 4.1.

Table 4.1: Length of Continous Service with the Firm

Years of Service	Frequency	Percent
Less than 5 Years	3	7.3
5 – 10 Years	10	24.4
10 – 15 Years	19	46.3
Over 15 Years	9	22.0
Total	**41**	**100.0**

Source: Research Data (2019)

Given the observation in Table 4.1, the implication is that over 80% of the participants have worked for more than 5 years meaning that the data collected was reliable and valid. The argument is that being in service with the company for extended period enabled the participants to be more reliable having been possibly involved in a number of activities related to the variables under study.

4.2.2 Position in the Firm

Table 4.2 show that many of of the informants occupied senior level management representing 68.3% followed by the middle level management being 17.1% and then the supervisory level management were represented by 14.6%.

Table 4.2: Position in the Firm

Postion	Frequency	Percent
Supervisory Level Management	6	14.6
Middle Level Management	7	17.1
Senior Level Management	28	68.3
Total	**41**	**100.0**

Source: Research Data (2019)

On the basis of observation in Table 4.2 all levels of management were represented hence it is possible to use these results across the manufacturing firms studied. It also ascertains the credibility of collected information since the targeted respondents were all managers of various levels.

4.2.3 Size of the Firm

How large the firm is was assessed on the basis staff quantity. The Table 4.3 show that most of the companies had employees of between 101-500 employees having a 41.5% while 31.7% of the companies had employees of between 501-1000 in number while 19.5% of companies had more than 1000 employees. The companies with the least number of employees had less than 100 employees and represented 7.3% of the population.

Table 4.3: Size of the Firm

Number of Employees	Frequency	Percent
Less than 100 Employees	3	7.3
101 – 500 Employees	17	41.5
501 – 1000 Employees	13	31.7
More than 1000 Employees	8	19.5
Total	**41**	**100.0**

Source: Research Data (2019)

As shown above a large percentage of the respondent were drawn from large organizations as observed from the number of employees ranging from 101 and 1000, this depicts appropriateness and validity of the data collected since it was perceived that large firms were best placed in terms of adoption of leagile manufacturing practices given a larger possession of the resources as opposed to smaller firms.

4.2.4 Level of Education

Table 4.4 indicate that many participants making up 63.4% had post graduate qualification while 31.7% held degrees qualification and only 4.9% were holders of diploma qualification.

Table 4.4: Level of Education

Level of Education	Frequency	Percent
Diploma Level	2	4.9
Degree Level	13	31.7
Post Graduate Level	26	63.4
Total	**41**	**100.0**

Source: Research Data (2019)

The implication is that the respondents had the relevant levels of qualification that enabled them to give a reliable responses regarding the variables under study.

4.2.5 Length of Operation of the Firm

The Table 4.5 show that the many of the firms making up 53.7% had been in operation for more than 20 years while 19.5% had operated for between 11-15 years and 17.1% had operated for between 16-20 years. Only 9.8% of the firms had operated from 5-10 years.

Table 4.5: Length of Operation of the Firm

Length of Operation	Frequency	Percent
From 5 – 10 years	4	9.8
From 11 – 15 years	8	19.5
From 16 – 20 years	7	17.1
More than 20 Years	22	53.7
Total	**41**	**100.0**

Source: Research Data (2019)

The implications on the basis of observation in Table 4.5 is that more than 90% of the firms had more than 10 years operation, a period long enough for adoption and implementation of the leagile manufacturing practices. Firms operating for many years tend to mature overtime in their operations and may possibly adopt better ways of operational excellence.

4.3 Extent of Adoption of Leagile Manufacturing Prcactices

The informants indicated the degree of implementation of leagile manufacturing practices. The analysis of the responses were based on the four practices which are explained in the following subsections:

4.3.1 Continous Improvement

Based on Table 4.6, firms implemented continuous improvement practices to a larger extent (M=4.58, SD=.298). This imply that the companies largely implemented and used continuous improvement to achieve leagile performance.

Table 4.6: Continous Improvement

Activities	N	Mean	Std. Deviation	Rank
The company has put in place feedback loop to assess performance quality.	41	4.24	.489	4
The company uses quality circle to consult on quality issues.	41	4.59	.547	3
There is production start checklist to affirm quality.	41	4.71	.512	2
The company uses quality checklist in each production line.	41	4.78	.419	1
Valid N (listwise)	**41**	**4.58**	**.298**	

Source: Research Data (2019)

As shown in Table 4.6, the mostly implemented continuous improvement activity was the use of quality checklist in each production line with a mean of 4.78 (SD=.419). This was followed by the use of production start checklist to affirm quality with a mean of 4.71 (SD=.512) and then the use of quality circle to consult on quality issues with a mean of 4.59 (SD=.547). The least implemented activity though still had a greater extent was the existence of feedback loop to assess performance quality having a mean of 4.24 (SD=.489).

4.3.2 Waste Management

The analysis is as stated in the Table 4.7 which indicate that the companies implemented waste management practices to a larger extent with a mean of 4.50 (SD=.220). The implication was that the companies largely put in place measures to manage waste.

Table 4.7: Waste Management

Activities	N	Mean	Std. Deviation	Rank
There is mechanisms to help in recycling of waste.	41	4.39	.494	5
The management have put in place a system of inspection of quality from the start.	41	4.41	.499	4
There is the use of error proof equipment.	41	4.59	.499	1
The company keeps optimal inventory levels.	41	4.56	.502	2
The company holds optimal inventory levels at all times.	41	4.54	.505	3
Valid N (listwise)	**41**	**4.50**	**.220**	

Source: Research Data (2019)

Table 4.7 show that the companies prioritized the practice of using error proof equipment with a mean of 4.59 (SD=.499). This was followed by the keeping of optimal inventory levels with a mean of 4.56 (SD=.502) and then the holding of optimal inventory levels at

all times with a mean of 4.54 (SD=.505). The companies also put in place a system of inspection of quality from the start with a mean of 4.41 (SD=.499). The least implemented waste management practice was mechanisms to help in recycling of waste having a mean of 4.39 (SD=.494).

4.3.3 Supply Chain Information Sharing

Table 4.8 shows that the companies implemented supply chain information sharing with an average mean of 4.45 (SD=.381). This meant that the companies imp,emented supply chain information sharing to a large extent.

Table 4.8: Supply Chain Information Sharing

Activity	N	Mean	Std. Deviation	Rank
There is supplier involvement at every critical stage in manufacturing.	41	4.27	.633	4
The company has mechanisms to enhance data and information sharing among partners.	41	4.41	.631	3
Supply chain partners are informed in advance in case of any change.	41	4.56	.502	1
The company has adopted new technology to facilitate information sharing.	41	4.54	.596	2
Valid N (listwise)	**41**	**4.45**	**.381**	

Source: Research Data (2019)

Table 4.8 indicate that the most practiced supply chain information sharing activity was giving information to supply chain partners in advance in case of any change with a mean of 4.56 (SD=.502). This was followed by the adoption of new technology to facilitate information sharing having a mean of 4.54 (SD=.596). The third ranked supply chain information sharing activity was putting in place mechanisms to enhance data and

information sharing among partners with a mean of 4.41 (SD=.631). The least implemented activity was the involvement of suppliers at every stage with a mean of 4.27 (SD=.633).

4.3.4 Postponement

Observation on Table 4.9 indicate that the companies implemented postponement practices to a great extent (M=4.48, SD=.339). The most practiced postponement activity was the scheduling of production and demand projections for product groups having a mean of 4.59 (SD=.499) each. This was followed by the practice of reducing order lead time (Mean=4.46 (SD=.596).

Table 4.9: Postponement

Activity	N	Mean	Std. Deviation	Rank
The company undertakes customer request analysis before manufacturing.	41	4.27	.549	4
The company reduces order lead time for customers.	41	4.46	.596	3
There is scheduling of production.	41	4.59	.499	1
The firm undertakes demand projections for product groups.	41	4.59	.499	1
Valid N (listwise)	**41**	**4.48**	**.339**	

Source: Research Data (2019)

Table 4.9 further also indicate that the least practiced postponement activity was customer request analysis before manufacturing with a mean of 4.27 (SD=.549).

4.4 Supply Chain Performance

The respondents were given a list of SCP indicators and rated the degree of their realization. The analysis was based on the indicators under the study.

4.4.1 Better Capacity Planning

The findings in the Table 4.10 show that companies realized improved capacity planning to a greater extent (mean=4.49). This was shown by adoption of entreprise resource planning system with a mean of 4.78 (SD=.419) and existence of advanced production planning systems having a mean of 4.41 (SD=.499).

Table 4.10: Better Capacity Planning

Indicators	N	Mean	Std. Deviation
There is collaboration with suppliers and customers.	41	4.27	.501
There are advanced production planning systems.	41	4.41	.499
Entreprise resource planning system is adopted.	41	4.78	.419
Valid N (listwise)	**41**	**4.49**	

Source: Research Data (2019)

Iit can be observed from Table 4.10 that there was improved collaboration with suppliers and customers with a mean of 4.27 (SD=.501)

4.4.2 Reduced Inventory Levels

Table 4.11 indicate that the companies experienced reduced inventory levels to a greater extent with a mean of 4.62 (SD=.489).

Table 4.11: Reduced Inventory Levels

Indicators	N	Mean	Std. Deviation
The use of vendor-managed inventory for effectiveness.	41	4.56	.502
There is collaboration with suppliers and customers for smooth inventory flow.	41	4.68	.471
Quick Response codes exist to manage inventory.	41	4.61	.494
Valid N (listwise)	**41**	**4.62**	**.489**

Source: Research Data (2019)

The findings in Table 4.11 is an indication that companies realized improved collaboration with suppliers and customers for smooth inventory flow with a mean of 4.68 (SD=.471) while there was existence of quick response codes to manage inventory at a mean of 4.61 (SD=.494) and there was also improved use of vendor-managed inventory for effectiveness having a mean of 4.56 (SD=.502).

4.4.3 Shorter Lead Time

As can be observed from Table 4.12, companies experienced shorter lead time to a greater extent (M=4.42, SD=.502).

Table 4.12: Shorter Lead Time

Indicators	N	Mean	Std. Deviation
There is emphasis on domestic suppliers.	41	4.17	.442
Consolidation of suppliers is achieved by the organization.	41	4.44	.550
Collaboration and communication system with suppliers exist.	41	4.66	.530
Valid N (listwise)	**41**	**4.42**	**.502**

Source: Research Data (2019)

This is an indication of improved collaboration and communication system with suppliers having a mean of 4.66 (SD=.530) as well as improved consolidation of suppliers with a mean of 4.44 (SD=.550). The companies also increasingly used domestic suppliers with a mean of 4.17 (SD=.442).

4.4.4 System Reliability

The findings in the Table 4.13 indicate that the companies realized improved system reliability to a greater extent with a mean of 4.54 (SD=.505).

Table 4.13: System Reliability

Indicators	N	Mean	Std. Deviation
There is the existence of internal cross functional teams.	41	4.51	.506
Plans exist for effective product life cycle management.	41	4.41	.547
Collaboration with customers and suppiers exist.	41	4.71	.461
Valid N (listwise)	**41**	**4.54**	**.505**

Source: Research Data (2019)

From Table 4.13, the companies on a specific basis realized improved collaboration with customers and suppiers with a mean of 4.71 (SD=.461) as well as increased existence of internal cross functional teams having a mean of 4.51 (SD=.506) and improved existence of plans for effective product life cycle management having a mean of 4.41 (SD=.547).

4.5 Leagile and Supply Chain Performance

The Table 4.14 gives a summary of the IV and DV. The former included continuous improvement, waste management, supply chain information and postponement. The latter on the other hand is a summary of the indicators under study including better capacity planning, reduced inventory levels, shorter lead time and system reliability.

Table 4.14: Leagile and Supply Chain Performance

S/NO	Continous Improvement (X_1)	Waste Management (X_2)	Supply Chain Information (X_3)	Postponement (X_4)	Supply Chain Performance (Y)
1	4.75	4.60	4.00	4.25	4.50
2	4.50	4.20	3.50	4.75	4.33
3	4.75	4.40	4.00	4.50	4.75
4	4.75	4.20	3.75	4.75	4.75
5	4.25	4.80	3.75	4.75	4.50
6	4.75	4.40	4.25	4.25	4.67
7	4.25	4.80	4.50	4.50	4.33
8	4.50	4.40	4.50	4.75	4.50
9	4.50	4.20	5.00	4.25	4.67
10	4.50	4.60	4.50	4.75	4.58
11	4.50	4.40	5.00	4.50	4.42
12	4.75	4.20	4.75	4.50	4.58
13	4.75	4.20	4.25	5.00	4.50
14	4.50	4.60	4.75	4.50	4.58
15	4.50	4.60	4.50	4.50	4.58
16	4.75	4.20	5.00	3.75	4.50
17	4.25	4.60	3.50	4.75	4.67
18	4.75	4.60	4.75	4.50	4.67
19	4.25	4.80	4.50	4.75	4.58
20	3.75	4.60	4.50	4.75	4.58
21	4.50	4.80	4.25	4.25	4.58
22	4.75	4.60	4.75	4.00	4.75
23	4.75	4.60	4.75	4.50	4.58
24	4.75	4.60	4.50	4.50	4.42
25	4.50	4.40	4.50	4.75	4.42
26	4.75	4.60	4.50	4.75	4.67
27	5.00	4.40	5.00	4.50	4.50
28	4.25	5.00	4.25	4.75	4.67
29	4.75	4.20	4.75	3.75	4.42
30	4.50	4.20	4.50	4.50	4.42
31	4.50	4.60	4.25	4.75	4.58
32	4.75	4.80	4.25	3.50	4.25
33	4.75	4.60	4.75	4.50	4.58
34	5.00	4.60	4.25	4.25	4.50
35	4.75	4.60	4.50	4.50	4.42
36	4.75	4.60	4.25	5.00	4.58
37	5.00	4.40	5.00	4.00	4.42
38	4.50	4.40	4.25	4.25	4.42
39	3.50	4.60	4.50	4.00	4.00
40	4.75	4.40	4.75	4.75	4.33
41	4.75	4.00	4.50	4.75	4.50

Source: Research Data (2019)

4.5.1 Diagnostic Tests

Before analyzing the data using multiple linear regression analysis, diagnostic tests were done to confirm that data does not violate important assumptions of regression. The diagnostic test included an analysis of normality, heteroscedasticity, autocorrelation and multicollinearity. The Table 4.1 shows results on normality

Table 4.15: Test of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
Leagile manufacturing and supply chain performance	.089	41	.200*	.985	41	.869

Source: Research Data (2019)

Table 4.15 indicate that the data was normally distributed with a Shapiro Wilk value above 0.05. Shapiro Wilk values are considered to have better statistical power than Kolmogrov-Smirnov test to assess normality.

Heteroscedasticity was tested using Koenker test. In this test, a p-Value > 0.05 indicate that the data meets the requirement of homoscedasticity. Beginning with, the macro syntax by Gwilym Pryce on Breusch-Pagan and Koenker was run in with the following results generated:

```
Run MATRIX procedure:

 BP&K TESTS

 ==========

Regression SS 7.6489

Residual SS 46.4826

Total SS 54.1315

R-squared .1413

Sample size (N) 41

Number of predictors (P) 4

Breusch-Pagan test for Heteroscedasticity (CHI-SQUARE df=P) 3.824

Significance level of Chi-square df=P (H0:homoscedasticity).4303

Koenker test for Heteroscedasticity (CHI-SQUARE df=P) 5.793

Significance level of Chi-square df=P (H0:homoscedasticity) .2151

------ END MATRIX -----
```

Because the sample size was small (48), the Koenker Test for Heteroscedasticity was deemed appropriate:

Step 1: Stating the hypotheses

H0: There is no heteroscedasticity in the data (data is homoscedastic).

H1: There is heteroscedasticity in the data.

Step 2: Level of significance: The level of significance, $\alpha = 0.05$

Step 3: Decision rule: Reject the null hypothesis if the p-value is less than 0.05

Step 4: Test statistic: From the output of SPSS, Koenker test statistic = 5.793 and p-value = .2151

Step 5: Conclusion

At a level of significance of 0.05, the data was found to be homoscedastic ($p>0.05$). This justifies the use of the model in fulfilling the objectives of the study ($p= .2151$).

Below is Durbin-Watson test done to check on autocorrelation.

Step1: Stating the hypotheses

H_0: $\rho = 0$ (autocorrelation is absent)

H_1: $\rho > 0$ (autocorrelation is present)

Step 2: Level of significance: Level of significance, $\alpha = 0.05$

Step 3: Decision rule

Number of independent variables, k = 2; Number of observation, n = 41. From the Durbin-Watson tables, d_l =1.285 and d_u = 1.721

Step 4: Test statistic

Table 4.17 gives the Durbin-Watson test statistic computed, d = 1.571

Table 4.16: Autocorrelation Test

Model	**Durbin Watson Test**
Continuous improvement, waste management, supply chain information, postponement and supply chain performance	1.571

Source: Research Data (2019)

Step 5: Conclusion

Comparing Durbin-Watson test statistics d = 1.571 against values obtained from the tables at 0.05 level of significance, the test was inconclusive. This is based on the hypotheses rule stipulating that:

If $d < d_1$ – Autocorrelation is present.

If $d > d_u$ – Autocorrelation is absent.

If $d_1 < d < d_u$ – test is inconclusive.

Multicollinearity was evaluated using VIF and tolerance values. VIF value should not be greater than 10 and less than 1 (O'Brien, 2007).

Table 4.17: Multicollinearity Test

Variables	Tolerance	VIF
Continous Improvement	.857	1.167
Waste Management	.878	1.140
Supply Chain Information	.858	1.165
Postponment	.883	1.133

Source: Research Data (2019)

From the observation on Table 4.18, all the VIF values were less than 5 while the tolerance values were above 0.20. This indicated lack of multicollinearity among the variables under study.

Linearity test was used to establish whether the relationship between IV and DV is linear or not. Using this test, linearity is shown by values higher than 0.05.

Table 4.18: Linearity Test

Variables	Deviation from Linearity	Significance Level
SCP and Continuous Improvement	**.232**	**.015**
SCP and Waste Management	**.063**	**.608**
SCP and Supply Chain Information	**.099**	**.504**
SCP and Postponement	**.067**	**.671**

Source: Research Data (2019)

As depicted in Table 4.16, the $p<0.05$ thus indicating linearity.

4.5.2 Pearson Correlation Co-efficient

The researcher computed pearson bivariate correlation to ascertain how the variables correlate. The outcomes are given in the Table 4.19.

Table 4.19: Correlation Matrix

		Continuous Improvement	Waste Management	Supply Chain Information	Postponment	Supply Chain Performance
Continuous Improvement	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	41				
Waste Management	Pearson Correlation	-.331*	1			
	Sig. (2-tailed)	.034				
	N	41	41			
Supply Chain Information	Pearson Correlation	.204	-.158	1		
	Sig. (2-tailed)	.200	.323			
	N	41	41	41		
Postponment	Pearson Correlation	-.150	.016	-.325*	1	
	Sig. (2-tailed)	.348	.921	.038		
	N	41	41	41	41	
Supply Chain Performance	Pearson Correlation	.286	.034	-.093	.311*	1
	Sig. (2-tailed)	.070	.835	.563	.047	
	N	41	41	41	41	41

*. Correlation is significant at the 0.05 level (2-tailed).

Shown in Table 4.19 is that continuous improvement and SCP has a low positive correlation though not siginificant (r=.286) while waste management and SCP equally have a low positive correlation though not significant (r=.034). additionally, supply chain information and SCP are negatively correlated (r=-.093) and lastly postponement is positively correlated to supply chain performance and the correlation is significant (r=.311). The implication is that continuous improvement, waste management and postponement positively correlate with supply chain performance meaning that an increase in continuous improvement, waste management and postponement induces increament in SCP.

4.5.3 Model Summary

Table 4.20 shows the results for relationship between outcome and predictor variables. R^2 is the coefficient of determination.

Table 4.20: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.484[a]	.234	.149	.13594	1.571

a. Predictors: (Constant), Postponment, Waste Management, Supply Chain Information, Continuous Improvement

b. Dependent Variable: Supply Chain Performance

From the model summary in Table 4.20, r = 0.484. The implication is that, leagile manufacturing practices studied and SCP are positively related. The test for significance of r was done following this procedure:

Step 1: Hypotheses is stated

H0: r = 0 (the relationship between leagile manufacturing practices and SCP is not significant.)

H1: r ≠ 0 ((the relationship between leagile manufacturing practices and SCP is significant)

Step 2: Level of significance

Significance $\alpha = 0.05$

Step 3: Decision rule

Degrees of freedom = n – 2 = 41 – 2 = 39; Therefore, $t_{0.05}, 39 = 2.023$

Reject the null hypothesis since computed t falls outside the region: $2.023 \leq t \leq 2.023$

Step 4: Statistic test

The computed

$$T = r\sqrt{\frac{n - 2}{1 - r^2}}$$

$$T = r\sqrt{\frac{41 - 2}{1 - .234}}$$

$$= 3.4535$$

Step 5: Conclusion

Given that calculated t (3.3435) lies in the area under rejection, null hypothesis is not accepted. This means that there is a significant relationship between leagile manufacturing practices and SCP.

The adjusted R^2 of .149 mean that 14.9% of variations in SCP is expressed by variations in continuous improvement, waste management, supply chain information and postponement. This is an indication of a relatively weak relationship such that the predictors identified in this study might not be greatly affect SCP of the FBMCs in Kenya. The is an implication the presence certain issues affecting supply chain performance other than the leagile manufacturing practices studied in this research.

4.5.4 Analysis of Variance

Table 4.21 shows overall p-value indicating a significant relationship between leagile manufacturing practices and SCP at 0.043 ($p<0.05$). The implication is that continuous improvement, waste management, supply chain information and postponement reliably predict SCP of FBMCs in Kenya.

Table 4.21: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.203	4	.051	2.746	.043[b]
	Residual	.665	36	.018		
	Total	.868	40			

a. Dependent Variable: SCP

b. Predictors: (Constant), Postponment, Waste Management, Supply Chain Information, Continuous Improvement

The results in Table 4.21 show that the F statistic was 2.746 and was significant at p = 0.043. The implication is the model was reliable in predicting the relationship between continuous improvement, waste management, supply chain information, postponement and SCP of FBMCs in Kenya.

4.5.5 Regression Coefficients

The Table 4.22 indictaes individual relationship between the various predictor variables with supply chain performance of FBMCs in Kenya and their coefficient betas.

Table 4.22: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	2.513	.847		2.967	.005		
	Continuous Improvement	.197	.078	.398	2.526	.016	.857	1.167
	Waste Management	.104	.104	.154	.991	.328	.878	1.140
	Supply Chain Information	-.013	.061	-.034	-.213	.833	.858	1.165
	Postponment	.156	.067	.358	2.305	.027	.883	1.133

a. Dependent Variable: Supply Chain Performance

Shown in Table 4.22 is that continuous improvement, waste management and postponement have positive coefficients showing that a positive increase in continuous improvement, waste management and postponement, positively affect supply chain performance by the same scale as given by β=.197, β =.104 and β=.156 respectively. Supply chain information however have a negative coefficient implying that improved supply chain information negatively affect supply chain performance with the same scale (β=-.013). This finding is also confirmed by the positive and negative t-values. The study also show that continuous improvement and postponement significantly affect SCP indicated by p=.016 and p=.027. The implication is that continuous improvement and postponement significantly affect supply chain performance with the p-values being $p<0.05$. This is also an indication that waste management and supply chain information do not contribute to supply chain performance having p=.328 and p=.833 respectively.

Based on the outcome substitution can be done as follows:

$$\mathbf{Y = 2.513 + .197X_1 + .104X_2 - .013X_3 + .156X_4 + \varepsilon}$$

Where:

Y = Supply Chain Performance.

X_1= Continuous Improvement

X_2= Waste Management

X_3 = Supply Chain Information Sharing

X_4 = Postponement

ε = Error term.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The proceding section sums up the outcomes of the research work that was carried out. It makes references to the preceding chapter thereby offering a recap, propositions that can be adopted, the main hardles encounted and necessary foresights that can form a basis for knowledge advancements in related areas.

5.2 Summary of Findings

The general aim was to establish the effect of leagile manufacturing practices on SCP of FBMCs in Kenya. particularly, the study was meant to asses the level to which leagile manufacturing practices have been adopted by the FBMCs in Kenya and to investigate the link between leagile manufacturing practices and supply chain performance of food and beverage manufacturing companies in Kenya. The demographics were also summarized to help generalize their effect in terms of adoption of leagile manufacturing practices.

5.2.1 Extent of Implementation of Leagile Manufacturing Practices

The intention was to ascertain the extent to which leagile supply chain practices were implemented by FBMCs in Kenya. That outcomes denoted that firms implemented continuous improvement, waste management, supply chain information sharing and postponement practices to a greater extent M=4.58, SD=.298, M=4.50, SD=.220, M=4.45, SD=.381 and M=4.48, SD=.339) respectively.

The implication of the findings is that food and beverage manufacturing companies have greatly implemented leagile manufacturing practices. The outcomes concur with those of

Aravind, Jayakrishna and Vimal (2018) who found out that companies adopt leagile systems to achieve higher performance.

5.2.2 Leagile Manufacturing Practices and Supply Chain Performance

The intention was in establishing the association between leagile manufacturing practices and supply chain performance of food and beverage manufacturing companies in Kenya. Equally the study aimed at ascertaining the effect of leagile manufacturing practices on supply chain performance of food and beverage manufacturing sector in Kenya.

The study found out that continuous improvement and waste management have a positive but low correlation with supply chain performance though the effect is not significant as given by the r=.286 and r=.034 with $p<0.05$. The study also found out that supply chain information and supply chain performance are negatively correlated (r=-.093) though not significant while postponement was positively correlated to supply chain performance and the correlation was significant (r=.311, $p<.05$). The implication is that continuous improvement, waste management and postponement positively correlate with supply chain performance meaning that an improvement in continuous improvement, waste management and postponement improves supply chain performance.

The results show that 23.4% of variations in supply chain performance is caused by variations in continuous improvement, waste management, supply chain information and postponement. This is an indication of a relatively weak relationship such that the predictors identified in this study might not be greatly affect supply chain performance of FBMCs in Kenya implying other elements not dealt with that affect supply chain performance other than the leagile manufacturing practices studied in this research. It

was also established existence of a significant linkage between leagile manufacturing practices and supply chain performance at 0.043 ($p<0.05$). These findings imply that continuous improvement, waste management, supply chain information and postponement reliably predict supply chain performance of FBMCs n Kenya. The results corroborates those of Monsur and Yoshi (2012) who concluded that a leagile system positively affect the performance of companies.

The findings based on the regression coefficients indicate that continuous improvement, waste management and postponement have positive coefficients showing that a positive increase in continuous improvement, waste management and postponement, positively affect supply chain performance by the same scale as given by $\beta=.197$, $\beta=.104$ and $\beta=.156$ respectively. Supply chain information on the other hand have a negative coefficient implying that improved supply chain information negatively affect supply chain performance with the same scale ($\beta=-.013$). It was equally found out that continuous improvement and postponement have significant effect on SCP indicated by $p=.016$ and $p=.027$ while waste management and supply chain information do not contribute to SCP having $p=.328$ and $p=.833$ respectively.

5.3 Conclusion of the Study

Ensuing from the research objectives, it is concluded that leagile manufacturing practices affect supply chain performance of FBMCs in Kenya. The p-value also leads to a conclusion that there is a significant association between leagile manufacturing practices and supply chain performance. The study also conclude that FBMCs have implemented leagile manufacturing practices including continuous improvement, waste management, supply chain information sharing and postponement practices to a greater extent ($M=4.58$, $M=4.50$, $M=4.45$ and $M=4.48$) respectively.

The conclusion of the the study is consistent with the work of Monsur and Yoshi (2012) who concluded that a leagile system would positively affect the industrial performance. It is also supportive of the study by Aravind, Jayakrishna and Vimal (2018) which laid emphasis on the need to adopt leagile systems to achieve higher performance. The conclusion is also in line with the findings by Paul and Eleni (2015) that leagility of an assembly line would help avoid execess production and encourage sustainability and proper use of resources.

5.4 Recommendations of the Study

Following the outcomes, the researcher makes the following propositions: Managers of FBMCs should find mechanisms of improving the initiation and use of the leagile manufacturing practices. This is because they were observed to improve on supply chain performance of the firms. The managers should focus on the challenges that may bedevil initiation of practices and put in place mechanisms for their sustainability.

The researcher also recommend that management in the FBMCs should exploit supply chain management indicators to help achieve superiority in the market that will translate to attaining a superior firm performance. This is based on the conclusion that indicators such as better capacity planning, reduced inventory levels, shorter lead time and system reliability were realized by the companies and that they indicate better SCP.

5.5 Limitations of the Study

There were some hardles pausing as challenges. The researcher faced lack of adequate cooperation from the respondents due to suspiscion as well as claims of lack of time. The researcher dealt with this issue by use of the introduction letter and convincing the respondents of the exact use of the information gathered. Generally, some of the

respondents were afraid that they would be victimized since the information being sought was confidential.

The researcher also faced the limitation of the researcher only receiving response from one person per firm that would not be easily generalized. The researcher however tried to focus on the key persons within the operations department for reliability of the responses.

5.6 Suggestions for Further Studies

The current research was concerned with the context FBMCs. Another research is recommended regarding the other sectors to assess whether the study outcomes can be generalized. Another study should also focus on other companies other than manufacturing companies, especially the service-based companies.

The researcher also suggests that another study be conducted to focus on factors that determine leagile manufacturing practices implementation to help assess possible challenges and difficulties. This would give adequate insight on how effectively the practices can be adopted.

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APPENDICES

APPENDIX I: QUESTIONNAIRE

Dear Sir/ Madam,

Please provide information on the following questions. Data collected using this questionnaire is for academic only confidentiality will he observed.

SECTION A: BIO DATA

Instruction: tick in the spaces provided.

	Name of the Company		
	Variable	**Responding Group**	
1.	Length of Continuous Service	Less than 5 Years	
		5 – 10 Years	
		10 – 15 Years	
		Over 15 Years	
2.	Your position in the firm TICK as appropriate	Senior Level Management.	
		Middle Level Management.	
		Supervisory Level Management.	
3.	Please indicate the size of the firm by TICKING as appropriate.	Less than 100 employees	
		101 – 500 employees	
		501 – 1000 employees	
		More than 1000 employees	
4.	Please indicate the level of education.	Secondary Level	
		Diploma Level	
		Degree Level	
		Post Graduate Level	
		Other Qualification	
5.	Please indicate the length of operation of the firm.	Less than 5 Years	
		From 5 – 10 Years	
		From 11 – 15 Years	
		From 16 – 20 Years	
		More than 20 Years	

SECTION B: LEAGILE MANUFACTURING PRACTICES

TICK appropriately based on the following scale to indicate the level of implementation of these practices:

5 = To a very large extent; 4 = Large extent; 3 = Moderate extent; 2 = Small extent and 1 = Very small extent.

	Statement					
A	**Continuous Improvement**	**1**	**2**	**3**	**4**	**5**
CI1	The company has put in place feedback loop to assess performance quality.					
CI2	The company uses quality circle to consult on quality issues.					
CI3	There is production start checklist to affirm quality.					
CI4	The company uses quality checklist in each production line.					
B	**Waste Management**	**1**	**2**	**3**	**4**	**5**
WM1	There is mechanisms to help in recycling of waste.					
WM2	The management have put in place a system of inspection of quality from the start.					
WM3	There is the use of error proof equipment.					
WM4	The company keeps optimal inventory levels.					
WM5	The company holds optimal inventory levels at all times.					
C	**Supply Chain Information Sharing**	**1**	**2**	**3**	**4**	**5**
SCI1	There is supplier involvement at every critical stage in manufacturing.					
SCI2	The company has mechanisms to enhance data and information sharing among partners.					
SCI3	Supply chain partners are informed in advance in case of any change.					
SCI4	The company has adopted new technology to facilitate information sharing.					
D	**Postponement**	**1**	**2**	**3**	**4**	**5**
P1	The company undertakes customer request analysis					

	before manufacturing.					
P2	The company reduces order lead time for customers.					
P3	There is scheduling of production.					
P4	The firm undertakes demand projections for product groups.					

SECTION C: SUPPLY CHAIN PERFORMANCE

Please indicate the degree of realization of performance using the key:

1 = Not at all; 2 = Small extent; 3 = Moderate extent; 4 = Great extent; 5 = Very great extent

	Statement					
A.	**Better Capacity Planning**	**1**	**2**	**3**	**4**	**5**
BCP1	There is collaboration with suppliers and customers.					
BCP2	There are advanced production planning systems.					
BCP3	Entreprise resource planning system is adopted.					
B.	**Reduced Inventory Levels**	**1**	**2**	**3**	**4**	**5**
RIL1	The use of vendor-managed inventory for effectiveness.					
RIL2	There is collaboration with suppliers and customers for smooth inventory flow.					
RIL3	Quick Response codes exist to manage inventory.					
C.	**Shorter Lead Time**	**1**	**2**	**3**	**4**	**5**
SLT1	There is emphasis on domestic suppliers.					
SLT2	Consolidation of suppliers is achieved by the organization.					
SLT3	Collaboration and communication system with suppliers exist.					
D.	**System Reliability**	**1**	**2**	**3**	**4**	**5**
SR1	There is the existence of internal cross functional teams.					
SR2	Plans exist for effective product life cycle management.					
SR3	Collaboration with customers and suppiers exist.					

APPENDIX II: LIST OF FOOD AND BEVERAGE MANUFACTURING FIRMS

	Company
	Czarnikow Sugar E.A.
	Chemelil Sugar Co. Ltd
	Arkay Industries Ltd
	Eldoret Grains Ltd
	Palmhouse Diairies Ltd
	Kabianga Dairy Ltd
	West Kenya Sugar Co. Ltd
	Kenya Tea Growers Association
	Karirana Estate Ltd
	Kisii Bottlers Ltd
	Kibos Sugar and Allied Industries
	Kambu Distillers
	Kenlab Supplies
	Equator Bottlers
	Insta Products (EPZ)
	Spectre International
	United Millers Ltd
	Mafuko Industries
	Al-Mahra Industries Ltd
	Global Tea & Commodities (K) Ltd
	Gold Crown Foods (EPZ) Ltd
	Kenya Nut Co. Ltd
	London Distillers (K)
	Milly Fruit Processors Ltd
	Miritini Kenya Ltd
	Trust Flour Mills
	Chai Trading Co. Ltd
	Coastal Bottlers Ltd
	Diamond Industries Ltd
	Mzuri Sweets
	James Finlay Kenya
	Sigma Supplies Ltd
	Kensalt Ltd
	Mombasa Maize Millers
	Wanainchi Marine Products (K)
	Kenya Meat Commission
	NesFoods Industries Ltd
	Pwani Oil Products ltd
	Kenya Tea Developent Agency

	Company
	Weetabix
	Mumias Sugar Co. Ltd
	Nicola Farms Ltd
	Africa Spirits Ltd
	Cadbury Kenya Ltd
	Kenchic
	Mastermind Tobacco (K) L
	Mini Bakeries (Nbi) Ltd
	Agriner Agricultural Development
	Alliance One Tobacco Kenya
	Alpha Fine Foods Ltd
	Alpine Coolers Ltd
	Belfast Millers
	Bidco Oil Refineries
	British American Tobacco
	Brookside Dairy Ltd
	C. Dormans
	Candy Kenya Ltd
	Deepa Industries
	Eastern Produce Kenya
	Europack Industries
	Farmers Choice
	Fresh Produce Exporters Association of Kenya
	Frigoken
	Gil Oil Co. Ltd
	Glaciers Products
	Global Fresh Ltd
	Kenya Seed Company
	Kenya Sweets Ltd
	Kenya Tea Packers Ltd
	Keroche Industries
	Koba Waters
	Kuguru Food Complex
	Kwality Candies & Sweets
	Lari Diaries Alliance
	Manji Food Industries Ltd
	Melvin Marsh International
	New Kenya Co-operative Cremaries
	Pembe Flour Mills
	Premier Flour Mills
	Premier Food Industries Ltd
	Pristine International
	Proctor & Allan (E.A.) Ltd

	Company
	Promasidor Kenya Ltd
	Rafiki Millers Ltd
	Razco Ltd
	The Breakfast Cereal Co. (K)
	Wrigley Co. (E.A.) Ltd
	Aquamist Ltd
	Chirag Kenya
	Coca-Cola East & Central
	E.A. Breweries
	E.A. Sea Food
	Erdermann Co. (K)
	Mount Kenya Bottlers
	Nairobi Bottlers
	NAS Airport Services
	Patco Industries
	Usafi Services
	Nairobi Four Mills Ltd
	Gonas Best Ltd
	Highlands Canners Ltd
	Jambo Biscuits (K) Ltd
	Re-Suns Spices Ltd
	Spice World Ltd
	Trufoods Ltd
	Kamili Packers Ltd
	Kenafric Industries
	UDV Kenya
	Unga Group
	Valuepack Foods
	Excel Chemicals Ltd
	Kapa Oil Refineries Ltd
	Kenya Breweries
	Pearl Industries Ltd
	Agro Chemical & Food Ltd
	Kenya Wine Agencies Ltd
	Nairob Flour Mills Ltd
	W.E. Tilley (Muthaiga) Ltd
	Nestle Foods Kenya
	Bunda Cakes & Feeds
	Menengai Oil Refineries
	Happy Cow Ltd
	Valley Confectionery Ltd
	Njoro Canning Factory (Kenya)
	Highlands Minerals Water Co. Ltd

	Company
	Rift - Valley Bottlers Ltd
	Jetlak Foods Ltd
	Broadways Bakery Ltd
	Capwell Industries Ltd
	Kevian Kenya Ltd
	Centrofood Industries Ltd
	Del Monte Kenya Ltd
	Sunny processors Ltd
	Kenblest Ltd

Source: KAM (2019)