Impacts of Supply Chain Integration, on Operational Performances: in The Case of Brothers Flour and Biscuit Factory in Adama Town

A Thesis Submitted to the School of Graduate Studies of Jimma University in Partial Fulfillment of the Requirements for the Award of the Degree of Master of Business Administration (MBA)

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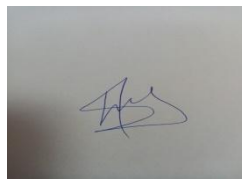
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Abstract

The main target of the study is to assess the impacts of supply chain integration on operational performance in brother's flour and biscuit factory. To maintaining competitive advantage the contribution of collaboration among supply chain partners and organized management system across organizational practice is quite substantial to stay in the competition. In today's business world the central concept of supply chain management is taken by the idea of integration, because the practice of SCM requires a systematic integration processes starting from sourcing, to manufacturing, and to distribution along the supply chain .The research design in this study used descriptive and explanatory research. An explanatory research design was employed with from 150 total populations a sample of 108 employees though stratified sampling. A questionnaire was used as a research tool for collecting data. Baseline data were captured from some informants and from secondary data. The collected data was analyzed using both descriptive statistics (mean & standard deviation) and inferential statistics (correlation and linear regression). Main findings of the study depicts that, there is high integration along the supply chain as the mean values of the four supply chain dimension (internal integration, customer integration, information integration and supplier integration)were above the minimum requirement(i.e. less than the mean value of 2.5).Moreover, dimension information integration of supply chain integration had a significant effect on operational performance of the factory, in which internal integration, customer integration, and supplier integration dimension had failed to signify the effect and needs to include other supply chain variables. Finally, the results on the conclusion entails us that the four research questions developed in this study were considerably rated high by the employees which actually indicates the supply chain integration is practiced at the required level of its employees. And also, the study recommends proper internal integration, supplier integration and customer integration in order to bring effective operational performance

Key words: Customer integration, information integration, internal integration, operational performance, supplier integration, supply chain integration

Declaration

I, the undersigned, declare that this study entitled: The Impact of Supply Chain Integration on Operational Performance: In The Case of Brothers Flour and Biscuit Factory in Adama Town.is my original work and has not been presented for a degree in any other university and that all sources of materials used for the study have been duly acknowledged.

Emaway Sitotaw   _____   <u>JUNE/</u> <u>25/202</u>

Candidate's Name   Signature

                                                                                                    Date

Statement of Certification

This is to certify that the Research paper prepared by Emaway Sitotaw The Impact of Supply Chain Integration on Operation Performance: In The Case of Brothers Flour And Biscuit Factory In Adama Town and submitted in partial fulfillment of the requirements for the Degree of Master of Business Administration complies with the regulations of the university and meets the accepted standards with respect to originality and quality.

Approved by

Wendesen Seyoum   JUN,25/2020

Main advisor   Signature   Date

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First of all I would like to give thanks to God for helping me working to this research.

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ABRIVATIONS

SCM: Supply Chain Management

SC: Supply Chain

SCI: Supply Chain Integration

TCA: transaction cost theory

RBV: Resource Based View

PAT: principal agent theory

IT: Information Technology

LAN: Local Area Network

WLAN: Wireless Local Area Network

SPSS-Statistical Package for Social Science

NT: Network Theory

CI: Customer Integration

CHAPTER ONE

INTRODUCTION

1.1. Back Ground of the Study

Supply chain management is defined as the integration of key business processes from end user though original suppliers that provides products, services and information that adds value to customers and other stakeholders (Lambert and Cooper, 2000). Integration leads to managing the entire supply chain as a single process. In an integrated supply chain, all functions that make up the supply chain are managed as a single entity rather than managing individual functions separately.

The prevailing conventional wisdom in SCM literature is that 'the more the integration, the better the performance of the supply chain' (Harland et al. 1999). Supply chain integration (SCI) helps firms to reconfigure their resources and capabilities internally and externally to consolidate their supply chain as a whole in an effort to improve long-term performance (Horvath, 2001; Huo, 2012). It is generally acknowledged that SCI is critical in achieving performance and competitive advantages (Flynn *et al.*, 2010; Frohlich and Westbrook, 2001; Vickery *et al.*, 2003; Zailani and Rajagopal, 2005; Zhao *et al.*, 2013).Supply-chain integration has become a prominent issue during the last decade. In recent years, there has been a great deal of empirical evidence to show that successful supply-chain integration can improve a firm's performance and competitive advantage (Wiengartenetal.2010). Supply chain management seeks to enhance competitive performance by closely integrating the internal cross-functions within accompany and effectively linking them with the external operations of suppliers, customers, and other channel members to be successful (Kim, 2006).This means that a firm that is pursuing SCM practices needs to pay attention to supply chain integration and its implementation (Hussein &Nassar, 2010).

The existing research on   SCI, however, is characterized by evolving definitions and dimensions (Van der Vaart and van Donk,2008). While some focuses on the individual dimensions of SCI (Cousins and Menguc, 2006; Homburg and Stock, 2004; Koufteros et al., 2007), in particular customer and supplier integration, others use   various omnibus definitions (Armistead and Mapes, 1993; Rosenzweig et al.,

2003), examining SCI as a single construct. In addition, many conceptualizations of SCI are incomplete, leaving out the important central link of internal integration.

These incomplete and evolving conceptualizations have led to inconsistent findings about the relationship between SCI and performance (e.g. Devaraj et al., 2007; Germain and Iyer, 2006; Das et al., 2006; Stank et al., 2001a).In order to fully understand SCI and its relationship to performance, there is a need to examine both how individual dimensions of SCI are related to different dimensions of performance, as well as how patterns of SCI are related to different dimensions of performance. This suggests taking both a contingency and a configuration approach to studying SCI, echoing the appeal of Harland et al. (2007).Supply chain integration (SCI) is characterized by a situation where members along the supply chain collaborate and work together for better performance and profitability while meeting the demands of the customer. Firms integrating their information and material flow would lead to optimal management of the supply chain [Samaranayake, P. (2005).]. It involves the alignment of business functions internally with in affirm and with its supply chain partners so a store duce costs, increase customer value and overall performance across the supply chain for all partners [Stank,etal.(2001).].Although the benefits of SCI are greatly covered in literature, the key design elements that will lead to improved performance have not been fully developed. Also there have been in reliabilities in the results as to whether integration really leads to improved supply chain performance. This study aims to make key contributions such as defining key performance signs through which supply chain integration can be measured. This study defines four constructs of supply chain integration which are the customer, supplier, internal, and information integration. Customer integration involves the strategic competencies and activities firms apply in providing finest services with customers though relationship building [Stank et al. (2001).]. Supplier integration refers to the processes and steps involved in sharing information and joint planning with key suppliers to achieve stated objectives and goals of the important firm with benefit of cost reduction, customer satisfaction and improved lad times[Quesada, G., Rachamadugu, R., Gonzalez, M., & Luis Martinez, J.(2008)].

Integration has been said to be the foundation of other kinds of integration and is defined as the linkage of business processes of departments in an organization in

to a strategic fit for improved performance [Fawcett, S. E., & Magnan, G. M. (2002).]. Finally, information integration involves the sharing of key information data among supply chain partners though IT systems in order to bring about mutually beneficial outcomes [Trkman et al. (2007).]

In maintaining competitive advantage the contribution of collaboration among supply chain partners and organized management system across organizational practice is quite substantial to stay in the competition. In today's business world the central concept of supply chain management is taken by the idea of integration, because the practice of SCM requires a systematic integration processes starting from sourcing, to manufacturing, and to distribution along the supply chain (Cooper, M., Lisa, M., Ellram, J., Gardner, T., & Albert, M. H. 1997). as of studies of, Flynn et al. (2010) operational performance and business performance are the two widely used measures of firm performance. The significance of Integrating supply chain is "to look beyond tactical order fulfillment and gain a better understanding of customer wishes for customized products and services which can help the company differentiate its offerings and increase profits.

The food processing industry is the dominant manufacturing sub-sector in Ethiopia. According to Balda (2011), the supply chain practice in most Ethiopian manufacturing industries including food is traditional. It is characterized by non-collaborative relationship with suppliers and customers in terms of aligning strategies and operations. The study will attempt to answer the research question 'Does supply chain Integration has an impact on operation performance?

The objective of SCI is to achieve accurate, timely and smooth flow of goods and services, information, and processes, to impart maximum value to the customer at low cost and minimum time in an efficient manner (Bowersox etal.,1999; Frohlich and Westbrook, 2001; Naylor et al., 1999). According to Christopher (1994), a supply chain is a network of institutions that have strong bonds from upstream to downstream in all processes and activities in such a cohesive manner that make value for organization and for end customer.

Therefore, in order to provide the empirical evidence for the research gap identified regarding supply chain integration and its impact on operational performance, the researcher have review different empirical evidences. However, there is limited

knowledge of how the supply chain integration practices are affected the performance of manufacturing industries.

1.2. Company Back Ground

The brothers' flour and biscuit factory is a sole proprietary firm established in 1992 E.C in Oromia Regional State located in Adama town. It produces biscuit and flour products. Some of the products are biscuit namely hard variety, soft variety biscuit and cream variety of biscuit. The factory is also engaged in milling wheat flour meant for in house consumption and accessible for local market.

The biscuit production was initiated with machineries from china and India; and now operating with world's best machines and equipment from Italy. Similarly the wheat milling started with typical mills from china and now operating with state of the art milling machines from turkey. The factory is promoted by well-established family group of two brothers having proven track record in the field of food manufacturing sector.

1.3. Statement of the problem

Efficiency of supply chain integration can be source of distinct competitive advantage for an organization to show better operational performance. In the contemporary business administration, it is quite difficult for businesses to compete as a single entity rather it should be done through the integration of supply chains. Based on the idea of supply chain management, the management of business had come with an era of inter-network competition, where the ultimate achievement of a single business depends on the total business performance and the capability of managing relationships with other supply chain partners (Lambert, et al ,1998).

There are constraints in the whole supply chain which critically affects operational performance of an organization such as longer lead times, supply disruptions caused by global customs, foreign regulations and port congestion, political and/or economic instability in a source country, and changes in economics such as exchange rates which in turn leads to increasing cost of product, reduces speed of delivery of product and flexibility of the company. Globally the operational problems of wholesale businesses is expressed through: Lack of guidelines for creating alliances

with supply chain partners; Failure to develop measures for monitoring alliances; Inability to broaden the supply chain vision beyond procurement or product distribution to encompass larger business processes; Inability to integrate the company's internal procedures; Lack of trust inside and outside a company; Organizational resistance to the concept; Lack of integrated information systems and electronic commerce linking firms (Fernie&Sparks,2014)

In manufacturing industries including food, supply chain is the most costly activity requiring significant attention, effective strategy, and management. These industries need to have clear supply chain strategy and direction that support firms 'business strategy. In addition, the supply chain management including; the production planning, inventory control, distribution, and logistics processes should be well integrated and coordinated to reduce costs and increase contribution margins (Heizer, 2011).Daniel Atnafu (2015) in his thesis examine that the effect of supply chain integration on operational performance in Chemical and Chemical product manufacturing firms in Ethiopia.   The result from study his study shows a significant positive effect of supply chain integration construct on the operational performance of firms.

Supply chain integration is a vital approach to enhance the various aspects of operational performance. Biniyam Gizaw (2016) try to assess the effects of supply chain integration on operational performance in Ethiopian trading enterprise. Main findings of the study depicts that, there is poor integration along the supply chain as the mean values of the four supply chain dimension (internal integration, customer integration, information integration and supplier integration)were below the minimum requirement. Moreover, internal integration, customer integration, and supplier integration dimensions of supply chain integration had a significant effect on operational performance of the enterprise in which information integration dimension had failed to signify the effect and needs to include other supply chain variables.

According to Daniel Atinafu and Shambachew Omer Hussen(2015) " the effect of supply chain integration on operational performance : the case of chemical industry in Ethiopia" tries to conclude that effective supply chain integration (internal, customer and supplier integration) leads directly to a higher operational performance. Some of the results of this study are consistent with the previous studies which were conducted in developed countries. In addition, the findings provide further evidence for the conventional wisdom that 'the more integration the better the performance'.

Daniel Atinafu. 2015 and Biniyam Gizaw 2016 are trying to look the impact of supply chain integration in different sector but with the knowledge of the researched it couldn't get any study that is made on the supply chain integration area of food sector in Ethiopia. Therefore, in order to provide the empirical evidence for the research gap identified regarding supply chain integration   and its impact on operational performance, the researcher have review different empirical evidences. However, there is limited knowledge of how the supply chain integration are affected the performance of monopolistic firm and services giving industries. With this regards the researcher tried to assesses the impact of supply chain integration on the operational performance "in case of Brothers flour and biscuit factories in Adama town".

The main research questions are:
1. What is the influence of internal integration in the operational performance?
2. How does the impact of information integration on operational performance of the factories reflected?
3. Does the integration of customer has an impact on operational performance of the factories?
4. What is the impact of supplier's integration on operational performance of the factories?

1.4. Objectives of the study

1.4.1. General objective:

To assess the impacts of supply chain integration on operational performance in brothers flour and biscuit factory.

, 1.4.2., Specific, objectives, of, this, study, are:

✓ To examine the influences of internal integration in the operational performance of brothers flour and biscuit factory.
✓ To examine the effect of information integration on operational performance of the factories.
✓ To assess the influence of customer integration on operational performance of the factories.

✓ To investigate the impact of provider (supplier) integration on operational performance.

1.5 Significance of the study

The findings of the study expected to benefit a number of players in the food processing industries in Ethiopia and academicians and researcher.

1.5.1 Food processing firms in Ethiopia

The findings of the study assist the managers along the supply chain to make sound and informed strategic management decisions and enable them to focus on their customers more efficiently. With such exposition, managers should be understood how firms can perform better and add value to the shareholders. The study will act as a guide to food processing firms in Ethiopia in their steps towards developing more competitive advantage in the market and pursuing market leadership in the industry. The study lead to higher firm profitability.

1.6 Scope of the study

The topic covers the issues of internal integration, customer integration, supplier integration and information integration on operational performance and was not include other performance measurements like profitability. The other delimitation is the subject of the study. The study was not addresses only employees who work under different departments (supply chain, store operation, category management, sales& marketing, quality assurance) and it was not consider the view of customers. The geographical scope of the study covers the Adama Town Oromia regional state because the factories under the study are found in the Adama Town and the researcher find out that it convenience as a factory that work integrate on flour and biscuit production and has a very reach experience on the sector.

CHAPTER TWO

2. LITERATURE REVIEW

Supply chain management (SCM) is the integration in the flow and transformation of goods from raw materials stage (extraction), though to the end user, as well as the associated information flows. Material and information flow both up and down the supply chain. The supply chain includes the management of information systems, sourcing and procurement, production scheduling, order processing, inventory management, warehousing, customer service and aftermarket disposition of packaging and materials (Handfeild& Nichols, 1999). Supply Chain is a linkage of various organizations and the chain comprises vendors. Supply Chain is a linkage of various organizations and the chain comprises vendors that supply raw materials, producers who convert the raw material into finished product, warehouses that store products, distributor‟s that deliver products to retailers and retailers who deliver products to the ultimate consumer though upstream and downstream linkages in different kinds of activities and processes (Christopher, 1998). Meanwhile, in 2004, Stadler summarized various definitions of SCM given by different authors as, an activity of linking different units of organizations along a SC and coordinating materials, financial and information flows in order to fulfill customer demands with the objective of boosting competitiveness of the supply chain of an organization as a whole.

2.1 Supply Chain Management (SCM)

The concept of "supply chain management (SCM)" has gone though huge developments globally. SCM seeks to enhance competitive performance by closely integrating the internal cross-functions within accompany and effectively linking them with the external operations of suppliers, customers, and other channel members to be successful (Otchere, Annan & Anin, 2013). The objective of supply chain management is to maximize the overall value generated rather than profit generation (Otchereetal, 2013). Although the importance of supply chain relations is widely acknowledged, seamless coordination is rarely achieved in practice coupled with

several challenges (Hussain and Nassar, 2010; Otchereet al, 2013).

2.2 Supply Chain Integration (SCI)

Supply chain integration is defined as "the extent to which all activities within an organization, and the activities of its suppliers, customers, and other supply chain members, are integrated together"(Narasimhan,etal.1998).SCM has three independent variables in its original scale they are: internal, suppliers and customer integrations. Some also considers integration in two levels: internal integration and external integration (TutuncuandKucukusta, 2008).Finally, Stevens (1989) classifies supply chain integration in to three levels, from functional integration to internal integration and to external integration. However, this study focuses only on internal and external integration, because functional integration is a pre-requisite for all firms to implement and achieve Internal Integration (Otchereetal,2013). The dominant belief is that supply chain integration (SCI) is a useful approach to improve various measures of firm performance (VanderVaart and VanDonk,2008). The basis of integration can therefore be characterized by cooperation, collaboration, information sharing, trust, partnerships, shared technology, and a fundamental shift away from managing individual functional processes, to managing integrated chains of processes (Pagell, 2004).

2.3 Internal Integration

Internal integration involves cross functional teams that may bring together a carefully selected array of specialists who share information and make product, process, and manufacturing decisions, jointly and simultaneously (Koufteros, Vonderembse& Jayaram, 2005)

Internal integration is defined as a process of inter-functional interaction, collaboration, coordination, communication and cooperation that bring functional areas together in to a cohesive organization (Flynnetal, 2010). Furthermore, Supply chain partners who exchange information regularly are able to work as a single entity, and can understand the needs of the end customer better and hence can

respond to market change quicker (Stein,1998).A pre requisite for successful SCM is internal integration (Lambert,Cooper&Pagh,1998).Also, companies with a low internal integration strategy will achieve low level of external integration and companies implementing the full internal integration strategy will have the highest levels of external integration (Gimenezand Ventura, 2005). Generally, it is believed that firms achieve a relatively high degree of internal integration before they attempt to develop a higher degree of external integration (Otchereetal. 2013). Internal integration can be accomplished through automation and standardization of each internal logistics function, the introduction of new technology, and continuous performance control under formalized and centralized organizational structure (Bowersox, 1989).

2.4 External Integration

As the competitive environment is becoming increasingly challenging, firms are undertaking efforts to compete along multiple fronts. However, many firms find it difficult to compete in the market by relying on their internal resources and competencies alone. They have turned to collaborate with their customers and suppliers to obtain information and complementary resources, which they can deploy to build competitive advantage. External supply chain integration reveals two major areas of emphasis. They are: Customer integration (CI) and Supply integration (SI). Supplier integration also called "backward" integration (Frohlich and Westbrook, 2001) refers to the process of interaction and collaboration between an organization and its suppliers to ensure an effective flow of supplies (Zhao et al, 2011). Customer integration, also called "forward" integration (Frohlich & Westbrook, 2001) refers To the process of interaction and collaboration between an organization and its" customers to ensure an effective Flow of products and/or services to customers (Zhao et al. 2002). Customer integration involves sharing demand information, help the manufacturer to understanding better the customer needs and to forecast better customer demand, as well as collaborative involvement of customers with respect to product design, provision of better quality products at lower cost and more flexibility in responding to customer demand (Flynn et al. 2010).

2.5 Information integration.

In supply chain, the importance of coordinating activities is important. This point is also noticeable for information management in the chain, information management systems and the data transaction. Coordinated and appropriate information between partners will lead to growing impacts on the speed, accuracy, quality and other aspects. Effective information management will lead to greater coordination in the chain. Information integration is the extent that operational, tactical and strategic information are transferred between business partners and the central company. (Elahi ei al, 2009) Frohlich and Westbrook (2001) downward flow of material in supply chain should be supported through information flows from bottom to top. Kalakota and Robinson suggested that significant progress in supply chain management can be achieved through the integration of business processes and information flow between business partners. Lai et al (2007) defined information integration as using information and communication technology in order to coordinate decisions and activities between an organization and its partner. Jayaram and Tan (2010) concluded that information integration has positive relationship with performance of an organization. Information integration in this study is reviewed through two dimensions of information technology (technical) and information sharing (social dimension). Importantly, to emphasis on information technology without the willingness to share critical information will not significantly associate organizations together. So they may fail in integrating their logistics. In other words, that organizations notice both side of information integration can then use the maximum benefits of integrated logistics.

2.5.1   Information technology.

Using information technology has the potential of developing supply chain partners in order to work together for efficient delivery of products to consumers. Information technology allows the supply chain partners act as a single entity. (Marzang, 2010) information technology is a mixture of telecommunications achievements, methods and strategies for problem solving and leadership skills using computer knowledge and include issues related to advanced science and computer technology, computer design, information systems implementation and their applications. (Dorudchi&Nikmehr, 2007) NASA (2001) knows information technology as compilation of traditional computer science and information

technology for storage, processing and exchange of any data (including text, sound and image, etc.) Information (and communication) technology plays a central role in supply chain management in the following aspects. First, IT allows firms to increase the volume and complexity of information which needs to be communicated with their trading partners.

Second, IT allows firms to provide real-time supply chain information, including inventory level, delivery status, and production planning and scheduling which enables firms to manage and control its supply chain activities. Third, IT also facilitates the alignment of forecasting and scheduling of operations between Firms and suppliers, allowing better inter-firms coordination. (Prajogo & Olhager, 2012)Vickrey et al (2003) explained that integrated information technology, is a key factor for supply chain integration. These technologies include electronic data exchange between organizations and within organizations though material requirement planning system. Elahi et al (2009) stated that information technology plays a vital role in the success or failure of the supply chain. When suppliers are scattered across the world, integration of activities within and outside the company become important. This requires an integrated information system, which leads to information-sharing. Devaraj et al (2007) have concluded that information technology affects information integration and production in supply chain and Supplier integration has a positive impact on organizational performance. Kelle and Akbulut (2005) concluded using information technology in supply chain management leads to integration and coordination of material flow, financial flow and information flow between suppliers, manufacturers, wholesalers, retailers and final customers. Prajogo & Olhager (2012) concluded that IT has a positive impact on logistics integration.

2.5.2 Information sharing.

While the technological aspect of information integration is important, it is the frequency, the quantity and the quality of information that is shared that really matters. Information sharing means "supply chain companies" willingness to give accurate, timely, related and common information to each other in order to create harmony at all levels of the supply chain." Information sharing in organizations causes better decisions, capacity allocation, production and materials planning through

increased transparency, demand, supply and inventory. Studies show that information sharing acts as a key component in achieving an integrated supply chain. Some results are as follow: Increase coordination, reduce uncertainty, expedite material flow, accelerate order fulfillment, reduced inventory costs, increase customer satisfaction by reliable and fast delivering, improve performance, increase operational effectiveness, reducing bullwhip effect and ...... (Koçoglu et al, 2011) Green and Shaw expressed that an important strategy for managing integrated supply chain is information sharing between trading partners. One of the main benefits of information sharing is inventory reduction. Koçoglu et al (2011) suggested Information sharing significantly reduce supply chain costs, improve communication with partners, increase the flow of materials, fast delivery, order fulfillment, and ultimately improve customer satisfaction, improve coordination and facilitate access to the competitive position.

2.6 Supplier integration

In the supplier-facing component of integration, a number of studies have found a positive association between supplier integration and operational performance (e.g., Petersen et al. 2005; Devaraj et al. 2007). Nevertheless, others have reported no direct association between supplier integration and operational performance (e.g., Stank et al. 2001; Flynn et al. 2010) or supplier integration and business performance (e.g., Flynn et al. 2010), and yet others find a negative association (e.g., Stank et al. 2001; Swink et al. 2007) between supplier integration and operational performance. Although failing to uncover direct effects, Flynn et al. (2010), for instance, find that the interaction between the external dimensions of integration is associated with operational performance. As for business performance, similar to customer integration, the few existing studies focusing on this aspect have not found a direct positive association between supplier integration and business performance (Flynn et al. 2010) or between integration intensity and business performance (Rosenzweig et al. 2003).

2.7 Customer integration

For the customer-facing component of integration, the literature indicates that this dimension is directly (Flynn et al. 2010; Wong et al. 2011) and indirectly (Devaraj et al. 2007) associated with improved operational performance. However, other studies contradict the customer-facing to operational performance association (e.g., Swink et al. 2007). As for business performance, studies have not found a direct positive association between customer integration and business performance (e.g., Flynn et al. 2010; Koufteros et al. 2010) and the link seems to remain under investigated and unclear

2.8 The effect of SCI on firm performance

Although financial performance has been widely used as a key output measure of firm performance (Boyer, 1999), numerous studies have pinpointed the limitations in relying solely on financial performance measures in supply chain studies (Eccles and Pyburn, 1998). For example, numerical performance measures used as simple qualitative evaluations may not adequately describe firm performance. Therefore, in this study, we adopt both operational and financial performance to measure the benefits of SCI. Internal integration can help functions to leverage each other's resources and capabilities to jointly design products, ensure product quality and reduce duplicated tasks (Schoenherr and Swink, 2012). For example, Tan (2001) found that internal integration could create a close link between manufacturing and distribution processes to deliver products and services in a timely and effective manner. Efficient external process integration allows manufacturers to speed up product delivery processes, improve production planning and reduce inventory obsolescence using accurate information about customer demands and preferences (Swink et al., 2007). Further, process integration with suppliers helps manufacturers reduce mistakes and enhance product quality though information sharing and joint planning,which are directly related to the manufacturers' operational performance (Petersen et al., 2005). Product integration with suppliers and customers can enhance manufacturers' new product development capabilities, promoting product quality, flexibility and innovation in addition to product competitive advantage (Koufteros et al., 2007).

Many studies have investigated the relationship between SCI and financial performance, and it is generally accepted that the former enhances the latter. For example, Frohlich and Westbrook (2001) concluded that manufacturers with the widest degrees of supplier and customer integration achieve the best performance improvements in terms of market share and profitability. Droge et al. (2004) found that both internal and external integration were related to financial performance though time-based performance. Zailani and Rajagopal (2005) noted that manufacturers with the greatest degrees of external customer and supplier integration achieved the highest overall performance improvement. The literature suggests that internal and external process and product integration can directly contribute to manufacturers' financial performance. Furthermore, it indicates that operational performance plays an important role in the relationship between SCI and financial performance. The literature also provides evidence that operational performance positively influences financial performance (Inman et al., 2011).

2.9 Facilitators of Supply Chain Integration

The most vital thing in supply chain is to identify and understand factors that facilitate supply chain integration. According to Ellinger et al. (2006), emphasis should be given to a whole encompassing communication; coordination at the place of work, joint accountability, and senior management involvement, a comprehensive integration among internal operations. Which takes the right position in facilitating supply chain integration. There are also other variables that enable external collaborative efforts which include information sharing, communication, interdependency, and common goals and objectives. There are also different mechanisms in order to enhance the aspects of supply chain integration, for instance, to establish inter organizational teams, designing performance measures, and to create effective communication and information exchange. The establishment of effective alliances and collaboration along cross-company members aids in order to develop strong commitment and alliance that cannot be broken easily and immersed by traditional organization structures. Establishing strong commitment in strengthening relationships across company members provides an organization to become a forerunner in its business activity (Moberg et al. 2003). Reduced cost of transportation and distribution, a coordinated planning, minimizing the level of inventories, better cycle times, and a prompted customer

service, are the most significant outcomes of properly governed relational integration. The existence of effective and better communication open doors in order to design an integrated measurement development and understanding. Enterprises which had a capability of creating a strong communication with their supply chain partners can develop standards that can enhance better decisions and strong performance (Froehlich and Westbrook, 2001). Generally, in order to facilitate the contribution of supply chain integration a critical improvement is needed on the factor that hinders better operational performance.

2.10 Theories of supply chain management

The study was based on four theories of supply chain management namely; the principal- agent theory, transaction cost analysis theory, the network theory and the resource-based view theory.

2.11 The principal-agent theory (PAT)

Based on the separation of ownership and control of economic activities between the agent and the principal, various agency problems may arise, such as asymmetric information between the principal and the agent, conflicting objectives, differences in risk aversion, outcome uncertainty, behavior based on self-interest, and bounded rationality. The contract between the principal and the agent governs the relationship between the two parties, and the aim of the theory is to design a contract that can mitigate potential agency problems. The "most efficient contract" includes the right mix of behavioral and outcome-based incentives to motivate the agent to act in the interests of the principal (Logan, 2000). The alignment of incentives is an important issue in SCM. Misalignment often stems from hidden actions or hidden information. However, by creating contracts with supply chain partners that balance rewards and penalties, misalignment can be mitigated (Narayanan and Raman, 2004)

2.12 Transaction cost analysis (TCA)

TCA offers a normative economic approach to determine the firm's boundaries and

can be used to present efficiency as a motive for entering inter-organizational arrangements (Williamson, 1996). A company may reduce its total transaction costs by cooperating with external partners. In the context of SCM, this question is addressed as: which activities should be performed within the boundary of each firm, and which activities should be outsourced? SCM relationships are represented by the hybrid mode of governance between markets and hierarchies. Asset specificity is the most influential attribute of the transaction (Rind fleisch and Heide, 1997). Behavioral assumptions of bounded rationality and the risk of being subject to opportunistic behavior from a partner also influence the transaction costs. Bounded rationality may result from insufficient information, limits in management perception or limited capacity for information processing. Mechanisms for mitigating the risk of opportunism include safeguards and credible commitments such as long-term contracts, penalty clauses if a partner fails to fulfill the contract, equity sharing, and joint investments. According to Williamson (1996), trust between the parties is based on "calculated risk" and not on personal trust between individuals.

TCA has often been used in make-or-buy decisions in supply chains. Examples are outsourcing of logistics activities (Halldorsson, 2002), buyer supplier relationships and restructuring of supply chains (Croom, 2001).In essence, TCA is a useful instrument to decide whether a transaction should be performed in the marketplace or in-house.

2.13 Network perspective theory

The performance of a firm depends not only on how efficiently it cooperates with its direct partners, but also on how well these partners cooperate with their own business partners. NT can be used to provide a basis for the conceptual analysis of reciprocity in cooperative relationships (Croom, 2001). Here, the firm's continuous interaction with other players becomes an important factor in the development of new resources (Haakansson and Ford, 2002). Relationships combine the resources of two organizations to achieve more advantages than through individual efforts. Such a combination can be viewed as a quasi-organization (Halldorsson, 2002). The value of a resource is based on its combination with other resources, which is why inter-organizational ties may become more important than possessing resources per se. Thus, the resource structure determines the structure of the supply chain and becomes

its motivating force. The network theory (NT) contributes profoundly to an understanding of the dynamics of inter-organizational relations by emphasizing the importance of "personal chemistry" between the parties, the build-up of trust through positive long-term cooperative relations and the mutual adaptation of routines and systems though exchange processes. Through direct communication, the relationships convey a sense of uniqueness, ultimately resulting in supply chains as customization to meet individual customer requirements. The parties gradually build up mutual trust through the social exchange processes. A network does not seek an optimal equilibrium, but is in a constant state of movement and change. Links between firms in a network develop through two separate, but closely linked, types of interaction: exchange processes (information, goods and services, and social processes) and adaptation processes (personal, technical, legal, logistics, and administrative elements) (Johanson and Mattsson, 1987)

NT is descriptive in nature and has primarily been applied in SCM to map activities, actors, and resources in a supply chain. The focus has been on developing long-term, trust based relationships between the supply chain members. Examples of issues include buyer-supplier relationships (Gadde and Haakansson, 2001), third party logistics (Halldorsson, 2002), and management roles in supply networks (Harland and Knight, 2001).

2.14 The resource based view (RBV)

Only a few articles have applied the resource-based view (RBV) to the field in focus in order to obtain the sources of competitive advantage through SCM (Carr and Pearson, 2002) or t with competitive advantages related to the firm's possession of heterogeneous resources (financial, physical, human, technological, organizational, and reputational) and capabilities (combination of two or more resources) (Miller and Ross, 2003). These resources and capabilities constitute the core competence of the particular firm and serve ultimately as its source of competitive advantage. The static stream of research focuses on attributes that contribute to the heterogeneity of resources and capabilities. Four barriers may prevent competitors from imitating a firm's resources and capabilities: durability, transparency, transferability and replicability (Miller and Ross, 2003). These attributes may also apply to inter-organizational arrangements (Jap, 2001). The more dynamic aspects of the RBV consider a firm's core competence to be its ability to react quickly to situational changes and build further competencies (Miller and Ross, 2003) or dynamic capabilities (Eisenhardt and Martin, 2000). Hence, a firm's competitiveness is associated with the configuration of resources and capabilities as the markets evolve. However, inter- organizational relationships may also facilitate and advance the learning processes of individual Firms. As such, relationships are not only output-oriented but also learning oriented. Efficiency may not only be explained in terms of productivity or operational measures, but also in terms of the opportunity to access another firm's core competencies through cooperative arrangements as an alternative to building such competencies in-house (Haakansson et al.,1999).

The RBV is an implicit assumption in many supply chain decisions. Often, outsourcing decisions are based on the idea of focusing on core competencies and outsourcing complementary competencies to external partners. TPL and outsourcing of standard components and processes to subcontractors are examples. However, outsourcing of design, NPD, or software development is often a way to gain access to other supply members' core competencies through inter-organizational collaboration. The PAT stresses issues of interfirm contracting and ultimately the notion of supply

chain transparency. The TCA considers hybrids such as integrated supply chains as the result of a market failure, whereas the NT and the RBV see the supply chains as a means to access resources and competencies outside the focal firm (Skjoett-Larsen, 1999)

2.15 Empirical Findings on SCM integration and Performances

. The forward vertical integration for distribution is used to be only explained by governance efficiency as described in Transaction Cost Theory (TCA). That is the ownership is to lower marginal transaction cost arising due to market imperfection and uncertainty. Range of internal and external factors could also explain the motive to integrate forward for distribution. External factors include customer demand and the potential benefits involving differentiation, increased information about customers, and supply chain efficiency improvement. Whereas, the most important internal factor driving the integration is company's Supply Chain positioning strategy.   And, this affects   company's   functions,   roles,   required   resources,   added   value,   and competitiveness. All in all, the forward vertical integration for distribution creates potential for selling more products (Guan & Rheme, 2012).Evangelista, Mogre, Perego, Rospagliesi, and Sweeney (2012) have used resource based perspective to describe and understand the relationship between IT adoption, logistics capabilities, and firm's performance.

Accordingly, a positive correlation between data gathering technologies (EDI, bar   code,   radio frequency, and RFID) and performance related to efficiency (asset utilization   improvement),   effectiveness   (operation   improvement,   customer   service improvement, and   flexibility   improvement),   and   transactional   capabilities (packing,   labeling,   and order management). • A positive correlation between enterprise   information   technologies   (LAN,   WLAN,   and   ERP)   and   financial performance (turnover improvement, market expansion, and increased customer). • Adoption of CRM and mobile phones is correlated to efficiency performance (asset utilization   improvement) • A positive correlation between transactional capabilities

(packing, labeling, and order management) performance measures in relation to asset utilization efficient

Supply chain integration as described by integration of supplier, customer and internal operation do have positive influence on supply chain performance. These performances are described in terms of raw material purchasing cost, transport cost, distribution cost, asset turnover and inventory holding cost (Patrick, 2013).

According to Makwemba and Xu (2009), uncoordinated information flow in Tanzania's food industry sector has resulted in a lot of wastage and product recalls. Bullwhip effect due to unreliable data was the major reasons for all these wastages. In addition, food products have relatively shorter shelf lives which make product recovery more difficult and expensive. Inventory management strategies and practices as described by setting optimal reorder and stock level, FIFO/FEFO, and stock evaluation practices were poor in all except in multinational companies. This along with produce-to-stock production strategy has resulted in stock piling, spoiled product, increased distribution recall costs, increased inventory cost, and significant decrease in profit margin. Poor forecasting along with production planning/scheduling activities that are not systematic and strategic has resulted into overstocking when the demand becomes low and or shortages when the demand turns to be high. Other challenges like technical knowhow, research and development, capital, difficulty in securing primary and secondary (packing) raw materials, and managerial/physical infrastructures were identified as bottleneck for the sector.

Deres (2011), in his comparative study on the level of SCM practices and performance in five selected medium and large footwear firms has found out that, the level of SCM practice implementation and performance among case firms varies depending on the SC variables. Specifically, the difference in performance with regard to; strictness of major customers' delivery requirement, cooperativeness in relationship with customers and suppliers, joint product planning with customers, in the occurrence of meeting with suppliers, internal material flow management, and made to stock production and modular system application is statistically insignificant. Whereas, statistically significant difference was observed among case organizations with regard

to their compliance to customers' requirement, joint product planning with suppliers, accepting and implementing suppliers' improvement suggestion, participation in the sourcing decision of suppliers, new product development, flexibility of production process, innovation, continuous improvement adoption, employees' professional skill, management know-how regarding supply chain, the extent of made to order production and production process automation, their information sharing practices (forecast, product related, adequacy, formal and informal information sharing agreement), in implementation of up to date automated ordering system with major suppliers, implementation of electronic ordering system with major customers and its adequacy, and in implementing automated production system.

According to Balda (2011), Kality Food Factory's Supply Chain practices and performance were not satisfactory. Specifically, the degree of relationship across the supply chain as described by joint product planning decision making is low and characterized as transactional or the traditional one. Even though; the company has good automated quality control and moderate flexible production system, innovation and efficiency in utilizing the available resource is weak. Good information sharing practices were observed among the supply chain partners even though the quality of information shared is under question mark. But, sales forecast information sharing with suppliers and customers is weak. Implementation and usage of information technology/tools in the company was found to be weak.

2.16 Conceptual framework

Supply chain integration (SCI) helps firms to reconfigure their resources and capabilities internally and externally to consolidate their supply chain as a whole in an effort to improve long-term performance (Horvath, 2001) SCI has both operational and financial performance benefit.

Independent Variable -SCI Dependent Variable

Independent Variables
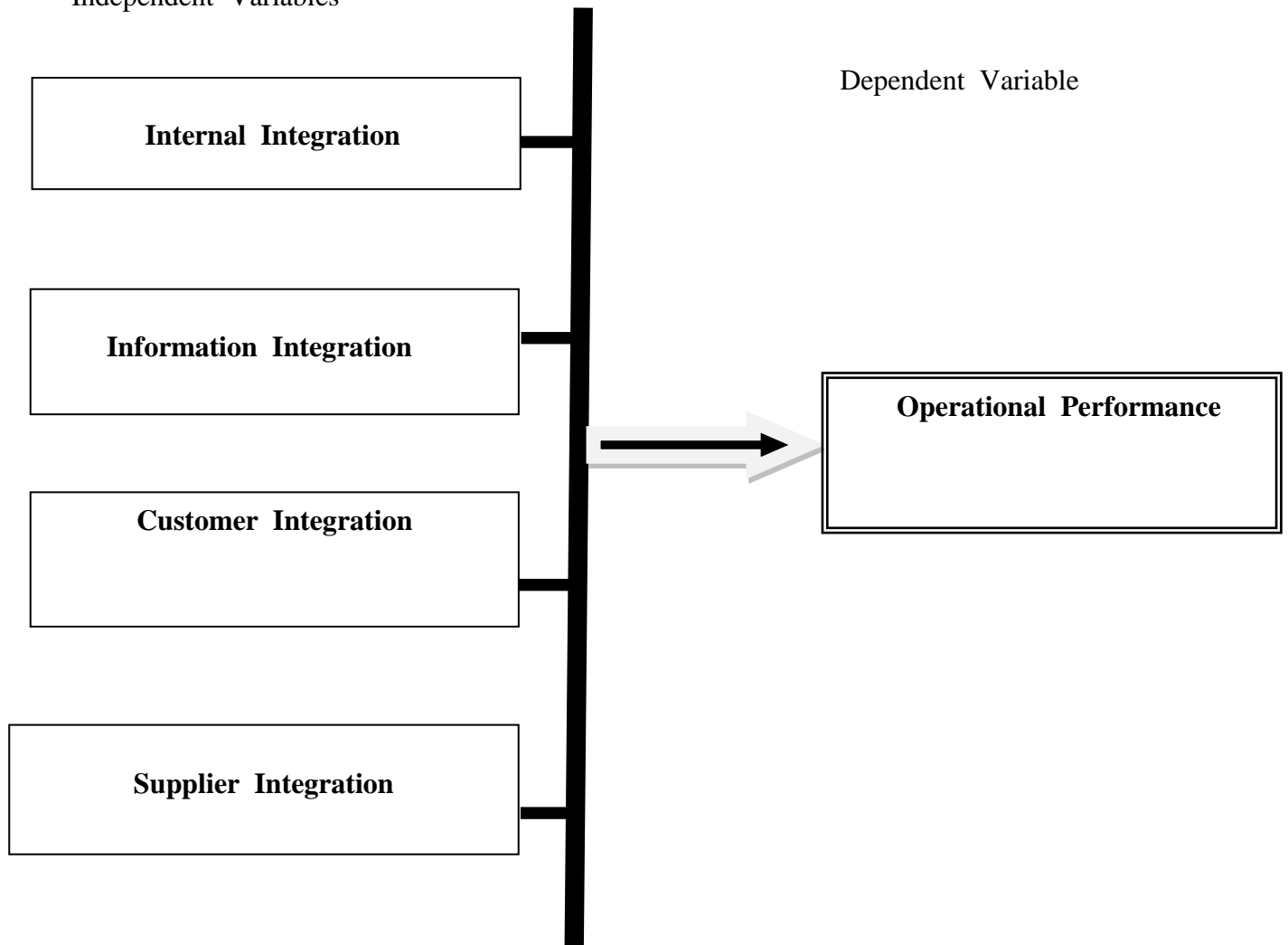
Figure 2. 1 conceptual frame work the impact of supply chain integration on organization performance: in the case of brother's flour and biscuit factory in Adama town.

Source: adopting from EvansMarokoMose.2015 and modified by the researcher.

Regression model: $Y = a + b1x1 + b2x2 + b3x3 + b4x4 + \mathcal{E}$ where Y = Operational or Organization performance; a= the y intercept when x is zero; b1, b2, b3, b4, , are regression coefficients of the following variables respectively; x1- internal integration;x2-infmation integration ; x3- customer integration ; x4- supplier- ntegration

CHAPTER THREE

3. Research Methodology

3.1 Research Design

Quantitative research design is the survey research. It provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population. It includes cross-sectional and longitudinal studies using questionnaires or structured interviews for data collection with the intent of generalizing from a sample to a population (Fowler, 2008). Consequently, the research design in this study was used descriptive and explanatory research design. Descriptive research design is preferred for better describe the group of individuals over the set of variables. Correlation was applied to investigate the association of variables and the regression is used to show the cause and effect relationship between the dependent variables and the independent of supply chain integrating.

3.2 Data Source and Collection

The study was used primary data. Primary data are first-hand information, data collected directly from an original source. Primary data can be collected through observation, interviews, or the use of questionnaires (Saunders *et al.,* 2009). The study was used questionnaires to collect primary data for quantitative analysis. Standard questionnaire was used as a primary data gathering mechanism and data collection from journal articles, company profile, online sight and others as a secondary source. Data was collected using self-administered closed ended questionnaire from employees. Questionnaire which is closed ended was prepared and distribute to employees of the manufacturer. The questionnaires was distributed and collected by the researcher to facilitate the study in order to effectively gather pertinent information to the study. The indicators of supply chain integration was measured by using a five point Likert scale (1=strongly disagree; 5=strongly agree) where higher values indicated stronger integration. This questionnaire type is selected

because it is easy to administer to groups of people simultaneously; it is less costly and less time consuming than other measuring instruments.

3.3 Target Population and Method of *Sampli*ng

3.3.1 Target Population

Population is defined as the entire set of individuals or other entities to which study findings are to be generalized (Schutt, 2011). The study population was focused on permanent employees   of Brothers flour and biscuit factory located at Adama Town. The target population of this study was permanent employees of the factory particularly those who have a certificate and above. The population is selected based on its reliability for the sources of data required and its convenience for data collection. Stratified sampling was used based on the strata of departments and simple random sampling using random table was done accordingly. The reason for using stratified simple random sampling to precise information inside the sub-population about the variables we are studying and we can raise precision of the estimate of the variables of the population.

3.3.2 Sampling Method

The study was used a purposive and simple random sampling method to select the study sample. This is because purposive sampling method is used when elements are selected due to a specific purpose, usually because of their unique position (Schutt, 2011). In this study the researcher used as purpose only managers, executive or any individual within the organization of the best knowledge of SCI implementation was selected. On the other hand, simple random sampling was used by the researcher because the nature of study is homogeneous (only concerned with one company) hence each individual both lower level and upper level employees has an equal chance of being included in the sample.   According to Cochran, when the population is small then the sample size can be reduced slightly. This is because a given sample size provides proportionately more information for a small

population than for a large population. Therefore these studies used the following formula:

$$n = \dfrac{n_o}{1+ \dfrac{(n_o-1)}{N}}$$

Where n is the sample size and N is the population size of Brothers flour and biscuit factories have total 150 employees whose they have certificate and above.

$$N=150$$
$$n = 385/1+ (385-1)/150)$$
$$n=108$$

Therefore, based on the above given information and sample size formula, 108 employees are selected for the survey and the researcher distributed for all 108 samples and 10 additional questioners. From 118 distributed questioners, only 98(90%) are collected and used for the analysis.

3.4 Data Presentation, Analysis and Interpretation

The quantitative data collected through questionnaire was analyzed by Statistical Package for Social Sciences (SPSS.23).

Descriptive analysis was compute to evaluate the demographic characteristic of the respondents and their position related to supplier integration, customer integration, information integration and internal integration. To check the strength of association between the four independent variables and organizational performance, correlation analysis used to compute. Finally, to check the impact of the independent variable to the dependent variable regression analysis was used to compute for all variables.

Regression model: $Y= a +b_1x_1+b_2x_2+b_3x_3+b_4x_4+\varepsilon$ where Y = Operational or Organization performance; $a=$ the y intercept when x is zero; b_1, b_2, b_3, b_4, , are regression coefficients of the following variables respectively; x_1-

internal integration; x2- information integration ; x3- customer integration ; x4- supplier integration.

3.5. Test reliability and validity

3.5.1 Reliability

Golafshani (2003) defines reliability as the extent to which results of a study are consistent over time and there is an accurate representation of the total population under study. According to Toke et al., (2012), the aim of reliability analysis is to find the extent to which a measurement procedure produced the same result if the process is repeated over and over again under the same conditions. The most common technique used in the literature to assess the scale's reliability and stability is use of the Chronbach Alpha Statistics. Chronbach Alpha should be over 0.70 to produce a reliable scale and any scale with Chronbach Alpha less than this standard should be eliminated Sekaran (2005).

Table 3. 1 Reliability test statics

Reliability Statistics

Cronbach's Alpha	N of Items
.916	32

Source: own survey result

To ensure the measurement and assessment of the real situation in the brother's flour and biscuit factory, the researcher conducted pilot survey on the questionnaire by taking 10 employees. The researcher has done this by himself. Having the respondents comment and suggestion, the researcher has made all the necessary improvements (adjustments) on both questionnaires structurally as well as content wise. Therefore, we can conclude that the data collection instruments were acceptable as reliable.

3.5.2 Validity

According to Mugenda and Mugenda (1999), validity of research tool has three components. The first is construct validity which deals with the consistency of the questions with the responses intended by the researcher. This validity is assured by structuring the questionnaire according to the specific objectives. The second form of validity is content validity, i.e. the ability of an instrument to gather the data required for the analytical techniques suggested (Peil, 1996). This is assured using close ended questions to avoid irrelevant answers. To ensure internal validity of the questionnaire, the researcher also gave the draft questionnaire to the supervisors for review and recommendations which are made part of the final questionnaire. Construct validity is assured by rearranging the questions according the comments of the respondents in order to keep the flow of questions.

3.6 Ethical considerations

In data collection appropriate ethical clearance was obtained from Jimma University. Confidentiality was ensured for the information by not recording the name of the respondent or other identifiers. While conducting the research, respondents was informed that the data collection process was carried out whenever they were willing to cooperate. In addition to this, any information collected via the instrument would never be used for any other purpose other than its academic intent i.e. the data would be kept confidential. They were also made to know that before it is publicized, the researcher will provide them the copy of the publication.

CAHPTER FOUR

Data Analysis AND Discussion

4.1 Introduction

Under this chapter the analysis and interpretation were carried out based on the data collected though questionnaire from all departments of Brothers flour and biscuit factory, which work along the line of supply chain. The data was analyzed using Statistical Package for Social Science (SPSS v.23).Based on the methodologies, research design and tools of the proposal the data was collected from 118 respondents. From the total 108 samples and additional 10 questionnaire distributed all were returned from which 15 were not returned. Therefore 98 were effectively used for analysis that shows response rate of 90 percent. This is a good response rate based on Fowler (2002) a 75 percent response rate is considered adequate. Data analysis, discussion and interpretation of the results are presented in the following subheadings: presentation of demographic data and frequency of respondents, analysis of mean, analysis of correlation and regression coefficient.

4.2 Demographic data presentation and analysis

Observing the demographic trend or characteristics of our sample population before starting the data analysis is useful to make the analysis more meaningful for the factory. This part of the questionnaire requested limited amount of information related to personal and demographic status of respondents. The purpose of demographic analysis in this research is to describe the characteristics of the sample such as proportion of male and female in the sample, academic qualification of respondents and experience of respondents. Accordingly these variables are summarized and described in tables shown below.

Table 4. 1Gender of the respondents

Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
male	52	53.1	53.1	53.1
female	46	46.9	46.9	100.0
Total	98	100.0	100.0	

Source :   own survey results

As the above table depicts that the gender dissemination of respondents in brother's flour and biscuit factory covers 53.1% of male and 46.9% percent of female respectively. This implies that the gender distribution of brothers biscuit and flour factory almost fair.

Table 4. 2 Qualifications of the respondents

certificate	10	10.2	10.2	10.2
Diploma	25	25.5	25.5	35.7
first degree	60	61.2	61.2	96.9
Master	3	3.1	3.1	100.0
Total	98	100.0	100.0	

Source :   own survey result

The results of respondents allied with their educational background show that, 10.2 percent of the respondents have certificate, 25.5 percent of the respondents have Diploma, 61.2 percent of the respondents have first degree and the rest 3.1 percent have a master's degree. This indicates that the majority of respondents are degree and diploma holders and also the number of Master holders is important figure. This suggests that the respondents provide relevant and accurate information needed for the study on the impact of supply chain integration on operational performance. Irrespective of the high educational levels of the respondents, the researcher finds it necessary to find the specific professional qualifications of the respondents in order

to have a fair view of their capacity to comply with the current practice and challenges of supply chain integration. The research established that understanding prospects of supply chain integration requires professionalism and therefore requires staff with supply chain qualification and training in order to understand the veracity of the practice

Table 4. 3 Work experience of the respondents

Experience	Frequency	Percent	Valid Percent	Cumulative Percent
<1 year	15	15.3	15.3	15.3
1-5 year	30	30.6	30.6	45.9
6-10 year	47	48.0	48.0	93.9
>10 year	6	6.1	6.1	100.0
Total	98	100.0	100.0	

Source: own survey result, 2020

Ultimately, the output in Table 4.3 shows that, 15.3 percent of the respondents had work experience less than 1 year, 30.6 percent of the respondents indicated that they had work experience of 1 to 5 years while 48 percent of the respondents said they had experience of 6 to 10 years and also 6.1 percent of the respondents replied that they have worked for more than 10 years. The results indicates that majority of the respondents have an experience in work area between 6 to 10 years which is an indication that they understand the effect of supply chain integration on their operational performance because they had the chance to work in different areas in different positions where it paves a way to analyze the circumstances of different problems. The implication of the result is that most of the respondents are young professionals which dominated the factory (6-10 years) and they are more cooperative and easily understand the questionnaire which is required to complete by them to provide information. The respondents are aware of the modern application and implication of supply chain procedures at the factory level and therefore they gave the correct and accurate information the researcher needed for the study.

4.3 Descriptive analysis

The mean or average is a measure of central tendency that offers a general picture of the data without unnecessarily covering one with each of the observations in the

data set. The mean of respondents in each dimensions of supply chain integration suggest that the average amount that each dimension has positive or negative response of respondents. In this case, the mean of each item together with their respective dimension overall mean/average mean was calculated in order to conclude the overall supply chain integration of Brothers flour and biscuit factory. The mean statistical values of the items were based on the 5 point Likert scale and will be illustrated through the following assumptions: if the mean (M) score is below 2.5 it implies that the respondents" disagree with the statement, if the mean score is equal to 2.5 it indicates that the respondents" prefer to stay Neutral, and finally if the mean score is above 2.5 it implies that the respondents" agree with the statement. Accordingly, the mean scores have been computed for all the four supply chain integration dimensions that includes supplier integration, information integration, customer integration, internal integration and also the dependent variable operational performance by equally weighting the mean scores of all the items under each dimension. The average mean result of each supply chain integration dimension together with their respective variables was separately presented, analyzed and interpreted as follows.

4.3.1 Supplier integration

Table 4. 4 Mean value of supplier integration

Items	N	Mean	Std.Deviation
You have long-term relationships with your suppliers.	98	4.3	0.82
You have effective communications with your suppliers on research activities and new product development (R&D).	98	4.25	0.72
There is high frequency of periodic contact with major suppliers	98	4.23	0.71
You and your supplier have transparent information about each other's inventory status.	98	4.21	0.72
You and your suppliers provide each other with each other's Sales and production plan	98	4.2	0.73
There is strong information exchange with major suppliers through information network	98	4.19	0.84
There is quick ordering system with major suppliers.	98	4.1	0.67

Source: own survey result, 2020

Table 4.4 illustrate responses from the first item of supplier integration which shows their agreement on the issue of effective communication with their supplier on

research activities and new product development, there is a transparent information about each other's inventory status, they provide each other with each other's sales and production, there is a quick ordering system with their major suppliers, they have a high frequency of periodic contact with their major supplier along term relationship with their supplier. These items have a mean and standard deviation score (M=4.25,SD=0.72),(M=4.21,SD=0.72), (M=4.2,SD=0.73),(M=4.1,SD=0.67),(M=4.23, SD=71),(M=4.19,SD=0.84)and(M=4.3,SD=0.82) respectively. The mean value of the internal integration result shows from 4.25-4.1 this result indicates there is a strong integration with their suppliers and each other's in Brother's flour and Biscuit factory employees.

As the results acquired from Brothers flour and biscuit factory indicated that, there is a strong integration with their supplier and this implies businesses are undertaken though modern way of operation which has a positive impact on their operation performance. The extent of information sharing with supplier and quick ordering system in the enterprise are the functions that were practiced. However, the stability of procurement with supplier and strategic partnership with supplier are also the variables that have given no emphasis. This has an implication that, the firm is strong in terms of suppliers" partnership practices and they understand the supply chain management practices that can play a great role in enhancing firms" performance. In today's business environment, companies are expected to perform in collaboration rather than competition where the integration among businesses plays a central role. Moreover, the results obtained depicts that Supplier integration has a substantial influence on operational performance of the factory which aligns with the finding of (chee yew wong,et al, 2011) And Petersen et al (2007).

Table 4. 5 Mean value of customer integration

ITEM	N	MEAN	STD.DE VATIN
Your company have systematic way to constantly measure customer satisfaction	98	4.31	0.74
You and your customers including the sub dealers have transparent information about each other's inventory status.	98	4.26	0.75
You have long-term relationships with your customers	98	4.23	0.83
You and your customers share technical information and technical assistance with each other.	98	4.2	0.75
You and your Sub dealers provide each other with each other's Sales plan.	98	4.19	0.78
You have effective communication with your Sub dealers and customers on research activities and new product development (R&D).	98	4.16	0.75
There is quick ordering system with major customers.	98	4.13	0.82
There is computerized system for major customer ordering	98	4.1	0.75

. Source: own survey result, 2020

The other critical dimension of supply chain integration is the integration of customer. The table above depicts that the respondents agreed the presence of linkage with customer though effective and transparent information communication with their sub dealer and customers on research activities and inventory status, they provide each other's sales plan with sub dealers, there is quick ordering system and computerized system with their major customer, the respondents also confirmed that the factory and customers share technical information and assistance ,there is a long time relationship with their customer and accompany have systematic way to constantly measure their customer satisfaction with a mean score of(M=4.16,SD=0.75), (M=4.26,SD=0.75),(M=4.19,SD=0.78), (M=4.13,SD=.82), (M=4.1,SD=0.75), (M=4.2,SD=0.75) (M=4.23,SD=0.83),and (M=4.31,SD=74) respectively. All mean values are above 4.0 this shows the respondents agreed and strongly agreed with there is a good integration with their customer in the above table dimensions. Consequently, The above result clearly shows that there is a strong integration with their customer in brothers flour and biscuit factory. Customer integration significantly influences the operational performance which aligns with the finding of chee yew wong, sakun boon-itt, Christina w.y.wong (2011) and Devaraj et al (2007).Based on the reflection

of results obtained from brothers flour and biscuit factory, This means that improving the extent to which the industry ensures customer integration has a great potential to improve the industry's performance. With a low level of customer integration, a focal firm is more likely to receive inaccurate or distorted supply and demand information, which results in high level of inventory and poor delivery reliability (Lee et al., 1997).

4.2.3 Internal integration

Table 4. 6 Mean value internal integration

ITEM	N	MEAN	STD
There is strong integrative inventory management	98	4.44	0.71
Different departments in your company share technical information with each other quickly if required.	98	4.36	0.69
Different departments in your company collaborate with the company development program (s).	98	4.35	0.73
There is better data integration among internal functions	98	4.31	0.68
You have effective communications between different departments regarding a new product or process development project.	98	4.3	0.66
Different departments in your company provide each other with their plan (s).	98	4.27	0.67
Different but related production sections have transparent information about the inventory status of each other.	98	4.14	0.78

Source: own survey result, 2020

The above table shows the respondents agreed and strongly agree with question on better data integration among internal functions, effective communications between different departments regarding a new product or process development, internal functions provide their plan each other different departments collaborate with the company development program, internal functions share technical information with each other quickly if required and there is integrative inventory management in the factory the mean value and standard deviation(M=4.31,SD=0.68)(M=4.3,SD=0.66),(M=4.14, SD=0.78),(M=4.27,SD=0.67),(M=4.35,SD=0.73), (M=4.36,SD=0.69),and(M=4.44,SD=0.71) respectively. The mean value of the above table shows the respondents agreed and

strongly agreed with the questions on internal integration. These results show different departments highly integrated with each other and they are transparent each other on company's activities this important for improvement of operational performance in the factory. Internal integration has a significant influence on operational performance which aligns with the finding of Huobaofeng (2010).The influence of internal integration arises from different dimensions. In brothers flour and biscuit factory there is good data integration, effective communication with departments on product development and there is collaboration with the company's overall development these implies the factories supply chain management highly practiced. The proper functioning of internal activities had a great contribution in the enhancement of the performance.

4.3.4 Information integration

Table 4. 7 Mean value of information integration

Item	N	MEAN	STD.
There is on time Delivery Record to Customers by the Company	98	4.38	0.76
Customer order processing time is short.	98	4.35	0.72
To deliver customer order on time the company avail necessary resources.	98	4.24	0.81
The time which elapses between the receipt of customer order and delivery is short	98	4.24	0.71
Time to solve customer complaints is short.	98	4.23	0.78

Source: own survey result, 2020

Information integration is another core dimension of supply chain integration. The preceding table 4.7 pinpoints the mean value of each item related to information integration with its aggregate average. Respondents show their agreements on timely delivery recorded to customers by the factory, short order processing time delivery system and the elapses between the receipts of customer order and delivery with a mean value of (M=4.38,SD=0.76),(M=4.35,SD=4.35,SD=.72),(M=4.23,SD=.78),(M= 4.24,SD=.81),and(M=4.24,SD=0.71) respectively. The effect of information integration is reflected in various ways in brothers' flour and biscuit factory: the low level of accurate and timely sharing of information along the supply chain and poor

utilization of information among Supply Chain partners. However, Koçoglu et al (2011) states that, sharing of information across the chain is a key and critical component in achieving an integrated supply chain because it is believed that SCI increases collaboration, minimizes uncertainty, increases the speed of material flow, accelerate order fulfillment, reduction of inventory costs, increases the satisfaction of customer though reliable and fast delivery of products. The other problem that arises due to poor integration of information is a fragmented coordination on the flow of information which results for ineffective utilization of information. So, from the outputs we can easily infer that there is a high utilization and coordination of information in brother's flour and biscuit factory.

4.3.5 Operational performance

Table 4. 8 Mean value of operational performance

ITEM	N	MEAN	STD,
Our firm provides a high level of customer service to our major Customer	98	4.5	0.64
Our firm can quickly respond to changes in market demand	98	4.37	0.65
Our firm can quickly introduce new product in the market	98	4.36	0.66
Our firm has an outstanding on-time delivery record to our customer	98	4.29	0.66
Our firm can quickly modify products to meet our major customer's Requirement	98	4.25	0.7

Source: own survey result, 2020

As per table 4.8 from the dimensions of operational performance respondents agree and strongly agree on the issue of on the factory quickly modify products to meet major customers requirement, quickly introduce new product in the market ,quickly respond changes in market demand, has an outstanding on-time delivery record to our customer and the factory provides high level of customer service to their major customer with the mean valueof(M=4.2,SD=0.7),(M=4.36,SD=.66),(M=4.37,SD=.65),(M=4.29,SD=.66)AND(M=4.5,SD=.64) respectively. Based on the indication of variables of operational performance it can be possible to conclude that aspects of operational performance are good.

4.3.5.1 Summary of the results of all the dimension of supply chain integration and Operational performance.

Table 4. 9 summary of the results

Item	N	MEAN	STD
Supplier integration	98	4.23	.54
Customer integration	98	4.21	.516
Internal integration	98	4.31	.415
Information integration	98	4.29	.56
Operation performance	98	4.36	.395

Source: own survey result, 2020

Table 4.9 shows the overall calculated mean scores of all the four supply chain and operational performance dimensions that have discussed above. It showed that the integration among stated items is high which is undertaken by brothers flour and biscuit factory as all the mean scores of each supply chain dimension is above 2.5. The strategic supply chain integrating with suppliers to customer implies to improved operations and overall performances of the firms Kim (2009), Flynn.et.al(2009).SCI has been found to improve performance of the supply chain. According to Sezen, B. (2008), .In the study of 125 manufacturing firms in the UK it was found that SCI and information sharing leads to improved supply chain performance. A study found that integrating with a firm's suppliers and customers along with the firm's competitive strategy will lead to improved operations performance (Zailani, S., & Rajagopal, P. 2005)

4.4. Correlation Analysis

Under research investigation we are expected to understand concepts beyond the means and standard deviations of the dependent and independent variables so we need to know how one variable is related to another which comes with the concept of correlation. Correlation is the relationship between two variables. So, we would like see the nature, direction, and significance of the bivariate relationship of the variables used in the study. The Bivariate Correlations procedure computes the pair wise associations for a set of variables and displays the results in a matrix. It is

useful for determining the strength and direction of the association between two scale and ordinal Bivariate Correlations. As noted above, a Pearson correlation matrix indicates the direction, strength, and significance of the bivariate relationships of all the variables in the study. According to Field (2005) correlation coefficient is a very useful means to summarize the relationship between two variables with a single number that falls between -1 and +1.The general symbol for the correlation coefficient is „r". So, a perfect positive relationship (r=+1.00) indicates a direct relationship and an „r" of -1.00 indicates a perfect negative relationship. Hence, in this study Bivariate Pearson Coefficient (r) was used to examine the relationship between the five supply chain dimensions by using a two-tailed test of statistical significance at the level of 95% significance, P< 0.05. Interpretation of correlation coefficient (r) size is as follows: if the correlation coefficient falls between 0.1 to 0.20, it is slight correlation or small; if it is between 0.20 to 0.40 is low correlation or weak relationship, if it lies between 0.40 to 0.70 moderate; if it falls along 0.70 to 0.90 high correlation or substantial relationship and if it is within 0.90 to 1.00 it is very high correlation or very strong correlation between variables (B.Burns & R.Burns, 2008).

Table 4. 10 Correlation of independent variables with dependent variables

Correlations

		supply_int ergation	customer_ integration	internal _integra tion	information _integratio n	opration al_perfor mance
supply_int ergation	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	98				
customer_ integration	Pearson Correlation	.730**	1			
	Sig. (2-tailed)	.000				
	N	98	98			
internal_in tegration	Pearson Correlation	.590**	.580**	1		
	Sig. (2-tailed)	.000	.000			
	N	98	98	98		
informatio n_integrati on	Pearson Correlation	.399**	.471**	.581**	1	
	Sig. (2-tailed)	.000	.000	.000		
	N	98	98	98	98	
oprational _performa nce	Pearson Correlation	.458**	.402**	.482**	.466**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	98	98	98	98	98

**. Correlation is significant at the 0.01 level (2-tailed).

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

Source: own survey result, 2020

Table 4.10 shows the correlation coefficient of the four factors measuring supply chain integration where all are positively correlated with operational performance of the factory within the range of 0. 402 up to 0.482 .All are significant at both $p<0.05$ and $p<0.01$ level. When we further look at into each factor with their coefficients which indicates the four independent variables: supplier integration (r=0.458), customer integration (r=0.402), internal integration (r=0.482) and information

integration (r=0.466). All are important determinants of supply chain integration and significant to show the effect of supply chain integration on operational performance. Regarding the relationship between independent variables, the above correlation table 4.10 depicts that all of the independent variables are correlated at P<0.01 and at P<0.05 level of significance. Supplier integration has a positive relationship with information integration and it is statistically significant with a confidence of 95 percent. This is displayed in the table as (r=.399, p <0.05) which actually means there is a true or significant correlation between the two variables. Supplier integration dimension shows the second positive and strong association with customer integration with the result of (r=.730, p <0.01). This result implied the two variables are strongly related with a confidence of 99%. The third positively and moderate correlated dimensions are information integration and customer integration with the value of (r=.471, p <0.01). There is also a direct, positive and significant association between information integration and internal integration (r=.581, p <0.01).

4.5 Regression Analysis

Regression analysis is a way of predicting an outcome variable from one predictor variable (simple regression) or several predictor variables (multiple regressions) (Andy field, 2009). The model of regression shows how much of the variance in the measure of supply chain integration is illustrated by the underlying dimensions of predictors of supply chain model. As of Field (2006), Multicollinearity is not the problem of this model, because VIF of the model approaches to 1.The value of VIF ranges between 2.397 to 1.576.The tolerance of the variables ranges between 0.635 and 0.417.

Table 4. 11Multicollinearity coefficients

Coefficients^a

		Collinearity Statistics	
Model		Tolerance	VIF
1	(Constant)		
	supply_intergation	.424	2.358
	customer_integration	.417	2.397
	information_integration	.635	1.576
	internal_integration	.497	2.012

Source: own survey result, 2020

Based on this figure it is possible to conclude that there is no multicollinearity effect and the inter relationships among independent variables doesn't cause concern. Therefore, as the indication of statistics that multicollinearity is not the problem of the study Since the value of tolerance for all independent variable is greater than 0.1 and all VIF is less than ten (VIF<10)

Table 4. 12 Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.569[a]	.323	.294	.33197

a. Predictors: (Constant), information integration, supplier integration, internal integration, customer integration

b. Dependent variable : operational performance

Source: own survey result, 2020

The model summary displays the significance and percentage of variation in supply chain integration which is caused by independent variables. Multiple correlations R of +0.569 represent the combined correlation of all the independent variables. Adjusted R^2 tells us that 29.4% of the variation in supply chain integration can be explained by variation in the four independent variables taken together.This leaves 70.6% unexplained. Or this results shows that the moderating effects of competitive strategies on the relationship between SCI practices and operational performance are insignificant, possibly because the operational performance is more process-focused and determined by the effectiveness of firm operational practices. The benefits and costs of SCI are not only reflected in operational measures, but also in financial measures such as capital and relational investment. The competitive strategy is a corporate-level action and financial performance is a more comprehensive measure compared with operational performance, which is an operational-level measure. Thus, when considering the overall effects of competitive strategies and SCI, the financial performance may reflect more apparent results.

Table 4. 13 ANOVA

Table14. ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4.899	4	1.225	11.114	.000^b
	Residual	10.249	93	.110		
	Total	15.148	97			

a. Dependent Variable: oprational_performance

c. Predictors: (Constant), information_ integration, supply_intergation, internal_integration, customer_integration

Source: own survey result, 2020

In the ANOVA sub table we have the F value of 11.114 which is significant with p <.001. This informs us that the four independent variables taken together as a set are significantly related to the dependent variable. The chance of obtaining these results assuming the null hypothesis to be correct is less than 1 in 1,000. The multiple correlations are therefore highly significant.

In order to see the contribution of factors that affect supply chain integration, regression analysis of operational performance were employed. Table 14, provides the result of multiple regression analysis beta coefficient and significance

Table 4. 14 coefficient

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.059	.367		5.608	.000
	supply_intergation	.185	.096	.254	1.937	.056
	customer_integration	-.013	.101	-.017	-.131	.896
	information_integration	.185	.075	.263	2.453	.016
	internal_integration	.181	.115	.190	1.572	.119

a. Dependent Variable: operational performance
   Source: own survey result, 2020

The standardize beta value shows the number of standard deviations that the outcome will change as a result of one standard deviation change in predictor. The standard deviation units are directly comparable; therefore, they provide a better insight in to the importance of a predictor in the model. The large value of beta coefficient in an independent variable has the more important determinant in predicting the dependent variable. The standardize beta value for information integration dimension is 0.263. This implies that, this variable has relatively strong degree of importance for analyzing the effect of supply chain integration than others. Respectively, the standardized beta value for supplier integration, internal integration and information integration are 0.254, 0.190 and -0.017 respectively. R-square value indicates only the variance in the operational performance as it is explained by independent variables. When we look at the detail to what extent each independent variable influence the dependent variable: customer integration, internal integration and supplier integration were found to be determinant of operational performance in decreasing order. The coefficient table depicts that the significant regression coefficients, such as internal integration, Supplier integration and customer integration are not significant at p=0.05.But, information integration is significant. This significance level tells us that those variables don't contribute to the regression equation thereby making a significant contribution to the prediction, but information integration contribute to the regression equation thereby making significant contribution to the prediction. Since, coefficients of predictor variables are statistically significant at less than five percent for information integration hypothesis related to these dimensions is accepted. Internal integration, supplier integration and customer integration are not significant and as a result null hypothesis related to this dimension is failed to reject. (Daniel Atinafu and Shambachew Omer 2015) explain their study result "The result farther shows that there is no statistically significant evidence on the relationship between internal and external integration (supplier and customer). This lead the researchers to infer that internal integration may not always grant firms external integration. Further, the result from this study shows the importance of applying supply chain integration in an industry, because supply chain integration can be a source of competitive advantage leading to superior performance through enhancing firms' operational performance

CHAPTER FIVE

CONCLUSSION AND RECOMENDATION

5.1 Summary

In this study, the researcher looked for the impact of supply chain integration on operational performance in case of brother's flour and biscuit factory. The study also illustrated the relationship that exists between the operational performance and supply chain integration dimensions and also along the dimensions of supply chain integration with the intent of knowing the strength of the relationship of the dimensions in this particular case. In order to achieve these objectives, data were collected from the employees of the factory and processed in both quantitative and qualitative approach of descriptive approach and also used regression analysis. From the demographic characteristics of respondents share is taken by (53.1%) was male and the remaining (46.9%) were female respondents. In relation to their qualification level, the respondents had a minimum of certificate in which we can assume that it is with educated employees. Finally, when we came to the work experience of the respondents, they had adequate exposure to the work area and had a potential of bringing change to the factory which reasonably increase the validity (as a whole the quality) of this research.

The analysis result depicts that the mean score values for supply chain integration dimensions were above the average mean value (between 4.1and 4.52) which really indicates the supply chain integration of brothers flour and biscuit factory is effective. The study also found a positive correlation among the four (supplier integration, information integration, customer integration, and internal integration) supply chain dimensions. Furthermore, the value of regression analysis shows that supplier integration, customer integration and internal integration have no statistical significant effect on operational performance.

5.2 Conclusions

Under this study, the major determining factors of operational performance identified were integrating variables of supply chain based on the response of employees which composed of four dimensions; supplier integration, information integration, customer integration and internal integration. Four research questions were developed and addressed in this research and unfortunately all the dimensions were rated above the average mean value of 2.5. In other words, it shows the good practice of supply chain integration in the factory.

- ✓ Information integration and operational performance are positively and significantly related. The exchange of information with supplier through information network, quick ordering system, creation of good strategic partnership with supplier and the stability of procurement with supplier are critical issues which are greatly practice by the factory. Information integration which composed of the issues like; free sharing of accurate information along the line of supply chain, the timely sharing of information with members of supply chain, strong coordination on the flow of information among supply chain partners and the strong utilization of information among supply chain partners are vital greatly practiced by the factory.

- ✓ Customer integration was another dimension which highly practiced by the factory. Its attribute included; linkage with customer though information network, the computerization of services for customer ordering, use of effective communication with major customer, the establishments of quick ordering system with customer, follow up with major customer for feedback and the frequency of contacts with supplier.

- ✓ Supplier integration and operational performance are positively related but statically insignificant. The exchange of information with supplier though information network, quick ordering system, creation of good strategic partnership with supplier and the stability of procurement with supplier are highly practiced by the factory.

✓ The final dimension which is over sought by Brothers flour and biscuit factory internal integration. The items here are; the integration of data among internal functions, use of cross functional teams in process improvement, enterprise application integration in internal function, strong integrative inventory management, real time searching inventory and utilization of periodic interdepartmental meeting. This implies that the employees highly integrated along the internal activities of the factory.

✓ The results given on the conclusion entails us that the four research questions developed in this study were considerably rated high by the employees which actually indicates the supply chain integration is greatly practiced at the required level of its employees. Regarding the correlation, it is possible to conclude that there is a strong and positive relationship among the four supply chain integration dimensions which this study was relied on.

5.3 Recommendation

Based on the findings of this research and the subsequent conclusions drawn, the following points are recommended.

As many literatures reflect that strategic supplier relationship and customer relationship are the major area that company should give priority to improve supply chain management practice. This requires mind shift to strategic thinking and build knowledge on such area instead of the traditional way of buy-sale relationship with suppliers and customers.

- To improve strategic relationship with suppliers, the company should select potential supplier that can be willing and cooperative for long-term relationship and plan jointly. In addition, they need to measure performance and reward for best achievements, share information continuously for suppliers.

- Regarding to customer relationship, the company should give more attention to create loyal customer though improvement collecting feedback from customer,

- Launch new construction design and service, long term relationship as well as improving strategic relationship with suppliers which help to get material

on time and enable to complaints with customer's full requirements of the product and time requirements.

- Information sharing and its quality were another important point that increase effectiveness and efficiency of decision making process as well contribute for improvement of supplier and customer relationship among the supply chain members. As the research findings revealed that there were good, timeliness, reliability and completeness of information and build trust and problem sharing or joint risk taking behavior.

- The poor applications of IT have strong effect on the level of integration within functional units and integration with suppliers and customers as well. Therefore, the case company give more emphasize on IT facilities, improve the knowledge and experience of existing IT specialists and other responsible workers on SCM practice. Generally, to increase operational and organization performance, the management and all stakeholders have to give due emphasis on SCI practices in modern way.

The integration of internal function within the organization is a primary activity in any organization. The organization has to work on different retention mechanisms in order to keep its employees. Customers should not wait until new employee is recruited and familiarize with the environment. Technical and Attitude Changing trainings should be given to employees periodically. The company should establish systems in order to align better data integration among departments.

5.4 Limitation of the study

This study assessed the impact of supply chain integration from the perspective of employees. This was a limitation as it used to more complete if the perspective of customers would also be incorporated. When we come to the issue of place, the result of the study reflected only in Adama and is not reflect the feeling manufacturing employees in other places.

5.5 Future Research

The relationships may not be the same for all company sizes, industries or regions. Future research should investigate the effects of these contextual factors on competitive strategies, SCI practices and company performance, along with the relationships among them.

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JIMMA UNIVERSITY

BUSINESS AND ECONOMICS

DEPARTMENT OF MANAGEMENT

QUESTIONNAIRE

Dear respondents, the purpose of this questionnaire is to gather data on the Impact of Supply Chain Integration on Organizational Performance in The Case of Brothers Flour and Biscuit Factory being prepared for partial fulfillment of Master Degree in Business Administration at Jimma University. The study is purely for academic purpose and thus not affects you in any case. So, your genuine, frank and timely response is necessary for successfulness of the study. The accuracy of the information you provide highly determine the reliability of the study. Therefore, I kindly request you to respond to each items of the question very carefully. Do not hesitate to contact me with the following contact address if you have any question/comment about the questionnaire.

Contact Address:

EMAWAY SITOTAW

Tel - +251 912060259

E-mail – emawaysitotaw@gmail.com

Thank you in advance for your unreserved cooperation!

General Instructions

- ✓ There is no need of writing your name
- ✓ For Section I please tick (√) for the answer in the appropriate box and indicate the number for your response to each statements of Section II.

Section I: Demographic Characteristics

1. Gender

Male ☐   Female ☐

2. Qualification

Certificate ☐   Diploma ☐   First Degree ☐

Masters ☐

3. Experience in the company

☐ 1-5   ☐ 6-10 years ☐

Less han 1year ☐ years ☐ ☐ More than 10 year

☐

Section II:

The Following Statements relate to the Impact of Supply Chain Integration on Organizational Performance In The Case of Brothers Flour and Biscuit Factory

Follow the instructions given for your responses

Please Indicate the extent of integration of your company (1=Strongly Disagree; 2=Disagree; 3=Neutral; 4=Agree; 5=Strongly Agree	1	2	3	4	5
Part 1 **Supplier Integration**					
1 You have effective communications with your suppliers on research activities and new product development (R&D).					
2 You and your supplier have transparent information about each other's inventory status.					
3 You and your suppliers provide each other with each other's Sales and production plan					
4 There is quick ordering system with major suppliers.					
5 There is high frequency of periodic contact with major suppliers					
6 There is strong information exchange with major suppliers through information network					
7 You have long-term relationships with your suppliers.					
Part 2 **Customer Integration**					
1 You have effective communication with your Sub dealers and customers on research activities and new product development (R&D).					
2 You and your customers including the sub dealers have transparent information about each other's inventory status.					
3 You and your Sub dealers provide each other with each other's Sales plan.					
4 There is quick ordering system with major customers.					
5 There is computerized system for major customer ordering					
6 You and your customers share technical information and technical assistance with each other.					
7 You have long-term relationships with your customers					

8	Your company have a systematic way to constantly measure customer satisfaction.				

Part 3	**Internal Integration**				
1	There is better data integration among internal functions				
2	You have effective communications between different departments regarding a new product or process development project.				
3	Different but related production sections have transparent information about the inventory status of each other.				
4	Different departments in your company provide each other with their plan (s).				
5	Different departments in your company collaborate with the company development program (s).				
6	Different departments in your company share technical information with each other quickly if required.				
7	There is strong integrative inventory management				
Part 4	**Information Integration**				
1	There is on time Delivery Record to Customers by the Company				
2	Customer order processing time is short.				
3	Time to solve customer complaints is short.				
4	To deliver customer order on time the company avail necessary resources.				

		1	2	3	4	5
5	The time which elapses between the receipt of customer order and delivery is short					
	Operational performance: please indicate the degree to which you agree to the following statements concerning your company's performance with respect to your customer. (1=Strongly disagree,2=Disagree,3=Neutral ,4=Agree,5=Strongly agree)	1	2	3	4	5
1	Our firm can quickly modify products to meet our major customer's Requirement					
2	Our firm can quickly introduce new product in the market					
3	Our firm can quickly respond to changes in market demand					
4	Our firm has an outstanding on-time delivery record to our customer					
5	Our firm provides a high level of customer service to our major Customer					

Thank you again for your cooperation!