



College of Business and Economics

Department of MBA- Concentrating in Finance

**A Study on “The Effect of Supply Chain Management on the Financial Performance of
the Sugar Manufacturing Sector in Ethiopia”**

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This is to certify that the thesis prepared by Selam Alebel, entitled: *The Effect of Supply Chain Management on the Financial Performance of the Sugar Manufacturing Sector in Ethiopia* and submitted in partial fulfillment of the requirements for the degree of Degree of Master of Business Administration in Finance complies with the regulations of the university and meets the accepted standards with respect to originality and quality. Signed by the examining committee:

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Statement of Declaration

I, Selam Alebel, declare that this study entitled ‘The Effect of Supply Chain Management on the Financial Performance of the Sugar Manufacturing Sector in Ethiopia’ is my original work, neither prepared previously by anyone else nor presented in any other academic institution at any level. All sources of materials used in this study have been duly acknowledged.

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ABSTRACT

Supply chain management has become a potentially valuable way of securing competitive advantage and improving organizational performance since competition is no longer between organizations, but among supply chains. This is essentially due to the fact that supply chains account for as much as 70% of the product's cost, which by any measure speaks volumes about its significance. In Ethiopia the importance of supply chains in the manufacturing sector will continue receiving increased attention as the on-going industrialization in the country, the sugar manufacturing sector being one, would inevitably be facing a reality check in the form of competition from its global counterparts that by far have the competitive edge in embracing supply chain. The objectives of the study were 1) to identify the supply chain management practices being put in use by the selected three sugar manufacturing industries in Ethiopia; and 2) to determine the extent to which supply chain management practices are influencing the financial performance of the three sugar manufacturing companies (Metehara, Wonji and Fincha). The research design adopted was descriptive research design. Two sets of data – primary and secondary- were gathered. Primary data was collected using a questionnaire that consisted of both open and closed ended questions while secondary data was collected from the factories' financial records covering a period of seven years (2010-2016). The data collected was analyzed using descriptive statistics and also an inferential analysis involving multiple regressions was performed. The findings of the study were that supply chain across the three factories on average account for 55.1% of their annual cost entailing its worth to successful performance; that some of the supply chain management practices (knowledge management and information technology) had a positive effect on various parameters of financial performance of the factories while others (strategic supplier partnership and logistics outsourcing) do have a negative effect; and that effective implementation of supply chain management practices led to decrease in the operational cost of the factories, reduction on the response time for product design change, increased accuracy of order processing for customers which leads to improved profitability. The range of supply chain management practices embraced by the factories were found to be very limited to strategic supplier partnership, logistics outsourcing and IT infrastructure (accounting for 55.1% of the factories' cost, which is quite lower than the 70% in other countries). The study recommends that the management of the sugar factories should consider implementing various supply chain practices as appropriate.

Key words: supply chain management, financial performance, financial measures

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Acronyms

AER	Asset Efficiency Ratio
BJ	Bera-Jarque
CGR	Cash Generation Ratio
CLRM	Classical Linear Regression Model
DA	Depreciation and Amortization
DW	Durbin-Watson

EBIT	Earnings Before Interest and Taxes
EV	Enterprise Value
FM	Financial Management
EV	Enterprise value
GTP	Growth and Transformation Plan
H.V.A	Hogeschool Van Amsterdam
ICT	Information and Communications Technology
ISO	International Standards Organization
IT	Information Technology
MBA	Masters in Business Administration
ROA	Return on Assets
ROCE	Return on Capital Employed (ROCE)
ROEC	Return on Employed Capital
ROI	Return on Investment
ROS	Return on Sales
SC	Supply Chain
SCC	Supply Chain Collaboration
SCM	Supply Chain Management
SCMP	Supply Chain Management Practices
SCR	Supply Chain Ratio
SPSS	Statistical Package for the Social Science
TCD	Thousand Tons of Cane

CHAPTER ONE

I. Introduction

1.1 Study background

This study, entitled ‘the effectiveness of supply chain management practices on the financial performance of the sugar manufacturing sector in Ethiopia’, has two overarching objectives.

It anticipates first, to identify the supply chain management practices being put in use by the sugar manufacturing industries in Ethiopia; and second, to determine the extent/magnitude to which supply chain management practices are influencing the financial performance of the sugar manufacturing companies. Both objectives are formulated based on the general assumption and hypothesizing that the performance of the supply chain has a significant impact on a company's financial performance (Morgan and Monczka, 2006).

Scholars argue that supply chains are inherently complex and subject to a number of conflicting requirements; this complexity and pressure from multiple agendas is reflected in the different measures that have been developed to support performance management and tactical and strategic decision making (Sandberg, 2007). Many of these metrics provide valuable operational insight, and further provide an overall measure of supply chain performance or link supply chain decisions directly to overall financial performance. However, this is proven to be true and standardized supply chain management practices are often put in use often in the context of giant businesses of the developed world.

In countries like Ethiopia where the manufacturing sector is so under developed and the practice of deploying advanced systems and ways of working are lagging, competitiveness of businesses in the global stage remains largely under threat. An empirical study on the economic significance of SCM revealed that 'collapsing product and technology lifecycles, the advent of internet technology fuelling a global customer and supply base, and increased demand for variety, together with unprecedented rates of change are all increasing the pressure on businesses and stimulating a change in the role of the supply chain' (Watts and Hahn, 2003). With supply chain accounting for 70% of a product's cost (Johnson, et.al 2011), manufacturing industries in countries like Ethiopia should be cognizant enough to consider the role of the supply chain and its contribution to their business performance.

This study, therefore, aspires to make a meaningful contribution to the on-going discourse on the importance of an effective supply chain management as a tool to positively influencing the financial performance of sugar manufacturing companies in Ethiopia. The study has further gone by presenting a proxy for supply chain performance that is shown to be statistically linked to financial performance based on analysis of all sugar manufacturing companies in Ethiopia over at least a seven year period.

1.2 The sugar manufacturing industry in Ethiopia

According to the 2016 Report of the Ethiopia Sugar Corporation, it was at Wonji in 1951, 110 km east of the capital Addis Ababa, that modern sugar industry started in Ethiopia as a share company established by foreign private investors & Ethiopian government. By then the Netherland's H.V.A. Company had entered into the sector as a foreign share holder. When the factory started production in 1954 its initial production was one thousand four hundred quintals of sugar a year. At the start, the share company had five thousand hectares of land for its sugarcane cultivation. As its location is one of the most suitable areas of the world to the sector it opened a door to Wonji Candy Factory to come forward. This was then followed by the Shoa Sugar Factory in 1962 with 1,700 quintals of sugar production capacity a day. The two factories known by the name Wonji Shoa Sugar Factory altogether had the capacity of producing 750,000 quintals of sugar per annum till recent time, i.e., prior to the completion of the new Wonji Shoa Sugar Factory. Serving for more than half a century and getting obsolete, these two factories (Wonji and Shoa) were closed in 2011 and 2012 respectively. Replacing these pioneer factories, the new and modern factory had started production in 2013 with higher production capacity (Ethiopia Sugar Corporation, 2016 Annual Report).

The second factory- Metehara Sugar Factory is established as a share company between same Netherlands Company and the then Ethiopian government in 1965 and started production in 1969 at a location known as Mertti, 200 km from Addis Ababa. Currently, the factory with a total 10,235 hectares of sugarcane cultivation land has a capacity of producing more than 1.3 million quintals sugar and 12.5 million liter ethanol a year on average. Five years after the establishment of Metehara Sugar Factory i.e in 1974 following the dawn fall of the emperor's regime all sugar factories were made to be administered under the ownership of the government and started operating under the then Ethiopian Sugar Corporation. The corporation had also been made to administer the Addis Ketema and Asmara Candy Factories together with the above mentioned three sugar factories (Ethiopia Sugar Corporation, 2016).

Fincha Sugar Factory as the third sugarcane crushing mill to the nation came into existence in late 1998 though its establishment process and other activities dated back to 1975. Its finance sources were African Development Bank and Development Fund; Governments of Australia and Spain as well as domestic banks of the nation. Its initial sugar production was 500,000 quintals per annum. More modern than the former factories, the factory's construction job

including its ethanol plant was executed by American company known as F.C. Shefer and Associates and Netherland's company called Dewetto International while many domestic construction companies had also played their part in the process (Ethiopia Sugar Corporation, 2010).

In 2006 Tendaho Sugar Development Project was established as a fourth two-phased project in the country. Construction of the first phase of the factory has started production in 2015. The two-phased project, reaching its maximum crushing capacity, eventually enables the factory produce 3 Million quintals of sugar and 30 million Litters ethanol a year. The factory, with its first phase factory construction finalized, has started producing sugar. The factory will in total have 50,000 hectares of sugarcane cultivation land (Ethiopia Sugar Corporation, 2007).

In general, as the Ethiopia Growth and Transformation Plan (2010) anticipates the sugar development sector is one among other huge projects which enables industry take a leading role in the nation's economy. Ethiopia has huge human as well as natural resources which enable the nation to broaden this export oriented manufacturing industry sector and its productivity. The nation has suitable climate, wide and proved irrigable agricultural land (more than 500 thousand hectares) as well as abundant resource of water to use through canal schemes. And, the government has started broadening the sugar development sector which had been limited around Wonji Shoa, Metehara and Fincha Sugar Factories for long years to Oromiya, Afar, Amhara, Tigray and Southern Nations, Nationalities and Peoples regional states. Accordingly, various activities are being carried out to build two sugar factories each with a capacity of crushing 12 thousand tons of cane (TCD) at Tana Beles Sugar Development Project in both Amhara and Benishangul Gumuz regions and these two factories all together have 50 thousand hectares of sugarcane cultivation land. Likewise, activities are being carried out at Omo-Kuraz Sugar Development Project of South Omo, Bench-Maji and Kaffa zones of Southern Nations, Nationalities and Peoples Regional State where four sugar factories are at different levels of construction owning 100 thousand hectares of sugarcane plantation land. Among them three are each with a crushing capacity of 12 thousand tons of cane a day while one with 24 thousand TCD. Omo-Kuraz Factory One is almost to start production in early 2017. Similarly, the construction of one sugar factory with 24 thousand TCD using 50 thousand hectares of cane plantation field is underway at

Wolkayit Sugar Development Project of Tigray Regional State (Ethiopia Growth and Transformation Plan II, 2015).

1.3 Challenges along the sugar industries – unmet demand, continually growing price, and edge in competitiveness

Though the sugar industry sector of the nation has more than half a century of experience the disparity in demand and supply of the product has prevailed over the years with the gap being addressed through import. The current annual domestic supply of sugar is between 6 to 6.5 Million Quintals of which 3.25 to 4 Million Quintals of sugar are produced domestically while the rest is imported with a subsidized price. Currently a rough study conducted on the annual consumption of sugar at an individual level is more than 10 Kilo Gram while the supply is only 7 Kilo Gram. And, to do away with above trend, the Government has put the sugar industry sub sector as one among other mega manufacturing industry sectors which have got great attention both in the first and second GTPs (Agridev Consult, 2014).

One notable feature of the industry, which steadfastly kept on rising over the years, is price. From the Derg regime to the existing Ethiopia's sugar sector is under control of the government which manages production, distribution and trade of sugar. In due course of time the price of sugar is persistently increasing for which government attributes the reason being rise in the cost of production; but scholars arguing inefficiencies in supply chain being the driving force for the price surge. Comparing the current retail price of Birr 18/kg against what it was a decade ago (averaging Birr7.5/kg) and with current prices in India (Birr9-11/kg) and China (Birr8.5-11.5/kg) all portray the substantially higher prices consumers are subject to pay in Ethiopia (Agridev Consult, 2014). The edge of competitiveness of local sugar manufacturing industries against their global counterparts (competitiveness as expressed in terms of price – disregarding other factors such as quality) is so low that it warrants a pressing need for efficient supply chain management practices, which often constitutes 70% of the product's cost (Johnson et.al 2011).

1.4 Statement of the problem

In the face of a competitive global market, organizations have downsized, focused on core competencies, and attempted to achieve competitive advantage by more effectively managing

purchasing activities and relationships with suppliers. The supply chain management refers to how firms utilize their supply processes, technologies, and capabilities to enhance competitive advantage (Farley, 2007), and how the manufacturing, logistics, materials, distribution and transportation functions are coordinated within organizations (Lee and Billington, 2002). Many firms have reduced their supply base so they can more effectively manage relationships with strategic suppliers. Buying firms are developing cooperative, mutually beneficial relationships with suppliers and viewing suppliers as virtual extensions of their firm (Farley, 2007).

There have been a number of studies on SCM implementations among manufacturing firms (Sandberg, 2007) and large retailer organizations (Sandberg and Abrahamsson, 2010) that have established the importance of SCM. These different researches found out that the overall performance of a company is greatly influenced by the capacity of the firm to deliver products to the widely dispersed customers on timely basis. Various literatures also insist that to compete successfully in today's fierce and challenging business environment, manufacturing companies need to focus on supply chain management components that have impact in enhancing better financial performance. Johnson et al. (2007), based on findings from empirical studies, argue that supply chain accounts for up to 70% of a product's cost. This means, inefficient supply chain entails compromising the edge to compete in the market.

In Ethiopia, limited studies are conducted on supply chain management and how it impacts organizational performance. Belachew (2012) researched and found out that the overall performance of the organization (Adwa Pharmaceuticals) is greatly influenced by the capacity of the firm to deliver products to the widely dispersed customers on timely basis because even a one hour late delivery will affect the sales level and this can only be remedied by having effective supply chain structures. Solomon (2011) and Abeje (2011) undertook research and found that sharing promotional information between retailers and manufacturers is useful especially in the international market. These studies have not fully explored the impact of SCM practices on an organization's performance. This research, will therefore, establish the role of the sugar industry's supply chain management on financial performance, and it will specifically seek to answer the questions: to what extent have the sugar firms (Metehara, Fincha and Wonji factories) employed SCM practices? What is the impact of these practices on the firms' financial performance?

1.5 Research questions

The study objectively attempts to address the following two basic questions:

- a. Do the sugar manufacturing companies operating in Ethiopia implement supply chain management practices?
- b. Does the use of supply chain management practices influence the financial performance of the three sugar manufacturing companies in Ethiopia?

1.6 Objectives of the study

The general objective of the study is to critically examine the influence of an effective supply chain management practices on the performance (with special focus on financial performance) of sugar manufacturing companies in Ethiopia. In particular, the study will have the following two specific objectives:

- a. To identify the supply chain management practices being put in use by the selected three sugar manufacturing industries in Ethiopia, and
- b. To determine the extent to which supply chain management practices are influencing the financial performance of the three sugar manufacturing companies.

1.7 Hypothesis

Hypothesis 1: Sugar manufacturing companies in Ethiopia properly implement supply chain management practices to tap financial benefits.

Hypothesis 2: The use of supply chain management practices positively affects the financial performance of companies engaged in the manufacturing of sugar in Ethiopia.

1.8 Significance of the study

While reviewing extensive literatures the author has witnessed the critical shortage of empirical researches in relation to supply chain management in the Ethiopian context. Many

of the references used, therefore, are from studies conducted in the western setting and are focusing in the manufacturing sector. Even the extremely limited studies conducted are intending to pay attention to exploring SCM from the wider ‘organizational performance’ perspective with little or no effort to look into the ‘financial performance’ aspect of businesses. This study, thus, has the following two objectively verifiable justifications underlining its importance.

First - why supply chain management? The author of this thesis believes that the issue of supply chain management in Ethiopia would inevitably receive increased attention as time goes by following the continued investment of the country in the manufacturing sector. Literatures insist that to compete successfully in today’s fierce and challenging business environment, manufacturing companies need to focus on supply chain management practices that have impact in enhancing profitability. Johnson et al. (2007), based on findings from empirical studies, argue that supply chain accounts for up to 70% of a product’s cost. Inefficient supply chain entails compromising the edge to compete in the market. This study, focusing on supply chain and on the sugar manufacturing sector, serves an ice breaker in its essence and provides substantive evidences for manufacturing companies to recognize the importance of SCM.

Second - why the sugar manufacturing sector? Evidences suggest that local demand for sugar in Ethiopia has all the time been surpassing the local supply. This is despite the fact that the country is endowed with vast natural and human resources to embark on the cultivation of sugarcane, which is a major ingredient of sugar. On the down side, such gaps in demand and supply have compelled the nation to engage in importing alternatives investing its meagre currencies. Equally important to consider is the participation of the private sector in the sugar manufacturing sector, which currently is non-existent. There is no single sugar manufacturing industry owned by the private sector in Ethiopia – all the existing and under construction factories are owned by the government. One of the backlogs, as often cited by people in the business frontier, for limited engagement of the private sector in sugar manufacturing is the government’s inability to put in an enabling platform. This study, therefore, sheds light into the potentials and profitability of investing in sugar manufacturing that the private sector would tap in.

1.9 Scope and limitation of the study

The study was capped to have the following set of boundaries to limit its substantive reach:

- a. The study analyses supply chain management from the view point of financial performance with little coverage of operational performance.
- b. Only the sugar manufacturing sector is the primary reference point of the study. Other manufacturing sectors or the service sector are not within the domain of the study's reach.

The researcher is also being cognizant of the limitation of the study. Unavailability of secondary data was very hard to overcome. The financial archive of the factories was able to provide data only for seven years. Results of the study might probably be different had the researcher been able to obtain secondary data for longer years (say 15-20 or more years). Particularly, results of the regression and the correlation analysis along the two independent variables (Strategic Supplier Partnership and Logistics Outsourcing as respectively represented by the proxies ROEC and Cash-to-Cash Cycle) could have been positive had longer years of data were analysed.

1.10 Organization of the paper

This study is organized under five chapters. The first section covers the general introduction and background of the study, which are all presented in the preceding chapter. The second section presents the literature review which sets out the theoretical and empirical foundations for the research. The third section deals with the research framework and methodologies pursued in the study process. The fourth chapter presents data analysis, results and discussions. The last chapter states the summary, conclusion and recommendations followed by the subsidiary lists of references and questionnaires used in the literature review process.

CHAPTER TWO

II. Literature Review

The section deliberates on the analysis and synthesis of supply chain management as it appears in wide range of publications. It attempts to examine what various scholars and authors have documented about the concept of supply chain management practices from theoretical and empirical points of views. Specifically, it covers definition and concept of supply chain management practices, firm performance and effect of supply chain management practices on organizations' financial performance.

2.1 Theoretical framework

2.1.1 Supply chain management practices

As with firm performance, supply chain practices connected to it have been analyzed from various perspectives, with multiple outcomes. In this proposal, the analyzed practices include strategic supplier partnership, outsourcing of logistics operations, supply chain collaboration, and information systems support.

2.1.1.1 Strategic supplier partnership

The choice of suppliers and how businesses are effectively integrated to obtaining proper complementary skills are important issues. Strategic sourcing consists of strategic outsourcing and supplier capability analysis. In addition, the construct strategic supplier partnership is an integral element to the second order construct of SCM (Li et al., 2006). The defining elements of strategic sourcing have been identified to be the status of supply management within the organizational hierarchy, internal coordination of supply management with other functions in a firm, active information sharing with suppliers, and comprehensive supplier development activities (Kocabasoglu and Suresh, 2006).

In the retail category management context, strategic sourcing has also been found to influence knowledge creation and sharing among suppliers and retailers (Dewsnap and Hart, 2004). Since suppliers and retailers have knowledge in different domains, the combination can

create unique knowledge that can be applied to improve business knowledge. Better relationships between retailers and their suppliers also improve prospects of new product acceptance (Kaufman, 2002). Retailers take risks in placing untried products on the shelves. The risks take several forms. The retailer's reputation is at stake if the product does not perform well, and consumers may hold the retailer responsible for selling substandard products.

2.1.1.2 Logistics outsourcing

Literatures assert that the phenomenon of outsourcing is not new (see e.g. Greif 1993), yet the possible benefits and downsides of outsourcing have been discussed more during the past 20–30 years. Traditionally, outsourcing has been seen as one of the possible ways to increase flexibility, enhance performance and cut the costs of operations. Bettis et al. (1992) argued that outsourcing could aid competitiveness providing it was managed properly. Aertsen (1994) also discuss it from the logistics perspective and subsequently analyzed the outsourcing of physical distribution. Also, D'Aveni and Ravenscraft (1994) and Gilley and Rasheed (2000) argue that 'one of the core motives for outsourcing is the firm's need to concentrate on its core competencies, thereby achieving higher performance'.

Kremic, Tukul and Rom (2006) have conducted a comprehensive literature review on the motives for outsourcing. They identified 'a curvilinear relationship between the level of outsourcing and firm performance, suggesting that there would be an optimal level of outsourcing, and distractions from it would be costly'. They stressed that the effects of logistics outsourcing on service performance are quite tremendous. Wallenburg (2009) and Brewer, Ashenbaum and Ogden (2013) have also analyzed the effect of logistics outsourcing on firm performance, both concluding that 'the motives, and thus the focus, of outsourcing is crucial to the performance outcomes'. They also argue that cost-driven outsourcing is dominant from the performance perspective. They take the idea further, suggesting that also more strategic motives for outsourcing could be beneficial on a long term basis.

2.1.1.3 Supply chain collaboration

One of the most discussed factors in the literatures that reportedly affect firm performance is supply chain integration. Numerous researchers report positive effects of collaboration on

performance. For example Bagchi, Ha, Skjoett-Larsen and Soerensen (2005) report these positive effects on ‘logistics costs and operational performance metrics such as perfect order fulfilment rate’. Sanders and Premus 2005 report ‘positive effects on a composite measure of firm performance consisting of cost, quality, delivery and new product introduction time’. Cao and Zhang (2010 and 2011) identify positive effects between supply chain collaboration and growth of sales, ROI, growth of ROI and profit margin.

Stank et al. (2001) consider supply chain integration to consist of internal and external integration, whereas Flynn, Huo and Zhao (2010) divide it into three dimensions: customer, supplier and internal. Barratt (2004) provides a detailed description on which activities are considered to be intra-organizational and which are inter-organizational. Other classifications also exist that ‘divide supply chain integration into three dimensions: information sharing, decision synchronization and incentive alignment’ (Simatupang and Sridharan, 2005). The same sources compiled a meta-analysis on the relationship between supply chain integration and performance, concluding that supply chain integration has three dimensions: 1) information integration, 2) operational integration and 3) relational integration. According to Vereecke and Muylle (2006), ‘firms engage in two forms of collaboration: exchange of information on forecasts, planning, inventory etc. or alternatively structural collaboration such as installing Kanban systems or co-locating plants’. Other researches also assume a straightforward relationship between supply chain integration and supply chain performance: the more integration, the better the performance (see e.g. Fabbe-Costes & Jahre 2008).

Kampstra, Ashayeri and Gattorna (2006) on the other hand are more concerned about “sub-optimization”, in other words ‘the failure of firms to commit enough to collaboration within a single supply chain’. In their analysis, Leuschner, Rogers and Charvet (2013) review 86 articles analysing the connection of supply chain integration and firm performance, concluding that ‘while supply chain integration would seem to have a positive impact on firm performance, the effects depend on the nature of the collaboration’.

2.1.1.4 Information systems support

The development of information and communications technology (ICT) has created new possibilities for improving firm performance. For example Brynjolf and Hitt (2000) review the evidence on how investments in (and thus the increased use of) IT influences

performance. As part of their definition, Simatupang and Sridharan (2005) include information sharing as one of the dimensions of supply chain collaboration. Assuming that supply chain collaboration has a positive effect on firm performance, the Simatupang and Sridharan (2005) framework argues that ‘increased information systems support is linked to better performance by enabling deeper supply chain collaboration’. Most other literatures assume an indirect rather than direct impact of IT on performance. Byrd and Davidson (2003) assume that ‘the technical quality of IT and the utilization plan for it, and support by top management for IT development influence its impact on the supply chain, which in turn affects firm performance’. Kent and Mentzer (2003) identify investment in inter-organizational IT as having ‘an effect on logistics efficiency through relationship commitment’. For their part, Wu et al. (2006) consider that ‘the alignment and advancement of IT are positively connected to supply chain capabilities, which in turn are tied to both the firm’s marketing and financial performance’.

Also direct relationships between IT and performance have been identified. Bayraktar, Demirbag, Koh, Tatoglu and Zaim (2009) detect a significant positive connection between information systems practices and operational performance of small and medium enterprises (SMEs), whereas Dehning et al. (2007) pinpoint ‘a positive relationship between a firm’s investments in IT based SCM systems and performance’. Some of the research (see e.g. Vijayasarathy 2010) has also been unsuccessful in identifying connections between information technology and IT use and performance. Sanders and Premus (2005) executed a survey-based study measuring IT capabilities and supply chain collaboration and their effects on firm performance. Their results suggest that IT capabilities positively affect firm performance. Closs, Swink and Nair (2005) argue that ‘information systems would have a mediating role between the flexibility of logistics and performance, in the form of information connectivity’.

2.1.2 Enterprise performance

So many researches have been conducted addressing the multidimensional phenomenon of enterprise performance. These studies consistently present essential elements of performance and its measurement as well as what is included and excluded (Akyuz & Erkan 2010). According to Neely, Gregory and Platts (1995) performance could be divided into four dimensions of quality, time, cost and flexibility while from the supply chain perspective

Beamon (1999) argued that supply chain performance consists three categories: resource-related, output-related and flexibility-related. Gunasekaran, Patel and McGaughey (2004), on the other hand, classified the performance metrics as strategic, tactical and operational.

Often, the performance metrics presented the various literatures included mainly cost-related metrics and measures of operational performance. Among the proposed metrics are sales, profit and Return on Investment (ROI). Sales, profit and ROI may be considered financial measures of performance (see e.g. Capon et al. 1990), which suggests that performance from the supply chain perspective may be measured as costs, operational performance and financial performance. Other studies such as one by Hofmann and Locker (2009) also support the argument that a performance measurement concept should include both financial and non-financial measures in order to be usable at all levels of the firm.

Lorentz et al. (2012) measured performance as intra-firm supply chain performance and financial performance. The former is asserted to include cost performance, service performance and asset utilization as its dimensions while the latter is measured as Return on Assets (ROA), Return on Capital Employed (ROCE) and Earnings Before Interest and taxes (EBIT-%). This proposal uses a similar definition for performance and particularly for financial performance in analysing the effectiveness of supply chain. The concepts of intra-firm supply chain performance and financial performance, together with the included and excluded components, are further elaborated in the section below.

2.1.2.1 Intra-firm supply chain performance

Logistics costs

One of the most prominently discussed elements of firm performance is logistics costs. Cost performance is considered a key part of firm performance, for example by Beamon (1999) and Mena (2009). Depending on the source and measurement technique used, the share of logistics costs of the total costs may vary significantly, but is estimated to be around 10% of sales in industrialized countries. The same source reveals that logistics costs are much higher, often in the range between 12-18%, in the context of the developing world.

Even though logistics costs are widely discussed, its definition rather is so diverse and disagreements are often exhibited on what is included and what is excluded. Heskett, Glaskowsky and Ivie (1973), divide logistics costs into four categories: transportation costs, warehousing costs, inventory carrying costs and logistics administration costs. A similar classification has since been used for example by ELA and AT Kearney (2004 and 2009). On the other hand, Beamon (1999) makes a distinction between operating costs and inventory costs and include customs risk and damage and handling and packaging as elements of logistics costs.

Service performance

In addition to the frequently discussed cost performance, different measures of service performance are also considered to be a crucial part of firm performance. Beamon (1999) lists fill rate, on-time deliveries, stockout, customer response time, manufacturing lead time, shipping errors and customer complaints as measures of output performance. Gunasekaran et al. (2004) include similar types of measures as part of operational level performance in source and deliver activities. Fawcett and Cooper (1998) consider perfect order fulfilment, order fulfilment cycle time and supply chain response time as measures of supply chain performance. In general, the measures of service performance are many, depending on the various objectives of performance measures. Some of the authors approach performance from the more traditional logistics perspective whereas especially recently, the discussion has been increasingly from the supply chain perspective (Morgan 2004; Whicker et al. 2009). Even though the approach has been towards supply chain performance, studies conclude that supply chain performance has still been analyzed from the focal firm point of view, considering mainly the performance of the focal firm, not the entire supply chain.

Asset utilization

In addition to service performance, asset utilization in some form or another is often mentioned among the important performance metrics to the firm (Stewart 1995; Gunasekaran et al. 2001; Johnson & Templar 2011). Some authors consider asset utilization to be a part of financial performance (Capon et al. 1990; Brewer & Speh 2000) while others depicting them as being “key numbers expressing operational performance in financial terms.” In this proposal, asset utilization is considered to be a measure of supply chain performance.

One of the possible ways to approach asset utilization is the cash to cash cycle time, sometimes called the cash conversion cycle. The basic idea of the cash to cash cycle time defined by Morgan (2004) is “the length of time between cash payment for purchase of resalable goods and collection of accounts receivable generated by sales of these goods.” Lancaster, Stevens and Jennings (1998) define the cash to cash cycle time as “the number of days between paying for raw materials and getting paid for product, as calculated by inventory days of supply plus days of sales outstanding minus average payment period for material.”

Brewer and Speh (2000) consider cash to cash cycle time to be a critical financial measure, tying together several important processes in the supply chain. It is being classified as a working capital measure, and a common indicator for measuring the performance of a supply chain. Further, Johnson and Templar (2011) argue that reducing the cash to cash cycle time is indicative of good SCM. According to the same source, successful SCM in the form of increased product and information flow and deeper integration with suppliers and customers can be seen in form of faster cash to cash cycle times, compared to firms that have been less successful in managing their flows and integrating their supply chain. Christopher and Ryals (1999) highlight the significance of cash to cash cycle time from the viewpoint of working capital, arguing that ‘by eliminating non-value adding time in the supply chain, the firm will be able to lower its needs for working capital’.

2.1.2.2 Financial performance

In the literatures the definition of financial performance is just as extensive as that of operational performance. One of the broadest definitions is presented by Gunasekaran et al. (2001), who include not only rate of return and net profit, but also logistics costs and delivery performance as measures of financial performance, whereas most of the literature, as indicated in the preceding section, consider logistics costs to be mainly an operational performance measure. On the other hand, D’Avanzo, Von Lewinski and Van Wassenhove (2003) surveyed the key drivers of financial performance and concluded that cost reductions are the most important. This again would imply that even though costs in general or logistics costs in particular are not a financial measure by their own, their contribution to financial performance is evident.

According to literatures different types of return-based measures of financial performance seem to be widely accepted. Wagner, Grosse-Ruyken and Erhun (2012) justify the financial ratio of ROA as ‘being a measure of how effective the firm is in utilizing its assets in order to generate profits’. Henderson, Raynor and Ahmed (2012) use ROA ‘as a measure of financial performance in a longitudinal setting’. Some variations based on ROA have also been used. For example, Hansen and Wernerfelt (1989) used ‘ROA deducted by the T-bill rate as a measure of financial performance’. Other return-based measures have been widely used. Others such as Tobin and Brainard (1968) question the validity of ROA as a comparable measure of performance, based on an argument that ‘a firm might be able to affect ROI with its financial leverage, thus making it incomparable between firms’.

Of the other return-based measures, Vickery et al. (2003) include Return on Sales (ROS), whereas Töyli et al. (2008) include EBIT-% ‘to check whether profitability behaved differently compared to asset-based measures’. Gotzamani, Longinidis and Vouzas (2010) also use EBIT, Depreciation and Amortization (EBITDA) together with EBIT-% in their analysis. In their analysis of determinants of financial performance, Capon et al. (1990) include Return on Equity and Return on Capital as measures of financial performance.

In addition to return-based measures, also others have been used including growth of sales and market share as valid measures of financial performance, whereas revenue growth is also being used as one measure. Stock price has also been recommended as one option to measure financial performance (Vickery et al. 2003)

From other measures of financial performance Greer and Theuri (2012) compiled a measure of different financial performance, including cost ratios such as cost to sales, activity ratios such as trading cycle, or liquidity ratios in the form of current ratio and cash turnover ratio. In this proposal, financial performance will be analysed using different return-based measures such as ROA, ROCE, and EBIT-%. Specifically, ROA will be used as a useful measure for evaluating the operating and investing performance of a firm. It also be a valid measure of financial performance for how effectively the firm utilizes its assets in generating profits. On the other hand, ROCE is will be used as a financial measure that specifically linked to SCM through operational performance and asset utilization. EBIT-% will be rather used as recommended by Töyli et al. (2008) ‘to check whether profitability has behaved differently

compared to asset-based measures'. Growth of sales and market share, if possible and depending on the availability of data, will be included in the analysis. However, stock price with its various forms will be excluded because the stock market in the Ethiopian context is nowhere to incorporate any of the manufacturing businesses.

2.1.3 Linking supply chain management with performance

Delaney et al. (2006) point that 'organizational performance can be evaluated by quality service and products, satisfying customers, market performance, service innovations, and employee relationships'. On the other hand, Hoque et al, (2000) in their study of organizational performance based on balanced scorecard, stated that 'organizational performance can be appraised by return of investment, margin on sales, capacity utilization, customer satisfaction and product quality'. In the same way, Greene et al, (2007) identified that return on investment, sales and market growth, and profit as important factors that can be measured by organizational performance. In all these performance measures, SCM practices are believed to have a positive relationship or generally affects the level of organizational performance.

A strong customer leads to improved marketing and financial performance (Green et al., 2005). The same sources argue, 'as customers begin to demand that the products and services that they purchase be eco-friendly, it is important that manufacturers generate intelligence related to these changing customer demands'. A manufactured product that remains unsold in inventory, because it does not satisfy customer demand is 'blatantly environmentally unfriendly' Greene et al. (2007). A company's customer relations practices can affect its success in managing the supply base as well as its performance (Turner, 1993). 'A key element of successful supply base management involves downstream integration of customers as well as the management of upstream suppliers,' argue Delaney et al (2006).

When a customer driven corporate vision is implemented simultaneously with effective supply base management practices, it can produce a competitive edge in a number of different ways. These include increases in productivity, reductions in inventor and cycle time, increased customer satisfaction, market share and profits. Chong and Ooi, (2008) assert that a good organized and executed SCM will make it possible for companies to decrease their inventories, have better customer service, diminish costs as well as aid fast inventory turns.

According to Turner (1993), one of the biggest advantages of SCM in the situation of short term objectives is increasing productivity and decreasing inventory and reducing lead time. Based on long term objectives, this factor has significant role in increasing company's market share and having outside integration of the SCM. (Li et al., 2006). Carr and Smeltzer (1999) have documented how firms with strategic purchasing are able to foster long-term, cooperative relationships and communication, and achieve greater responsiveness to the needs of their suppliers. Although other factors, such as restructuring and governance, and transaction cost economizing are also important for understanding strategic purchasing and its linkage to supply management, according to various sources, they are beyond the scope of this proposal. Strategic purchasing fosters communication, which is critical to achieving effective integration throughout the supply chain. Effective communication contributes to the development and maintenance of inter-organizational routines that have been documented to enhance a firm's capability for effectively managing strategic alliance (Zollo et al., 2002).

2.1.4 Creating a financial proxy for the supply chain management practices

Underpinning this study was the need to develop and empirically test a proxy that could be used to determine supply chain efficacy. This proxy measures the positive and negative change of supply chain performance compared to financial and operational measures of firm performance. Professor Martin Christopher identified three financial dimensions - profitability, liquidity and asset utilization - that supply chain practitioners need to take into consideration when formulating their supply chain strategy. Professor Lisa Ellram and Dr. Baohong Liu also identified these as critical business areas which supply chain and purchasing initiatives impact on. Constructing and testing the proxy required identifying financial attributes for each of the business imperatives impacted significantly by supply chain performance. Supply chain ratio is calculated as a net cash inflow from operations divided by total assets less current liabilities.

According to Johnson et al. (2007) the supply chain proxy is derived from two financial ratios. The first measures the cash generation from sales in a financial period. The second measures asset efficiency through dividing the value of sales generated by total assets less current liabilities in the same financial period.

a. Cash generation ratio

Net cash inflow from operations, the numerator of the ratio, is determined by taking the operating profit from the income statement and then adjusting for non-cash items (depreciation and amortisation) which are disclosed in notes to the annual report and accounts. The other adjustment takes into consideration the change in working capital (inventories, debtors and creditors) in the financial period. The denominator is the value of sales for the financial period and is taken from the organisation's income statement.

b. Asset efficiency ratio

The asset efficiency ratio uses as its numerator the organisation's sales value from the income statement and the denominator is the value of the organisation's total assets (fixed and current assets) minus the current liabilities as disclosed in the balance sheet.

Any supply chain tactical decision will have an impact on one or more of the financial variables that underpins profitability, liquidity and asset utilization. The focus for manufacturing companies should be to develop a combination of supply chain initiatives which will increase the cash generated from operations - improving profitability and liquidity - and improve the efficiency of the total assets employed in the organisation. This will increase the proxy by impacting on both the numerator (increasing cash generation) and the denominator (reducing the total assets employed).

Johnson et al. (2007) argues that the supply chain proxy can be linked back to the generic organisational strategies as differentiation leads to increased profitability and cost advantage leads to greater profitability and asset utilisation whilst an increase in liquidity leads to the mitigation of risk. An increase in liquidity mitigates risk through providing an increase in cash which can be invested to provide strategic advantage to the organization.

Table 1: Business imperatives impacted by SC performance Vs relevant financial attributes

Business imperative impacted by supply chain performance (independent variable)	Commentary	Financial attributes
Differentiation (Adoption of Information Technology, Information Sharing)	The level of differentiation is reflected in the incremental value as perceived by the customer. Value is invariably measured by what a customer is prepared to pay for the goods or service. Price, or collectively turnover, needs to be factored into the proxy.	Sales
Cost advantage (Logistics costs /Logistics outsourcing)	The supply chain structure and performance drives fixed and variable operating costs (COGS, logistics etc). For many organisations this represents in excess of 70% of the cost base.	Operating costs (ROCE)
Resilience (Knowledge Management on asset profile and market changes)	The resilience of the supply chain is represented by its ability to recover readily from changes to market conditions and demands. Supply chains are asset intensive. The structure and profile of the asset base limits impedes an organisation's ability to change its ways of working in line with a shift in market dynamics.	Total Asset
Responsiveness and flexibility. (Strategic Partnership with Supplier and customer)	If the supply chain is to react quickly in a world of increasing volatility and uncertainty such that it can readily modify its response to customers without "breaking" it needs to be able to maintain the highest level of operational flexibility. This means retaining the greatest range of options and deferring the point of commitment until as late as possible. Cash provides the supply chain with the greatest set of options (it is equivalent to the "stem cell" of the supply chain), once committed however the range of options is reduced significantly. The quicker the cash can be re-cycled through	Cash-to-cash cycle

Business imperative impacted by supply chain performance (independent variable)	Commentary	Financial attributes
	the supply chain the greater the level of responsiveness and flexibility.	

2.2 Empirical review

Having reviewed the salient theories underlying the effect of supply chain management on financial performance, it is important for this study to review some significant research that has been conducted in the field. This is in order to determine if the theory reflects the reality - in other words, to determine if supply chain management influences financial performance, as suggested by the theory, can be verified in practice when examining the situation in developing and developed countries.

One of the notable empirical studies conducted in this regard was the comprehensive study undertaken to analyse ‘the influence of supply chains on a company’s financial performance’ by the PA Consulting Group. This research begins to explore whether supply chain performance influences company performance by developing a financial ratio (proxy) that represents the supply chain; and empirically testing the ratio using publicly available accounts. The research made use of traditional financial ratios, widely used to evaluate the financial performance of organisations with regard to profitability, liquidity, asset utilisation, productivity and capital structure. The data were used to statistically analyse and explore the relationships between supply chain and firm performance.

The analysis was performed on a sample frame consisting of 117 UK based manufacturing firms that were publicly traded over the period 1995-2004. The dataset consisted of 1,040 distinct datasets - representing the financial data for the company within the year. The analysis was performed on data that had been converted to represent the annual change (i.e. change in ROCE). By using change in values the research was able to more accurately determine whether changes in supply chain performance yielded change in firm performance.

The scope of the supply chain within the analysis covered all of the activities, functions and assets under the direct control and ownership of the company, from procurement of raw materials, through production, to delivery to the final customer.

Findings from the correlation analysis of the showed that change in the ratio is correlated, at a statistically significant level, with favourable changes in output prices (potentially due to efficiencies caused by better supply chain management). Likewise, findings of the regression analysis indicated that the supply chain has a statistically significant ($p=0.001$), with positive coefficient, direct impact upon change in Enterprise Value. Thus: improving supply chain performance influences the value of the firm. Variables that also directly affect the rate of change of enterprise value at a statistically significant level are: the constant ($p=0.048$), input prices ($p=0.018$), industry sector (SIC30 $p=0.003$; SIC32 $p=0.003$), total assets employed ($p=0.000$) and total sales ($p=0.000$).

In general, organizations adopt numerous business strategies to improve their performance. As competition intensifies, so do the challenges associated with getting a product or service to the right place at the right time at the lowest delivered total cost. Manufacturing organizations have begun to realize the potential benefits and importance of strategic and cooperative buyer-supplier relationships. They have started to involve strategic suppliers in resource management decisions (Morgan and Monczka, 2006). Instead of relying on tools such as acceptance sampling to establish the quality of incoming materials and component parts, manufacturers purchase from a more limited number of qualified or certified suppliers and embrace the concept of supply base management, hoping to reduce costs by cutting inventory and improving efficiency throughout the supply chain (Watts and Hahn, 2003). In addition, organizations have come to place more emphasis on customer driven corporate policies that seek to simultaneously pursue objectives of customer satisfaction, quality and productivity improvement, and cost reduction.

SCM practices have received numerous definitions; Koh et al., (2007) defined SCM practice as a set of activities undertaken by an organization to promote effective management of its supply chain; as the approaches applied in integration, managing and coordination of supply, demand and relationships in order to satisfy clients in an effective way (Wong et al., 2005); as tangible activities/technologies that have a relevant role in the collaboration of a focal firm with its suppliers and/or clients (Vaart and Donk, 2008); and as the approach to involve

suppliers in decision making, encouraging information sharing and looking for new ways to integrate upstream activities. As a consequence, it involves developing customer contacts by customer feedback to integrate the downstream activities and delivering orders directly to customers (Chow et al., 2008). The concepts and practices of SCM have been touted as improving the performance of organizations who participate in them.

The supply chain management in general aims at improving value delivery to customers; relying on just-in-time system; eliminating waste; getting the involvement of all stakeholders in the value creation process as well as working closely with suppliers. According to Ireland and Webb (2007), SCM continues to be adopted by organizations as the medium for creating and sustaining a competitive advantage and points out that such a displacement is understandable considering the potential benefits of successful supply chain management. These benefits attributed to supply chain management include inventory reduction, improved delivery service, and shorter product development cycles. On their part, Slack et al., (1995) argued that the objectives of supply chain management include focusing in satisfying end customers, to formulate and implement strategies based on capturing and retaining end-customer business and also to manage the whole chain effectively and efficiently. SCM is one of the most effective ways for firms to improve their performance (Ou et al., 2010). With the purpose of managing the supply chain actions for realizing improvement in enterprise performance, it is necessary to improve the planning and management of activities such as materials planning, inventory management, capacity planning, and logistics (Chandra and Kumar, 2000) with suppliers and clients.

The simultaneous integration of customer requirements, internal processes, and upstream supplier performance is commonly referred to as supply chain management (SCM). Supply chain management (SCM) is an integrated approach beginning with planning and control of materials, logistics, services, and information stream from suppliers to manufacturers or service providers to the end client; it represents a most important change in business management practices (Fantazy et al., 2010). SCM is one of the most effective ways for firms to improve their performance (Ou et al., 2010). With the purpose of managing the supply chain actions for realizing improvement in enterprise performance, it is necessary to improve the planning and management of activities such as materials planning, inventory management, capacity planning, and logistics with suppliers and clients.

Supply chain practices cannot on their own improve efficiencies individually, since the efficiency can be achieved through the interaction of various supply chain practices. Dawe (2004) point that, for effective SCM, a comprehensive effort for improvement in all of supply chain functions within a firm should be made, and, first of all, the focus of supply chain practices should shift from functional and independent to general and integrative. This implies that the performance of each supply chain practice should be evaluated depending on how the practice has a significant effect on the efficient integration of entire supply chain processes, and thus, the successful achievement of SC integration can be possible by the systematic utilization of various supply chain practices.

2.3 Conceptual framework and variables of the study

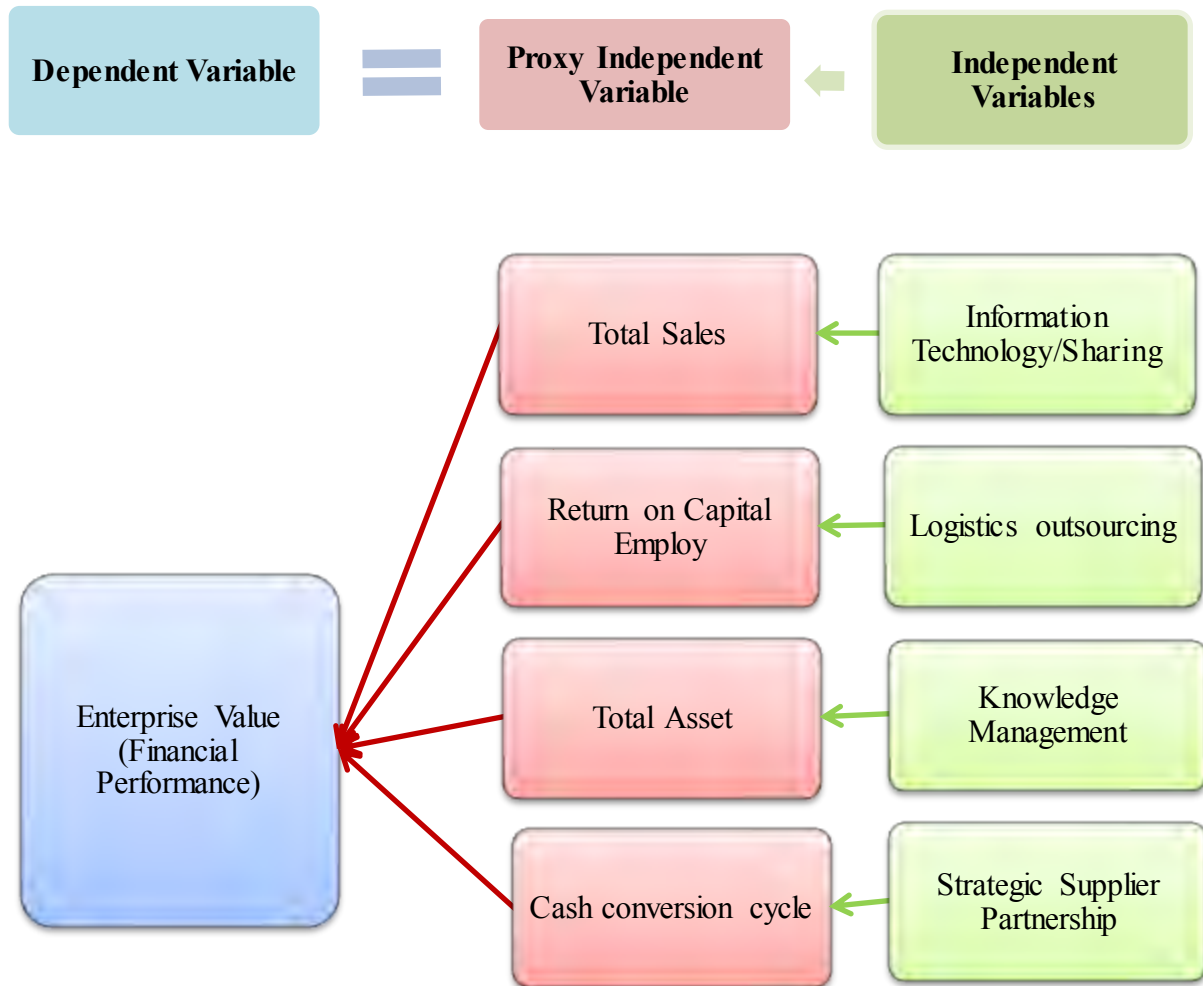
2.3.1 Conceptual framework

A conceptual framework can be defined as a set of broad ideas and principles taken from relevant fields of enquiry and used to structure a subsequent presentation (Reichel and Ramey, 1987). The schematic diagrams below will not only guide the study but will also show the interrelationship among the key variables in the study.

The conceptual framework used in this study was first developed by the Supply Chain Research Centre, Cranfield School of Management and latter refined and put in use by different practitioners of SC (mainly Professor Martin Christopher, Professor Lisa Ellram and Dr. Baohong Liu) as Johnson et al. (2007) argued. Based on years of research and intensive analysis of the driving forces behind supply chain and its impact on the performance of companies the Centre managed developing the ‘business imperative’ framework (table 1 above) which established linkages between supply chain practices and financial measures. The Centre had further tested its raw assumptions over 117 selected companies and empirically proved that there are certain financial measures which are directly related to particular supply chain practices. According to the study, for example, firm value is directly and positively related to financial performance. Specifically, the Centre has developed financial measures which are labelled as proxies to numerically gauge supply chain management practices. These include Total Sales as a proxy for Information Technology/Sharing, Return on Capital Employ for Logistics Outsourcing, Total Asset for

Knowledge Management, and Cash Conversion Cycle for Strategic Supplier Partnership. One of the unwavering contributions of the study conducted on 117 companies was that the proxy financial measures are positively related to their respective supply chain management practices.

Figure 1: Variables used in this study, supply chain practices and their respective proxies



Source: PA Consulting Group, Cranfield University, School of Management, 2007

2.3.2 Description of the variables

As the title of the study, Effectiveness of Supply Chain Management Practices (SCMP) on the Financial Performance of Sugar Manufacturing Sector in Ethiopia, asserts and figure 1 above depicts Enterprise Value (financial performance being the proxy) is the dependent variable. The independent variables include Information Technology/Sharing (Total Sales being the proxy), Logistics Outsourcing (Return on Capital Employ being the proxy), Knowledge Management (Total Asset being the proxy), and Strategic Supplier Partnership (Cash Conversion Cycle being the proxy). In this study, these variables (both the dependent and the independents) were used with the meaning and sense indicated below.

1. Total sales: A total sale is the total amount of sales in a given period. Total sales revenue can be represented in several ways, but it is typically formulated as total number of units sold times price per unit. It is important to distinguish total sales revenue from total revenue, as total revenue includes interest, income from investments and any other sources as well as total sales. Total sales revenue is a very important metric for business owners/managers and investors alike as it provide a reasonably accurate projection of the near-term performance of the business.
2. Total Asset: A total asset is the combined amount of a company's fixed asset and current asset as recorded in the company's balance sheet. This shows all the assets used by a company regardless of how they are financed. It is the sum of all cash, investments, furniture, fixtures, equipment, receivables, intangibles, and any other items of value owned by a person or a business entity. The investors review the company's total assets before determining whether or not the business has enough existing value to make an investment.
3. Return on Capital Employed (ROCE): measures the efficiency and profitability of a company's capital investments. ROCE is used to analyse the productivity of capital employed within the company. It can be used in the supply chain context to understand the linkages between supply chain decisions and financial performance, for example in an outsourcing decision where profit maybe increased and capital employed reduced. Whilst ROCE is a primary performance measure it does not

incorporate measures of liquidity or cash generation. The capital employed does not distinguish between fixed and current assets, nor does it distinguish between cash and inventory to reflect levels of postponement and implicitly flexibility and responsiveness. It is calculated as: $ROCE = \frac{EBIT}{\text{Total Assets} - \text{Current Liabilities}}$.

4. Cash Conversion Cycle (Cash to Cash Cycle): The cash to cash cycle is the time period between when a business pays cash to its suppliers for inventory and receives cash from its customers. The concept is used to determine the amount of cash needed to fund on-going operations, and is a key factor in estimating financing requirements. The cash to cash calculation is: $\text{Days inventory on hand} + \text{Days sales outstanding} - \text{Days payables outstanding} = \text{Cash to cash days}$

5. Enterprise Value (EV): the enterprise value - or organization value - is an indicator of how the market attributes value to a firm as a whole. Enterprise value is a term coined by analysts to discuss the aggregate value of a company as an enterprise rather than just focusing on its current market capitalization. It measures how much you need to fork out to buy an entire public company. When sizing up a company, investors get a clearer picture of real value with EV than with market capitalization. Why doesn't market capitalization properly represent an enterprise's value? It leaves a lot of important factors out, such as a company's debt on the one hand and its cash reserves on the other. Enterprise value is basically a modification of market cap, as it incorporates debt and cash for determining a company's valuation. Simply put, EV is the sum of a company's market cap and its net debt. To compute the EV, the first step is to calculate the company's market cap, add total debt (including long- and short-term debt reported in the balance sheet) and subtract cash. Thus, the Enterprise Value calculation is: adding up the market capitalization, or market cap, (+) plus all of the debts in the company (Debts may include interest due to shareholders, preferred shares and other such things that the company owes. - Subtract any cash or cash equivalents that the business currently holds, = the enterprise value and investments.

CHAPTER THREE

III. Research design and methodology

This chapter presents the research methodology that was used to carry out the study, what inform the selection of the research design, the target population, sampling method to be used, data collection instrument and how data was analyzed, interpreted and presented.

3.1 Research design

A descriptive cross sectional research design was used to establish the effect of SCM practices in the financial performance of the three sugar firms in Ethiopia. A similar research design was used by Chege (2012) successfully. A descriptive research designed was adopted because the study was concerned about a univariate question in which the researcher asked questions about the size, form, distribution and existence of SCM practices and its effect on financial performance of sugar firms in Ethiopia. This permitted the researcher to make statistical inference on the broader population and generalize the findings to real life situations and thereby increase the external validity of the study.

3.2 Population of the study

The target population consisted of all the three sugar manufacturing firms in Ethiopia. Given the relatively small number of the respondents a census survey was conducted. The respondents were the SCM staff including the head of procurement, production manager and the agricultural service manager. A total of 34 supply chain practitioners across the three factories were all participated in the questionnaire administration process.

3.3 Sampling and data collection

According to reports from the Ethiopia Trade and Industry as well as from the Sugar Corporation there are four sugar manufacturing companies in Ethiopia during the year 2016 (Metehara, Wonji, Fincha and Tendaho factories). The sample companies that this study

selected to achieve its two objectives were, therefore, from the existing sugar manufacturing companies. The fact that Tendaho Sugar factory has begun operation only in 2016 means only the other three factories can be relied upon to conduct the study (based on availability of financial data over a period of time).

Primary data was collected by means of a questionnaire (Appendix II) to achieve the first objective of the study. The questionnaire was administered through the use of email, drop and pick later method to the firms. The questionnaire had three parts; Part A covered the demographic and respondent's profile, Part B covered the extent to which supply chain management practices have been employed and finally Part C examined the impact of supply chain management practices on organizational performance with special focus on financial measures. The questionnaire allowed greater uniformity in the way questions were asked, ensuring greater compatibility in the responses. The use of close-ended questions on the questionnaire allowed for uniformity of responses to questions; while unstructured (close ended) questions gave the respondent freedom of response which helped the researcher to gauge the feelings of the respondent; he/she could use his or her own words (Field, 2005).

Secondary data was collected referring to records of the three factories. In this regard, financial reports of the three factories covering the period from 2010 to 2016 were exhaustively collected expectedly yielding in 21 observations. Specific financial data includes balance sheet, profit and loss statement, and cash flow of the three sample factories.

3.4 Data analysis

The data collected was analyzed using descriptive statistics (measures of central tendency and measures of variations) to achieve the first objective and multiple regression analysis for objective number two. In this regard, the dependent variable in the study was Enterprise value while the independent variables were total asset, total sales, cash to cash cycle, and return on capital equity.

Multiple regression was performed in an attempt to form a causal link between supply chain and firm performance as correlation does not indicate causality as indicated by Kennedy (2003). In the analysis variables such as share price, market capitalisation and dividends were not included as these are open to the vagaries of the market. Company performance was

operationalized through the enterprise value of the firm which takes into account total cash, total debt and short term investments as this reduces the influence of market forces.

In the regression analysis the change in enterprise value (EV) was selected as the repressor (dependent variable). Change in enterprise value was selected as initial analysis indicates that if the static value is used it is highly correlated to factors such as assets and employees. This is to be expected as it can be generalised that organisations with larger quantities of assets have a greater enterprise value.

Change in EV was selected to examine whether a positive change in the supply chain proxy, analogous to an improvement in supply chain performance, contributes to a positive change in EV. In addition to using change in EV as the independent variable, change in the regressands was used for the same reasons as listed earlier. Total assets, ROCE, cash-to-cash and sales are all hypothesised to influence firm performance, thus are included in the regression model.

This paper used the major dimensions of a sugar factory's supply chain effectiveness on financial performance: total assets employed, ROCE, cash-to-cash cycle and total sale. These variables can be measured in the following formulas:

- i. **ROCE**= EBIT/ Total Assets - Current Liabilities
- ii. **Cash to cash cycle (cash conversion cycle)** = Days inventory on hand + Days sales outstanding - Days payables outstanding
- iii. **Total Asset**: Fixed Assets + current Asset
- iv. **Total sales** : formulated as total number of units sold times price per unit

In order to determine the effects that change in supply chain, total assets employed, ROCE, cash-to-cash cycle and total sales have upon company's financial performance the following regression model was used. The next section discusses the empirical testing of the model. The multiple regression equation assumed the following form:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_4 X_4 + \alpha$$

Where,

Y	=	Enterprise value
β_0	=	Constant
X ₁	=	Total Asset
X ₂	=	Total Sales
X ₃	=	Return on Capital Employ
X ₄	=	Cash to Cash Cycle

Entry and analysis of the primary as well as the secondary data was made using appropriate software. SPSS version 21 was used for the primary data while Eviews was put in use for the secondary data.

CHAPTER FOUR

IV. Results and Discussion

4.1 Introduction

This chapter narrates findings of the study from two perspectives, which are mainly tailored along the two specific objectives of the study. Part 1, under section 4.1, deals with ‘identifying the supply chain management practices being put in use by the selected three sugar manufacturing industries in Ethiopia’, the first objective of the study. It articulates findings from the survey that was administered through the deployment of structured questionnaires. Part 2, under section 4.2, deliberate on presentation of findings along the second objective of the study, i.e., ‘to determine the extent/magnitude to which supply chain management practices are influencing the financial performance of the three sugar manufacturing companies’. Financial reports from the three sugar factories covering the period from 2010 to 2016 were exhaustively analysed in such a way to evidently examine the link between supply chain management practices and financial performance.

Specifically, the findings against the first objective are presented in percentages and frequency distributions, mean and standard deviations. A total of 20 questionnaires were issued out in which ten questionnaires were issued per firm and four other questionnaires in the Ethiopia Sugar Corporation. Of the 34 questionnaires issued out, 29 were returned. This represented a response rate of above 85% and this was considered satisfactory for the analysis.

4.2 Demographic and respondents profile

The demographic information considered in this study included name of the respondent, organization and the duration that the respondent had been in the organization. This information was important since a staff that had been in existence in an organization for a long period of time with responsibilities related to supply chain management will have had the time to better understand and practice the instituted supply chain management practices and also evaluate what effect the same supply chain practice will have had on the performance of the company.

4.2.1 Experience of respondents

This section aimed to establish from the respondents the period in which they had been in the organization with responsibilities related to supply chain management and the results are presented in the table below.

Table 2: Experiences of respondents in responsibilities related to SCM (in Years)

SC experience of respondents in the factory they are working in (years)?	Frequency	Percent	Cumulative percent
Under 5 years	6	21%	21%
6 – 10 years	12	41%	62%
11 – 15 years	4	14%	76%
Over 16 years	7	24%	100%
Total	29	100%	

The results in the above table indicate that 24% of the respondents had been in the sugar firms had been in operation for over 16 years compared to 21% which had practiced SC for less than 5 years. The other respondents which represent 41% had practiced SC for between 6-10 years. The results indicate that majority of the respondents had been practicing SC for more than 16 years meaning that they will have implemented adequate supply chain practices as a performance catalyst. This finding indicates that the results will be more representative in terms of reflecting the balanced judgment respondents could make in analysing the impact of supply chain on financial performance of the sugar factory they represent.

4.3 Extent of adoption of supply chain management across the three sugar factories

In the context of the three sugar factories different types of supply chain management practices were reported to be put in use. This goes well with the arguments of Handfield and Nichols (2008) who stressed the fact that different organizations adopt different supply chain management practices depending on the activities that they are engaged in and also which supply chain practice will yield better competitiveness to the firm. As interview with the Logistics Head of the Sugar Corporation yielded the factories set up their processes based on knowledge of existing supplier partnership, management of knowledge, logistics and IT

requirements. The sub section below sought to establish whether the firms under consideration had put in place supply chain practices and also whether they appreciate the effect that the supply chain had on their financial performance.

4.3.1 Adoption of supply chain management practices

According to 85.1% of survey respondents the companies are reaping financial benefits emanating from the adoption of different supply chain management practices while only 14.9% holding a differing view not to appreciate the effect of supply chain management practices on the companies' performance.

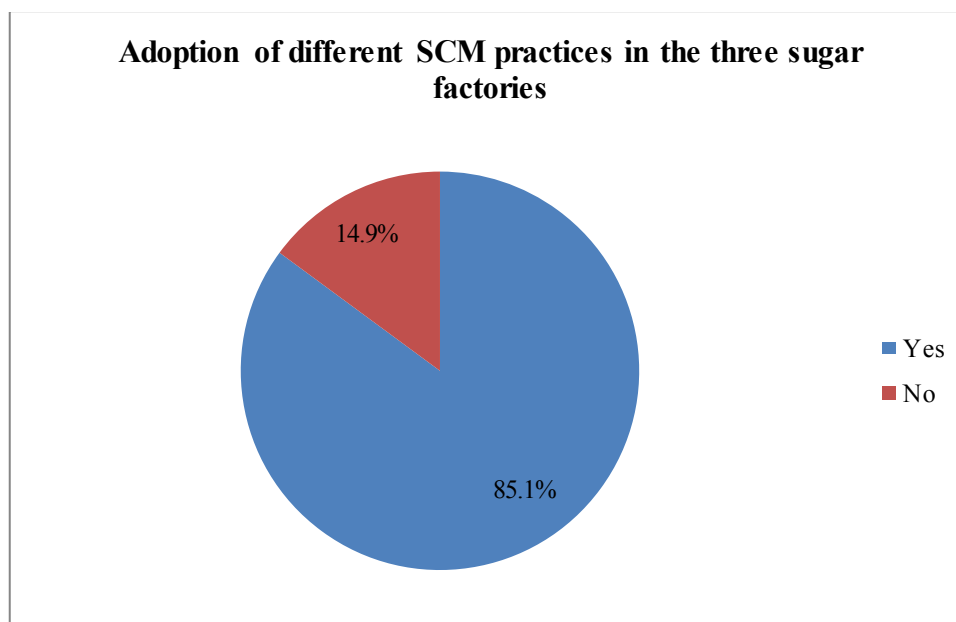


Figure 2: Adaption of different SCM Practices

The results portray that the sugar factories have adopted different forms of supply chain practices on the recognition that the same will have a positive impact on their financial performance.

Further analysis of the supply chain management practices that were adopted in the three sugar factories revealed a varying level of recognition (but not indicating economic significance of the practice). Strategic supplier partnership, logistics outsourcing, and IT infrastructure being recognized respectively by 78%, 75%, 67% and 64% of respondents

stood out as the dominant practices. Other practices constituting 7% were also reported to form part of the overall SCM practices being put in use by the factories.

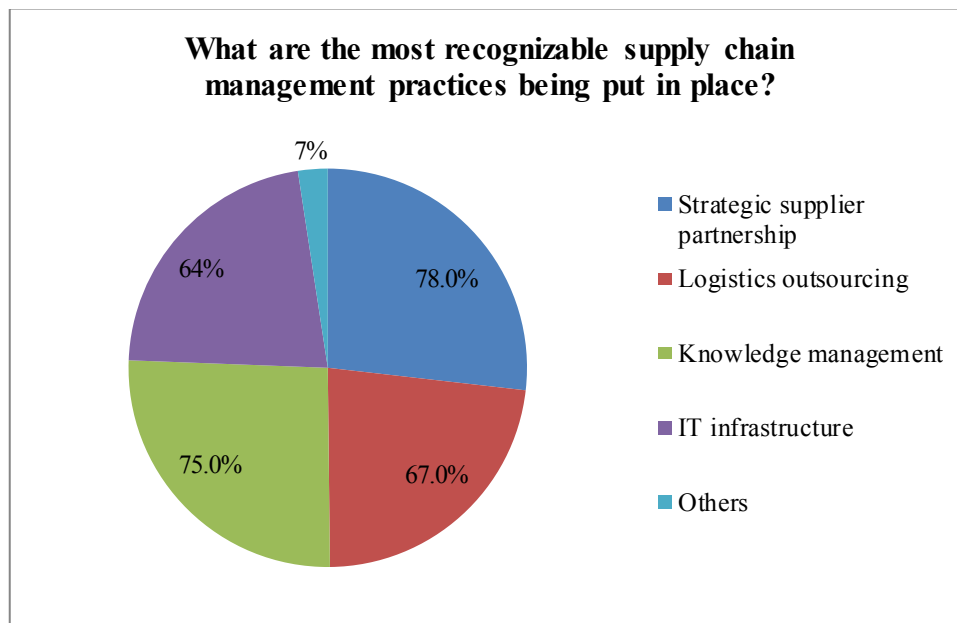


Figure 3: Most recognizable SCM practices being put in place

Put together, according to secondary sources from the Sugar Corporation, these supply chain management practices often constitute 50-60% of the factories' cost of production. In 2016 alone the three factories spent nearly 55.1% of their cost on activities tied closely with supply chain management. It is, therefore, a simple common sense to argue that effectiveness in supply chain management would entail significant financial gains to the sugar factories. This is also in conformity with Johnson et al. (2007), who, based on findings from empirical studies, argued that supply chain accounts for up to 70% of a product's cost and hence inefficient supply chain entails compromising the edge to compete in the market.

4.3.2 Effects of Supply Chain Management Practices on financial performance of the Sugar Factories

As can be seen from the table below, the questions sought to establish from the respondents the various benefits accruing to the sugar factories as a result of adopting various supply chain management practices in their distribution channels. Pertinent financial measures were identified to represent the potential benefits as presented in table 2 below.

Table 3: Effect of Supply Chain Practices on financial performance of the sugar factories

Effects of supply chain management practices	Mean
Improved liquidity level	3.8235
Increase in customer order process	4.0000
Market share growth	3.9412
Cost reduction	4.2941
Increased return on investment	4.1765
Reduction in response time for product volume changes	3.7059
Reduction in response time of product design	3.7059
Sales growth	4.0000
Overall Mean	3.5163

According to the results presented in the above table supply chain practices adopted by a firm had effects in all the financial performance. Two of the most important measures, cost reduction (mean, 4.2941) and increased return on investment (mean 4.1765), were found to be greatly influenced by the adoption of the supply chain practices. An increase in customer order process and delivery of the firm's products (mean 4.00) were also influenced highly by the firm's nature of supply chain practices. These results show that an effective adoption of supply chain practices will help in reduction of operating costs associated with the delivery of cane and also the distribution of the final sugar product. The sugar cane and the final product are bulky products and it is expected therefore that the management of the transportation cost component of the firms will affect the performance of the firm. In addition, the results also show that effective supply chain practices will influence the liquidity

level (mean, 3.8235), reduction in response time of product design (mean, 3.7059) and reduction in response time for product volume changes (mean, 3.7059). These findings further explain the need for a firm to implement the concept of supply chain management in their operation.

4.3.3 Impact of Supply Chain Management Practices on financial performance of the Sugar Factories

Moving beyond assessing respondents view on the effect of SCM, the study had also examined the impact that various supply chain practices have had on the performance of the firms. The supply chain practices considered were strategic supplier partnership, adoption of information, information sharing, knowledge management, and logistics outsourcing in a five point Likert scale. The range was ‘strongly disagree (1)’ to ‘strongly agree’ (5). The scores of strongly disagree have been taken to represent a variable which had a mean score of 0 to 2.5 on the continuous Likert scale; ($0 \leq S.E < 2.4$). The scores of ‘moderate’ have been taken to represent a variable with a mean score of 2.5 to 3.4 on the continuous Likert scale; ($2.5 \leq M.E < 3.4$) and the score of both agree and strongly agree have been taken to represent a variable which had a mean score of 3.5 to 5.0 on a continuous Likert scale; ($3.5 \leq L.E < 5.0$). The results are presented in table below.

Table 4: Impact of Supply Chain Management Practices on the performance of sugar factories

Strategic Supplier Partnership	Mean
We analyze our suppliers before contracting them and also develop unique cordial relationship with them for effective delivery of cane	4.2981
We actively involve our suppliers in new sugar cane breed and their development process	4.0143
We include our suppliers in production and quality of sugarcane setting and at the same time continuously support them	3.3233
The supplier partnership has created unique knowledge on the farmers’ needs and challenges that has been applied to improve business knowledge and performance	3.4615

Strategic Supplier Partnership	Mean
As a result of the supplier partnership, we have continuous improvement programs that include our suppliers processes and this has helped the firm to improve its various performance measures	3.6582
Adoption of Information Technology	
The introduction and installation of internet-based infrastructure has enabled the firm to communicate with its suppliers more easily and react where need be faster in solving challenges arising in the transaction	4.1633
Adoption of IT has also facilitated internet-based technology, information flow within the organization's departments and therefore improved the quality of information sharing.	4.1176
The flexibility of product specifications and testing of raw materials has been enhanced due to the adoption of information technology and as a result reduced the overall cost of the company.	3.7059
Logistics outsourcing	
It has increased the factory's flexibility, enhancing performance and cutting the costs of operations	4.5882
The factories were able to achieve competitiveness through continuous production and supply process	4.5294
Enabled the factories to concentrate on its core competencies, thereby achieving higher performance	4.5882

The findings on the strategic supplier partnership as a supply chain management practice was that analyzing the firms' suppliers before contracting them and also developing unique cordial relationship with them for effective delivery of cane (mean 4.2981) were the major activities that result in improved organizational performance. The factories were able to keep on sugar production to their full capacity using the cane supplied by out growers including

individual farmers and private investors. This means that the factories should endeavor to have a liaison office where out growers’ suggestions and input to the supply chain operations will be considered and if possible implemented. Their knowledge and performance came out as the major activities identified that have a greater effect on the performance of the firm. Otherwise, the process of including the firms’ suppliers in production and quality of sugarcane setting (mean, 3.3233) and also involving their suppliers in new sugar cane breed and development process (mean, 4.0143) was found to have had a strong effect on the operational performance of the firms.

The adoption of information technology by a firm came out also as a strong factor that influences the performance of the firms. The introduction and installation of internet based infrastructure in the supply chain (mean, 4.1633), adoption of IT in a firm to facilitate internet-based technology, as well as introducing flexibility in product specifications and testing of raw materials was identified as having enhanced better operations of the firms.

Respondents considered logistics outsourcing as one of the most significant supply chain management practices that substantially impact the financial performance of the sugar factories. For most, logistics out sourcing increased the factory’s flexibility, enhancing performance and cutting the costs of operations (mean, 4.5882), the factories were able to achieve competitiveness through continuous production and supply process (mean, 4.5294), enabled the factories to concentrate on its core competencies, thereby achieving higher performance (mean, 4.5882)

Table 5: Effect of Information Sharing and Knowledge Management on financial performance

Information sharing	Mean
Information sharing among the different sugar manufacturing factories coordinated through the Sugar Corporation has enhanced controllability of supply chain management and as a result reduced transaction costs between factories and their partners	3.4706
Our suppliers share proprietary information between themselves and the factories and as a result led to improvement in raw material quality	3.5882

Information sharing	Mean
and output	
We and our suppliers exchange information that help in establishment of business planning	3.4118
Knowledge Management	
Sharing of knowledge between the factories and the suppliers has helped the factories to manage uncertainty since the suppliers have faith and dependence in the factories	3.6471
Knowledge management systems for organizations create a greater base for tacit learning to be leveraged	3.7647
Knowledge management in SCM are lower costs, improved customer value and satisfaction in the factories to achieve competitive advantage	3.5294
Green Supply Chain	
The attaining of ISO 9001 by the company has increased its customer loyalty	3.4118
The organization has included KAIZEN ¹ in its strategic planning process in order to reduce its operational costs	3.2353
By employing in-bound logistics the company has been able to grow its market reach through having a larger geographical coverage across the country	3.2353

The effect of information sharing on the performance of the sugar firms was also sought. The results of the study were that the firms' practice of keeping employees informed on the issues that affect the businesses (mean, 3.4706) and sharing of the proprietary information between customers, employees and the firms (mean, 3.5882) came out as a common practice that is employed by the sugar firms. This means that firms will be advised to share selected strategies among their employees and also some major clients in order to reduce the level of resistance between the groups when the practice is adopted. The management of the factories' knowledge pool contained by their employees is yet another critical factor to consider by the factories. Adoption of knowledge management systems for organizations creates a greater base for tacit learning (mean, 3.7647), sharing of knowledge between the firms and the

¹ Kaizen is a Japanese term with the meaning 'change for the better'.

suppliers help the firms to manage uncertainty (mean, 3.6471) were found to reduce the cost levels of the firms and also increase customer value and satisfaction.

The information sharing between the out growers and the sugar factories has been found to be an important parameter in the supply chain process of the factories. Advances in information technology enable information availability which facilitates communication, coordination, collaboration and controllability among supply chain partners through information sharing. As observed by Lang (2001), supply chain management through better information linkages among business partners, will help highlighting various deficiencies present in the supply chain which might include, long lead times, large batch sizes, high inventory levels, slow new product design and development, and long order fulfilment cycles. Therefore in conformity with the results of this research, by identifying the deficiencies early enough in the supply chain, the organization can be able to mitigate the same before its effect can have adverse impact on the organizations performance.

A stronger emphasis on knowledge management as part of organizational strategy may help supply managers to manage uncertainty better. This finding will be in line with that of Iyer and Ye, (2000). It is observed that establishment of internal knowledge management systems for organizations create a greater base for tacit learning to be leveraged. On the other hand, external knowledge management brings value chain members closer together and adds value to the product through increased quality and customer perception of brand platforms. What comes out from the finding is that for the factories to realize the benefits of adopting the supply chain practices, there is a need to approach the same through a holistic view and not only employing selectively

4.4 Supply chain management practices and financial performance

This section mainly deals with the results of study which include diagnosis test for the regression models and regression analysis to gauge how the effectiveness of supply chain management practices (which are indicated in the preceding part 1) were influencing financial performance of the three sugar factories. The data analysis was done using E-views 9 software.

4.4.1 Regression analysis results and discussions

In this section regression analysis of financial performance measures; Enterprise Value have been undertaken to understand the relationship between determinants of the sugar factories' financial performance and the explanatory variables. According to Damodar N. Gujarati (4th edition, pp 650)² if T (the number of time series data) is large and N (the number of cross-sectional units) is small, there is likely to be little difference in the values of the parameters estimated by Fixed Effect model and Random Effect model. Hence the choice here is based on computational convenience. On this score, Fixed Effect model is preferable.

Diagnosis tests

The study did a test of the Classical Linear Regression Models (CLRM) assumptions, after running regression models for Enterprise value. As per Chris Brooks (2008), the first assumption required that the average value of the errors is zero ($E(u_t) = 0$). In fact, if a constant term is included in the regression equation, this assumption will never be violated. Since there is no intercept parameter without constant term the first assumption will never be going against implying that there is no potentially severe bias in the slope coefficient estimates in the regression model.

Heteroscedasticity test: white test

The second assumption of CLRM stated that the variance of the errors is constant (σ^2) and this is known as the assumption of homoscedasticity. If the residuals of the regression have systematically changing variability over the sample then that is a sign of heteroscedasticity. White test was used for general test of heteroscedasticity. Since the table below shows that the test result for the regression analysis p -values are considerably in excess of 0.05, we can say that there is no evidence for the presence of heteroscedasticity.

Table 6: Heteroscedasticity Test: White

F-statistic	1.264789	Prob. F(4,16)	0.3244
Obs*R-squared	5.044945	Prob. Chi-Square(4)	0.2827

² BASIC ECONOMETRICS, FOURTH EDITION Damodar N. Gujarati, United States Military Academy, West Point

Scaled explained SS 1.259864 Prob. Chi-Square(4) 0.8681

Source: E-views output from Sugar factories financial statements

Autocorrelation test: Breusch-Godfrey (BG) test

According to Chris brooks (2008), the third assumption states that the CLRM’s disturbance terms is the covariance between the error terms over time (or cross-sectional, for that type of data) is zero. In other words, it is assumed that the errors are uncorrelated with one another. In addition, he argued that if the errors are not uncorrelated with one another, it would be stated that they are rather ‘auto correlated’ or that they are ‘serially correlated’. To test this assumption the Breusch-Godfrey (BG) statistical test was applied. As the table below indicates *p*-values are considerably in excess of 0.05. As Chris brooks (2008) pointed out the there is no autocorrelation problem if the *BG* is above. That means if the test statistic exceeds the critical value from the Chi-squared statistical tables, there is no autocorrelation.

Table 7: Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.941066	Prob. F(2,14)	0.4136
Obs*R-squared	2.488632	Prob. Chi-Square(2)	0.2881

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 05/30/17 Time: 02:41

Sample: 1 21

Included observations: 21

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CASH_TO_CASH	2.62E-05	9.70E-05	0.269809	0.7912
ROCE	0.002325	0.012009	0.193608	0.8493
TOTAL_ASSET	-0.008070	0.087272	-0.092464	0.9276
TOTAL_SALES	0.040055	0.232825	0.172038	0.8659
C	-0.289102	1.461493	-0.197813	0.8460
RESID(-1)	0.393639	0.294858	1.335016	0.2032
RESID(-2)	-0.117842	0.360327	-0.327041	0.7485

R-squared	0.118506	Mean dependent var	2.45E-15
Adjusted R-squared	-0.259277	S.D. dependent var	0.064759
S.E. of regression	0.072671	Akaike info criterion	-2.144543

Sum squared resid	0.073935	Schwarz criterion	-1.796369
Log likelihood	29.51770	Hannan-Quinn criter.	-2.068980
F-statistic	0.313689	Durbin-Watson stat	1.735270
Prob (F-statistic)	0.919240		

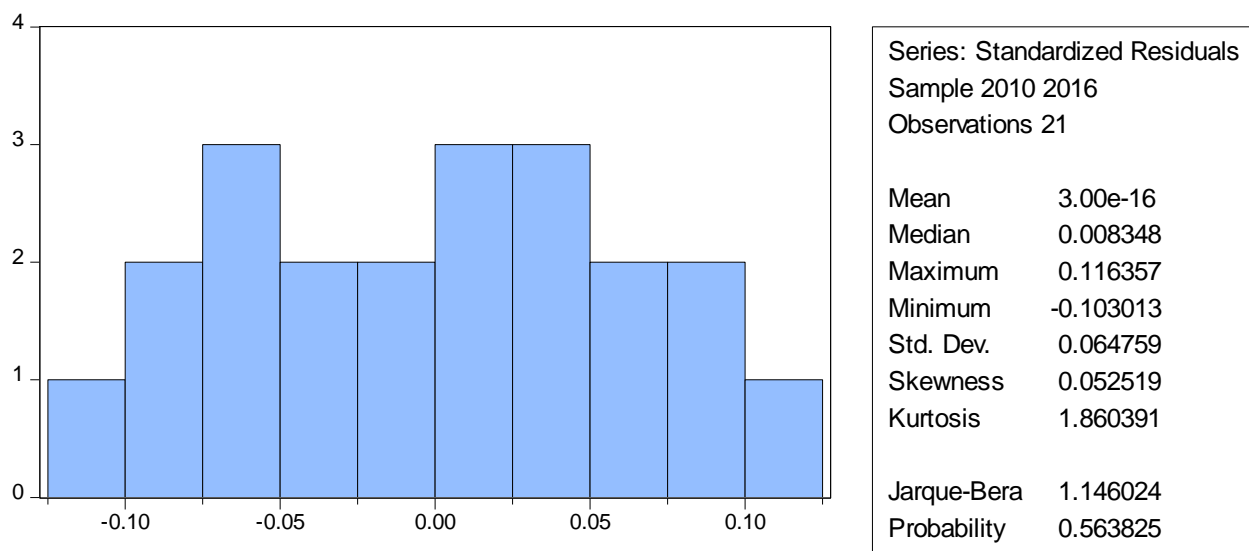
Source: E-views output from Sugar factories financial statements

Normality test: Bera-Jarque (BJ) test

Assumption five require to check whether the disturbances are normally distributed or not. According to Chris brooks (2008), one of the most commonly applied tests for normality is the Bera-Jarque (BJ) test. BJ uses the property of a normally distributed random variable that the entire distribution is characterised by the first two moments, the mean and the variance. If the residuals are normally distributed, the histogram should be bell-shaped and the Bera-Jarque statistic would not be significant. This means that the *p*-value given at the bottom of the normality test screen should be bigger than 0.05 to not reject the null of normality at the 5% level.

Thus, the study did test for this assumption and as it can be seen from the below graph, the Bera-Jarque result was a probability of **0.56** for regression model, implying that the inferences made about the coefficient estimates was appropriate.

Figure 4: Normality test - Bera-Jarque (BJ) test



Source: E-views output from Sugar factories financial statements

Thus, the study managed a test for this assumption and as can be seen from the above graph, the Bera-Jarque result was a probability of 0.56 regression model, implying that the inferences made about the coefficient estimates was appropriate.

Multicollinearity test

The correlation between explanatory variables; asset, sales ROCE and cash to cash included in this study are analyzed and presented. As presented in the table below, total asset with total sales and cash to cash is highly correlated as compared to other explanatory variables included in this study with the coefficient of 0.70 and -0.356 respectively. Since their coefficient is less than 0.75 it can be concluded that there is no series multicollinearity problem as supported with empirical evidence. Mashotra (2007) argued that the correlation coefficient can be 0.75. Cooper & Schindler (2009) suggested that a correlation coefficient above 0.8 should be corrected for. Lastly, Hair et al. (2006) also argued that correlation coefficient below 0.9 may not cause serious multicollinearity problem.

As presented in table below, total asset has a positive correlation coefficient with total sales and cash to cash cycle. But, it has a negative correlation coefficient value of -0.356569 with ROCE. ROCE has a negative correlation coefficient value of with all explanatory variables except with cash to cash cycle.

Table 8: Multicollinearity test

	TOTAL_ASSET	TOTAL_SALES	ROCE	CASH_TO_CAS H
TOTAL_ASSET	1.000000	0.703095	-0.356569	0.246766
TOTAL_SALES	0.703095	1.000000	-0.020454	0.000475
ROCE	-0.356569	-0.020454	1.000000	0.013796
CASH_TO_CAS H	0.246766	0.000475	0.013796	1.000000

As per the above table, cash to cash cycle has a positive correlation coefficient with all explanatory variables. Total sales is also positively correlated with total asset and cash to cash cycle, but it is negatively correlated with ROCE.

Model test

According to Chris Brooks (2008), one of the most commonly applied tests whether the model should be linear can be formally tested using Ramsey's (1969) RESET test, which is a general test for misspecification of functional form. The Ramsey RESET test for this regression is in effect testing whether the relationship between the sugar factories' financial performance and the explanatory variables is linear.

Both F- and χ^2 versions of the test are presented, and it can be seen that there is no apparent non-linearity in the regression equation and so it would be concluded that the linear model for the Enterprise value is appropriate.

Table 9: Ramsey RESET Test

Ramsey RESET Test
 Equation: EQOK
 Specification: EV CASH_TO_CASH ROCE TOTAL_ASSET
 TOTAL_SALES
 C

Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.601371	15	0.5566
F-statistic	0.361647	(1, 15)	0.5566
Likelihood ratio	0.500298	1	0.4794

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.001975	1	0.001975
Restricted SSR	0.083875	16	0.005242
Unrestricted SSR	0.081900	15	0.005460

LR test summary:

	Value	df
Restricted LogL	28.19326	16
Unrestricted LogL	28.44341	15

4.4.2 Correlation analysis between financial performance and the explanatory variables

According to results of the correlation analysis undertaken between the proxy financial measures (total asset, total sales, ROCE and cash to cash cycle) and the Financial

Performance, a positive correlation was observed between FP and total asset; and between FP and total sales; whereas, FP has experienced a negative correlation with ROCE and with cash to cash cycle.

Numerically, the correlation coefficient between financial performance and total asset was 0.93 and between FP and total sales was 0.67, which are the highest positive coefficients as compared to the other variables. This entails that total asset being a proxy to knowledge management and total sales being a proxy to Information Technology/Sharing have highest association with financial performance of the study sugar factories. The result asserted that Information Technology/Sharing and knowledge management were the two most influential supply chain management practices to have significant relationship with the financial performance of the three Sugar Factories.

On the other hand, the correlation coefficient for Return on Capital Employ (the proxy for Logistics Outsourcing) and Cash Conversion Cycle (the proxy for Strategic Supplier Partnership) was found to be negative. This was quite contrary to findings of the survey where Strategic Supplier Partnership and Logistics Outsourcing were being recognized respectively by 78% and 67% of survey respondents as the dominant and most impacting SCM practices.

4.4.3 Regression analysis between financial performance and the explanatory variables

In this section regression analysis of the proxy financial measures (the explanatory variables) and that of financial performance (the dependent variable) was undertaken to understand the magnitude of their relationship. Accordingly, a regression analysis was run to examine the relationship between financial performance and the explanatory variables with the regression model indicated below.

$$EV = -4.6 + 0.83ASSET + 0.67SALES - 0.066ROCE - 0.001chash\ to\ cash\ cycle$$

Table 10: Regression analysis result between Enterprise value and explanatory variables

Dependent Variable: EV

Method: Panel Least Squares

Date: 05/30/17 Time: 02:29
 Sample: 2010 2016
 Periods included: 7
 Cross-sections included: 3
 Total panel (balanced) observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TOTAL_ASSET	0.827517	0.068384	12.10096	0.0000
TOTAL_SALES	0.671350	0.163258	4.112206	0.0008
ROCE	-0.065556	0.011797	-5.556880	0.0000
CASH_TO_CASH	-0.000310	8.89E-05	-3.490930	0.0030
C	-4.534980	1.062230	-4.269301	0.0006
R-squared	0.980467	Mean dependent var	9.038608	
Adjusted R-squared	0.975584	S.D. dependent var	0.463359	
S.E. of regression	0.072403	Akaike info criterion	-2.208882	
Sum squared resid	0.083875	Schwarz criterion	-1.960186	
Log likelihood	28.19326	Hannan-Quinn criter.	-2.154909	
F-statistic	200.7827	Durbin-Watson stat	1.030282	
Prob(F-statistic)	0.000000			

Source: E-views output from Sugar factories financial statements

The regression analysis indicated that some of the supply chain practices have a statistically significant ($p=0.000$), with positive coefficient, direct impact upon change in financial performance asserting the notion that improving supply chain performance influences the value of the firm. In this regard, two of the variables that directly affect the rate of change of financial performance at a statistically significant level are: the constant ($p=0.0006$), ROCE ($p=0.000$), cash to cash $p=0.003$), total assets employed ($p=0.000$) and total sales ($p=0.0008$). The R^2 and adjusted R^2 values of the regression model are, respectively, 98% and 97.5%, which are acceptable given that the model was based on cross sectional panel financial data.

Regression is used to investigate and model the relationship between a response variable (in this case Enterprise value) and all predictors. p -values of less than 0.05 indicate that the predictor has a statistically significant effect upon the response variable.

The statistical significance of the constant indicates the presence of industry specific factors such as innovation rate, cost of switching for customers, etc. As should be expected, as the level of sales increases, the enterprise value of a firm increases. Also statistically significant is that an increase in the total assets within the sugar factories leads to an increase in financial

performance. This is due to two factors. The first of which is that larger companies (with greater enterprise value as the case been with the three sugar factories) often have more assets. The second of which is that total assets is a component of enterprise value. On the other hand, Cash-to-Cash did not have very high levels of statistical significance like the other variables, but should be expected to influence financial performance indirectly. Improving the cash-to-cash time implies that a company will need to finance its inventory for a shorter period of time: reducing its need to leverage debt, thereby increasing profit.

In general, the two explanatory variables (total sales and total asset) have a positive relationship with financial performance in agreement with the hypothesis but not ROCE and cash to cash, where low coefficient of -0.06 shows that ROCE has weak impact on the financial performance of the selected Sugar factories. It is statistically significant and an increase in the ROCE within the factories leads to reducing financial performance. The fact that the ROCE measures return against the book value of assets in the business means even though cash flow has remained the same the depreciating ROCE will increase. Thus, older businesses with depreciated assets will tend to have higher ROCE than newer, possibly better businesses. In addition, while cash flow is affected by inflation, the book value of assets is not. Consequently, revenues increase with inflation while capital employed generally does not (as the book value of assets is not affected by inflation).

CHAPTER FIVE

V. Summary, conclusions and recommendations

5.1 Summary

The study has sought to investigate the effectiveness of supply chain management practices on the financial performance of the sugar manufacturing sector in Ethiopia considering the period from 2010 through to 2016. Two objectives were laid to set the framework of the study, one leading to the other. The study has first attempted ‘to identify the supply chain management practices being put in use by the selected three sugar manufacturing industries in Ethiopia’. Strategic supplier partnership, logistics outsourcing, and IT infrastructure being recognized respectively by 78%, 67% and 64% of respondents stood out as the dominant supply chain management practices that the factories rely on. This has led to the second objective of the study, ‘to determine the extent/magnitude to which supply chain management practices are influencing the financial performance of the three sugar manufacturing companies’. In this regard, the study deployed appropriate econometric methodology for the estimation of variables coefficients under regression model.

5.2 Conclusions

From the findings of the study, it can also be concluded that financial performance does not result from the products and services an organization is offering alone but instead it is those inimitable characteristics of a firm such as policies and supply chain practices that will differentiate and give an organization the required competitiveness. The benefits accruing to the sugar factories as a result of the adoption of supply chain practices have been found to include competitive advantage and reduction in operational cost. Based on key findings and comprehensive analysis of observations the following conclusions were drawn.

5.2.1 Methodologically, the study constructed a proxy that makes it empirically possible to test the efficiency of supply chain management practices on financial performance. The overall results of the study’s analysis indicate that improving supply chain performance has a statistically significant impact upon financial performance of the

three sugar factories, as do sales, total assets and, in certain cases, the sector in which a firm operates.

- 5.2.2 In the context of the three sugar factories different types of supply chain management practices were reported to be put in use. This goes well with the arguments of Handfield and Nichols (2008) who stressed the fact that different organizations adopt different supply chain management practices depending on the activities that they are engaged in and also which supply chain practice will yield better competitiveness to the firm.
- 5.2.3 According to 85.1% of survey respondents the companies are reaping financial benefits emanating from the adoption of different supply chain management practices while only 14.9% holding a differing view not to appreciate the effect of supply chain management practices on the companies' performance.
- 5.2.4 According to secondary sources from the Sugar Corporation, these supply chain management practices often constitute 50-60% of the factories' cost of production. In 2016 alone the three factories spent nearly 55.1% of their cost on activities tied closely with supply chain management.
- 5.2.5 Detailed analysis of the effect of the specific supply chain management practices indicated that two of the most important measures, cost reduction (mean, 4.2941) and increased return on investment (mean 4.1765), were found to being greatly influenced by the adoption of the supply chain practices. An increase in customer order process and delivery of the firm's products (mean 4.00) were also influenced highly by the firm's nature of supply chain practices.
- 5.2.6 Assessment of the impact that various supply chain practices have had on the performance of the firms had also revealed that strategic supplier partnership, the adoption of information technology and improved ways of innovations, and logistics out sourcing were found to be instrumental SCM practices that the sugar factories were deploying. Logistics out sourcing in particular was reported as essential because it increases the factory's flexibility, enhancing performance and cutting the costs of operations (mean, 4.5882), the factories were able to achieve competitiveness through

continuous production and supply process (mean, 4.5294), enabled the factories to concentrate on its core competencies, thereby achieving higher performance (mean, 4.5882).

5.2.7 According to results of the correlation analysis undertaken between the proxy financial measures (total asset, total sales, ROCE and cash to cash cycle) and the Financial Performance, a positive correlation was observed between FP and total asset; and between FP and total sales; whereas, FP has experienced a negative correlation with ROCE and with cash to cash cycle. Similarly, results of the regression analysis indicated that the two explanatory variables (total sales and total asset) have a positive relationship with financial performance in agreement with the hypothesis but not ROCE and cash to cash, where low coefficient of -0.06 shows that ROCE has weak impact on the financial performance of the selected Sugar factories. It is statistically significant and an increase in the ROCE within the factories leads to reducing financial performance.

5.2.8 Finally, the study has used both primary and secondary data to explain the relationships between supply chain and financial performance of the sugar factories. It is the conviction of the researcher that the findings of this research allow supply chain practitioners to evaluate the relative merits of alternative strategies, technologies and approaches in terms of their impact on a company's overall financial performance and with confidence to advocate the supply chain as a critical driver of superior company performance.

5.3 Recommendations

5.3.1 Methodologically, this study claims neither to be comprehensive nor to be exhaustive. Future studies in this regard should make a focussed effort to get into the depth of the supply chain management practices and how these are influencing financial and non-financial performance of the manufacturing sector in Ethiopia. As scholars noted supply chain accounts for 70% of costs in the manufacturing sector and competitiveness therefore remain high along supply chains.

5.3.2 As it exists now, the sugar manufacturing sector is monopolized (perhaps not a deliberate act) by the government. All the time, demand for sugar is surpassing supply

from local factories, further forcing the government engage in importing sugar. In such contexts where there is no competition, the sugar factories and manufacturers might not be pushed to the limit of embracing supply chain practices in full. This study strongly recommends that the sugar factories should look well beyond their comfort zone and challenge themselves to adopt other improved supply chain practices that can absolutely lower production cost and give them the competitive edge with sugar manufacturers in other countries such as India and China.

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APPENDICES

Appendix I: Cover Letter

Selam Alebel
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Addis Ababa
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April, 2016

Dear Respondent,

RE: RESEARCH QUESTIONNAIRE

The attached questionnaire is designed to gather information for the study entitled “The Effectiveness of Supply Chain Management Practices on the Financial Performance of the Sugar Manufacturing Sector in Ethiopia”. This study is being carried out as a requirement in Partial Fulfilment of the Requirements for the Degree of Master of Business Administration in Finance, Addis Ababa University.

Please note that this is strictly an academic exercise towards the attainment of the aforementioned purpose. You are hereby assured that the information will be treated with strict confidentiality. Your co-operation will be highly appreciated.

Thank you for your anticipated kind response.

Yours Sincerely,

Selam Alebel

Appendix II: Research Questionnaire

PART A: DEMOGRAPHIC AND RESPONDENT’S PROFILE

1. Name of the Respondent (optional)
2. Name of your factory.....
3. For how long have you been working in this factory in responsibilities related to supply chain management?
 - a) Under 5 years [] b) 6-10 years []
 - b) 11-15 years [] d) Over 16 years []

PART B: EXTENT TO WHICH SUPPLY CHAIN MANAGEMENT PRACTICES HAVE BEEN ADOPTED

4) Does your organization practice supply chain management in recognition of its effect on the performance of the factory?
 Yes () No ()

5) The statements below describe the extent of supply chain management practices on the performance of the factory you are working in. Please indicate the extent to which the supply chain management practices adopted by your factory have influenced financial performance:

Key:

- 5) Very great extent 4) Great extent 3) Moderate extent
 2) Low extent 1) Very low extent

	Key performance parameters	5	4	3	2	1
1	Return on Investment					
2	Market share growth					
3	Total cost reduction					
4	Sale growth					
5	Financial liquidity					
6	The reduction of response time for product design change					
7	The reduction of response time for product volume					
8	The accuracy of order processing for customers					

PART C: IMPACT OF SUPPLY CHAIN MANAGEMENT PRACTICES ON ORGANIZATIONAL PERFORMANCE

6) Below are some of the supply chain management practices that can be employed by a firm, Please tick appropriately the extent to which your factory has been practicing the following

supply chain management practices and the degree to which it has affected the performance of the factory you are working in.

Keys:

5) Strongly agree; 4) Agree; 3) Moderate extent; 2) Disagree; 1) strongly degree

	Strategic Supplier Partnership	5	4	3	2	1
1	We analyze our suppliers before contracting them and also develop unique cordial relationship with them for effective delivery of cane					
2	We actively involve our suppliers in new sugar cane breed and their development process					
3	We include our suppliers in production and quality of sugarcane setting and at the same time continuously support them					
4	The supplier partnership has created unique knowledge on the farmers' The accuracy of order processing for customers					
5	As a result of the supplier partnership, we have continuous improvement programs that include our suppliers processes and this has helped the firm to improve its various performance measures					
6	Our strategic sourcing has also influenced knowledge creation and sharing among suppliers and retailers					
	Adoption of Information Technology					
7	The introduction and installation of internet-based infrastructure has enabled the firm to communicate with its suppliers more easily and react where need be faster in solving challenges arising in the transaction.					
8	Adoption of IT has also facilitated internet-based technology, information flow within the organization's departments and therefore improved the quality of information sharing.					
9	The flexibility of product specifications and testing of raw materials has been enhanced due to the adoption of information technology and as a result reduced the overall cost of the company.					
10	The adoption of IT has helped the organization get accurate information of inputs as well outputs from the firm and therefore helped in reducing losses					
	Information Sharing					
11	Information sharing among different sugar manufacturing firms has advanced the controllability of supply chain management and as a result reduced transaction costs between firms and their partners.					
12	Our suppliers share proprietary information between themselves and the firms and as a result led to improvement in raw material quality and output					
13	Our suppliers keep us fully informed about the issues that					

	affect our businesses in comparison with our competitors					
14	We and our suppliers exchange information that help in establishment of business planning					
15	Sharing information in the early stages of product development better positions the firm to support the retailer while avoiding costly stocking errors.					
16	Information exchange between our suppliers and us is timely, accurate and complete					
	Knowledge Management					
17	The sharing of knowledge between the firm and the suppliers has helped the firm to manage uncertainty since the suppliers have faith and dependence in the firm.					
18	The establishment of internal knowledge management systems for organizations creates a greater base for tacit learning to be leveraged.					
19	The consequences of knowledge management in SCM are lower costs, improved customer value and satisfaction in the firm to achieve competitive advantage.					
20	The establishment of internal knowledge management systems has created opportunities for reduction of knowledge isolation within departments and instead created a greater base for tacit knowledge to be leveraged.					
	Logistics outsourcing					
21	It has increased the factory's flexibility, enhancing performance and cutting the costs of operations					
22	The factories were able to achieve competitiveness through continuous production and supply process					
23	Enabled the factories to concentrate on its core competencies, thereby achieving higher performance					
	Green Supply Chain					
24	The attaining of ISO 9001 by the company has increased its customer loyalty					
25	The organization has included KAIZEN in its strategic planning process in order to reduce its operational costs					
26	By employing in-bound logistics the company has been able to grow its market reach through having a larger geographical coverage across the country					