



**DEBRE MARKOS UNIVERSITY**  
**COLLEGE OF BUSINESS AND ECONOMICS**  
**DEPARTMENT OF MANAGEMENT**  
**MASTER OF BUSINESS ADMINISTRATION (MBA)**  
**THE EFFECT OF SUPPLY CHAIN MANAGEMENT PRACTICES ON**  
**SUPPLY CHAIN RESPONSIVENESS AND OPERATIONAL**  
**PERFORMANCE OF THE FIRM - A CASE STUDY ON GOZAMEN**  
**COOPERATIVE UNION**

By

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**May 2025**

**Deber markos, Ethiopia**

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CHAIN RESPONSIVENESS AND OPERATIONAL PERFORMANCE OF THE  
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A THESIS SUBMITTED TO COLLAGE OF BUSINESS AND ECONOMICS,  
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Advisor

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May 2025

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## **Declaration**

I, Rebecca Belachew hereby declare that this research thesis work entitled “Assessment of Supply Chain Management Practices Effects on Supply Chain Responsiveness and operational performance of the firm - a case study on gozamn cooperative union” is my original work and has not been presented for a degree in any other university, and that all sources of materials used for the study have been fully acknowledged. No section copied in whole or in part from any other source unless explicitly identified in quotation marks and with detailed, complete and accurate referencing.

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## **Certification**

This is to certify that Rebecca Belachew has carried out her research work on the topic entitled “Assessment of Supply Chain Management Practices and Effects on Supply Chain Responsiveness And operational performance of the firm - a case study on gozamn cooperative union” is her original work and is suitable for submission for the award of Masters of business administration.

Advisor: \_\_\_\_\_

Date & Signature \_\_\_\_\_

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## **List of Acronyms**

<b>CA</b>	Competitive Advantage of the Firm
<b>CR</b>	Customer Relationship
<b>IS</b>	Information Sharing
<b>LPR</b>	Logistic Process Responsiveness
<b>OP</b>	Operational Performance
<b>OSR</b>	Operation System Responsiveness
<b>SCM</b>	Supply Chain Management

## **Abstract**

*The study aims to identify the impact of different dimensions of supply chain management practices (strategic supplier partnership, customer relationship, and information sharing) and supply chain responsiveness on operational performance study is intended to assess the supply chain management practice and their impact on SCM practice with supply chain responsiveness and operation performance of the firm, and last identified the factor affect the SCM practices of the firm. The study employed quantitative research and descriptive as well as explanatory research design and survey questionnaires were sent to 65 respondent in number. The study tests the relationships between supply chain management practices, supply chain responsiveness, and competitive advantage of the firm using descriptive statistics such as (mean, Standard Deviation and percentage frequency) as well as inferential statistics correlation and regression analysis using SPSS. Both primary and secondary source of data were used for this study. Data were collected using questionnaire in the form of closed ended question. The questionnaires were rated using five point's liker scale. The major finding indicated that, most of SCM practices were poor performance practiced in gozamen cooperative union Supply chain. The study found that the supply chain management practices have a significant positive impact on supply chain responsiveness and operation performance (competitive advantage). The study recommend for gozamen cooperative union Improving supplier partnership and relationship to minimized cost and time overrun in order to increase profit of the firm..*

***Keywords: Supply chain management practices, Supply chain responsiveness, and competitive advantage of the firm (operational performance).***

# Chapter one

## Introduction

### 1.1. Background of the study

Supply Chain Management practices is defined as a set of activities undertaken in organization to promote effective management of its supply chain (EBRAHIM, 2019). The research objectives were designed to investigate the effect of supply chain management practices in terms of strategic supplier partnership, customer relationship, and information sharing on supply chain responsiveness and to determine whether supply chain responsiveness has impact on competitive advantage of the firm. (A, 2010) Within these objectives, there are three concepts that needed to be explored, to obtain an understanding of these objectives. These concepts are reviewed both supplier and customer (externally) and internally. These concepts are (1) supply chain management practices that encompasses supplier partnership, customer relationship and information sharing, (2) supply chain responsiveness that includes operation system responsiveness, logistic process responsiveness, and supplier network responsiveness, (Christopher, 2016)

The supply chain starts with the extraction or raw material (or origination of raw concepts for services) and each link in the chain processes the material or the concept in some way or supports this processing. Arguably, it should also cover the disposal of waste associated with the consumed product. The recognition of the supply chain as a key and vital area both in the public and private sectors would focus attention on its effectiveness (Chowa S.Wing, 2008). Identified supply chain management practices in form of strategic supplier partnership, customer relationship, and information sharing

Strategic supplier partnerships including working closely with suppliers to design or redesign products and processes, solve problems, as well as prepare back-up plans is critical in attaining supply chain responsiveness (Alvarado, 2001). Customer relationship is essential for attaining supply chain wide responsiveness (Christopher, 2016). Information sharing practice in a supply chain increases responsiveness to customer's needs (Lopienski, 2024) find that a higher level of information sharing practices will lead to a higher level of supplier network responsiveness. Sharing information (and data) with other parties within the supply chain can be used as a source of competitive advantage (MEKDES TILAHUN JUNE, 2017).

Business in those days focused primarily on managing finished product as it came off manufacturing lines (Beesley A. 2010. Time compression in the supply chain. In Waters, Beesley A. 2010. Time compression in the supply chain. In Waters,D., GLOBAL LOGISTICS New directions in supply chain management (6thed). US: Kogan Page Limited. (pp. 69-91).).SCM focuses on how companies utilize their supplier's processes, technology and capability to enhance competitive advantage, and the coordination of the manufacturing, logistics and materials management functions within an organization (Min s., 2008).

Ethiopian firms are not sufficiently getting the benefits of SCM due to lack of the practice of Integration, collaboration and not having willingness and the practice of managing supply chains. The traditional way of managing from suppliers to customers is just a buy and sale (Transactional) relationship, (efficiency & important, 2016)

On this study three SCM practices were be examined by consolidating prior research (Anderson, 2024) namely strategic supplier relationship (SSR), customer relationship (CR), and information sharing (IS). Supply chain responsiveness (SCR) is constructed by conceptualizing it as a three-dimensional construct (operations system responsiveness, logistics process responsiveness, and supplier network responsiveness (Chowa S.Wing, 2008) Competitive priorities was conceptualize to measure operational performance by using cost, quality, delivery, flexibility, (Beesley A. 2010. Time compression in the supply chain. In Waters, Beesley A. 2010. Time compression in the supply chain. In Waters,D., GLOBAL LOGISTICS New directions in supply chain management (6thed). US: Kogan Page Limited. (pp. 69-91).)

## **1.2. Background of the organization**

Gozamn Cooperative union is non-governmental organization that was established to increase the production supply chain and stabilize the market. The objective of the union is to provide the best seeds and soil fertilizers for the farmer. It was founded in 1991 E.C by 73 women and 7149 men with a capital of 100,000 birr. The organization currently has a capital of 130 million. And totally 139,329 members (men 103,970 & women 35,359) and it has 67 primary unions in 7 districts (wordas) and the head office is in deber markos. The union supplies the product only government organizations. The union currently has its own warehouses with its own delivery vehicles, one pulp factory in deber markos and it also works in warehouse rent.

### **1.3 Statement problem**

Current supply chain management practices in the supplier company are performed on fragmented basis with unstructured communication and no clearly established responsibilities between the parties involved. The highly fragmentation is a result lack of coordination and integration between various functional disciplines, poor communication, etc. the important factors causing performance-related problems such as delay in ordering and receiving, low productivity, cost and time overrun, conflict and disputes. Despite the increased attention paid to SCM, the literature has not been able to offer much by way of guidance to help the practice of SCM that is applicable to every situation (Cigolini, et al., 2004).

supplier company are always under pressure from all sides to reduce costs and deliver excellent performance, while improving availability, reliability, safety and sustainability of its complex supply chain management is neglected. Companies which have recognized opportunities that exist there in the supply chain management and directed their effort towards developing a competitive supply chain based on speed, flexibility, innovation, quality & responsiveness had significant improve customer service and their profitability. Therefore, the primary goal of supply chain management is to enhance competitive performance by closely integrating the internal function within a company and closely linking them with external operation of suppliers, customers, and other channel member (Kim, 2006).

For seeking the efficient and effective cooperation between organizations of a supply chain, each chain member must seek not only to improve its own individual competitiveness (i.e., quality, cost, delivery lead time, and etc.) but also improve the competitiveness and performance of all enterprises in its supply chain. This improves sharing of information, working together to reduce costs, cut lead time and building total quality into all the stages

### **1.3 Objective**

#### **1.3.1 General objective**

The general objective is investigate supply chain management practices of the firm and examining the effect of SCM practices on the firm performance in terms of supply chain responsiveness

### 1.3.2 Specific objective

The specific objective is:-

- To examine the effect of SCM practice on supply chain responsiveness of gozamen cooperative union
- To examine the effect of SCM practice on operational performance of gozamen cooperative union
- To examine the effect of supply chain responsiveness on operational performance of gozamen cooperative union.

### 1.4 Significance of the study

The investigation results are important to the academicians, researchers, policy makers, for business practitioners, and management units in the case company. More specifically, research endeavors are limited within gozamen cooperative union in debre markos. This study, which is undertaken in the area of the effects of supply chain management strategy on supply chain responsiveness and operational performance were contribute to the development and effective implementation of supply chain management strategies. Company also underline the importance of sufficient and relevant information for planning and making successful decisions about a marketing strategy.

Other non-manufacturing institutions were also benefit from the findings of this study since it shed more light on the effect of supply chain management practices on organizational operational performance. The findings of this study were used as a reference point by other researchers for further research on the same field. They can also use the findings as a secondary source of information.

The result of the study believed to give an insight for the company's management as well as other concerned bodies about the existing challenges of enhance supply chain management, supply chain responsiveness and efficiency .it will also suggest possible solutions that enable the company to improve its supply chain management.

## **1.5 Research Question**

This study is primarily aim to answer, what is the effect of supply chain management practice and supply chain responsiveness on operational performance of gozamen cooperative union? And more specifically to answer the following basic research questions.

1. What is the supply chain management practice effect on supply chain responsiveness of gozamen cooperative union?
2. What is the effect of supply chain management practice on operational performance directly and indirectly through supply chain responsiveness of gozamen cooperative union?
3. What is the effect supply chain responsiveness on operational performance of gozamen cooperative union?

## **1.6 Research hypothesis**

1. Strategic supply chain management practices have positive and significant effect on supply chain responsiveness.
2. Supply chain management practices have positive and significant effect on operational performance.
3. Supply chain responsiveness that positively and significantly effect on operational performance.

## **1.7 Scope of the project**

The study was conducted in gozamn district east gojam zone with special focus on Gozamn Cooperative union. In deber markos head office. Conceptually study to investigate supply chain management practices of the firm and examining the effect of SCM practices on the firm performance in terms of supply chain responsiveness

SCM is a vast area to be address. However, due to shortage of time, finance and manageability issue, the study is delimited to SCM practice and performance measurement: Supply chain management responsiveness and firm competitive advantage of the firm (operational performance) of the selected public project on Gozamn Cooperative union.

The conceptual scope of the research is also limited to areas of SCM practices such as supplier relationship, customer relationship, information sharing with related to supply chain management responsiveness and Competitive advantage of the firm (operational performance).

### **1.8 Limitation of the study**

In this study it is difficult to cover entire domain of supply chain practices just in one study. The study sample didn't include all the supply chain practices; it used strategic supplier partnership, customer relationship, and information sharing. Future researcher should extend this study by incorporating additional practices. The study is limited to only in debre markos it didn't, include the other branches which found out of debre markos .This researcher deployed quantitative method to get data for this study and there are some issues that should be answered through qualitative but the researcher filled to use. Limitation of the study is insufficient of empirical researches related to the study area in Ethiopian context area could not get easily for review in any context. That has shortage of data for literature review of the thesis as limitation. And the research study and get information only in debre markos branch. Some employees refused to answer the gaps in this study for financial and security reasons, employees outside the headquarters were not included

### **1.9 Organization of the Study**

This study is organized into five chapters, Chapter one contains background of the study, statement of the problem, basic research questions, objective of the study, definition of terms, significance of the study, delimitation/scope of the study and limitation of the study. The second chapter deals with the literatures relevant to the study and conceptual frame work adapted from previous studies. Chapter three, the type and design of the research, the subjects/participants of the study, the sources of data, the data collection tools, the procedures of data collection, and the methods of data analysis used are described. Chapter four interprets and discusses the findings. Finally chapter five includes summary, conclusions and recommendations.

### **1.10 Definition of key Terms**

- **Supply chain management practices (SCMP):-** it is a number of activities that are accepted by organization to enhance their supply chain effectiveness and efficiency. On this study supply chain management practices are strategic supplier partnership, customer relationship, and information sharing.

- **Supply chain responsiveness (SCR):-** it is the act of supply chain to respond the market change rapidly. For this study operation system responsiveness, logistics process responsiveness, and supplier system responsiveness are used to measure Supply chain responsiveness.
- **Operational performance (OP):-** is the system of producing great value product differently than the competitors. Cost, quality, flexibility, and delivery are used to measure operational performance.

## Chapter two

### Review of related Literature

#### 2.1 concept of Supply chain

Different practitioners and researchers depending on the background where they come from define supply chain management. Generally, the following definitions can be used as a working definition of supply chain and supply chain management.

First let's define Supply chain, Supply chain is the sequence of events that cover a product's entire life cycle, from the conception to consumption (efficiency & important, 2016). Supply chain is defined to be a network of facilities that procure raw materials, transform them into intermediate goods and then final products, and deliver the products to customers through a distribution system (celonis, 2007) have yet another analogous definition: SC is a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers (Anderson, 2024).

In general supply chain is a network of organizations involved, from the supplier of the supplier until the client of the client, on the different processes and activities that produce value in the form of products and services for the final client. Its major components are the suppliers' network, the transformation unit and the clients' network. The effective management of the supply chain is necessary for successful competition in today's global markets.

SCM is a philosophy that describes how organizations should manage their supply chains to achieve strategic advantages. Its goal is to synchronize the client requirements with the materials and information flows along the supply chain, until reaching a balance between the client satisfaction and the cost. It refers then to the coordination of the activities of all that participate in the supply chain, to knowing the production requirements with the purpose of satisfying the client, to delivering of products of higher value and to reducing the costs of the organization that apply these principles (Chopra, 2016).

Many definitions describe Supply Chain Management as the chain linking each element of the manufacturing and supply process from raw materials to end users, encompassing several organizational boundaries. This is well summarized as, the management of upstream and downstream relationships with suppliers and customers to deliver superior customer value at less

cost to the supply chain as a whole (Chowa S.Wing, 2008). Another scholar defined SCM as the process of strategically managing the movement and storage (if necessary) of materials, parts and finished products from suppliers, through the manufacturing process and onto customers or end-users, as well as the associated information flows (Anderson, 2024). A simple definition provided in the Handbook of Supply Chain Management is that SCM is about the design, maintenance and operation of supply chain processes for the satisfaction of end-users need (Tan, 1998)

The supply chain encompasses all activities associated with the flow and transformation of goods from raw materials stage (extraction), through to the end user, as well as the associated information flows. Materials and information flow both up and down the supply chain. Supply chain management (SCM) is the integration of these activities through improved supply chain relationships, to achieve a sustainable competitive advantage (celonis, 2007).

## 2.2. Supply chain management practices (SCMP)

(Jenkins, 2022) Stated that, SCM practices is defined as “the set of activities undertaken by an organization to promote effective supply chain management. SCM practices” as a multidimensional construct that includes both upstream and downstream sides of the supply chain (Christopher, 2016). The literature identifies various practices as dimensions of this construct.

Table 2.1 SCM practices

No	Author	Practices
1	Chin et al. 2011	Information sharing, customer relationship, strategic supplier Partnership, material flow management and corporate culture.
2	Inda S et al 2012	Strategic supplier partnership , customer relationship , information Sharing
3	Chowa S.Wing, et al, 2008	There are four elements (suppliers and customer management, information sharing, speed of communication, supply chain features)
4	Min s., Mintzer J. , 2004	There are seven elements of supply chain practice such as a greed vision and goals, information sharing, risk and award sharing, cooperation, process integration, long-term relationship and a greed supply chain Leadership.
5	(Paulraj., 2004)	Using supplier base reduction , long-term relationship , communication , cross-functional teams and supplier involvement to measure buyer

		supplier relationships
6	(Tan, 2002)	Six elements of supply chain practice (using factor analysis) supply chain integration, information sharing supply chain characteristics customer service management , geographical proximity and JIT Capability
7	( Alvarado, U. Y., & Kotzab, H. , 2001)	Using inter-organizational system in supply chain practice such as EDI , and elimination of excess stock levels by postponing customization toward the end of the supply chain
8	(Tan, K. C., Kannan, V. R., & Handfield, R. B , 1998)	Supply chain practice includes purchasing quality, and customer relations
9	(Donlon, 1996)	Supply chain practice includes supplier partnership , outsourcing cycle time compression, continuous process flow and information sharing

Construction Supply chain management comprised of the network of organization involved in the different processes and activities which produce the material, components and services that come together to design, procurement and deliver a building. It also consists of different organizations involved in the construction process including client/owner, designer, contractor, subcontractor and suppliers (Cox, *et al.*, 2007).

A supply chain is the network of organization that are involved through upstream and downstream linkages, in the different processes and activities that produce value in the form of products services in the hands of the ultimate consumer‘ (Christopher, 2005). Moreover, Christopher defines the objective of SCM in a relative manner as delivering superior value at less cost. In order to reflect the fact that there will normally be multiple suppliers and suppliers to those suppliers as well as multiple customers and customers to be included in the total system, Christopher argues that the word chain should be replace by network (Christopher, 2005). He also argues that since the chain should be drive by the market, not by the suppliers, the phrase SCM should be termed demand chain management. A supply chain is a network of organizations to perform a variety of processes

and activities to generate value in the form of products and services to end consumers (Christopher, 2005).

As Li *et al.* (2006) described, SCM is a concept which its goal is to integrate both information and material flows seamlessly across the supply chain as an effective competitive weapon. Li *et al.* (2006) also stated that SCM applies to show the collaborative relationships of members of different echelons of the supply chain and refers to common and agreed practices performed jointly by two or more organizations. The supply chain management has dual purpose, in one side is to improve the performance of an individual organization as well as that of the entire supply chain. In other side the supply chain management reduces organization total cost (Li *et al.*, 2006).

Shapiro (2005) showed that the SCM combining concepts from different disciplines such as strategic management and theory of the formation of the company; logistics, production and inventory management; accounting management; scientific forecasting and marketing, and operations research. Supply chain management (SCM) is one of business strategy increasingly being used in the business world today and has become the focus of academic attention in recent years (Ballou, Gilbert & Mukherjee, 2004).

Construction projects take place where sites are very crowded; this situation is recurrent for projects located in urban areas. In big cities like Addis Ababa where virtually no storage space exists, a good management of supply chains in order to get materials, people, information, machines, and equipment to the workforce in a Lean manner (Just-in-Time) is vitally important to project success (Mossman, 2007).

### 2.2.1. Strategic supplier partnership (SSP)

SSP is defined as “the long term relationship between the organization and its suppliers. It is designed to leverage the strategic and operational capabilities of individual participating organizations to help them achieve significant ongoing benefits” (Li, et al 2006) In the past two decades there has been a growing trend in long term collaborative relationships by organizations with a few trusted suppliers, instead of the traditional approach of a onetime cost based supplier relationship ( (D.Simichi- Levi, 2003). Some of the key advantages of long term relationships with suppliers identified in prior literature include: shared benefits and ongoing collaboration in key strategic areas like technology, products, and (Christopher, 2016), Strategic partnerships with suppliers enable organizations to work more effectively with a few important suppliers who are willing to share responsibility for the success of the products. Suppliers participating early in the

product-design process can offer more cost effective design choices, help select the best components and technologies, and help in design assessment (Tan, et al 2002). Strategically aligned organizations can work closely together and eliminate wasteful time and effort (MEKDES TILAHUN JUNE, 2017) an effective supplier partnership can be a critical component of a leading edge supply chain (Noble, 1997)

### 2.2.2. Customer relationship (CR)

CR is defined as “the entire array of practices that are employed for the purpose of managing customer complaints, building long-term relationships with customers, and improving customer satisfaction” (Li et al., 2006, ) Customer relationship is considered as an important component of SCM practices (Noble, 1997; Tan et al.,1998). As pointed out by (GS, 2000) devoted relationships are the most sustainable advantage because of their essential barriers to competition. Focusing and maintaining the customer relationship will enable the organizations to be more responsive towards customers“ needs and will result creating greater customer loyalty, repeat purchase and willing to pay premium prices for high quality product (Carr A. S. and Pearson J. N., 1999)). Besides, the main goals of SCM are customer satisfaction and their loyalty as (EBRAHIM, 2019). Customer relationship management is an important component of supply chain management practices (Noble, 1997). The growth of mass customization and personalized service is leading to an era in which relationship management with customers is becoming crucial for corporate survival Good relationships with supply chain members, including customers, are needed for successful implementation of SCM programs. Close customer relationship allows an organization to differentiate its product from competitors, sustain customer loyalty, and dramatically extend the value it provides to its customers (Li et al., 2006)

### 2.2.3. Information Sharing

Information sharing has two aspects: quantity and quality. Both aspects are important for the practices of SCM and have been treated as independent constructs in the past SCM studies. Level (Quantity aspect) of information sharing refers to the extent to which critical and proprietary information is communicated to one’s supply chain partner (Beesley A. 2010. Time compression in the supply chain. In Waters, Beesley A. 2010. Time compression in the supply chain. In Waters,D., GLOBAL LOGISTICS New directions in supply chain management (6thed). US: Kogan Page Limited. (pp. 69-91).) Shared information can vary from strategic to tactical in nature and from information about logistics activities to general market and customer information (A, 2010) Many

researchers have suggested that the key to the seamless supply chain is making available undistorted and up-to-date marketing data at every node within the supply chain (Christopher, 2016). By taking the data available and sharing it with other parties within the supply chain, information can be used as a source of competitive advantage (C., 1998). (BJ,1998)considers sharing of information as one of five building blocks that characterize a solid supply chain relationship. Supply chain partners who exchange information regularly are able to work as a single entity (Stein T, 1998). Moreover, (Tompkins J, 1999) consider the effective use of relevant and timely information by all functional elements within the supply chain as a key competitive and distinguishing factor. The empirical findings of (Marchi, 2017) reveal that simplified material flow, including streamlining and making highly visible all information flow throughout the chain, is the key to an integrated and effective supply chain. Information sharing also includes such aspects as the accuracy, timeliness, adequacy, and credibility of information exchanged (celonis, 2007). While information sharing is important, the significance of its impact on SCM depends on what information is shared, when and how it is shared, and with whom. Literature is replete with example of the dysfunctional effects of inaccurate/delayed information, as information moves along the supply chain (Tan, 1998). Divergent interests and opportunistic behavior of supply chain partners, and informational asymmetries across supply chain affect the quality of information (Sukati)). It has been suggested that organizations will deliberately distort information that can potentially reach not only their competitors, but also their own suppliers and customers (Mason-Jones, 2007). It appears that there is a built in reluctance within organizations to give away more than minimal information since information disclosure is perceived as a loss of power. Given these predispositions, ensuring the quality of the shared information becomes a critical aspect of effective SCM (Suarez, 2010)

### **2.3. Resource Dependent Theory (RDT)**

The theory centers on how some firms become reliant on others for needed inputs such as goods and materials, and how firms can manage such relationships (D.Simichi- Levi, 2003)). The asymmetric interdependence that exists in these inter-firm relationships is critical to reduce environmental uncertainty for some firms. As supply chain members work together closely, they often become more dependent on each other thus developing partnerships, alliances and cooperation. Thus, RDT has a high level of value in the supply chain context. The assumptions in this theory include; commitment to partnership for mutual benefits, creating conditions favorable

to be depended on by your partners to create a position of strength, trust in the partnership deal. Thus, from the perspective of best value supply chains, dependencies should be used to create mutual forbearance and trust, not to drive aggressive exploitation of one chain member by another.

## **2.4. Supply chain responsiveness (SCR)**

Responsiveness concept enters SCM literature based on the needs to respond the rapid environment change and 21st century competition. Responsiveness in the beginning was more related with company's internal process; that every company need to have the ability to response to the changes of customers' needs and demands, particularly in industries that are highly affected by customers' preference such as fashion, PC, electronics, construction and vehicle industries (Sukati). Responsiveness concept then developed not only on individual company level but also as supply chain responsiveness. A supply chain with high responsiveness level will be able to respond the demand and customers' preference change compared with unresponsive supply chain. In other word, supply chain responsiveness will, in return, influence performance (Suarez, 2010)). Responsiveness in general defined as ability to react purposefully and within an appropriate time-scale to customer demand or changes in the marketplace, to bring about or maintain competitive advantage (Tan, 1998) in supply chain context, responsiveness defined as the capability of Promptness and the degree to which the supply chain can address changes in customer demand (Christopher, 2016)). Responsiveness concept used in this research using (MEKDES TILAHUN JUNE, 2017) suggestion, which distinguish the supply chain responsiveness into three sub-constructs, namely: operation system responsiveness, logistic process responsiveness and suppliers' network responsiveness. (Christopher, 2016)Argue that being responsive is normally considered as an adaptive response to the environmental uncertainty. (Christopher, 2016)Advocate the need for organizations to be responsive when the penalties associated with uncertainty are higher. These penalties for an organization could include cost of stock outs or carrying the wrong inventory and which can be mitigated through a responsive system, by adopting effective SCM practices as indicated and proposed in this study.

### **2.4.1. Operations system responsiveness (OSR)**

OSR is defined as the ability of a firm's manufacturing system to address changes in customer demand (Tan, 1998). OSR includes both manufacturing and service operations. It would also include the ability to rapidly configure or reconfigure assets and operations of a manufacturing system to cope with consumer trends (Chopra, 2016) respond rapidly to changes in product

volume, and effectively expedite emergency customer orders. As a supply chain responds to customer demand, the constituent organizations may be required to move quickly from producing one product to another, or quickly change production levels for a given product. From a manufacturing standpoint, the responsiveness of an operations system would be an ability of the manufacturing or production function to respond rapidly to unexpected events, and an ability to swiftly accommodate special or non-routine customer requests. Operations responsiveness at each node in a supply chain is an integral component of SCR, since each entity in a supply chain is required to deliver the product or service in a timely and reliable manner, to satisfy customer demand (Marchi, 2017) The items under this category measure the responsiveness associated with a specific node or firm in a supply chain (Suarez, 2010) This firm could be a supplier, manufacturer, or customer, or distributor. (Anderson, D. and Lee, H., 2000) Identify operations responsiveness as a valuable component of a successful supply chain strategy. Flexibility and speed of response are essential ingredients of a firm's manufacturing (Chowa S.Wing, 2008)

#### 2.4.2. Logistics process responsiveness (LPR)

LPR is defined as the ability of a firm's outbound transportation, distribution, and warehousing system (including 3PL/4PL) to address changes in customer demand. Logistics and distribution Management includes the activities of transportation of goods from suppliers to manufacturer to distribution centers to final points of consumption (Christopher, 2016)). These activities include warehousing, packaging and shipping, transportation planning and management, inventory management, reverse logistics, and order tracking and delivery. This study focuses on the outbound logistics of the focal firm (Hoek, 2010) Suggest that a firm's logistics system is instrumental in creating value for its customers. This value creation implies ensuring logistics flexibility (celonis, 2007) and speed within the supply chain to serve each distinct customer's needs.

A typical response to uncertainty is to build flexibility into the supply (A, 2010)). Organizations can minimize risk and stay competitive. If flexibility can be supplemented by an increased velocity of sensing and responding. This responsiveness in the logistic processes is a vital component in the success of a responsive supply chain strategy (Fawcett, 1992). The responsiveness components in the logistics system include - selecting logistics components that: accommodate and respond to wide swings in demand over short periods, adjust warehouse capacity to address demand changes, handle a wide range of products, vary transportation carriers, have the ability to pack product-in

transit to suit discreet customers' requirements, and have the ability to customize products close to the customer. It is vital that a firm has easy access to and is able to utilize different modes of transportation to be logistically responsive (Chow S.Wing, 2008) States that companies need a capability and flexibility to adjust logistic systems quickly to respond to changes in market needs, and the necessitated product assortment. (Sukati) Put forth some of the critical logistics process flexibility aspects of a supply chain, which are vital for supply chain responsiveness. These criteria are adapted for the logistics process responsiveness dimension in this study, and are as follows: logistics system's ability to - rapidly respond to unexpected demand changes, rapidly adjust warehouse capacity to address demand changes, rapidly vary transportation carriers to address demand changes, accommodate special or non-routine customer requests, and effectively deliver expedited shipments.

#### 2.4.3. Supplier network responsiveness (SNR)

SNR is defined as the ability of a firm's major suppliers to address changes in the firm's demand. A key to responsiveness is the presence of responsive partners upstream and downstream of the focal (Beesley A. 2010. Time compression in the supply chain. In Waters, Beesley A. 2010. Time compression in the supply chain. In Waters, D., GLOBAL LOGISTICS New directions in supply chain management (6th ed). US: Kogan Page Limited. (pp. 69-91).) argue that suppliers' manufacturing systems' responsiveness can be treated as the supply chains responsiveness. The ability of a firm to react quickly to customer demand is much dependent on the reaction time of its suppliers to address the firm's demand. Thus, responsive firms should be able to select suppliers who can add new products and make desired changes, quickly. Supply chains should be capable and ready to address ripple effects caused by new technologies, terrorist threats (Walker, 2005) or increased competition. (Slack, 1991) Argue that supplier networks are the essential building blocks of a flexible system. Supplier network flexibility (Slack, 1991) and thus supplier network responsiveness is an important part of supply chain responsiveness. (Howler, M. and Pill, F. K., 2001) Argue that flexibility in the supplier network is an important ingredient of being responsive to changes in customer demand. It is well known that responsive suppliers are a vital resource of a firm when design (McGinnis M. A. and Vallarta R. M., 1999), (Burt, D. N. and Souk up, W. R. , 1985) and manufacturing of outsourced products are involved. (Fisher M.L., Raman A., and McClelland A.S. ", , 2000) found that for short lifecycle products, such as fashion apparel, retailers are most successful if they can work with suppliers who can provide initial shipments of

products based on forecasts, but then rapidly increase production to the right style, color, size, etc. based on actual sales. They note that fast supply chains can produce products as they sell rather than worrying about accurate forecasts.

## **2.5. The resource-based view**

The resource-based view (RBV) is useful for describing the role of strategic resources and capabilities within the firm and its network (Barney). “Tangible resources (e.g. Facilitators and technologies) and intangible capabilities (e.g. inter organizational relationships, infrastructures, and processes kill-sets) are both critical in enabling firms to implement a responsive product strategy a cross the supply chain” (Beesley A. 2010. Time compression in the supply chain. In Waters, Beesley A. 2010. Time compression in the supply chain. In Waters,D., GLOBAL LOGISTICS New directions in supply chain management (6thed). US: Kogan Page Limited. (pp. 69-91).)Since responsive supply chain often requires cross-organizational product development, coordination mechanisms among diverse supply chain partners are essential (A, 2010)Thus, a responsive supply chain necessitates higher levels of interactive communications with both upstream suppliers and downstream customers. These communications can be facilitated by the supply chain partners“ information technology infrastructure, internal organizational structure, and manufacturing capabilities (Chowa S.Wing, 2008)

## **2.6. Operational Performance**

It is no exaggeration to view operations management as being able to either „make or break“ any business. This is not just because the operations function is large and, in most businesses, represents the bulk of its assets and the majority of its people, but because the operations function gives the ability to compete by providing the ability to respond to customers and by developing the capabilities that will keep it ahead of its competitors in the future. (Nigel Slack, Stuart Chambers, and Robert Johnston, 2010) Broad stakeholder objectives form the backdrop to operations decision-making, and top management’s objectives provide a strategic framework, but running operations at an operational day-to-day level requires a more tightly defined set of objectives. These are the four basic „operational performance objectives“ and they apply to all types of operation. I.e. **Quality, cost, flexibility, Delivery Dependability, and speed** (Slack, et al 2010). On this study the researcher used the first four objectives of operational performance measurements (**Quality, cost, flexibility, and Delivery**). The idea of competitive priorities has its roots in the trade-off approach (Skinner, W. 1969, 1974), according to which a manufacturing

operation cannot perform in all dimensions and has to define priorities, therefore the term competitive and the concept of focused factory proposed by (skinner, W. 1974). The most basic competitive priorities were cost, quality, flexibility and delivery (Boyer K.K., & Lewis, M.W., 2002; Ward et al., 1998), but (Leong G.K., Snyder, D.L., & War P.T., 1990) introduced a fifth, innovativeness, less explored in empirical studies with few exceptions. The relationship between these competitive priorities is still subjected to debate within the operations management literature. Three approaches can be identified: the trade-off, cumulative, and integrative models (Boyer K.K., & Lewis, M.W., 2002). The trade-off perspective takes the position that often a better performance in one dimension comes at the expense of another dimension where the operation will inherently have a lower performance. Since resources are scarce, management would need to prioritize and choose where to focus time and energy. This would inevitably cause a lower performance in dimensions not so critically prioritized. The trade-off concept and the related focused factory solution to it were originally proposed by the seminal papers of Skinner (Skinner, W. 1969, 1974) and found some support in recent empirical papers (Boyer K.K., & Lewis, M.W., 2002). The cumulative perspective considers the competitive priorities complementary rather than mutually exclusive. With intense and global competition with the help of advanced manufacturing technologies companies need to excel in

## **2.7. Research hypotheses**

Strategic supplier partnerships including working closely with suppliers to design or redesign products and processes, solve problems, as well as prepare back-up plans is critical in attaining supply chain (That, et al 2013 & Liu, E. R. and Kumar, A. , 2003) observed that collaborative practices such as 3PL, VMI, and CPFR between supply chain partners led to increased supply chain responsiveness. In a special report of logistics and transport (2003), information sharing and strategic supplier partnership practices have been highlighted as the critical steps to being responsive. Close relationship with suppliers, has been empirically found to positively affect the volume flexibility, mix flexibility and new product flexibility dimensions of manufacturing flexibility (Suarez, F., Cushman, M. A., and Fine, C., 1995). Numerous studies emphasize the importance of integrating suppliers, manufacturers, and customers in order to achieve supply chain responsiveness (Chopra, 2016)

Customer relationship is essential for attaining supply chain wide (Chopra, 2016)Information sharing plays an important role in constructing a responsive supply chain network (Lau, H. C. W.

and Lee, W. B., 2000). A great amount of visibility is required through the supply chain in order to attain supply chain responsiveness (Christopher, 2016) This would, it is argued, enable all the players in the supply chain “to see from one end of the pipeline to another, in as close to real time as possible (D. Simichi-Levi, 2003). Information sharing practice in a supply chain increases responsiveness to customer’s needs enabling firms to respond rapidly to unexpected events

**Hypothesis1:** Strategic supply chain management practices have positive and significant effect on supply chain responsiveness.

Empirically, several research have found the relationship between SCM practices with operational performance (sometimes replace it with competitive advantage) such as (Kim, 2006); (Li, 2006); (Miguel, P. L. S., Ledur Brito, L. A. L., 2011); Thatte, et al 2007 & 2013). Others studies have indicated that the various components of SCM practices (such as strategic supplier partnership, customer relationship, and information sharing) have an impact on various aspects of operational performance which is source of competitive advantage (such as price/cost, quality, delivery dependability, product innovation, and time to market) Moslem et al. (2013).

**Hypothesis2:** supply chain management practices have positive and significant effect on operational performance.

Responsiveness concept enters SCM literature based on the needs to respond the rapid environment change and 21st century competition. Responsiveness in the beginning was more related with company’s internal process; that every company need to have the ability to response to the changes of customers’ needs and demands, particularly in industries that are highly affected by customers’ preference such as fashion, PC, electronics, construction and vehicle industries (Reichhart, A., and Holweg, M., 2007). Responsiveness concept then developed not only on individual company level but also as supply chain responsiveness. A supply chain with high responsiveness level will be able to respond the demand and customers’ preference change compared with unresponsive supply chain.

**Hypothesis3:** supply chain responsiveness that positively and significantly effect on operational performance.

## **2.8. Constructs and conceptual framework**

The conceptual framework is shown in Figure 1. The researcher construct that SCM practices have an impact on operational performance both directly and indirectly through supply chain responsiveness.

## Conceptual framework

### Supply chain management practices [SCMP]

Strategic supplier's partnership [SSP]

Customer relation [CR]

Information sharing [IS]

### Supply chain responsiveness [SCR]

Logistic process responsiveness [LPR]

Operational system responsiveness [OSR]

Suppliers network responsiveness [SNR] (Tan, 1998) (Sukati) (Suarez, 2010)

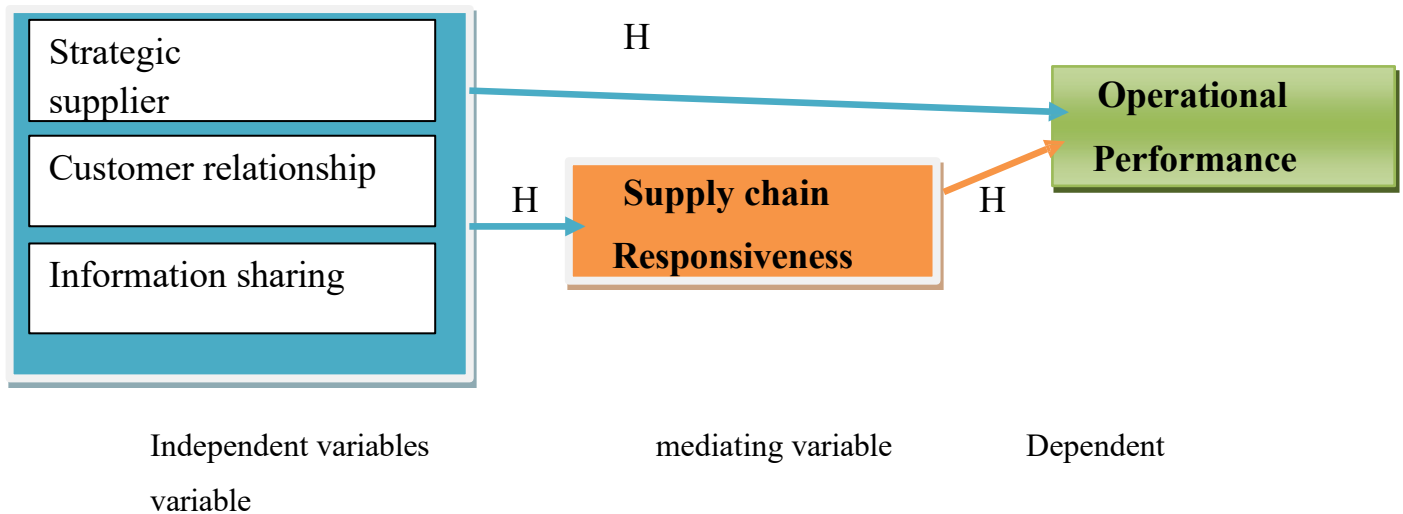
### Operational performance [OP]

Cost

Quality

Delivery

Figure 1 Conceptual framework of the study



Source: (Thatte, et al 2013 & Miguel, P. L. S., Ledur Brito, L. A. L., 2011)

## **Chapter Three**

### **Research Methodology**

#### **Introduction**

Research methodology is described for the instrument development and data collection in this section, the choice of particular research designs, data type and source of data, research approach, sampling and sampling techniques and data analysis techniques along with an appropriate justification associated with each method

#### **3.1 Study area**

the study will be conducted in debre markos located in east gojam zone of amhara national regional state of Ethiopia it is one of the 18 districts found in the zone at geographical location of  $10^{\circ} 1' 46''$  and  $10^{\circ} 35' 12''$ N and longitudes  $37^{\circ} 23' 45''$ E. agriculture is the mainstay of farmer in the district which is characterized by mixed crop livestock production system.

#### **3.2 research design**

The study adopted Explanatory research design since the major focus of the research is the Effects of supply chain management strategy on supply chain responsiveness organizational Performance. Explanatory research designs are those types which are applied in order to measure and understand the casual relationships among two or more different groups. This studies are concerned to look for patterns, hypotheses or ideas that can be tested. The independent variable refers to the antecedent phenomenon, while the dependent variable relates to the consequent phenomenon. The research used quantitative method in order to gather the most appropriate data to answer the research question. Therefore, in order to accurately describe the effect & relationships between the independent variables and the dependent variable, Explanatory research studies were employed.

This paper utilizes a mixed-methods approach, combining qualitative and quantitative research methods. A thorough literature review was conducted to gather existing knowledge and theories on supply chain management practices. Additionally, case studies of companies that have successfully implemented efficiency-enhancing strategies were analyzed to draw practical insights.

### **3.3 Target Population**

The total population is 65 employer's so selected all population for observation and analysis. Sampling can also be defined as the process of selecting all individuals working for the study in research investigation. In the Census Survey it was considered all staff members those are directly participates in the Supply chain management.

### **3.4. Data Types and Source**

The main sources of data were primary and secondary data type used. The primary data are those that are gathered for the first time and therefore original in character. On the other hand, the secondary data are those already founded by someone else and passed through the statistical process. Both primary and secondary data were used for this study. The types of data that used for the study includes primary data that was obtained through questionnaire. The study also used secondary data that obtained from unpublished firm report, publication (books, magazines, pamphlet, bulletins, journals), and firm's database which are retrospective in nature collected to compare with result obtained from primary data analysis.

### **3.5. Data Gathering Instruments**

The primary data was gathered particularly using survey questionnaire the researcher was distributing the questionnaire to respondents For the purpose of this study a quantitative methodology involving a close-ended questionnaire were used as the measuring instrument and The Liker-type scale method a range of responses: strongly disagree, disagree, Neutral, Agree and Strongly Agree applied to collect data from the respondents with a numeric value of 1-5 respectively.

### **3.6. Procedure of data gathering**

There are various mechanisms useful to collect data. The main ones are questionnaires, interviews and observations (Greener & Martelli, 2015). In this research both primary and secondary sources of data was utilized through Questionnaires and literature review. The primary data was gathered particularly using survey questionnaire. For the purpose of this study a quantitative methodology involving a close-ended questionnaire were used as the measuring instrument. The close-ended questionnaires can be administered to groups of people simultaneously. The standard questionnaire used to collect the necessary information regarding the study was adopts from the work (Thatte, et al 2013) to measure supply chain management practice and supply chain responsiveness and

(Miguel, Ledur Brito, 2011) measurement for operational performance. The Liker-type scale method a range of responses: strongly disagree, disagree, neutral, agree and strongly agree applied to collect data from the sample respondents with a numeric value of 1-5, respectively.

The primary data collected from employees who work in debre markos head offices. The questioner was distributed in person and collected after giving them adequate time filling it. The questioner is written in both Amharic and English.

### **3.7. Data Analysis Method**

Before processing the responses, the completed questionnaires were edited for completeness and consistency. The data were analyzed by the help of statistics name, descriptive statistics. Objective one which is assessing the supply chain practices and performance measure adopted by gozamen cooperative union were analyzed using descriptive statistics such as mean and standard deviation and regression analysis. For objective which is factor affect SCM practices using frequency and relative index. Specifically a dimension level analysis was also performed using regression analysis which was instrumental in indicating whether the independent variables of SCM practices significantly predict the dependent variable supply chain responsiveness as well as operational performance of the firm.

Regression model:  $Y = a + b_1x_1 + b_2x_2 + b_3x_3$  where  $Y$  = Supply chain responsiveness or competitive advantage of the firm  $a$  = the  $y$  intercept when  $x$  is zero;  $b_1$ ,  $b_2$ ,  $b_3$  are regression coefficients of the following variables respectively;  $x_1$ - strategic supplier management;  $x_2$ - customer relationship management;  $x_3$ - information sharing.

The results are analyzed from 58 questionnaires using MS Excel 2007 and SPSS version 20 software and the analysis and results are presented in form of tables as shown in Chapter 4. The results are prepared to present the information about the sample size, response rate. The Primary data that have been collected and analyzed using quantitative analysis which mainly involve six major activities namely, data preparation, counting, grouping, relating, predicting and statistical testing. The Descriptive statistics that have been used for the study are mean & standard deviation. And the inferential statistics have been used is correlation. The data analysis tool used for the study is primarily SPSS packages.

### 3.8 Validity and Reliability

#### 3.8.1. Reliability

Reliability analysis is concerned with the internal consistency of the research instrument (Bryman, A., and Bell, E., 2007). As multiple items in all constructs were used, the internal consistency/reliabilities of SCM practices, operational performance, and organizational performance were assessed with Cronbach's Alpha and the reliability values for all constructs are confirmed as greater than 0.928

##### 3.8.1.1 Cronbach's Alpha Reliability test

According to (Bonett and Wright, 2015) Cronbach's alpha is one of the most widely used measures of reliability in the social and organizational sciences. Current practice is to report the sample value of Cronbach's alpha reliability, but a confidence interval for the population reliability value also should be reported. Reliability analysis is concerned with the internal consistency of the research instrument.

*Table 2.1 Rule of Thumb of Cronbach's Alpha*

Cronbach's Alpha	Description
$\geq .9$	Excellent
$\geq .8$ but $< .9$	Good
$\geq .7$ but $< 0.8$	Acceptable
$\geq .6$ but $< 0.7$	Questionable
$\geq .5$ but $< .6$	Poor
$< .6 = .5$	Unacceptable

In this research multiple items in all constructs were used, the internal consistency/reliabilities of SCM practices, supply chain responsiveness (SCR), and competitive advantage (CA) were assessed with Cronbach's Alpha and the reliability values for all constructs are confirmed as greater than 0.7, which are considered acceptable. The following tables shows the summary of reliabilities of all constructs of supply chain management and the average Cronbach's alpha in the table below shows that 0.928 which is greater than 0.7, which confirms acceptability of the research instrument.

A reliability analysis was carried out on the perceived task values scale comprising 5 items.

Cronbach’s alpha showed the questionnaire to reach acceptable reliability,  $\alpha = 0.928$ .

*Table 3.3 reliability statistics for each item*

Variables	Number of Items	Corrected Item-Total Correlation
Strategic supplier partnerships (SSP)	4	.709
Customer relationships (CR)	3	.365
Information sharing (IS)	3	.823
Operational system responsiveness (OCR)	3	.768
Logistics process responsiveness (LPR)	3	.714
Supplier network responsiveness (SNR)	3	.748
Cost (C)	3	.705
Quality (Q)	3	.754
Delivery (D)	3	.956

Source: Own survey result (SPSS Output, 2025)

### 3.8.2. Validity

Validity refers to the degree to which an instrument measures what it is supposed to be measuring. Validity has a number of different aspects and assessment approaches. There are two ways to evaluate instrument validity: content validity and statistical validity, which include criterion-related validity and construct validity. This study was addressed content validity, through reviewing of literature and adapting instruments that is used in previous research (Thatte, et al 2013 and Miguel, P. L. S., Ledur Brito, L. A. L., 2011) and convergent.

### 3.9. Ethical considerations

All the research participants included in the study were duly informed about the purpose of the study and their willingness and the agreement was secured before the beginning of filling the questionnaire and conducting interview. Regarding the right to privacy of the respondents, the study maintained the confidentiality of the identity of each participant. In all cases, names are kept confidential and collective names such as ‘the respondents,’ the participants; the interviewees etc were used in the study.

## Chapter Four

### Data presentation, analysis and interpretation

#### 4.1. Introduction

The chapter deals with presentation and discussion of the statistical result of both the descriptive and inferential statistics.

#### 4.2. Response rate on Questionnaire

For this study a questionnaire with 33 close-ended items were used to collect information from employees of gozamen cooperative union regarding the assessment of supply chain management practices and effects on supply chain responsiveness and organizational operation performance is used. A total of 65 questionnaires were distributed to employees gozamen cooperative union and from total dispatched questionnaires, 58 (89.2%) were filled up and returned.

#### 4.3 Demographic Characteristics of Respondents

A total of 65 questionnaires were distributed to employees and 58 (89.2%) questionnaire were obtained. The remaining 7(10.8%) questionnaires were not collected due to unwillingness to provide information and some respondents were in absence of leave.

*Table 4.1 Frequency and % age of Respondents' Demographic Characteristics*

	Category	Frequency	%
Gender	Male	49	87.5
	female	7	12.5
Education	Certificate	11	19.6
	College diploma	14	25.0
	first Degree	31	55.4
	Total		
Year of working experience	1 up to 3	10	17.9
	4 up to 6	30	53.6
	7up to 11	8	14.3
	above to 11	8	14.3

Source: Own survey result (SPSS Output, 2025)

#### 4.4. Descriptive Statistics of Variables

To examine the supply chain management practices of gozamen cooperative union mean and standard deviation statistical analysis were performed using variable such as strategic supplier relationship customer relationship, and information sharing. Each variable. The mean and group mean statistical values of approaching to 2.00 and indicates poor performance, 3.00 indicates average/moderate, while 4.00, and 5.00, indicate higher and very high/excellent performance respectively.

##### 4.4.1 Analysis of Supply Chain Management Practices

This research used descriptive statistical analysis based on the three components of the conceptual framework developed for this study to assess the supply chain management practice of gozamen cooperative union under this investigation. The most common supply chain management practices are strategic supplier relationship, customer relationship, and information sharing. (Frederico, Guilherme Francisco, 2015) states that SCM's practices involve a set of activities undertaken by organization to promote effective management of their supply chain. And SCM lead to changes in the structure of the organization by integrating internal functions and linking these with the external operation of suppliers, customers and others stakeholders of the supply chain.

##### 4.4.1.1 Perception Level of Employees on SCM Practices and operational performance

In this section of the analysis, the employees 'responses were used to assess their perception level on supply chain management practices and operational performance. From the collected data, mean scores and standard deviations were calculated for all Five-Point Likert Scale items. Then to assess the employees 'perception level of on each supply chain management practices and operational performance in descriptive statistics, mean and standard deviation were considered.

*Table 4.2 Mean Score Range for Five-Scale Likert's Response*

Mean	Response
From 1.00 to less than 2.00	Strongly Disagree
From 2.00 to less than 3.00	Disagree
From 3.00to less than 3.10	Neutral
From 3.10 to less than 4.00	Agree
From 4.00 to less than 5.00	Strongly Agree

#### 4.4.1.2 Supply chain management practices (SCMP) on Strategic supplier partnership (SSP)

Different SCM practices serve different purposes, for example, close partnership with the supplier is a practice that focuses on investing for the sake of integration with the supplier (Aslam, et al., 2021). Closer coordination of activities within and among firms throughout the supply chain creates flexible operating systems characterized by coordinated source, make, and deliver operations that drastically cut raw material to consumer cycle times, enabling the firm to respond to actual market needs rather than anticipate demand with inventory. From the supply perspective, supplier development, supplier partnerships, supplier involvement, and strategic sourcing all positively influence the buying firm's operational performance.

*Table 4.3 Strategic supplier partnership (SSP)*

		measn	Std. Deviation	<b>Over all Response</b>
consider quality as our number one criterion in selecting suppliers	58	2.76	1.406	Strongly Disagree
helped our suppliers to improve their product quality	58	2.03	.973	Strongly Disagree
include our key suppliers in our planning and goal- setting activities	58	3.00	1.325	Neutral
actively involve our key suppliers in new product development processes	58	2.22	1.298	Strongly Disagree

Source: Own survey result (SPSS Output, 2025)

Table 4.3 above indicates the level of relationship that exists between suppliers and the case of gozamen cooperative union. Accordingly, the group means of supplier's relationship was 2.52 and it indicated poor performance average with respect to the overall measures taken into consideration. Especially the descriptive statistics of include our key suppliers in our planning and goal- setting activities supplier performance measurement system are 3.00. These mean values imply that practice average/moderate on supplier performance measurement Strategic supplier

partnership (SSP) the result the firm has a weak information sharing with the supplier in forecasting the product need for.

#### 4.4.1.3 Supply chain management practices (SCMP) on Customer relationship (CR)

According to (Jones, 2005) all the practice for managing customer relationships could be source of competitive advantage. For example, managing customer complaints, building long-term relationships, and improving customer satisfaction are effective methods of managing customer relationship.

*Table 4.4 Customer relationship*

		mean	Std. Deviation	Over all Response
We frequently measure and evaluate customer satisfaction	58	2.56	1.254	Strongly Disagree
We frequently determine future customer expectations	58	3.00	1.134	Neutral
We facilitate customers' ability to seek assistance from us	58	2.91	1.199	Strongly Disagree

Source: Own survey result (SPSS Output, 2025)

In general, as indicated in tables 4.4 average mean value of 2.83 showed that the company's performance with regard to customer's relationship was approach to indicated poor performance average. Especially the descriptive statistics of include our key suppliers frequently determine future customer expectations in our planning and goal- setting activities supplier performance measurement system are 3.00. These mean values imply that practice average/moderate on supplier performance measurement performances in the customer's relationship from the result the firm has a weak information sharing with the supplier in forecasting the product need for.

#### 4.4.1.4 Supply chain management practices (SCMP) on Information sharing (IS)

Information sharing is an important aspect in achieving perfect integration in a supply chain. Cross functional integration and inter organizational integration requires the visibility of information across the supply chain. Poor information sharing between partners in a supply chain will result in poor coordination that will lead to many serious problems such as high inventory levels, inaccurate forecasts, low resource utilization, and high production costs. Indeed, information sharing is highly

considered as the way to reduce demand uncertainty (Impact et al., 2011). (Frederico, Guilherme Francisco, 2015) stated the maturity of SCM measured in Excellence in costs, total focus on client and high level of satisfaction, process totally integrated and structured, extensive use of information systems, sharing information with stakeholders, excellence on project management, extensive performance measurement, supply chain seen as a competitive factor among the competitors, responsive action before the demand variations caused by customers, extensive regulation and fomentation for credit lines.

*Table 4.5 Information sharing (IS)*

		mean	Std. Deviation	Over all Response
Our trading partners share proprietary information with us	57	2.86	1.274	Strongly Disagree
Our trading partners keep us fully informed about issues that affect our business	57	2.91	1.199	Strongly Disagree
Our trading partners share business knowledge of core business processes	57	3.07	1.334	agree

Source: Own survey result (SPSS Output, 2025)

According to information sharing the group mean scoring the value of 2.94 showed that the company's performance with regard to Information sharing (IS) was approach to indicated poor performance average. Especially the descriptive statistics of include trading partners share business knowledge of core business processes performance measurement system are 3.07. Moderate information sharing from the result the firm has a weak information sharing with the supplier in forecasting the product need for.

#### 4.4.2 Analysis of Supply chain responsiveness (SCR)

*Table4. 6 Supply chain responsiveness (SCR)*

		mean	Std. Deviation	Over all Response
--	--	------	----------------	-------------------

Our operations system effectively expedites emergency customer orders	58	3.46	1.415	Agree
Our operations system rapidly reconfigures equipment to address demand changes	58	2.42	1.309	Strongly Disagree
Our logistics system responds rapidly to unexpected demand change	58	3.47	1.269	agree
Our logistics system responds rapidly to unexpected demand change	58	3.50	1.265	Strongly agree
Our logistics system rapidly adjusts warehouse capacity to address demand changes	58	2.39	1.123	Strongly Disagree
Our logistics system rapidly varies transportation carriers to address demand changes	58	2.18	1.177	Strongly Disagree
Our major suppliers consistently accommodate our requests	58	2.61	1.107	Strongly Disagree
Our major suppliers provide quick inbound logistics to us	58	2.48	1.175	Strongly Disagree
Our major suppliers effectively expedite our emergency orders	58	3.50	1.221	

Source: Own survey result (SPSS Output, 2025)

According to supply chain responsiveness the group mean scoring the value of 2.77 showed it implies that majority of respondents dis agreed to the fact that the company supply chain responsiveness performance is poor performance average. From this results, the researcher has concluded that the supply chain management responsiveness of gozamen cooperative union

Operations system responsiveness (OSR, Logistics process responsiveness (LPR), Supplier network responsiveness (SNR) , indicated poor performance average. Especially the descriptive statistics of include major suppliers effectively expedite our emergency orders, logistics system responds rapidly to unexpected demand change, operations system effectively expedites emergency customer orders 3.07. Moderate performance average in the supply chain responsiveness.

#### 4.4.3 Analysis of operational performance

*Table 4.7 operational performance*

		mean	Std. Deviation	Over all Response
Our production cost is decreasing over time	57	3.52	1.221	Strongly agree
Our inventory turnover is high.	57	2.09	1.240	Strongly Disagree
Our productivity rapidly increasing over time	57	2.79	1.358	Strongly Disagree
We have lower number of defects per unit of product	57	.25	.437	Disagree
We offer high quality products to our customers	57	2.45	1.143	Strongly Disagree
We have lower number of customer's complaints	57	2.50	.920	Strongly Disagree
We deliver customer order on time	57	2.84	.804	Strongly Disagree
We deliver the kind of products needed	57	2.76	.941	Strongly Disagree
Time to solve customer complaints is short	57	2.67	.795	Strongly Disagree

Source: Own survey result (SPSS Output, 2025)

According to operational performance the group mean scoring the value of 2.43 showed it implies that majority of respondents dis agreed to the fact that the company supply chain responsiveness performance is poor performance average. From this results, the researcher has concluded that the operational performance of gozamen cooperative union indicated poor performance averages.

#### **4.5 Correlation analysis**

Correlations are the measure of the linear relationship between two variables. A correlation coefficient has a value ranging from -1 to 1. Values that are closer to the absolute value of 1 indicate that there is a strong positive relationship, closer to -1 strong negative correlation between the variables being correlated whereas values closer to 0 indicates that there is little or no linear relationship. As described by Andy (2006), the correlation is a commonly used measure of the size of an effect: values of  $\pm 0.1$  represent a small effect,  $\pm 0.3$  is a medium effect and  $\pm 0.5$  is a large effect. The relationship between supply chain management practices and firm performance, in terms of supply chain responsiveness and competitive advantage of the firm (operational performance) and also relationship between supply chain responsiveness and competitive advantage of the firm (operational performance) was investigated using correlation analysis. This provided correlation Coefficients which indicated the strength and direction of relationship. The p-value also indicated the probability of this relationship's significance.

##### **4.3.1. Correlation between supply chain management practice and supply chain responsiveness**

Abbreviation key: - supply chain responsiveness, according Strategic supplier partnership (SSP), customer relation (CR), information sharing (IS) The Pearson correlation test depicted in table 4.8 represents the correlation between the supply chain management and the Operational Performance.

Therefore, as observed from the result of the SPSS analysis 58 entry, there is a positive significant relationship between strategic supply chain management supplier partnership (SSP) and supply chain responsiveness are a positive significant relationship with the correlation coefficient 0.676 ( $r=0.676$ ) and the customer relationship (CR) and supply chain responsiveness are a positive significant relationship with the correlation coefficient of 0.367 ( $r=0.367$ ) the significance value of p of both correlation is less than 0.001 and also, the supply chain responsiveness (SCR) practice

level increases according to information sharing (IS) level increases. This means there is a positive significant relationship between information sharing (IS) and the supply chain responsiveness (SCR) with the coefficient of relation 0.767 ( $r=0.767$ ) and the significance value of  $p$  less than 0.001.

*Table 4.8 Correlation between supply chain management practice and supply chain responsiveness*

		SCR	SSP	CR	IS
SCR	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	57			
SSP	Pearson Correlation	.679**	1		
	Sig. (2-tailed)	.000			
	N	57	57		
CR	Pearson Correlation	.367**	.252	1	
	Sig. (2-tailed)	.005	.059		
	N	57	57	57	
IS	Pearson Correlation	.767**	.650**	.341**	1
	Sig. (2-tailed)	.000	.000	.009	
	N	57	57	57	57

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

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

#### 4.3.2 Correlation between supply chain management practice and operation performance

Abbreviation key: - Operational Performance (OP), according Strategic supplier partnership (SSP), customer relation (CR), information sharing (IS)

The Pearson correlation test depicted in table 4.9 represents the correlation between the supply chain management and operation performance Therefore, as observed from the result of the SPSS version 24 analysis 58 entry, there is a positive significant relationship between strategic supply chain management supplier partnership (SSP) and Operational Performance (OP) are a positive

significant relationship with the correlation coefficient 0.721 ( $r=0.721$ ) and the customer relationship (CR) and Operational Performance (OP) are a positive significant relationship with the correlation coefficient of 0.351 ( $r=0.351$ ) the significance value of  $p$  of both correlation is less than 0.008 and also, Operational Performance (OP) level increases according to information sharing (IS) level increases. This means there is a positive significant relationship between information sharing (IS) and Operational Performance (OP) with the coefficient of relation 0.843 ( $r=0.843$ ) and the significance value of  $p$  less than 0.001.

*Table 4.9 Correlation between supply chain management practice and operation performance*

		OP	SSP	CR	IS
OP	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	56			
SSP	Pearson Correlation	.721**	1		
	Sig. (2-tailed)	.000			
	N	56	58		
	Pearson Correlation	.351**	.258	1	
	Sig. (2-tailed)	.008	.050		
	N	56	58	58	
IS CR	Pearson Correlation	.843**	.650**	.341**	1
	Sig. (2-tailed)	.000	.000	.009	
	N	56	57	57	57

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

#### 4.3.3 Correlation between supply chain responsiveness and operation performance

Abbreviation key: - Operational Performance (OP), according Operations system responsiveness (OSR), Logistics process responsiveness (LPR), Supplier network responsiveness (SNR)

The Pearson correlation test depicted in table 4.10 represents the correlation between the Operational Performance (OP) and supply chain responsiveness (SSR), Therefore, as observed from the result of the SPSS version 24 analysis 58 entry, there is a positive significant relationship

*Table 4.10 Correlation between supply chain responsiveness and operation performance*

		OP	OCR	LPR	SNR
OP	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	56			
OCR	Pearson Correlation	.755**	1		
	Sig. (2-tailed)	.000			
	N	56	58		
LPR	Pearson Correlation	.757**	.515**	1	
	Sig. (2-tailed)	.000	.000		
	N	56	58	58	
SNR	Pearson Correlation	.818**	.639**	.585**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	56	58	58	58

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

between Operational Performance (OP) and Operations system responsiveness (OSR) are a positive significant relationship with the correlation coefficient 0.755 ( $r=0.755$ ) and Logistics process responsiveness (LPR) and Operational Performance (OP) are a positive significant relationship with the correlation coefficient of 0.757 ( $r=0.757$ ) the significance value of p of both correlation is less than 0.000 and also, Operational Performance (OP) level increases according to Supplier network responsiveness (SNR) level increases. This means there is a positive significant relationship between Supplier network responsiveness (SNR) ) and Operational Performance (OP) with the coefficient of relation 0.818 ( $r=0.818$ ) and the significance value of p less than 0.001.

## 4.6 Regression Analysis

Regression analysis is conducted to know by how much the independent variable explains the dependent variable. The regression was conducted between supply chain management practices (independent variable) and supply chain response (SCR) (dependent variable) in the first regression. The second regression was made between supply chain management practices (independent variable) and competitive advantage (dependent variable). The third regression was made between supply chain response (SCR) (independent variable) and competitive advantage (dependent variable). The results of the regression analysis is presented as follows. In this linear regression model, the p-value (“sig” for significance”) of the predictor’s effect on the criterion variable, if less than .05 is generally considered “statistically significant.”

The model specification is as follows:

### 4.6.1. Assumptions of Multi Collinearity Test

There is a very simple test to assess multicollinearity in your regression model. The variance inflation factor (VIF) identifies correlation between independent variables and the strength of that correlation. Statistical software calculates a VIF for each independent variable. Multicollinearity can affect any regression model with more than one predictor. It occurs when two or more predictor variables overlap so much in what they measure that their effects are indistinguishable. One popular detection method is based on the bivariate correlation between two predictor variables. Multicollinearity is the occurrence of high inter correlations among two or more independent variables in a multiple regression model.

There is a very simple test to assess multicollinearity in your regression model. The variance inflation factor (VIF) identifies correlation between independent variables and the strength of that correlation. Statistical software calculates a VIF for each independent variable. Multicollinearity can affect any regression model with more than one predictor. It occurs when two or more predictor variables overlap so much in what they measure that their effects are indistinguishable. One popular detection method is based on the bivariate correlation between two predictor variables. Multicollinearity is the occurrence of high inter correlations among two or more independent variables in a multiple regression model. Multicollinearity refers to a situation in which more than two explanatory variables in a multiple regression model are highly linearly related.

We have perfect multicollinearity if, for example as in the equation above, the correlation between two independent variables is equal to 1 or  $-1$ . Therefore, in the table below the variable inflation rate is 1.419, 2.910, and 3.289 and this states that the variables are not collinear and they will not be a problem on the multiple regression analysis since these values are less than 10 such that  $VIF < 10$ . And the tolerance of each independent variables are 0.588, 0.881, and 0.554 and these are greater than 0.1.

Table 4.11 Multi Collinearity test of independent variable

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.541	.175		3.085	.003		
	SSP	.164	.047	.302	3.481	.001	.588	1.701
	CR	.045	.052	.060	.849	.400	.881	1.135
	IS	.417	.059	.629	7.024	.000	.554	1.806

a. Dependent Variable: OP

Dependent Variable: Organizational Performances

The result in table 4.15 show that the collinearity between independent variables has no series problem Since the value of tolerance for all independent variable is greater than 0.1 and all VIF is less than ten ( $VIF < 10$ )

4.6.2. Assumptions of Normality test

The two well-known tests of normality, namely, the Kolmogorov–Smirnov test and the Shapiro–Wilk test are most widely used methods to test the normality of the data. Normality tests can be conducted in the statistical software ‘SPSS’ (analyze → descriptive statistics → explore → plots → normality plots with tests).

Table 4.12 The normality test of regression of the SCR, OP, SSP, CR, IS

**Tests of Normality**

	Kolmogorov-Smirnov <sup>a</sup>	Shapiro-Wilk
--	---------------------------------	--------------

	Statistic	df	Sig.	Statistic	df	Sig.
SCR	.159	56	.001	.944	56	.012
OP	.123	56	.035	.961	56	.070
SSP	.212	56	.000	.919	56	.001
CR	.091	56	.200*	.964	56	.093
IS	.092	56	.200*	.972	56	.221

\*. This is a lower bound of the true significance.

#### a. Lilliefors Significance Correction

The above table presents the results from two well-known tests of normality, namely the Kolmogorov-Smirnov Test and the Shapiro-Wilk Test. The Shapiro-Wilk Test is more appropriate for small sample sizes (< 50 samples), but can also handle sample sizes as large as 2000. For this reason, we will use the Shapiro-Wilk test as our numerical means of assessing normality. If the Sig. value of the Shapiro-Wilk Test is greater than 0.05, the data is normal. If it is below 0.05, the data significantly deviate from a normal distribution.

Therefore, in the normality test table depicted above the sig value for SCR, OP, CR, IS 0.012, 0.07, 0.93 and 0.221, respectively that are greater than the p value of 0.05. And the data is normal for each case.

#### 4.6.3. Assumptions of Residual test

We have now looked at how to assess the first assumption of multiple regression. To understand several of the other assumptions, you first need to understand what is meant by the term 'residuals. To explain this look at the black line drawn on the graph and the point that are plotted on the black line on the following three graphs. This represents a linear model of our data. Residuals help to determine if a curve (shape) is appropriate for the data. A residual is the difference between what is plotted in your scatter plot at a specific point, and what the regression equation predicts "should be plotted" at this specific point.

*Figure 2 the normal Q-Q plot of standardize residuals for SCR*

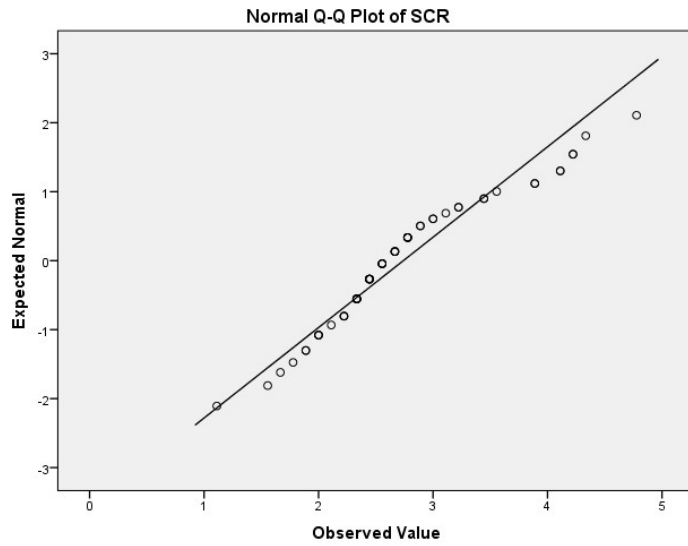


Figure 3 the normal Q-Q plot of standardize residuals for OP

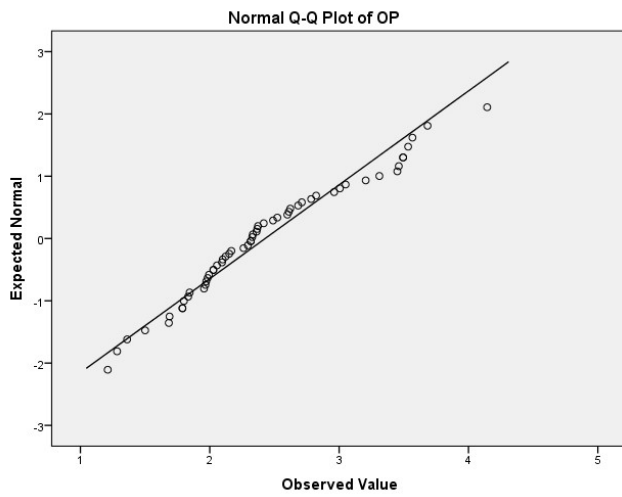
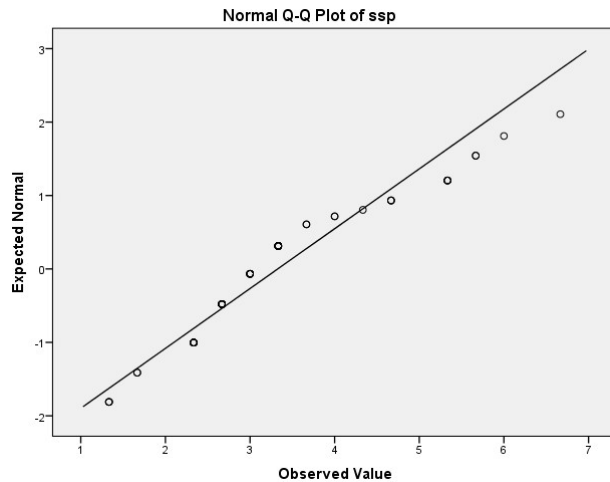


Figure 4 the normal Q-Q plot of standardize residuals for SSP



It is a scatter plot of residuals on the y axis and fitted values on the x axis to detect non-linearity, unequal error variances, and outliers. Characteristics of a well-behaved residual vs fitted plot: The residuals spread randomly around the 0-line indicating that the relationship is linear.

A residual plot shows the difference between the observed response and the fitted response values. The ideal residual plot, called the null residual plot, shows a random scatter of points forming an approximately constant width band around the identity line. The residual plot shows a fairly random pattern - the first residual is positive, the next two are negative, the fourth is positive, and the last residual is negative. This random pattern indicates that a linear model provides a decent fit to the data. Below, the residual plots show three typical patterns. The first plot shows a random pattern, indicating a good fit for a linear model. The residual test of the independent and dependent variables shows that there is a linear relationship between the independent and dependent variables.

#### 4.6.4. Assumption of Homoscedasticity test

The next assumption to check is homoscedasticity. The scatterplot of the residuals will appear right below the normal scatter plot in your output. Ideally, you will get a plot that looks something like the plot below. The data looks like you shot it out of a shotgun it does not have an obvious pattern, there are points equally distributed above and below zero on the horizontal axis, and to the left and right of zero on the vertical axis

*Figure 5 Homoscedasticity test for the independent variable SCR*

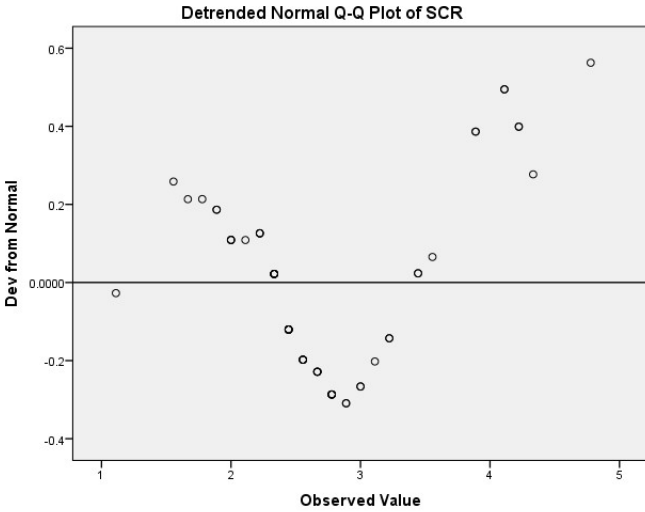
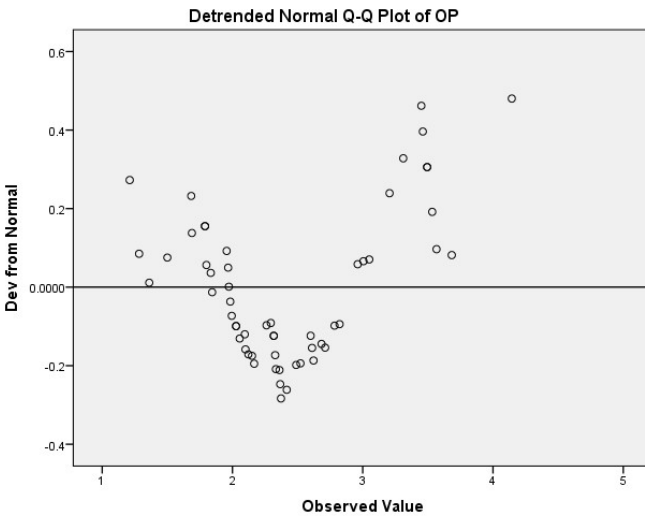


Figure 6 Homoscedasticity test for the independent variable OP



To test the homoscedasticity, you need to look at the final graph of the output. This tests the assumption of homoscedasticity, which is the assumption that the variation in the residuals (or amount of error in the model) is similar at each point of the model. This graph plots the standardized values our model would predict, against the standardized residuals obtained. As the predicted values increase (along the X-axis), the variation in the residuals should be roughly similar. If everything is ok, this should look like a random array of dots. If the graph looks like a funnel shape, then it is likely that this assumption has been violated. But in the above graph depicted in figure 4 and 5 the scatter plot shows that the distribution is uniform below 0 and above

zero for vertical and horizontal axis or x and y axis therefore the assumption of homoscedasticity met.

#### 4.6.5. Regression Analysis between SCM Practices and Supply chain responsiveness

Based on the output of the SPSS regression to interpret the result on the relationship between the supply chain management (SCM) practice and the supply chain responsiveness (SCR), let's observe the beta value.

*Table 4.13 Regression Analysis between SCM Practices and Supply chain responsiveness*

#### Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics		
	B	Std. Error	Beta			Tolerance	VIF	
1	(Constant)	.676	.243		2.779	.008		
	SSP	.188	.065	.306	2.878	.006	.576	1.736
	CR	.093	.073	.109	1.271	.209	.882	1.134
	IS	.398	.082	.531	4.859	.000	.544	1.840

a. Dependent Variable: SCR

The beta values above show the magnitude of relationship between variables, higher values being an indication of strong relationship. In this study, strategic supplier partnership had highest Beta coefficient of 0.531. This result implies that Information sharing (IS) had highest impact on supply chain responsiveness. Whereas, strategic supplier partnership(ssp), is found to be the second most significant SCM dimension with Beta value of 0.306 implying that this dimension is significantly related and strongly influences the supply chain responsiveness (SCR). Then the influence followed by customer relationship, on the supply chain responsiveness (SCR) is 0.109, it has positive influence but relationship by the significance is not much.

*Table 4.14 Regression Analysis between SCM Practices and supply chain responsiveness*

#### Model Summary

	R				Change Statistics	

Model	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.810 <sup>a</sup>	.655	.457	.655	33.598	3	53	.000	1.503

a. Predictors: (Constant), IS, CR, SSP  
b. Dependent Variable: SCR

As shown in the table 4.14 above, there was causal relationship between SCM practices and supply chain responsiveness. There might be many factors that can explain this variable, but our model, which includes SCM practices, can explain approximately 65.50% of it. This suggests that the remaining 34.5% of the variation in supply chain responsiveness cannot be explained by those dimensions of SCM practices.

#### 4.6.6. Regression Analysis between SCM Practices and operational performance

Table 4.15 Regression Analysis between SCM Practices and operational performance

##### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.541	.175		3.085	.003		
	SSP	.164	.047	.302	3.481	.001	.588	1.701
	CR	.045	.052	.060	.849	.400	.881	1.135
	IS	.417	.059	.629	7.024	.000	.554	1.806

a. Dependent Variable: OP

Based on the output of the SPSS version 24 regression to interpret the result on the relationship between the supply chain management (SCM) practice and the operational performance (OP), let's observe the beta value. The beta values above show the magnitude of relationship between variables, higher values being an indication of strong relationship. In this study, strategic supplier partnership had highest Beta coefficient of 0.629. This result implies that Information sharing (IS) had highest impact on supply chain responsiveness. Whereas, strategic supplier partnership(ssp), is found to be the second most

significant SCM dimension with Beta value of 0.302 implying that this dimension is significantly related and strongly influences the supply chain responsiveness (SCR). Then the influence followed by customer relationship, on the operational performance (OP) is 0.06, it has positive influence but relationship by the significance is not much.

#### 4.6.7. Regression Analysis between Supply chain responsiveness and operational performance

*Table 4.16 Regression Analysis between Supply chain responsiveness and operational performance*

#### Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	
	B	Std. Error	Beta			
(Constant)	.230	.137		1.681	.099	
1	OCR	.231	.050	.331	4.625	.000
	LPR	.286	.055	.359	5.173	.000
	SNR	.284	.056	.395	5.060	.000

a. Dependent Variable: OP

Based on the output of the SPSS regression to interpret the result on the relationship between the supply chain responsiveness (SCR) practice and the operational performance (OP), The beta values above show the magnitude of relationship Supplier network responsiveness (SNR) between variables, higher values being an indication of strong relationship. In this study, strategic supplier partnership had highest Beta coefficient of 0.395. This result implies that had highest impact on the operational performance. Whereas, Logistics process responsiveness (LPR), is found to be the second most significant SCM dimension with Beta value of 0.359 implying that this dimension is significantly related and strongly influences the operational performance. Then the influence followed by Operations system responsiveness (OSR) on the operational performance (OP) is 0.331, it has positive influence but relationship by the significance is not much.

*Table 4.17 Regression Analysis between Supply chain responsiveness and operational performance*

### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.919 <sup>a</sup>	.844	.835	.269

a. Predictors: (Constant), SNR, LPR, OCR

As shown in the table 4.17 above, there was causal relationship between Supply chain responsiveness and operational performance. There might be many factors that can explain this variable, but our model, which includes SCR practices, can explain approximately 84.4% of it. This suggests that the remaining 15.6% of the variation in operational cannot be explained by those dimensions of SCR.

### 4.7. Structural Model – Hypotheses Testing

Hypotheses	Relationship	Beta ( $\beta$ )	Hypotheses Result
H1	<i>SCR</i> <--- <i>SCMP</i>	0.53	Accepted
H2	<i>OP</i> <--- <i>SCMP</i>	0.629	Accepted
H3	<i>OP</i> <--- <i>SCR</i>	0.395	Accepted

\* Significant at  $P < 0.05$ , \*\*\* Significant at  $P < 0.001$

#### Source: survey data (2025)

The above table reflects the hypothesis tested result of hypothesized relationships among variables. All hypotheses are accepted is significant and positively impact on operational

**Hypotheses 1** which states about relationship between supply chain management practices and supply chain responsiveness have beta value of ( $\beta = 0.53$ ) were significant at  $P < 0.001$  level, that is accepted. The result values confirm that the relationships between supply chain management practices and supply chain responsiveness have positive and statistical significance. The response confirms that a well implemented supply chain management practice enhance the ability of an organization to respond quickly to changes in demand.

**Hypotheses 2** states that relationship between supply chain management practices and operational performance ( $\beta = 0.629$ ,  $P < 0.001$ ). The effect size of supply chain management practices on operational performance is that 62.9% which is considered as large impact. This means that, when supply chain management practices increases by one (1), operational performance increases by

0.629. The result empirically confirms the positive and significant relationship between supply chain management practices and operational performance.

**Hypotheses 3** refer about the relationship between supply chain responsiveness and operational performance. The result support hypothesis 3 since ( $\beta = 0.395$ ,  $P < 0.05$ ); it indicates there is causal relationship between supply chain responsiveness and operational performance. The value of 39.5% implies that supply chain responsiveness can account for 39.5% of the variation in operational performance. Although there might be many factors that can explain the variable on operational performance, nearly 36.3% of it is explained by customer relationship. The impact indicates that customer relationship is significant and positively impact on operational performance.

## **CHAPTER FIVE**

### **Summary of results, conclusion and recommendation**

#### **5.1. Summary of Results**

This study is intended to assess the SCM practices of gozamen cooperative union in terms of three major practices, test if there is a relationship between SCM practices, supply chain responsiveness,

and operational performance. Based on the results of the study the summaries of major findings are explained as follows.

This study supports major finding of related literature (Ashish Thatte, Subba Rao, Ragu-Nathan, 2013, Miguel, Ledur Brito, 2011) regarding the relationship between supply chain management practices, supplier responsiveness, and operational performance. The results prove that the implementation of supply chain management practices should improve supply chain responsiveness and leads to higher level of operational performance.

The study identifies, the level of relationship that exists between suppliers and gozamen cooperative union which is strategically supplier relationship practices, the group means was 2.52 and it indicated that the respondent dis agree the firm have a not good strategically supplier relationship with respect to the overall measures taken into consideration. The level of relationship that exists between customer which is Customer relationship practices, group mean value of 2.9 showed that the respondent dis agree the firm have weak customer relationship with respect to the overall measures taken into consideration. According to information sharing the group mean scoring the value of 2.77 showed that the respondent dis agree the firm have a low level of information sharing with supply .

The study identifies Pearson correlation test was conducted between SCM practices (collective representative of three constructs of SCM practices) and Supply chain responsiveness (SCR). Hence, there was significantly strong correlation between SCM practices and Supply chain responsiveness (SCR). In other words, SCM practices and supply chain responsiveness have strong positive relationship with correlation coefficient of 0.767 ( $r=0.767$ ) and significance value less than 0.001. Pearson correlation test conducted between SCM practices (collective representative of three constructs of SCM practices) and operational performance (OP). Hence, there was significantly strong correlation between SCM practices and operational performance (OP). In other words, SCM practices and operational performance (OP) have strong positive relationship with correlation coefficient of 0.818 ( $r=0.818$ ) and significance value less than 0.01.

In other way, from the regression analysis SCM practices have also contributed 65.50% for the variability of Supply chain responsiveness. Similarly, the test result of SCM practices contributed 84.4% for the variability of competitive advantage of the firm (operational performances).

## 5.2. Conclusion

The objective of the study was to assess the current SCM practices of gozamen cooperative union, examine the relationship between supply chain management practices with supply chain responsiveness, supply chain management practices with competitive advantage supply chain responsiveness and operational performance of the firm (operational performance) and relationship between supply chain responsiveness and competitive advantage of the firm (operational performance) and also try to see the major factor affect the SCM practice of the firm. Based on the results of the study obtained and summary of findings the following conclusions are given.

First: from the assessment of SCM practice in gozamen cooperative union in terms of three major practices (Strategic supplier relationship, customer relationship, information sharing). Strategic supplier relationship practices the survey results revealed that the existing performance is some performance was not satisfactory level. The other major practices is customer relationship, the findings indicated that there was low performance level of customer relationship. The last important practice was information sharing, the result showed that there was low practice of information sharing

Second the study takes a look the relationship between supply chain management practices and supply chain responsiveness and operational performance for hypothesis 1, this study found a significant positive relationship between SCM practices and supply chain responsiveness. Supply chain management practices have 65.5% significant positive impact on Supply chain responsiveness. For hypothesis 2 the study test the relationship between supply chain management practices and operational performance. The researcher found supply chain management practices have positive and significant relationship impact on competitive advantage of the firm (operational performance). Supply chain management practices have 84.4% variation on operational performance.

Finally the research has assessed that construction is ineffective and many problems can be observed. Analysis of these problems has shown that a major part of them are supply chain practice problems originating at the interfaces of different parties or functions, among which late and. The findings show that the problems that are related to materials management are changes made to the design while construction is in progress as well as incomplete contract documents at

commencement of project. Further challenges include inappropriate storage leading to damage or deterioration, Purchase products that do not comply with specification

### **5.3. Recommendation**

Based on the findings of the study and the discussions above. In view of what should be done and by whom and why it needed, the following recommendations were forwarded in order to encourage the implementation of supply chain management practices and performance measurement in the case companies.

1. To improve strategic relationship with suppliers, the company should select potential supplier that can be willing and cooperative for long-term relationship and plan jointly, they need to measure performance and reward for best achievements, share quality information continuously for suppliers. In addition, quality should be given priority rather low cost approach for product purchasing from supplier. They should start motivate and give reward for satisfactory supplier to increase their relationship and build a trust. Regarding to customer relationship, the company should give more attention to create loyalty to the union through improvement collecting feedback long term relationship as well as improving strategic relationship with suppliers which help to get material on time and enable to complaints with customer's full requirements of the product and time requirements. Information sharing and its quality were another important point that increase effectiveness and efficiency of decision making process as well contribute for improvement of supplier and customer relationship among the supply chain members. As the research findings revealed that there were more gaps on adequacy, timeliness, reliability and completeness of information and build trust and problem sharing or joint risk taking behavior.

2. For the responsive supply chain, the firm must have to work for enhancement of top level management commitment to build responsive supply chain for the purpose of efficient operational performance. To build responsive supply chain, effective implementation of customer relationship must be needed. Customers of the case industries are looking to the competitors who are complete the project on time with the best quality as the contract agreement. The business environment is uncertain, as a result the case companies need to build responsive supply chains to reduce cost and time delay to improve customer's satisfaction.

3. The current supply chain management practices of the case companies are average. Therefore; the case companies should implement supply chain management practices to improve responsiveness to customers need and support their operational performance. To advance a sustainable operational performance and supply chain responsiveness, supply chain management practices are a necessary variable. Generally, to increase supply chain responsiveness and competitive advantage of the firm (operational performance), the management and all stakeholders have to give due emphasis on SCM practices in modern way and develop sequences hierarchy work of who report to who, in this case it help to identify the missing information so it can easy to solve the problem.

4. Obstacles for SCM are found to be poor level of logistical competence, lack of guidance for creating strategic alliances, SCM is a great opportunity for the production industry primarily to reduce cost and time, and thus improve profitability. SCM principles seem to have much strength to smoothen and integrate the processes.

5. The measures practiced to manage its supply chain better include improving the Just In time material delivery system at project sites, refining the relationship with the few suppliers which are currently involved with and the vertical integration of organization, planning strategically and holding safety stalk will also enhance the supply chain management better.

#### **5.4. Limitations and Suggestions for Future Research**

Multiple sources of information were combined in this study. The purpose and scope of this study were essentially exploratory. Based upon survey data were developed and integrated into a theoretical framework that should be refined and validated in future research. The scope of the research was limited in the sense that the suppliers and no consider all primary union side of the supply chain was not taken into account. It is worthwhile to extend the case study and include the entire supply chain. Because of a lack of time and resources, this could not be realized in the current study. In a future research, the suppliers' of the supply chain needs to be studied as well.

In addition, this study not use other option of data collection method like interview The present case study only involves only in gozamen cooperative union. Since the firm common SCM practices.

The concept of SCM is complex and involves a network of company's effort for collaboration, joint planning and cooperative as well as strategic thinking and mind shift for mutual benefits within the supply chain members rather than focus on individually as traditional approach. Since SCM has rooted in manufacturing industry, there is lack of many literature and empirical evidence in general and particularly for Ethiopian. As a result, most of the variables and measurements of SCM practice adopted from manufacturing literature have limitation to evaluate and measure the SCM practices. In addition, as many literature supports, the fragmentation of the various factors such as, suppliers, customers, and other actors are the challenge for the bring SCM practice successful. Moreover, there is limitation of the right IT application that can be adopted for more importantly a major challenge for Ethiopian cases.

Future research can expand the domain of SCM practice by considering additional dimensions such as supply chain integration and logistics integration which have not been include in this study. In addition, though this study also tried to test the relationship between the three major dimensions of SCM practices with supply chain responsiveness and competitive advantage of the firm, other major dimensions that can affect performance has to be included in future study. Future research should also focus on the suitability of this industry and how supply chain management practices should be implemented.

## References

- A, B. (2010, 4 22). Time compression in the supply chain. In Waters. *GLOBAL LOGISTICS New directions in supply chain management (6thed).*, pp. Limited. (pp. 69-91).
- Alvarado, U. &. (2001, 5). supply chain managemnet ;the integration of losgstics in marketing industial marketing management. *journals of businccss logistics*, pp. 183-198.

Anderson, M. (2024, April 10). How to Reduce Costs in the Supply Chain? 5 Proven Strategies. p. 15.

Beesley A. 2010. Time compression in the supply chain. In Waters, D. G.-9. (Beesley A. 2010. Time compression in the supply chain. In Waters,D., GLOBAL LOGISTICS New directions in supply chain management (6thed). US: Kogan Page Limited. (pp. 69-91)., . (pp. 69-91).). Beesley A. 2010. Time compression in the supply chain. In Waters,D., GLOBAL LOGISTICS New directions in supply chain management (6thed). US: Kogan Page Limited. (pp. 69-91). *Beesley A. 2010. Time compression in the supply chain. In Waters,D., GLOBAL LOGISTICS New directions in supply chain management (6thed). US: Kogan Page Limited. (pp. 69-91).*

celonis. (2007, novmber 27). *cost reduction strategies in supply chain* . Retrieved from celonis: <https://www.celonis.com>

Chopra, S. &. (2016). Supply chain management: Strategy, planning, and. *Supply chain management: Strategy, planning, and.*

Chowa S.Wing, C. N.-H. (2008). Supply chain management in the US and Taiwan. Omega the international. *Supply chain management in the US and Taiwan. Omega the international.*

Christopher, M. .. (2016). . Logistics & supply chain management . *Logistics & supply chain management* . , p. (5th ed.).

D.Simichi- Levi, R. &.-L. (2003). Designing& managing the supply chain concepts, strategie. *D.Simichi- Levi, Rominsm,P. & E. Simich, - Levi. 2003. Designing& managing the supply chain concepts, strategies* .

EBRAHIM, K. ( 2019, MAY). EFFECTS OF SUPPLY CHAIN MANAGEMENT STRATEGY ON ORGANIZATIONAL SALES PERFORMANCE;. *THE CASE OF EAST AFRICA BOTTLING S.C.*

efficiency, s. c., & important, i. (2016, january 5). *studysmarter uk*. Retrieved from <https://www.studentsmarter.co.uk>: <https://www.studentsmarter.co.uk>

Eyasu, S. (2023, Feburary ). The Impact of Supply Chain Management Strategy practices on the Performance of Business Organization (Case study on Ambasel Trading House P.L .C).

- Hoek, R. (2010). Hoek, R.v. 2010. Building more agile supply chains. In Waters,D., GLOBAL LOGISTICS New directions in supply chain management. *Building more agile supply chains*, pp. Limited. (pp. 92-107).
- Jenkins, A. (2022, November 6). Supply Chain Efficiency: Definitions, Metrics and Steps to Improve. p. 22.
- Lopienski, K. (2024, October 14). 7 Steps To Efficient & Responsive Supply Chains (2024). p. 1.
- Marchi, B. &. (2017).
- MEKDES TILAHUN JUNE, 2. A. (2017, JUNE). RELATION OF SUPPLY CHAIN MANAGEMENT PRACTICES WITH ORGANIZATIONAL COMPETITIVENESS. *THE CASE OF ETHIOPIAN PULP AND PAPER S.C (EPPSC)*.
- Min s., M. J. (2008). Developing and measuring supply chain management concepts.
- Suarez, F. C. (2010). An Empirical Study of Flexibility in Manufacturing. Sloan Management Review, . *An Empirical Study of Flexibility in Manufacturing*. , pp. . 25-32.
- Sukati, I. A. (n.d.). A Study of Supply Chain Management Practice: Investigation on Consumer Goods Industry in Malaysia. International Journal of Business and Social Science, . *International Journal of Business and Social Science*,, pp. . 166-176.
- Tan, K. C. (1998). Tan, K. C., Kannan, V. Supply chain management: Supplier performance and firm performance. International . Journal of Purchasing and Materials Management,. pp.
- Tan, K. C., Kannan, V. R., & Handfield, R. B . (1998). Supply chain management:
- Rahmanseresht, H., & Afsar, A. (2008). Impact of Information Sharing on Competitive Strategy and Performance of Supply Chain. Iranian Journal of Information Technology Management, 1(1), 37–48.
- Tiwari, R., Shepherd, H., & Pandey, R. K. (2014). Supply Chain Management in Construction: A Literature Survey. International Journal of Management Research and Business Strategy, 3(1).

- Reid, S. (1987). *Working with Statistics: An Introduction to Quantitative Method for Social Scientist* (1st ed.). Polity.
- Ross, D. F. (1998). *Competing through Chin Management: Creating Market- Winning Strategies through Supply Chain Partnership*. Chapman and Hall.
- Rungtusanatham, M., Salvador, F., Forza, C., & Choi, T. Y. (2003). *Supply Chain Linkage and Operational Performance, a Resource-Based View Perspective*. *International Journal of Operations and Production Management*. Published.
- Vrijhoel, R., & Koskela, L. (2000). *The Four Roles of Supply Chain Management in Construction*. *European Journal of Purchasing & Supply Management*, 6.
- Sadikoglu, E., & Zehir, C. (2010). *Investigating the Effects of Innovation and Employee Performance on the Relationship between Total Quality Management Practices and Firm Performance: An Empirical Study of Turkish Firms*. *International Journal of Production Economics*, 127, 13–26.
- Sadri, G., & Lees, B. (2001). *Developing Corporate Culture as a Competitive Advantage*. *Journal of Management Development*, 20(10), 853–859.
- Simchi-Levy, D., Kaminsky, P., & Simchi-Levy, E. (2000). *Designing and Managing the Supply Chain*. McGraw-Hill Education.
- Sunil, C., & Peter, M. (2004). *Supply Chain Management Strategic Planning and Operation*. Prentice of India.

Reso

## **Appendices**

### **Survey questioner**

Dear respondents, this questionnaire is to gather data on **The impact supply chain management practices and supply chain responsiveness on operational performance of gozamen cooperative union** for the partial fulfillment of Master's degree in business administration at debre markos university. The study is purely for

academic purpose and thus not affects you in any case. So, your genuine, frank and timely response is vital for successfulness of the study. Therefore, I kindly request you to respond to each items of the question very carefully

**Thank you for scarifying your valuable time in advance!**

**General  
Instructions**

- There is no need of writing your name
- Where answer options are available please tick (✓) in the appropriate box for part I and circle for your response to each statements of part II

**Part I. Respondents Profile**

1. Year of work experience in the organization:

1-3 years  4- 6 years  7-11 years  above 11 years

2. Educational Qualification:

Certificate  College diploma  first Degree  Second Degree   
and above

3. Your current position \_\_\_\_\_

4. Age \_\_\_\_\_

**Section one: supply chain management practices**

With regard to supply chain management (SCM) practices of your firm, please circle the appropriate number to indicate the extent to which you agree or disagree with each statement. The item scales are five-point Likert type scales with 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree

N O	<b>supply chain management practices(SCMP)</b>	Strongly	Disagree	Disagree	Neutral [3]	Agree [4]	Strongly agree [5]
	<b>Strategic supplier partnership(SSP)</b>						
1.	We consider quality as our number one criterion in selecting suppliers						
2.	We have helped our suppliers to improve their product quality						
3.	We include our key suppliers in our planning and goal- setting activities						
4.	We actively involve our key suppliers in new product development processes						
	<b>Customer relationship(CR)</b>						
5.	We frequently measure and evaluate customer satisfaction						
6.	We frequently determine future customer expectations						
7.	We facilitate customers' ability to seek assistance from us						
	<b>Information sharing (IS)</b>						
8.	Our trading partners share proprietary information with us						
9.	Our trading partners keep us fully informed about issues that affect our business						
10.	Our trading partners share business knowledge of core business processes with us						

**Section two: Supply chain responsiveness**

With regard to supply chain responsiveness of your firm, Please circle the number that accurately reflects the extent of your supply chain current level of responsiveness.

N O	<b>Supply chain responsiveness(SCR)</b>	Strongly	Disagree	Disagree	Neutral [3]	Agree [4]	Strongly
				[2]			agree [5]
	<b>Operations system responsiveness (OSR)</b>						
1.	Our operations system effectively expedites emergency customer orders						
2.	Our operations system rapidly reconfigures equipment to address demand changes						
3.	Our operations system rapidly adjusts capacity to address demand changes						
	<b>Logistics process responsiveness (LPR)</b>						
4.	Our logistics system responds rapidly to unexpected demand change						
5.	Our logistics system rapidly adjusts warehouse capacity to address demand changes						
6.	Our logistics system rapidly varies transportation carriers to address demand changes						
	<b>Supplier network responsiveness (SNR)</b>						
7.	Our major suppliers consistently accommodate our requests						
8.	Our major suppliers provide quick inbound logistics to us						
9.	Our major suppliers effectively expedite our emergency orders						

### Section three: operational performance

With regard to operational performance of your firm, Please circle the number that accurately reflects the extent of your firm's operational performance on each of the following.

N O	<b>Operational performance(OP)</b>	Strongly	Disagree	Disagree	Neutral	Agree [4]	Strongly
				[2]			agree [5]
	<b>Cost (C)</b>						

1.	Our production cost is decreasing over time					
2.	Our inventory turnover is high.					
3.	Our productivity rapidly increasing over time					
	<b>Quality (Q)</b>					
4.	We have lower number of defects per unit of product					
5.	We offer high quality products to our customers					
6.	We have lower number of customer's complaints					
	<b>Delivery(D)</b>					
7.	We deliver customer order on time					
8.	We deliver the kind of products needed.					
9.	Time to solve customer complaints is short.					

*Figure 7the normal Q-Q plot of standardize residuals for CR*

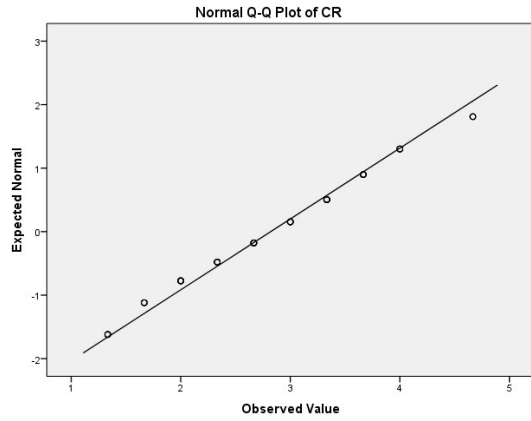


Figure 8 the normal Q-Q plot of standardize residuals for IS

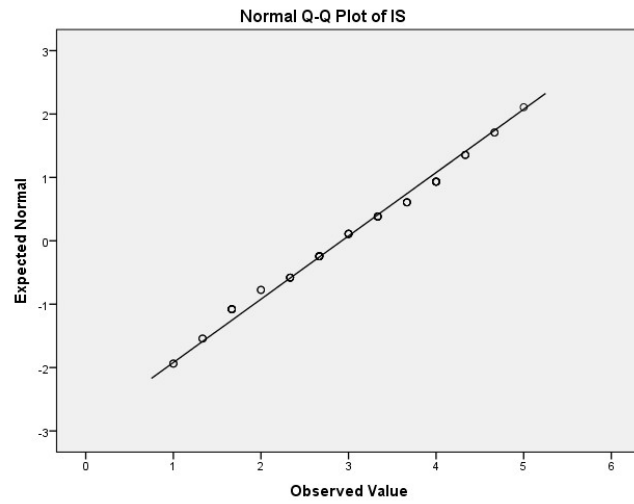


Figure 9 Homoscedasticity test for the independent variable CR

