

**THE DETERMINANTS OF INFORMATION SHARING AND
THE PERFORMANCE OF SUPPLY CHAIN:
A CASE OF BEVERAGE MANUFACTURING COMPANIES IN
DAR ES SALAAM, TANZANIA**

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DAR ES SALAAM, TANZANIA**

By

Deus P. Kabelele

**A Dissertation Submitted in Partial Fulfillment of the Requirements for the
Degree of Masters of Science in Procurement and Supply Chain Management of
Mzumbe University**

2019

CERTIFICATION

We, the undersigned, certify that we have read and hereby recommend for acceptance by the Mzumbe University, a dissertation entitled: The determinants of information sharing and the performance of supply chain: A case of beverage manufacturing companies in Dar es salaam, Tanzania, in partial/fulfillment of the requirements for award of the degree of Master of Science in Procurement and Supply Chain Management of Mzumbe University.

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DECLARATION AND COPYRIGHT

I, **Deus P. Kabelele** declare that this dissertation is my own original work and that it has not been presented and will not be presented to any other university for a similar or any other degree award.

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DEDICATION

I dedicate this Dissertation to my beloved father Dr. Paul Nsimbila Kabelele, for being a role model to me and for always pushing me towards greatness in all aspects of life let alone the sacrifices and efforts he made for me to be where I am today.

LIST OF ABBREVIATIONS

AMOS	Analysis of Moment Structures
CFA	Confirmatory Factor Analysis
IT	Information Technology
ICT	Information and Communication Technology
NBS	National Bureau of Statistics
NT	Network Theory
RBV	Resource Based View
SCM	Supply Chain Management
SEM	Structural Equation Modeling
SET	Social Exchange Theory
SPSS	Statistical Package for Social Sciences

ABSTRACT

Due to the increasing importance of information sharing in the supply chains towards better performances while there is lack of studies conducted in developing countries like Tanzania, trying to investigate the determinants of information sharing among trading partners and the impact of information sharing on the supply chain performance led to the conduction of this study so as to fill the empirical gap. The general objective of the study was to assess the determinants of information sharing and the performance of supply chain, where the first three specific objectives focused on ascertaining the influence of intra-organizational factors, inter-organizational factors and environmental factors on information sharing while the fourth and last one focused on ascertaining the influence of information sharing on the supply chain performance. The study was conducted at Dar es Salaam taking beverage manufacturing companies as a case. Resource based view (RBV), social exchange theory (SET) and network theory (NT) together with other empirical studies conducted in the developed countries were used as a basis for the development of the conceptual framework. Both quantitative and qualitative research designs were employed for findings triangulation purposes. The snowball sampling technique was used to collect data from 170 respondents using online survey while purposive sampling was used to collect data from 10 respondents through interviews. Confirmatory factor analysis and structural equation modeling were used to analyze quantitative data while explanation building process was used for qualitative data. The study findings indicated that for intra-organizational factors only information technology had significant contribution on information sharing while top management support had insignificant contribution; for inter-organizational factors only trust was significant while commitment, common vision and reciprocity were insignificant determiners; both of the environmental factors the competitive environment and environmental uncertainty were found to have significant positive influence on information sharing. Moreover, the study found that supply chain performance is significantly determined by information sharing. The study had several implications to various concerned stakeholders and suggested future studies to take into account the indirect effects of determinants of information sharing on the supply chain performance since they were ignored in this study.

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CHAPTER ONE

OVERVIEW OF THE STUDY

1.0 Introduction

The study is about the determinants of information sharing and the performance of supply chain, where this chapter encompasses of background of the problem, statement of the problem, research objectives, and research questions. Moreover, it gives a clear state on the scope of the study, significance of the study and the organization of the dissertation.

1.1 Background of the Problem

Globalization has extremely changed the way businesses operate within the supply chain, the presence of new opportunities brought by global world on reaching new markets and supply to customers worldwide has made the businesses to be exposed to intensified competition. Due to the rapid changes in business competition that result to the focus on inter-supply chain rather than inter-organizational sphere, necessity high levels of cooperation, that has led to the realization of collaborative strategy among supply chain participants to improve cost effectiveness and stay competitive in the business (Baihaqi & Sohal, 2013; Huong Tran, Childerhouse, & Deakins, 2016).

The major objective of supply chains is to enhance the operational efficiency through delivering the required goods and services to the final consumers on desired time and minimal cost. The complexity of these supply chains is very enormous whilst still continue to grow due to presence of a big number of participants and marketplaces that need to be managed around the world, as well as due to changes in customer demand, pressure to cost reduction and technological advancements. Consequently, information sharing is a prerequisite for supply chain participants to facilitate effective and efficient supply chains (Denolf, 2014).

According to Tan, Kannan, Handfield, and Ghosh (1999) the role of information sharing was started to be recognized as a major competitive resource after 1980s due to firms focus on supply chain management initiatives, which was the foundation for coordination and collaboration among the supply chain participants (Baihaqi & Sohal,

2013). Supply chain management depends so much on coordination among the supply chain participants who are suppliers, manufacturers, logistics service providers, wholesalers, retailers and customers. Supply chain coordination necessitates each stage of supply chain to take into consideration the effect of its activities on other stages which is enhanced by having objectives that do not conflict and effective information sharing among the participants (Zissis, Ioannou, & Burnetas, 2015). Information sharing amongst supply chain participants is a facilitator of better organization and planning of the supply chain activities as the best way to achieve optimum performance since all of the supply chain participants are kept well informed about their responsibilities towards the fulfillment of the market's needs (Marinagi, Trivellas, & Reklitis, 2015).

The participants in the supply chain are enabled to achieve the needed visibility in acting towards the changing business settings through information sharing, whereas the visibility's degree impacts the performance of supply chain. The realization of the benefits within the supply chain resulting from information sharing to chain members can be noted by them having access to timely, accurate and relevant information (Zaheer & Trkman, 2017). Information sharing and its proper utilization among trading partners in the supply chain have been considered beneficial as it improves the supply chain efficiency, where information enables effective decision making, that facilitates to better exploitation of the resources through improved organization and control in supply chain. Moreover, it helps to lower the degree of uncertainty while mitigating the bullwhip effect (Vallandingham & Sangachhen, 2016).

While the role of information sharing among the participants of supply chain is extremely essential, most of the chain participants are still hesitant to share the information as it is believed a source of power in the market can come from the information they could provide and that will directly affect their competitive position in their business activities. The supply chain actors seem to be skeptical on information sharing with their business partners due to the apparent risks, associated costs and different complexities, where the act of information sharing becomes a trade-off between the responsiveness of the information resources and efficiency (Kembro & Näslund, 2014). The information within the chain tends to be withheld and distorted

in a way that it limits the level of information needed to assist decision making, despite the benefits that can be realized from information sharing.

Some firms in the supply chain perceive that there is no any difference made with the information shared, and their supply chain partners do not have enough capacity to utilize the shared information appropriately which creates negative views among firms towards information sharing (Barratt & Barratt, 2011). Other firms are faced with several challenges such as lack of effective managerial acts and insufficient technological capabilities that hold them back from sharing information with their trading partners of which have impact on the supply chain performance (Maskey, Fei, & Nguyen, 2015). The understanding of the circumstances under which the trading partners will be motivated to share information is crucial with respect to the increasing importance of information sharing in supply chain towards its performance. Due to this, it was therefore vital to examine and apprehend the key factors that influence the development and implementation of information sharing in the supply chain and the influence of information sharing on the supply chain performance.

1.2 Statement of the Problem

The intensification and readiness of companies to share information with trading partners in the supply chain is crucial for maximization of end customers satisfaction and cost effectiveness achievements (Huong Tran et al., 2016; Yu, Jacobs, Salisbury, & Enns, 2013). Furthermore, it results to improvement in decision making in production planning, inventory control, ordering activities, resources allocation and short lead times, thus through it the supply chain partners can formulate a collaborative strategy from which shared benefits can be realized in a win-win situation to enhance supply chain performance. Firms can share a range of information from operational to tactical and strategic with their downstream and upstream partners (Baihaqi & Sohal, 2013; Kembro, Näslund, & Olhager, 2017).

In spite the renowned benefits of sharing the information among trading partners in the supply chain, firms may still decide on not to share the required information especially when it is seeming that the presence of information asymmetries result to a source of competitive advantage where more rents can be generated, particularly when

the established relationships are more opportunistic and purely transactional (Denolf, 2014). This is often motivated by the presence of conflicting objectives and focus on enhancing individual competencies so as to realize competitive advantage and gain of trading power over trading partners. Moreover, the firms gain an influence towards the terms and conditions of conducting business in their own favor by having control over the information due to direct access resulting to erratic degrees of information sharing among supply chain participants (Denolf, 2014; Khan, Hussain, Papastathopoulos, & Manikas, 2018).

Various empirical studies have been conducted to ascertain a range of factors that influence the supply chain partners to share information, as a step towards facilitation on development of strategies that could lead to improvement on information sharing and hence improvement in the supply chain performance as well. Factors such as commitment, trust, reciprocity and top management support were found significant in influencing information sharing in the supply chain among trading partners (Chen, Wang, & Yen, 2014; Lee & Fernando, 2015; Wu, Chuang, & Hsu, 2014). Moreover, there were exploration of other determinants like information technology, environment uncertainty, institutional policies, external support and level of competition (Ganotakis, Hsieh, & Love, 2013; Hung, Lin, & Ho, 2014; Huong Tran et al., 2016; Lotfi, Mukhtar, Sahran, & Zadeh, 2013). Furthermore, a number of studies have been done to examine the relationship between information sharing and supply chain performance where it was found that presence of information sharing among supply chain participants has a positive impact on the general performance of the supply chain (Lotfi et al., 2013; Marinagi et al., 2015; Qrunfleh & Tarafdar, 2014; Rashed, Azeem, & Halim, 2010).

However, most of the studies focused on a small number of factors that were sometimes repeated or overlapped by using different terminologies and few investigated the relationship between information sharing and the performance of the supply chain thus leading to lack of a clear framework that could include a large number of factors to be explored or/and tested at once while taking supply chain performance into account as well. Furthermore, most of the studies were piloted in the developed countries creating a doubt on whether the same determinants could be

applicable to developing countries, particularly in Tanzania where the business settings are quite different among trading partners in the supply chains. Hence a clear framework was essential to establish the factors that would illustrate the relationship between the determinants, information sharing and the performance of supply chain. Therefore, this study sought to establish a framework that provides a better understanding on how information sharing in the supply chain context can be facilitated, leading to establishment of proper strategies to improve information sharing among supply chain partners with regard to the factors that have been identified so as to improve the performance of the supply chain.

1.3 Research Objectives

1.3.1 General Objective

The general objective of this study was to assess the determinants of information sharing and the performance of supply chain.

1.3.2 Specific Objectives

- i. To determine the influence of intra-organizational factors on information sharing in the supply chain among beverage manufacturing companies in Dar es Salaam;
- ii. To ascertain the influence of inter-organizational factors on information sharing in the supply chain among beverage manufacturing companies in Dar es Salaam;
- iii. To determine the influence of environmental factors on information sharing in the supply chain among beverage manufacturing companies in Dar es Salaam;
- iv. To ascertain the influence of information sharing on the performance of the supply chain among beverage manufacturing companies in Dar es Salaam.

1.4 Research Questions

- i. What is the influence of intra-organizational factors on information sharing in the supply chain among beverage manufacturing companies in Dar es Salaam?

- ii. What is the influence of inter-organizational factors on information sharing in the supply chain among beverage manufacturing companies in Dar es Salaam?
- iii. What is the influence of environmental factors on information sharing in the supply chain among beverage manufacturing companies in Dar es Salaam?
- iv. What is the influence of information sharing on the performance of the supply chain among beverage manufacturing companies in Dar es Salaam?

1.5 Scope of the Study

The study focused on the assessment of the factors influencing information sharing and the performance of supply chain, where specifically the assessment based on determining the effect of intra-organizational factors, inter-organizational factors and environmental factors on information sharing in supply chain and how information sharing affects the performance of the supply chain taking a case of beverage manufacturing companies in Dar es Salaam. The study involved the companies which are engaged in the manufacturing and distribution of beverages at different destinations within the country and beyond the country's borders, which are specifically located in Dar es Salaam.

1.6 Significance of the Study

The study enables the supply chain participants especially the manufacturing companies to get a clear understanding on the major factors that influence information sharing among them and how it can affect their performances, due to the fact that with the current business changing conditions where the customers are so demanding it is crucial for the firms and their trading partners to work together so as to be able to meet the needs of the markets they serve.

Moreover, the study adds knowledge to the empirical literature where the coming researchers can use the study as a source of new explorations from which further studies can be conducted with the use of different research methodologies and conceptual framework perspectives with respect to theories used in the study.

The study also gives insights to the government and policy makers as well with regard to the contribution of manufacturing sector in the Gross Domestic Products of the

country where its performance relies on the availability and the tendency of information sharing, to set measures and create an environment that will facilitate the willingness and capacity of supply chain participants to share information.

1.7 Organization of the Study

The dissertation encompasses six chapters; Chapter One, provides the general overview of the study by entailing specific aspects such as background of the study, statement of the problem, research objectives, research questions, significance of the study, scope of the study and organization of the study. Chapter Two deals with the literature review focusing on both the theoretical and empirical reviews and the formulation of conceptual framework for the study. Chapter Three of this study stipulates the research methodology guided the conduction of this study where it includes research design, area of the study, sampling procedure, and data collection methods as well as data analysis techniques. Chapter Four covers the presentation of the findings and analyses that is based on data obtained from the field. Chapter Five is about the discussion on the findings presented on the chapter four, where critical analyses have been made with comparison to previous studies. Chapter six, which is the final chapter summarizes the findings of the study, makes conclusions and address potential areas of policy implications as well as areas to be focused for further studies.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter covers the analysis of literature on both theoretical and empirical parts as the foundation for formulation of a conceptual framework which guided this study in answering the research questions. The chapter includes definition of key terms, theoretical literature review, empirical literature review, research conceptual framework and research hypotheses.

2.1 Definition of Key Terms and Concepts

2.1.1 Information Sharing

Information can be defined as organized data that have added value beyond the collected data (Stair & Reynolds, 2013), while information sharing refers to the degree to which proprietary, critical and exclusive information is communicated among supply chain partners (Spaho, 2011). Information sharing involves several activities that facilitate the distribution of useful information among chain participants in an open setting by addressing important aspects such as what information to share, with whom to share and how to share it as means of maximizing the utilization of available information (Kantor et al., 2005).

2.1.2 Supply Chain

Supply chain refers to the set of organizations that work together in different activities and processes related to production of goods and services for ultimate consumers that covers both upstream (supplier to manufacturer) and downstream (manufacturer to end customers) links. It is made up of suppliers, manufacturers, distributors, wholesalers, retailers and final customers (Lotfi et al., 2013).

2.1.3 Supply Chain Performance

Gunasekaran, Patel, and Tirtiroglu (2001) describe supply chain performance as the overall efficiency and effectiveness of the supply chain in fulfilling its set objectives. (Qrunfleh & Tarafdar, 2014) provide further description on supply chain performance

by defining it in terms of the ability of the supply chain to respond to customers' requirement, be flexible to the prevailing environment and the integration of its processes. Consequently, different studies have proposed the measure of supply chain performance to be based on both financial and non-financial aspects. (Beamon, 1999) suggests the use of three performance measures on supply chain that include resources, output and flexibility covering both aspects of financial and non-financial.

2.2 Theoretical Literature Review

2.2.1 Resource Based View (RBV)

The resource based view (RBV) focuses on strategic assets, where major emphasize is put on the combination of firm's intangible and tangible resources as well as competences and capabilities which are valuable, rarely, inimitable and very well organized (Amit & Schoemaker, 1993). The great concern of resource based view is on formulating and maintaining a firm's sustainable competitive advantage by creating resources that are immovable and heterogeneous in nature (Agan, 2011; Barney, 1991). Due to the focus of RBV on internal competitive advantage of the firm which is resulting from the competencies, capabilities and resources, the RBV has been widely used to analyze and describe how firms uses its resources on achieving its set objectives (Halldorsson, Kotzab, Mikkola, & Skjøtt-Larsen, 2007).

The complementary interactions among firms based on inter-organizational systems of information has also been analyzed using the resource based view (Kim & Mahoney, 2006). Moreover, The RBV has been used to analyze how different determinants contribute to the firm's competitive advantage by creating unique and different competencies based on financial, human, technological, physical and reputational resources as well as on organizational resources specifically in management and cultural aspects (Amit & Schoemaker, 1993).

The relevance of RBV to information sharing among supply chain participants comes on the aspect of how the firm can use its own resources and capabilities to ensure that it acquires the required information from the trading partners while providing the same so as to create a shared competitive advantage among them for the general performance of the supply chain as whole (Halldorsson et al., 2007). Information

technology capabilities and top management support are among the factors that have been explained by RBV on its configuration to achieve the set objectives of the firm and creation of competitive advantage as a way of enhancing its performance, where at this study they were assessed if they ascertain their influence on facilitating information sharing among the supply chain participants and how it affects the companies' performance.

2.2.2 Social Exchange Theory (SET)

The Social Exchange Theory (SET) describes how the interchange of resources is done centered on shared value and control of opportunism behavior by creating trustworthy relationships between trading partners (Zhao, Huo, Flynn, & Yeung, 2008). The theory helps to understand the social relations and norms that enhance certain acts done with individuals when interacting with other counterparts. Furthermore, it helps to analyze the acceleration of benefits from both in an individual and network perspectives by taking great consideration on aspects such as norms, group characteristics and trust (Narayan & Cassidy, 2001). The investments on social values grounded on respect, trust and mutuality could result on long term relationships and benefits subsequent to corporate well-being and innovativeness (Widén-Wulff & Ginman, 2004).

For ones to well recognize the role of social factors in facilitating information sharing, SET provides a context for exploring different motivational determinants for information sharing. The theory has based on cost-reward scheme that stimulates trade partners to share information, where they expect some sort of reciprocity once information is being shared. Additional, social exchange between individuals includes association and entails high degree of trust as it may not be legally binding (Hall, 2003; Stafford, 2008). The SET was earlier used to describe the circumstances of information withholding from both individual and firm viewpoints and it was found that outcome expectations of individuals have a significant influence on information sharing (Lin & Huang, 2010). This connection paves the way to looking at possible variables like commitment, trust, reciprocity and common vision that have been addressed in the study.

Recently, SET has gained a substantial attention in the literature, where different studies have used it to analyze inter-organization relationships. These relationships include; supplier and manufacturer relationship; manufacturer and distributor relationship; buyer and seller relationship as well as other sorts of relationships established for the sake of strategic alliances within the supply chain (Chao, Yu, Cheng, & Chuang, 2013). In particular, several studies (Wei, Wong, & Lai, 2012; Wu et al., 2014; Zaheer & Trkman, 2017) have used SET to establish the antecedents and development of supply chain relationships to give a theoretical background of motivational factors, where factors such as power, trust, commitment and relational capital were found to exert significant effects on supply chain information sharing and performance. Hence the use of SET provides an essential framework and much indispensable theoretical background for these determinants of information sharing in the supply chain and the influence on information sharing in the supply chain performance.

2.2.3 Network Theory (NT)

The performance of the organization relies not only on the efficient cooperation with its trading partners, but also it depends on how well these trading partners interact with their own business partners with respect to business conditions on aspects of external influence and existing competition. NT has been widely used for provision of an analysis for the theoretical framework of reciprocity in cooperative relations, where development of new resources depends so much on how well firms continue to interact with other key players given certain business settings in which they operate (Håkansson & Ford, 2002; Oliver, 1990). The theory contributes significantly to describing the dynamics of relations based on inter-organizational perspective and how they are affected with the external interventions such as competitive pressure and environmental uncertainty (Halldorsson et al., 2007).

A network is usually at a relentless state of movement and change where it is difficult to establish an optimal equilibrium. Firms tend to establish links in a network through two major interactions: exchange processes that involve exchange of, services, goods and information; as well as adaptation processes that comprise of personal, technical, administrative and legal elements (Johanson & Mattsson, 1987). The established links

helps to combine resources of two or more firms to gain more benefits than that of individual efforts. Thus, the resources configuration governs the formation of supply chain structure and turns out to be its motivating force (Halldorsson et al., 2007). The theory has been functional in SCM to plan activities, incorporate resources and actors in the supply chain. The emphasis is on creating long term and trust based dealings between supply chain participants for minimizing competitive pressure and reducing the extent of environmental uncertainty where the flow of goods and services can be enhanced through supply chain visibility facilitated by information sharing (Halldorsson, 2002; Halldorsson et al., 2007).

2.3 Empirical Literature Review

Huong Tran et al. (2016) found that information exchange amongst trading partners is an indispensable strategy for companies to the delivery of best needed value to customers at possible lowest cost. Moreover, they discovered that major challenges for information sharing are absence of trust between trading partners, limited negotiation power and high level of uncertainty which are in line with findings of (Basnet, Childerhouse, Foulds, & Martin, 2006). Trust was found to have a positive impact on commitment as well, thus the study stipulated how trading partners can encourage trust by establishing personal relationship and long-term collaboration through working together openly and honestly rather than relying on legally binding contracts to enhance information sharing.

Zaheer and Trkman (2017) on evaluating information sharing theory perspective on willingness to share information in the supply chains found that trust is the most important factor for willingness to share information while the impact of reciprocity, information technology infrastructure capability and commitment are also significant. Surprisingly, power and job satisfaction were found not to be significant antecedents towards information sharing. The power and job satisfaction factors have been considered to have more impact when the information to be shared is by colleagues within the same organization rather than sharing it with people from an outside organization (Boh & Wong, 2015).

In examining the role of information sharing in supply chain management Lotfi et al. (2013) explained that firms are needed to make a best use of information technologies which are more advanced and innovative to enhance information sharing between supply chain participants in order to stay competitive. Further, the study identified the barriers of information sharing such as presence of confidentiality, incentives issues, quality of information and anti-trust problems. The study suggests that firms have to develop competences and capabilities that will allow them to make a proper utilization of the shared information within and across the supply chain.

Hung et al. (2014) found that environmental uncertainty and mutual trust are the two vital determinants that can fuel supply chain participants to share information, where most of the relationships between trading partners in downstream and upstream are mainly still in transactional form. Due to supply chain risks, firms tend to not share sensitive information to be used as bargaining chips in creating competitive advantage. Chen et al. (2014) surprisingly found that environmental uncertainty had no significant impact towards information sharing, availability and quality which is contrary to other studies such as (Wang, 2001; Zhou & Benton Jr, 2007). However, top management support, information technology, shared vision and commitment were found to have a significant contribution towards information sharing (Chen et al., 2014).

Maskey et al. (2015), focused on identifying factors that were significantly correlated to information sharing in supply chain in an attempt to stimulate trading partners to develop strategies for increasing information sharing in inter-organizational level. The results show that information sharing is influenced positively by power dependence, commitment, top management support, information technology, government support and trust in supply chain partners. Furthermore, the study stipulated that the findings are imperative as they can underpin the importance of building relationships with supply chain partners with an objective to advance the timeliness, accuracy and quality of information shared.

Wu et al., (2014) conducted a study that analyzed the relationship among determinants of information sharing based on SET variables, information sharing and collaboration and supply chain performance. The key SET variables included were reciprocity, trust,

commitment and power as the factors influencing information sharing and collaboration. The study findings show that the SET variables play an important role to determine the process of information sharing and collaboration within a supply chain and both information sharing and collaboration have a significant effect on supply chain performance. Moreover, the study stipulated that in the modern business, the focus on competition is on supply chains as it is no longer among organizations hence major efforts are needed to improve the performances of supply chains.

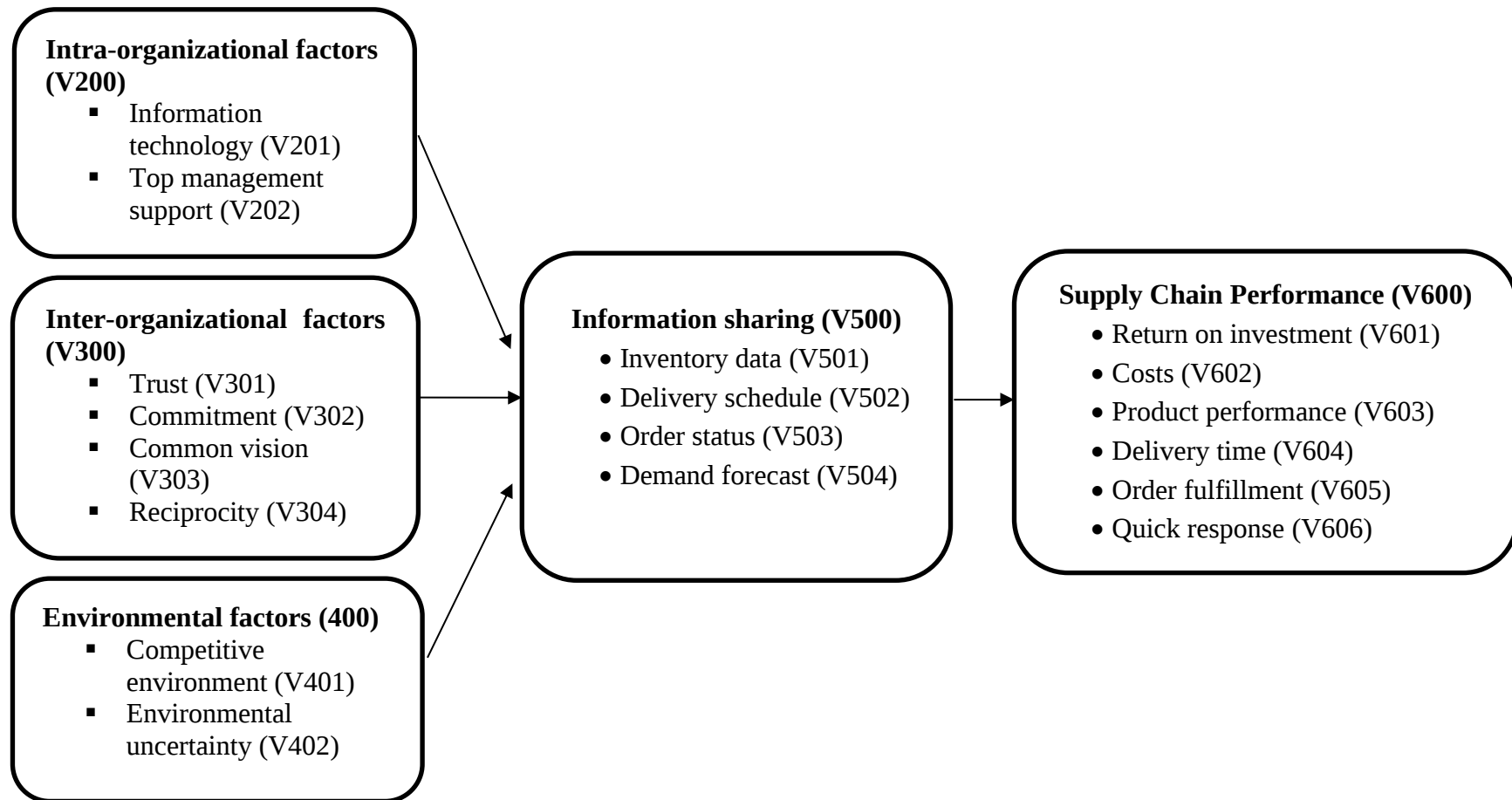
Qrunfleh and Tarafdar (2014) examined the existing relationship between strategies of supply chain and supply chain information systems, and its impact on the performance of supply chain. The study findings show that information system strategy in the supply chain enhances the relationship between agile supply chain strategy and supply chain performance. The study contributes empirically to the supply chain body of knowledge by providing a critical understanding on how supply chain strategies alongside information systems strategies can jointly contribute to the improvement of supply chain performance. In doing so, companies and trading partners can work together in establishing different initiatives on proper application of supply chain strategies for the target of improving the performance of the supply chain as whole.

Rashed et al., (2010) aimed on examining the collective impact of knowledge and information sharing on supply chain performance by focusing on operational performance of supplier through the established buyer-supplier relationship. The findings indicate that information sharing is essential for knowledge sharing and both are vital factors for increasing the supplier's operational performance within the supply chain. Moreover, information sharing has a critical role in coordinating supply chain partners with their processes, where information sharing among trading partners in the supply chain facilitates overall performance as a result of jointly practices of supply chain management enhanced by information quality and reliability (Lotfi et al., 2013).

2.4 Research Conceptual Framework

Based on resource-based view, social exchange theory and network theory with respect to previous studies, the study has a conceptual framework that comprises of three major aspects: the first one is the factors influencing information sharing in the supply chain; the second one is about the extent of information sharing in the supply chain; and the third and final one is concerning the performance of supply chain. The model is illustrated in figure 2.1.

Figure 2.1 Research Conceptual Framework



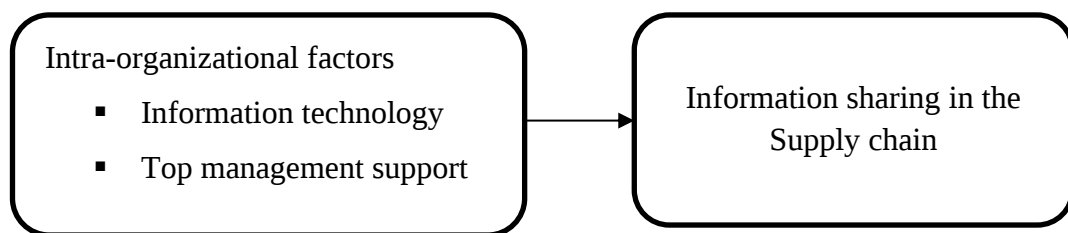
Source: Researcher (2019)

2.5 Variables Description and Hypotheses

2.5.1 Intra-Organizational Factors and Information Sharing

Different scholars have used organizational and its management features as a predictor of various aspects that involve organizational behavior (Maskey et al., 2015). For inter-organizational information sharing to be enhanced, it requires considerably internal efforts for its development as there are several organizational factors that affect the decision of firms on whether to share or not to share information with its trading partners within the supply chain (Maskey et al., 2015). All of the factors that arise between divisions and departments of the organization, where the management of such factors is up on the hand of the firm itself they are referred to intra-organizational factors (Premkumar & Ramamurthy, 1995). This study has included information technology and top management support as major intra-organizational factors towards information sharing in the supply chain. The inter-organizational model is summarized on figure 2.2

Figure 2.2 Intra-Organizational Factors Influencing Information Sharing in the Supply Chain



Source: Researcher (2019)

2.5.1.1 Information Technology and Information Sharing

In this study information technology is referred to the use of different computerized systems, software and other means of telecommunication such as internet, EDI, intranet, extranet, and emails for exchange of information. The fast development of IT has been a backbone for establishment of integrated supply chains as many firms have been facilitated to integrate, thus IT has been extensively acknowledged as a driver of supply chain management (Li & Lin, 2006). Through IT, online communication has been supported that provides links for supply chain participants to share information

on a real time routine regardless of their location (Handfield, Handfield, & Nichols Jr, 2002). IT allows firms to develop information processing capabilities required for effective information sharing, due to the fact that it becomes easier for them to acquire, process and transmit information among trading partners to enhance decision making (Baihaqi & Sohal, 2013).

Through integration of information technologies, firms are more exposed to potential capabilities of extending their supply chain coordination through effective utilization of shared information as firms can provide accurate information in a timely manner (Baihaqi & Sohal, 2013). Moreover, lack of information technology can inhibit supply chain members to share information adequately and becomes difficult for them to realize the benefits resulting to fast, accurate and adequate information sharing among them (Siau & Tian, 2004). IT does not only deliver a certain level of information by overcoming differences in physical location but also it facilitates the supply chain members to be provided with quality information, where generally it is positively correlated to information generation and dissemination (Nicolaou, Ibrahim, & van Heck, 2013; Yurov & Montes Botella, 2014; Zaheer & Trkman, 2017). However, other studies see (Li & Lin, 2006; Wang, Hu, & Hu, 2013; Xiao, Xie, & Hu, 2013) have found that the presence of advanced levels of IT infrastructure certainly affects the willingness to share information, but not necessary its quality as well. The following hypothesis is proposed based on above discussions:

H1: Information technology is positively related to information sharing in the supply chain.

2.5.1.2 Top Management Support and Information Sharing

Top management support has been well-defined as the extent to which top managers understand the specific benefits of information sharing and take necessary efforts to facilitate information sharing and its quality with supply chain partners (Spaho, 2011). Lee, Kim, Hong and Lee (2010) furthermore, stipulated that top management support can be referred to the degree to which top managers at both organizations understand and support their existing business relationship. Better collaborations among supply chain partners are formulated by top managers to have a well understanding of each

other and an intention to build mutual beneficial relationships which are usually facilitated with two way information flow (Mentzer et al., 2001). Top management has to set together the expected benefits to be realized for both firms once engaging in information sharing so as to avoid the presence of conflicting objectives between participating firms. By understanding the significance of information sharing, firms can provide vision, support and guidance for its application, thus creating an organization culture that facilitates accurate information sharing with absence of distortions and delays (Spaho, 2011).

Management support has been considerably known as one of the important factors for any successfully change in the firm since it formulates a vision that plays a significant role in formulating firm's values, reputation and unique identity (Wu, Chiag, Wu, & Tu, 2004). Top management should be willing to allocate required resources to facilitate effective information sharing, enhanced by firm's top management to provide valuable intuitions on the role of information sharing with the supply chain members who are also keen to act on the same (Chen et al., 2014). For information sharing to be promoted, it is crucial to get backing from the top management on formulating information integration strategies within the supply chain, as it has been evidenced that the greater level of top management support the more information is shared between trading partners in supply chain (Chen et al., 2014; Lin & Huang, 2010; Spaho, 2011). The following hypothesis is proposed based on above discussions:

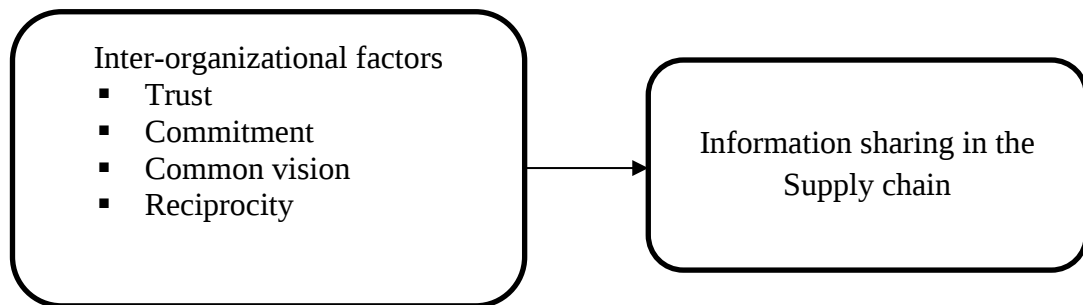
H2: Top management support is positively related to information sharing in the supply chain.

2.5.2 Inter-organizational Factors and Information Sharing

The inter-organizational factors consist of all those factors that arise as a result of networks or establishment of relationships between two or more firms. Such factors are usually related to organizations that work together and there is great potential and willingness to manage them together (Maskey et al., 2015). Once organizations establish working relationship, there are numerous factors that they need to take into account so as to enhance the level of information sharing among them, under this study

such factors include trust, commitment, common vision and reciprocity. The inter-organizational behavior factors model is summarized on figure 2.3

Figure 2.3 Inter-organizational Behavior Factors Influencing Information Sharing in the Supply chain



Source: Researcher (2019)

2.5.2.1 Trust and Information Sharing

Trust in trading partners is described as the willingness to count on a trading partner in whom one has confidence (Monczka, Petersen, Handfield, & Ragatz, 1998; Spekman, Kamauff Jr, & Myhr, 1998). Furthermore, Spekman et al. (1998) stipulates that trust is borne through belief, reliance, faith and confidence in the supply chain partner, regarded as the willingness to relinquish opportunistic deeds. Trading partners that operate in a high degree of trust relationship are usually not skeptical to share the required information and rely in the information they receive, thus taking more efforts to ensure there is two ways information flow to enhance their working relationship (Wu et al., 2014). Trust motivates supply chain partners to create an open communication and willingness to take risks, through which trading partners enhance freely flow of information to help supply chain activities configuration (Zaheer & Trkman, 2017).

In absence of trust in the supply chain among trading partners creates a condition where execution of business transactions become complex due to need of inspection and verification of each transaction need to be made. The trading partners often put major efforts on examining their trading partner's reliability, credibility and trustworthiness, rather than enhancing their operations (Spaho, 2011). Thus leading to

high transactions cost resulting to loss of productivity as effectiveness and efficiency cornerstones of supply chain objectives are compromised (Spaho, 2011). Trust has been substantially discussed in the setting of playing a great role in enhancing information sharing in supply chain, where they indicate that trading partners in the supply chain will have confidence in sharing information with each other once trust is present (Ebrahim-Khanjari, Hopp, & Iravani, 2012; Kalyar, Naveed, Anwar, & Iftikhar, 2013; Lee & Fernando, 2015). Consistent with these arguments, the following hypothesis is proposed:

H3: Trust is positively related to information sharing in the supply chain.

2.5.2.2 Commitment and Information Sharing

Commitment is a continuing aspiration to maintain a valued relationship established between supply chain partners, where it takes into account each party's expectation and intention for a last long relationship and willingness to devote resources in the supply chain management (Mentzer, Min, & Zacharia, 2000). To a great degree, commitment makes it more challenging for supply chain partners to make decisions that might undesirably affect their relationship and whole supply chain performance (Spaho, 2011). Commitment is one of the major components in maintaining a relationship in the supply chain and essential for the long-term accomplishments of the trading partners (Xiao, Zheng, Pan, & Xie, 2010). Commitment has an important role in motivating trading partners to share information since it allows them to willingly take risks (Tan & Ramayah, 2014). Thus commitment is a significant element for developing willingness to share information among trading partners in supply chain (Chao et al., 2013).

Explicitly, commitment enables supply chain participants to enhance their efforts in forming relationships through the actions of cooperation and collaborations, where is more credible to be willing to share information among supply chain members (Yang, Wang, Wong, & Lai, 2008). Moreover, a strong sense of commitment ensures improvement in communications between the supply chain members and facilitates coordination of their activities based on strategic, tactical and operational aspects through effective information sharing (Hunt, Lambe, & Wittmann, 2002; Narayandas

& Rangan, 2004). Various studies argued that commitment significantly relates to information sharing among trading partners, where (Moshkdanian & Molahosseini, 2013; Vijayasathy, 2010; Zaheer & Trkman, 2017) found that commitment significantly influence information sharing among supply chain participants. Thus, it is hypothesized that:

H4: Commitment is positively related to information sharing in the supply chain.

2.5.2.3 Common Vision and Information Sharing

Common vision refers to the extent of correspondence of the configuration of values and beliefs among trading partners (Li & Lin, 2006), where it incorporates how supply chain partners understand each other's expectations (Bronnenmayer, Wirtz, & Göttel, 2016). The trading partners should precisely formulate objectives which are very clear and measurable in a mutual discourse in advance (Simon, Kumar, Schoeman, Moffat, & Power, 2011). Furthermore, in order to effectively implement the vision developed, all involved trading partners have to ensure the sufficient communication of formulated goals (Bronnenmayer et al., 2016). Collaboration within supply chain influenced by organizational compatibilities between supply chain members, in terms of control systems, job stability, reputations, goals, and culture tend to have more information sharing engagements (Fawcett, Wallin, Allred, Fawcett, & Magnan, 2011). The supply chain partners with common vision share the idea of what goals, policies and behavior are right, appropriate and important for the success of their business and relationship survival. Therefore, it is evident that with common vision in business relationship trading partners are encouraged to share more information (Fawcett et al., 2011; Li & Lin, 2006). The discussion leads to the formulation of the following hypothesis:

H5: Common vision is positively related to information sharing in the supply chain.

2.5.2.4 Reciprocity and Information Sharing

Reciprocity has a very imperative meaning in the context of information sharing, where it refers to a tendency in which the supply chain members are willing to share information with each other as long as they will get information of the same value in exchange or any other sort of benefit equivalent to the value of information provided

(Zaheer & Trkman, 2017). Precisely, motives of reciprocity in the business dealings in the supply chain emphasize the development of collaboration and cooperation among members, which is focusing on collaborative means that pursue common goals (Humphreys, Lai, & Sculli, 2001). Willingness to share information is driven by reciprocity and extrinsic rewards as supply chain members who are willing expect to be reciprocated (Adler & Kwon, 2002). This reciprocity is experienced through the presence of relational stability in supply chain collaborations, which requires relational commitment (Yang et al., 2008).

Accumulation and sharing of information have been associated with reciprocity, where it implies that the part receiving information from other parties is obliged to reciprocate so as to maintain the balance of benefits and offerings among them (Adler & Kwon, 2002; Haeussler, 2011). The set of information sharing intents and the actual information sharing tend to develop with the presence of reciprocity among supply chain members (Lin, 2007). Reciprocity is one of the powerful forms of social capital that aids supply chain partners to share information across the supply chain (Haeussler, 2011). Humphreys et al. (2001) specify that reciprocity in the supply chain can enhance information sharing between trading partners. With reciprocity, both upstream and downstream sides can be facilitated with the building of virtual business networks for access of information for effective management of production based activities and delivery of goods and services required by the ultimate customers (Wu et al., 2014). It is well proven that reciprocity impacts the tendency of information sharing among trading partners in the supply chain (Bock, Zmud, Kim, & Lee, 2005; Chen & Hung, 2010; Zaheer & Trkman, 2017). Therefore, it can be hypothesized that:

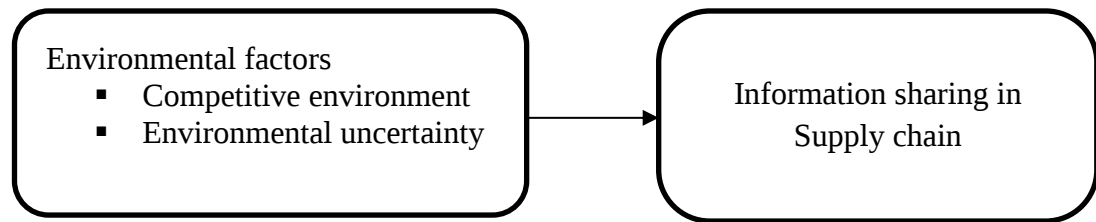
H6: Reciprocity is positively related to information sharing in the supply chain.

2.5.3 Environmental Factors and Information Sharing

These are factors that are reflected from various external conditions and forces faced by the organization due to changes in customer demand, technological developments, business competition and of which the firm's management capability is beyond reach since it lacks direct influence on such aspects (Mentzer et al., 2000). For this study,

competitive environment and environmental uncertainty were incorporated. The environmental factors model is summarized on figure 2.4

Figure 2.4 Environmental factors influencing information sharing in the supply chain



Source: Researcher (2019)

2.5.3.1 Competitive Environment and Information Sharing

According to Ward, Duray, Leong, and Sum (1995) competitive environment refers to the degree of competition faced by a firms in the supply chain which is related to the balance between the level of demand and supply with regard to the number of companies offering the same king of products and services. Decrease in demand or excess in supply in the supply chain will need the firms to either lower their prices or increase the quality to their customers so as to win the market, thus competition will become stiff among trading firms (Huo, Zhao, & Zhou, 2014). The competitive environment in the supply chain requires the firm to provide a high degree of customization, fast responses to the demands of the customers, short lead times and low costs in a business environment characterized with uncertainty and volatility (Chiang & Feng, 2007; Li, Sikora, Shaw, & Tan, 2006). Due to this, firms are required to share as much information as possible with their trading partners so as to meet the competitive requirements (Jain, Seshadri, & Sohoni, 2011). It is evident that the competitive environment is one of the major drivers for establishment of supply chain information systems and information sharing (Huo et al., 2014; Jain et al., 2011; Zhou & Benton Jr, 2007). Thus, it can be hypothesized that:

H7: Competitive environment is positively related to information sharing in the supply chain.

2.5.3.2 Environmental Uncertainty and Information Sharing

Environmental uncertainty is described as the extent of change and unpredictability of customer's taste and demand, supplier's product quality and delivery performance as well as technological developments in firm's industry (Li & Lin, 2006). The current business setting in the supply chain is characterized by presence of great competitive environment, in which markets are more customers driven. Customers are demanding better quality products, more varieties, faster delivery and higher reliability; the life cycles of products are shortened while the choices for customers are increasing with respect to the increase in number of suppliers (Li & Lin, 2006). The uncertainties caused by the supplier will spread over the supply chain in the form of order variability, excess keeping of safety stock, insufficient use of resources and increase in logistical costs. A firm in order to offer high levels of customer service in unstable environment will have to focus on how to manage such uncertainties experienced from the suppliers (Yu, Yan, & Edwin Cheng, 2001).

The development of Information technology provides various opportunities for the firm, which includes supply chain process integration, new products development and establishment of information systems to reduce transaction costs that are related with the flow of goods and services. In spite of that, technology development imposes threats as well to the individual firms, since rapid advancements in technology increase the competition base (Li & Lin, 2006; Zhou & Benton Jr, 2007). For firms to be able to react to such level of uncertain environment in the supply chain, they are needed to increase the level of cooperation and outsourcing with their customers and suppliers which requires high extent of information sharing (Li & Lin, 2006). Environmental uncertainty is significantly influencing cooperation and information sharing among supply chain members (Hung et al., 2014; Li & Lin, 2006; Zhou & Benton Jr, 2007). Therefore, it is hypothesized that:

H8: Environmental uncertainty is positively related to information sharing in the supply chain.

2.5.4 Information Sharing and the Supply Chain Performance

The types of information shared in a supply chain can vary greatly, as it depends on the requirements of the firm (Omar, Ramayah, Lo, Sang, & Siron, 2010). Different classifications on shared information types have been made by several authors. Six categories of information have been established according to Lee and Whang (2000) which comprise information on; inventory, order status, delivery schedule; sales forecast; sales data and production planning. Huang, Lau and Mak (2003) has grouped into inventory order, process, product, resource, and planning information. Moreover, other authors have classified information shared centered on the anticipated schedule of activities levels; operational level: where firms share order and sales information to enhance reduction in stock levels and facilitate customer orders; tactical level: where firms share production plans and forecasts to enhance reserve on adequate capacities for production and logistics activities; strategic level: where companies share annual demand information, promotion plans and marketing strategies to facilitate potential purchases and growth within supply chain (Kembro et al., 2017; Klein & Rai, 2009; Yigitbasioglu, 2010).

In assessing the extent of information sharing in the supply chain this study had focused on the information based on inventory levels, delivery schedules, order statuses and demand forecasts information that is shared between the beverage manufacturing companies and its trading partners in the supply chain (Chen et al., 2014; Wu et al., 2014).

A number of studies have empirically established the link between information sharing and supply chain performance. Fawcett, Osterhaus, Magnan, Brau and McCarter (2007) have examined the relationship between information sharing and supply chain performance by assessing two dimensions of information sharing based on willingness and connectivity, which were both found to exert positive influence on supply chain performance. Lotfi et al., (2013) have stipulated that information sharing has a greater value in supply chain since the benefits achieved outweigh the costs involved hence improvement in the general performance of the supply chain. Furthermore, Ajay and Maharaj (2010) reveal that information sharing has a major effect on the overall cost

of running supply chain, while improving the holistic management of the activities within the supply chain. The following hypothesis is suggested:

H9: Information sharing in the supply chain is positively related to the supply chain performance.

2.5.5 Supply Chain Performance

In this study, supply chain performance is defined as the ability of the supply chain to be flexible in given prevailing conditions, enable the integration of activities and processes as well as to quickly respond to the customers' needs while achieving the set objectives (Qrunfleh & Tarafdar, 2014). According to Beamon (1999) supply chain performance can be measured with the use of both financial and non- financial measures by focusing on resource, output and flexibility aspects. Resource is related to the efficient management of resources to meet system's objectives such as inventory costs, manufacturing costs and return on investment costs. Output is basically used to measure the aspects of product quality, customer responsiveness and on time delivery while flexibility measures the ability of the supply chain to cope with uncertainties caused by fluctuations from suppliers, manufactures and customers (Wu et al., 2014).

The study had measured supply chain performance by using six items that cover both financial and non-financial aspects. The items focus coverage was on the improvement of return on investment, lowering of production and inventory costs, improvements in product's performance, on time deliveries to respectively places, order fulfillment rate and quick response to customers' requirements (Li, Rao, Ragu-Nathan, & Ragu-Nathan, 2005; Marinagi et al., 2015; Wu et al., 2014).

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

Research methodology refers to the systematic way to solve a research problem, it shows how the research is done scientifically by stipulating the rationality behind the methods and techniques employed in the setting of the research study given various adopted steps in studying such research problem (Kothari, 2007). This chapter comprises of research design, study area, study population, unit of analysis, sampling techniques and sample size, data collection methods, methods for testing validity and reliability of the study and data analysis methods.

3.1 Research Design

The study employed both the quantitative and qualitative designs. The quantitative design was used since there were hypotheses tested that have been formulated based on the discussed theories and empirical studies, where an online survey questionnaire was developed for data collection. The qualitative approach was used through the conduction of interviews to a small sample size so as to get a better understanding and extra information on the factors influencing supply chain information sharing and supply chain performance so as to triangulate the findings that were obtained from the quantitative design. Hence, the research design for this study is a follow up qualitative methods in a quantitative study (Morgan, 1998).

3.2 Area of the Study

The study was conducted in the city of Dar es Salaam by involving beverage manufacturing companies located at the three districts of Ilala, Kinondoni and Temeke. The city was conveniently selected due to the presence of more establishments on manufacturing industry than in other regions particularly on beverage manufacturing companies as well (NBS, 2016). Moreover, this is convenient due to financial and timeframe constraints to cover more than one region.

3.3 Study Population

The study involved the companies which are engaged in the manufacturing and distribution of beverages at different destinations within the country and beyond the country's borders, which are specifically located at Dar es Salaam. The targeted population was the employees of those manufacturing companies at all levels of the organization from the top management to the low-level management personnel whom interact and share information with trading partners within their supply chain.

3.4 Unit of Analysis

The theories discussed in chapter two; RBV, SET and NT were premised on examining firm-based contexts. Moreover, the focus of the study is to see how the beverage manufacturing firms tend to share information with their trading partners in the supply chain based on the given determinants to be studied and how it influences the general performance of their supply chain. Hence the unit of analysis in this study is firm, where data were collected from the managers and employees of sampled beverage companies.

3.5 Sampling Techniques and Sample size

3.5.1 Sampling Techniques

Snowball sampling and purposive sampling techniques were used to obtain the required sample size for data collection through online survey and interview methods respectively. The sampling requirement for this study was important with regard to the limited resources in terms of time and associated costs (Kothari, 2007).

3.5.1.1 Snowball Sampling

The study adopted the snowball sampling technique to obtain a sample size required for data collection with the use of a structured questionnaire through an online survey. The major reason for using this technique was due to lack of an established sampling frame from which a sample size could have been obtained with the use of probabilistic sampling techniques, since the questionnaire part is mainly for collection of data for quantitative study. Snowball sampling is referred to non-probability sampling procedure in which successive respondents are attained from the information and means provided by initial respondents (Saunders, Lewis, & Thornhill, 2009). In this

study the initial identified respondents were used to locate and share the link to other respondents to enable the process of data collection.

3.5.1.2 Purposive Sampling

The study employed the purposive sampling so as to obtain the sample size required for data collection through interview method to cover the qualitative part of the study. The technique was appropriate due to the involvement of a small sample size from which qualitative data was collected with a motive to allow in-depth collection of data from respondents who are more experienced, informative and familiar with information sharing aspects within the supply chain. The purposive sampling technique enables the researcher to use own judgment to select respondents that best fit and facilitate the researcher to answer available research questions so as to meet the research objectives (Saunders et al., 2009).

3.5.2 Sample Size

3.5.2.1 Sample Size for Quantitative Design

Due to lack of the established sampling frame the sample size for quantitative design was obtained basing on number of variables available on the conceptual framework and statistical data analysis techniques employed in the study, where data collection was done by using an online survey. Pituch and Stevens (2015) recommends at least 15 subjects to be included per variable on the conceptual framework for conduction of statistical analysis, making it a total of 150 sample size required in our study since there are 10 variables. Moreover, with the use of structural equation modeling (SEM) in our study, sample adequacy for its application has to be considered. Gerbing and Anderson (1985) suggest a minimum of 150 sample size in SEM for enabling provision of convergent and sufficiently proper solution respectively while Tanaka (1993) recommends a maximum of 400 sample size as when it exceeds 400 the SEM becomes sensitive and may suggests a poor fit for the model. Therefore, our sample size was expected to be at least 150 cases to meet the requirement for the number of variables and at most 400 to meet the SEM requirement. Consequently, we were able to collect data from 170 respondents, hence we met the sample size requirements for both the number of variables and SEM.

Table 3.1 Sample Size for Quantitative Design

Category	Frequency	Percent
Chief Executive Officer (CEO)	2	1.2
Managing Director	3	1.8
Supply Chain Manager	10	5.9
Logistics Manager	5	2.9
Procurement Manager	8	4.7
Assistant logistics officer	11	6.5
Assistant Procurement officer	6	3.5
Assistant Sales Officer	10	5.9
Finance manager	7	4.1
Human Resource Officer	8	4.7
Logistics Officer	20	11.8
Procurement officer	19	11.2
Production Officer	1	.6
Production operator	4	2.4
Quality Assurance officer	2	1.2
Sales Assistant	1	.6
Sales Officer	22	12.9
Supplies Officer	31	18.2
Total	170	100.0

Source: Study findings (2019)

3.5.2.2 Sample Size for Qualitative Design

The established sample size in this design was used to collect data through conduction of personal interviews with the respondents. Qualitative design normally requires a smaller sample size than quantitative design. Morse (1994) suggests the inclusion of approximately 30 – 50 respondents for grounded theory, while Creswell (1998) suggests only 20 – 30 respondents for interviews when the qualitative design is a major research design of the study. Since a qualitative design is not a major research design in this study rather than a follow up on the quantitative design, thus a total of 10 respondents were featured in the interviews for qualitative data collection.

Table 3.2 Sample Size for Qualitative Design

District	Frequency	Percent
Ilala	5	50.
Kinondoni	3	30
Temeke	2	20
Total	170	100

Source: Study findings (2019)

3.6 Data Types and Data Collection Methods

3.6.1 Data Types

Both primary and secondary data were collected by the researcher in this study in order to accomplish the set research objectives. The use of both types of data enabled the researcher to triangulate the findings and helped to gain the advantages associated with the primary and secondary data collectively.

3.6.1.1 Primary Data

The researcher intended to gather this type of data so as to be able to get the results which could reveal the reality of the situation from the sampled companies. The primary data are those which are collected for the first time, and therefore happen to be original in character (Kothari, 2007). Primary data were collected through structured questionnaire and interviews to ensure the accuracy and relevance of the data collected.

3.6.1.2 Secondary Data

The researcher made a use of secondary data for triangulation purpose as for comparing with the findings that were obtained through primary sources. Secondary data are those which have already been processed qualitatively or passed through the statistical process as they have already been collected and analyzed by someone else (Kothari, 2007). In this study, secondary data was gathered from different sources such as journal articles, research papers, books, publications and reports of various associations, research reports by different scholars, and public records and statistics.

3.6.2 Data Collection Methods

3.6.2.1 Survey

An online survey was conducted with the use of a structured questionnaire that was floated online using several platforms. Firstly, the survey was prepared using google forms on the google drive's web where various respondents could access it. Secondly, links were sent to all of the organizations whose emails were obtained and also were shared during interviews for those whose emails could not be obtained earlier. Furthermore, social networks were also utilized to reach the targeted demographics mostly with the use of WhatsApp. The researcher intended to use online survey for the

purpose of ensuring that the respondents are getting enough time to read and understand the questions so as to provide appropriate answers, as well as to increase the response rate while minimizing costs and time used in collecting data.

3.6.2.2 Personal Interview

This method was used through conduction of face to face conversations with respondents; the interview method was employed for collection of qualitative data to triangulate with the quantitative findings of the study. Moreover, additional information and views of respondents were obtained through asking straight questions, as this method allowed them to provide their own views and direct explanations due to the method's flexibility and discussions that were made under the study.

3.7 Reliability and Validity

3.7.1 Reliability

Reliability in this study refers to the consistency of a measurement instrument, concerned with stability of the scores obtained from a measure over certain periods of time and across different settings (Marczyk, DeMatteo, & Festinger, 2005). For the aim of insuring that the measurement instruments of the study will produce the same results when tested repeatedly, internal consistency of the scale was assessed. The internal consistency refers to the degree to which the items that make up the hypothesized variable are all measuring the same underlying construct (Pallant, 2013). The Cronbach's coefficient alpha is the static that was used in measuring the internal consistency scale, of which provided the average correlations among all of the items making up the scale. Pallant (2013) suggests a minimum level of 0.7 Cronbach's alpha values for the scale items to be reliable. Moreover, the questionnaire items used to test our conceptual model were extracted from previous studies that have already been tested so as to ensure scale reliability (Kilangi, 2012).

The data collected were therefore subjected to reliability test by being put into SPSS version 25 with the use of Cronbach's alpha model for analysis. The analysis results showed that all of the items expects for those of Information technology, commitment, environmental uncertainty and supply chain performance measured within the variables are reliable in a sense that they have consistency in measuring the same

underlying construct for each variable, as the Cronbach's alpha (α) for all variables were above 0.7 as shown in the table 3.

The initial overall Cronbach's alpha of information technology items was 0.83, but the item V201e was found to have a little correlation (0.170) with the rest of the items which was below the recommended value of 0.3. Hence the item was deleted and the Cronbach's alpha improved to 0.898.

Commitment as well initially had a Cronbach's alpha of 0.624 due to poor correlation of item V302c (0.010) with other items. Hence the item had to be deleted which resulted to the improvement of overall Cronbach's alpha to 0.717.

The same case happened to environmental uncertainty and supply chain performance variables, where initially they had overall Cronbach's alpha of 0.674 and 0.769 respectively. But one item (V402e) in environmental uncertainty and one item (V605) on supply chain performance found to have poor correlations with other items that were below the recommended value (0.3), hence the items were deleted making the new overall Cronbach's alpha of environmental uncertainty and supply chain performance to be 0.758 and 0.827 respectively.

Table 3.3 Data Reliability Test

Variable	Variable Items	(α)
Information technology	V201a, V201b, V201c, V201d, V201f	0.898
Top management support	V202a, V202b, V202c, V202d, V202e	0.890
Trust	V301a, V301b, V301c, V301d, V301e	0.877
Commitment	V302a, V302b, V302d, V302e	0.717
Common vision	V303a, V303b, V303c	0.850
Reciprocity	V304a, V304b, V304c, V304d	0.774
Competitive environment	V401a, V401b, V401c, V401d	0.819
Environment uncertainty	V402a, V402b, V402c, V402d, V402f	0.758
Information sharing	V501, V502, V503, V504	0.880
Supply chain performance	V601, V602, V603, V604, V606	0.827

Source: Study findings (2019)

3.7.2 Validity

Validity refers to the extent to which the measurement instruments measures what is was intended to measure by providing adequate coverage of the topic under the study (Kothari, 2007; Pallant, 2013). Under this study, the validity of the scale was assessed basing on the content validity analysis that refers to the relevance of the measurement

strategy or instrument to the construct being measured (Marczyk et al., 2005) which was accomplished by employing delph technique. Thus, the items that make up a scale for each variable were subjected to several professionals in the field of logistics and supply chain management to determine how well the instruments were appropriate and what major changes could be made to ensure their validity.

3.8 Operationalization of Variables

The study has a total of nine independent variables and two dependent variables where one variable is acting as both dependent and independent variable at the same time due to its mediating effect that have been developed with regard to the theoretical literature review that includes resource based view, social exchange theory and network theory as well the empirical studies. The independent variables are intra-organization factors which comprise of information technology and top management support; inter-organizational behavior factors comprise of trust, commitment, common vision and reciprocity; and environmental factors comprise of competitive environment and environmental uncertainty while the dependent variables are information sharing which is independent variable as well and supply chain performance.

The instruments of measurement that were used to collect data have been adopted from different past studies and there are some modifications that have been done to some of the items so as to make them fit for the intended purpose. Intra-organizational factors are adopted from (Lee et al., 2010; Li & Lin, 2006), where information technology has six items and top management support has five items. Inter-organizational behavior factors are adopted from (Chen et al., 2014; Coote, Forrest, & Tam, 2003; Li & Lin, 2006; Wu et al., 2014) where trust has five items, commitment has five items, common vision has three items and reciprocity has four items. Environmental factors are adopted from (Chen et al., 2014; Huo et al., 2014; Li & Lin, 2006), where competitive environment has four items and environmental uncertainty has six items. Items for information sharing in supply chain have been adopted from (Chen et al., 2014; Wu et al., 2014), comprise of four items based on inventory levels, delivery schedules, order statuses and demand forecasts. Supply chain performance comprise of six items that cover both the financial and non-financial aspects which are the improvement of return on investment, lowering of production and inventory costs, improvements in product's

performance, on time deliveries to respectively places, order fulfillment rate and quick response to customers' requirements (Li et al., 2005; Marinagi et al., 2015; Wu et al., 2014). A five-point likert scale of strongly agree to strongly disagree was used for all variables to ensure measurement consistency.

3.9 Preliminary Data Analysis

3.9.1 Missing Data Analysis

Due to the fact that multivariate statistical techniques are sensitive to missing data, we had to run the descriptive review of the variables to check for the possibility of any missing data. The results indicated that there were no missing cases which was attributed to the use of google forms on data collection that restricted the submission of forms that have not been fully filled.

Table 3.4 Missing Data Analysis

Variable	Cases	Minimum	Maximum	Valid	Missing
Information technology	170	1	5	170	0
Top management support	170	1	5	170	0
Trust	170	1	5	170	0
Commitment	170	1	5	170	0
Common vision	170	1	5	170	0
Reciprocity	170	1	5	170	0
Competitive environment	170	1	5	170	0
Environment uncertainty	170	1	5	170	0
Information sharing	170	1	5	170	0
Supply chain performance	170	1	5	170	0

Source: Study findings (2019)

3.9.2 Normality and Outliers

Many of the statistical techniques are sensitive to non-normal distributed data and outliers, as they tend to violate the assumptions set hence leads to unstable model fit results and insignificances as well (Pallant, 2013). Due to that the study used the histograms with normal distribution curves together with analysis of skewness and kurtosis values to assess data normality and the presence of outliers, where the histograms showed almost perfect bell shapes with skewness and kurtosis values not greater than 3 and 10 respectively as suggested by Kline (2015) indicating that there was no problem (see appendix iv).

3.10 Data analysis Methods

The study employed both the qualitative and quantitative data analysis techniques with respect to the nature of data that were collected. The qualitative data analysis technique was used for the case of data that were collected through interview method while quantitative data analysis was used for the case of data that were collected through the survey questionnaire.

3.10.1 Qualitative Data Analysis

The qualitative data were analyzed basing on explanation building process technique suggested by Yin (2009), where the collected data from the respondents were organized, reviewed, categorized and being re-coded to formulate and explain themes. In the analysis process, each interviewee was assigned a generic name for the purpose of preserving anonymity, as the researcher presented quotes from some of the interviewee's responses during discussion of the findings on chapter 5.

3.10.2 Quantitative Data Analysis

The statistical methods that was used for quantitative data processing and analysis were mainly descriptive and inferential methods using Statistical Package for the Social Sciences (SPSS) version 25 and Analysis of a Moment Structures (AMOS) software version 24 respectively. Specifically, Structural Equation Modeling was used for the case of inferential statistics.

3.10.2.1 Descriptive Statistics

Descriptive statistics includes the preparation of frequency distribution tables; graphs; charts; tabulations; and computation of indices such as mean, mode, median, variance, range, standard deviation, minimum and maximum (Ndunguru, 2007; Pallant, 2013). For this study, descriptive statistics was used for preliminary data analysis and presentation of the characteristics of the respondents. In the preliminary data analysis, the descriptive statistics enable the research to screen and clean the data by finding the errors and correcting them, being able to do different manipulations on the data, as well as to check the normality and possible outliers on the data to so as to make it suitable for statistical analyses (Pallant, 2013).

3.10.2.2 Structural Equation Modeling (SEM)

Structural equation modeling (SEM) is a statistical technique used to present, estimate and test a network of relationships between variables that integrates a number of different multivariate techniques such as Confirmatory Factor Analysis (CFA) and regression or path analysis (Hox & Bechger, 1998; Suhr, 2006). The study employed SEM due to the fact that the research model established in chapter two has a system of relationships which include the presence of direct and indirect relationships rather than a relationship of dependent variable and a set of predictors with absence of mediating variable(s).

The SEM has two primary components; the measurement model and structural model, where the measurement model is the one responsible for describing the existing relationship between observed variables (items) and measured latent variables (constructs) while the interrelationships among measured latent variables (constructs) are described by the structural model (Weston & Gore Jr, 2006). The measurement model enables the researcher to examine how well the observed variables (items) combine to explain the hypothesized constructs it represents, whereby the Confirmatory factor analysis was used to if the measurement model fits the collected data. The structural model is the one the researcher used to test the hypothesized relationships established among measured latent variables through SEM regressions after testing the model fit adequacy. The model fit test enabled the researcher to assess whether the model describes well the data collected from which the proposed hypotheses were tested (Weston & Gore Jr, 2006).

CHAPTER FOUR

PRESENTATION OF FINDINGS

4.0 Introduction

This chapter is hereby to present and analyze the study findings with respect to the data collected. The chapter comprises of three major parts which include, the presentation of respondents and firms' characteristics, confirmatory factor analysis for measurement model and structural model for hypotheses testing.

4.1 Respondents and Firms Characteristics

As stated earlier in the chapter three, that the unit of analysis for this study is firm based where data were collected from the top management personnel and other employees of the firms who are involved in one way or the other in information sharing processes between their company and other trading partners in the supply chain. Hence the characteristics of the respondents and their companies were crucial to be examined as they tend to have an influence on the way a company conducts its activities, however the characteristics have not been used for statistical analysis in relation to the study variables. The characteristics of the respondents' that were examined include gender, age, education level and working position while firms' characteristics examined were number of employees and firm's experience in the business.

4.1.1 Gender of Respondents

The findings on the gender of respondents indicated that males were 68.2% of the sample and females were 31.8% of the sample, hence the majority of the population were male by far. This implies that males were more responsive to the online survey compared to females or/and majority of the employees in the beverage manufacturing companies are males which could be influenced by the nature of their activities.

Table 4.1 Gender of Respondents

Category	Frequency	Percent
Male	116	68.2
Female	54	31.8
Total	170	100.0

Source: Study findings (2019)

4.1.2 Age of Respondents

The study findings indicated that the majority of the respondents were aged between 21-40 years which is 74.7% of the sample, followed by individuals aged between 41-60 years whom comprise of the 21.2% of the sample, the study had as well the respondents aged below 20 years and above 60 years having 1.2% and 2.9% of the total sample respectively. The study findings imply that the sample employed comprise of matured population hence are individuals whom can make rational decisions hence data were collect from the appropriate representatives in terms of working age.

Table 4.2 Age of Respondents

Category	Frequency	Percent
Below 20 years	2	1.2
21-40 years	127	74.7
41-60 years	36	21.2
Above 60 years	5	2.9
Total	170	100.0

Source: Study findings (2019)

4.1.3 Education Level

The majority of the respondents participated in our study were found to have bachelor degree or advanced diploma (67.6%), followed by those who had diploma and master's degree accounted for 14.1% and 12.9% of the sample used respectively. Moreover, the study found that only few respondents (5.3%) had certificate. With majority of the respondents been having a high level of education from certificate and above, it implies that the respondents had little or enough knowledge on the subject matter and their responses given are reliable for the study.

Table 4.3 Education Level

Category	Frequency	Percent
Certificate	9	5.3
Diploma	24	14.1
Bachelor Degree/Advanced Diploma	115	67.6
Master's Degree	22	12.9
Total	170	100.0

Source: Study findings (2019)

4.1.4 Working Positions

The study aimed to collect data from all the personnel at all management levels of the beverage manufacturing companies that are mainly involved in the process of sharing information between their companies and other trading partners within their supply chain. The study findings indicated that different personnel from top management to operational workers had been included in the sample. The top and middle management levels included in the sample where: Chief Executive Officer (CEO) (1.2%); managing director (1.8%); supply chain manager (5.9%); Procurement manager (4.7%); Finance manager (4.1%); and logistics manager 2.9%. Other positions included in the sample were Assistant logistics officer (6.5%); Assistant Procurement officer (3.5%); Assistant Sales Officer (5.9%); Human Resource Officer (4.7%); Logistics Officer (11.8%); Procurement Officer (11.2%); Production Officer (0.6%); Production operator (2.4%); Quality Assurance officer (1.2%); Sales Assistant (0.6%); Sales Officer (12.9%) and Supplies Officer who were the majority (18.2%) of the sample. The study findings imply that there is even distribution of samples in terms of their job titles as they cover several departments that are found within beverage manufacturing companies, hence appropriate data have been provided since all of these departments tend to have interaction among themselves and other external parts in which information sharing is a key aspect for their activities to be implemented.

Table 4.4 Working Positions

Category	Frequency	Percent
Chief Executive Officer (CEO)	2	1.2
Managing Director	3	1.8
Supply Chain Manager	10	5.9
Logistics Manager	5	2.9
Procurement Manager	8	4.7
Assistant logistics officer	11	6.5
Assistant Procurement officer	6	3.5
Assistant Sales Officer	10	5.9
Finance manager	7	4.1
Human Resource Officer	8	4.7
Logistics Officer	20	11.8
Procurement officer	19	11.2
Production Officer	1	.6
Production operator	4	2.4
Quality Assurance officer	2	1.2
Sales Assistant	1	.6
Sales Officer	22	12.9
Supplies Officer	31	18.2
Total	170	100.0

Source: Study findings (2019)

4.1.5 Number of Employees

The study findings as on the table 4.5, shows that majority of the firm's respondents (31.2%) had 101-200 employees, followed by 51-100 employees which represented 30.6% of the sample. Furthermore, the study found that there were firm with above 200 employees and below 50 employees which represented 30% and 8.2% of the sample respectively.

Table 4.5 Number of employees in the firm

Category	Frequency	Percent
Below 50	14	8.2
51-100	52	30.6
101-200	53	31.2
Above 200	51	30.0
Total	170	100.0

Source: Study findings (2019)

4.1.6 Working Experience of the Firm in the Business

The study also found that most of the beverage manufacturing companies were established between six and fifteen years ago, as the majority (23.5%) have been in the business for 6-10 and 11-15 years respectively, while others that have been in the business for 16-20 years and above 20 years represented 14.7% and 22.9% of the sample respectively. For the companies established for less than five years ago were represented 15.3% of the sample.

Table 4.6 Working experience of the firm in the business

Category	Frequency	Percent
1-5 years	26	15.3
6-10 years	40	23.5
11-15 years	40	23.5
16-20 years	25	14.7
Above 20 years	39	22.9
Total	170	100.0

Source: Study findings (2019)

4.2 Confirmatory Factor Analysis (CFA)

Confirmatory factor analysis (CFA) was performed to assess the measurement model on whether the data collected fit the hypothesized measurement model, whereby both the independent and dependent variables items were subjected to this statistical analysis. The measurement model was analyzed by assessing the internal consistence

of the latent variables' items, whereby the items with factor loading above 0.6 in the CFA were considered acceptable for forming and analyzing the structural model except for co-vary items in which being below 0.6 is not a problem since their covariances are summed up together. The analysis was performed at two stages, that included the analysis of the proposed measurement model and the modified measurement model of which the results were compared.

The study adopted the most recently recommended model fit indices to assess the measurement and structural model fit as Kline (2015) suggested four minimum set of fit indices that should be reported of which are Model chi-square; Root Mean Square Error of Approximation (RMSEA; Steiger, 1990) and its 90% confidence interval; Bentler Comparative Fit Index (CFI; Bentler, 1990) and Standardized Root Mean Square Residual (SRMR). Therefore, in this study the fit indices used were normed chi-square (CMIN/DF), Root Mean Square Error of Approximation (RMSEA) and its 90% confidence interval (PCLOSE), Comparative Fit Index (CFI) and Standardized Root Mean Square Residual (SRMR).

4.2.1 CFA for Information Technology

The variable "Information technology" was measured by using six items, whereby the initial reliability test discarded one item (V201e) due to its poor correlation with the other items. Hence the rest of the five items were then subjected to CFA for further analysis. The results indicated that all of the items had acceptable factor loadings and exhibited no significant difference between them, and due to that all of the items were retained. The items were adopted from (Lee et al., 2010; Li & Lin, 2006), measuring information technology in the extent of using internet, email, intranet, extranet, Electronic Data Interchange (EDI) and Enterprise Resource Planning (ERP).

Table 4.7 Information Technology CFA

Item code	Item	Initial Std Factor Loading (β)	Final Std Factor Loading (β)	Status
V201a	Internet usage	0.79	0.79	Retained
V201b	Email usage	0.86	0.86	Retained
V201c	Extranet usage	0.80	0.80	Retained
V201d	Intranet usage	0.78	0.77	Retained
V201f	ERP usage	0.78	0.78	Retained

Source: Study findings (2019)

4.2.2 CFA for Top Management Support

The top management support variable was measured by using five items, which centered on examining on how the top management perceives the importance of business relationships through persuasions, provision of requirements, and participation in the relationship management within the supply chain (Lee et al., 2010; Li & Lin, 2006). The initial reliability test indicated that all of the items had significant correlations as they were all measuring the same underlined construct. The CFA results as well indicated that all of the items had acceptable factor loadings, hence all of the items were retained in the model. However, after the inspection of modification indices due to initial model poor fit the item V202d and V202e appeared to have high covariance estimates indicating that the two items could have been measuring the same thing. Due to that and for the sake of improving the model fit, the two items were made to co-vary in the model, of which had significant contribution to the improvement of the model fit.

Table 4.8 Top Management Support CFA

Item code	Item	Initial Std Factor Loading (β)	Final Std Factor Loading (β)	Status
V202a	Top management perceives the relationship between us and our trading partners as important	0.78	0.79	Retained
V202b	Top management is concerned in pursuing business relationship with our trading partners	0.84	0.87	Retained
V203c	Top management provides required resources for supply chain management	0.80	0.80	Retained
V204d	Top management regards supply chain management as a very important aspect	0.79	0.75 (co-vary)	Retained
V204e	Top management participates in the management of the supply chain	0.73	0.68 (co-vary)	Retained

Source: Study findings (2019)

4.2.3 CFA for Trust

The trust latent variable was measured by using five observed variables, whereby the items focused on the aspect of honest, truthfulness, confidence, integrity and reliable by the trading partners in executing their daily business dealings. The initial reliability test indicated that all of the items had significant correlation as they were all measuring

the same underlined construct. The CFA results as well indicated that all of the items had acceptable factor loadings, hence all of the items were retained in the model.

Table 4.9 Trust CFA

Item code	Item	Initial Std Factor Loading (β)	Final Std Factor Loading (β)	Status
V301a	Honest	0.71	0.71	Retained
V301b	Truthfulness	0.82	0.82	Retained
V301c	Confidence	0.83	0.83	Retained
V301d	Integrity	0.80	0.80	Retained
V301e	Reliable	0.69	0.69	Retained

Source: Study findings (2019)

4.2.4 CFA for Commitment

The initial reliability test for five commitment items indicated that item V302a which was measuring the extent of efforts invested by the firms in maintain their relationship with trading partners had poor correlation with the other items. The other four items based on sacrifices, agreements standings, intention to maintain relationship and keeping promises were subjected to CFA for further analysis where it was found that item V302a had poor factor loading ($\beta=0.49$) compared to the other items, hence had to be discarded so as to improve the general model fit of the measurement model.

Table 4.10 Commitment CFA

Item code	Item	Initial Std Factor Loading (β)	Final Std Factor Loading (β)	Status
V302a	Sacrifices	0.49	-	Discarded
V302b	Agreements standings	0.61	0.66	Retained
V302d	Intention to maintain relationship	0.69	0.65	Retained
V302e	Keeping promises	0.71	0.72	Retained

Source: Study findings (2019)

4.2.5 CFA for Common Vision

Common vision was measured by three items that included similar understanding on supply chain objectives, similar understanding on supply chain collaborations and similar understanding on supply chain improvements adopted from Li and Lin (2006). The initial reliability test for the items indicated that all of the items were measuring the same underlined construct since they had good general Cronbach alpha value and inter item correlation coefficients. The three items were subjected to CFA for further

analysis, where the items found to have acceptable standardized factors loadings hence, they were retained for further analysis.

Table 4.11 Common Vision CFA

Item code	Item	Initial Std Factor Loading (β)	Final Std Factor Loading (β)	Status
V303a	Similar understanding on supply chain objectives	0.71	0.71	Retained
V303b	Similar understanding on supply chain collaborations	0.87	0.87	Retained
V303c	Similar understanding on supply chain improvements	0.86	0.86	Retained

Source: Study findings (2019)

4.2.6 CFA for Reciprocity

CFA was conducted for four unobserved variables of the latent variable “Reciprocity”, the items were adopted and modified from the empirical studies, refer to (Coote et al., 2003; Li & Lin, 2006). The items were all about assessing the business relationship between the firms and their trading partners in terms of presence of fair policies, equitable treatment, positive contribution and fairly treatment in reciprocating business dealings. The CFA results indicated that item V304b had low factor loading value ($\beta=0.56$) compared to the other items, hence the item had to be discarded so as to improve the general model fit. The item had low factor loading due to the fact that the initial reliability test showed that the item had low inter item correlation value which might have been influenced by its resemblance with item V304e in wording and measurement aspects hence only one item had to be used for further multivariate analysis.

Table 4.12 Reciprocity CFA

Item code	Item	Initial Std Factor Loading (β)	Final Std Factor Loading (β)	Status
V304a	Fair policies	0.73	0.67	Retained
V304b	Equitable treatment	0.56	-	Discarded
V304d	Positive contribution	0.72	0.76	Retained
V304e	Fair treatment	0.73	0.76	Retained

Source: Study findings (2019)

4.2.7 CFA for Competitive Environment

CFA was conducted for four items of the latent variable “Competitive Environment”, that were adopted and modified from the previous studies, the items were measuring competitive environment of the supply chain by focusing on the existence of intense competition, declining demand, excessive supply and product varieties. The initial reliability test of the items indicated that the general Cronbach’s alpha and the inter item correlations were of satisfactory values (0.819 and >0.5 respectively). The CFA results indicated that all of the items had acceptable factor loadings that can be retained for further statistical analysis. However, item V401c and V401d were found to have a large covariance estimate value indicating that they were measuring the same thing. This is due to the fact that item V401c was measuring the extent of excessive supply while item V401d was measuring the extent of products varieties available in the supply chain, in which they are associated as due to presence of products varieties leads to excessive supply in the supply chain market. For improving the model fir of the measurement model, the two items V401c and V401d were made to co-vary for further analysis to be undertaken.

Table 4.13 Competitive Environment CFA

Item code	Item	Initial Std Factor Loading (β)	Final Std Factor Loading (β)	Status
V401a	Intensive competition	0.83	0.90	Retained
V401b	Declining demand	0.62	0.63	Retained
V401d	Excessive supply	0.72	0.63 (co-vary)	Retained
V401e	Product varieties	0.74	0.65 (co-vary)	Retained

Source: Study findings (2019)

4.2.8 CFA for Environmental Uncertainty

The variable “environmental uncertainty” had six items, of which were subjected to initial reliability test and results found that one item “V402e” had to be deleted so as to improve the general Cronbach alpha since it had a correlation of (<0.3) that caused the poor general alpha value. The other five items remained were subjected to CFA and the results indicated that items V402a, V402b and V403c had poor factor loadings of below 0.6 and had to be discarded. However, item V402a and V402b were found to have high estimate covariance estimate value indicating that they were measuring the

same aspect. This is because there is a close relationship between customers ordering different products combinations and changes in customers preferences. Therefore, the item V402c was discarded while item V402a and V402b were retained and made to co-vary so as to improve the general model fit.

Table 4.14 Environmental Uncertainty CFA

Item code	Item	Initial Std Factor Loading (β)	Final Std Factor Loading (β)	Status
V402a	Intensive competition	0.48	0.35 (co-vary)	Retained
V402b	Declining demand	0.59	0.48 (co-vary)	Retained
V402c	Excessive supply	0.59	-	Discarded
V402d	Excessive supply	0.71	0.75	Retained
V402f	Product varieties	0.71	0.72	Retained

Source: Study findings (2019)

4.2.9 CFA for Information sharing

The Information sharing latent variable was measured by using four observed variables, whereby information sharing between the supply chain members was assessed by looking on the extent of information shared in the aspects of inventory levels data, delivery schedules information, order status information and demand forecasts information. The items were adopted from previous studies so as to ensure their reliability for the study (Chen et al., 2014; Wu et al., 2014), moreover the items were subjected to initial reliability test were they exhibited a significance consistency by having a general Cronbach alpha above 0.8 and inter item correlations above 0.7 . Furthermore, in the CFA results all of the items were found to have high factor loadings (above 0.7), hence they were all retained.

Table 4.15 Information Sharing CFA

Item code	Item	Initial Std Factor Loading (β)	Final Std Factor Loading (β)	Status
V501	Inventory levels	0.84	0.84	Retained
V502	Delivery schedules	0.85	0.85	Retained
V503	Order status	0.73	0.73	Retained
V504	Demand forecasts	0.78	0.79	Retained

Source: Study findings (2019)

4.2.10 CFA for Supply Chain Performance

Supply chain performance comprised of six items that covered both the financial and non-financial aspects which were the improvement of return on investment, lowering of production and inventory costs, improvements in product's performance, on time deliveries to respectively places, order fulfillment rate and quick response to customers' requirements (Li et al., 2005; Marinagi et al., 2015; Wu et al., 2014). CFA was conducted for five unobserved variables of the latent variable, as item V605 was discarded earlier during initial reliability test as it exhibited poor inter item correlation with the rest of the items. The CFA results indicated that items V601 and V606 had low factor loadings value of ($\beta=0.46$) and ($\beta=0.38$) respectively compared to the other items, hence the items had to be discarded so as to improve the general model fit. The items had low factor loadings due to the fact that the initial reliability test showed that the items had low inter item correlation values.

Table 4.16 Supply Chain Performance CFA

Item code	Item	Initial Std Factor Loading (β)	Final Std Factor Loading (β)	Status
V601	Returns on investment	0.46	-	Discarded
V602	Costs reduction	0.85	0.85	Retained
V603	Products performance	0.94	0.92	Retained
V604	Order fulfillment rate	0.90	0.92	Retained
V606	Quick response	0.38	-	Discarded

Source: Study findings (2019)

4.2.11 CFA General Model Fit

Confirmatory factor analysis (CFA) was performed to assess the measurement model on whether the data collected fit the hypothesized measurement model, whereby both the independent and dependent variables items were subjected to this statistical analysis. The study adopted the most recently recommended model fit indices to assess the measurement model fit as Kline (2015) suggested, therefore, the study used normed chi-square (CMIN/DF), Root Mean Square Error of Approximation (RMSEA) and its 90% confidence interval (PCLOSE), Comparative Fit Index (CFI) and Standardized Root Mean Square Residual (SRMR).

The proposed measurement model had a total of 44 items, whereby a CFA was performed and the results of the model fit indices were as follows; CMIN/DF:1.409, CFI:0.905, RMSEA:0.049 with PCLOSE:0.577 and SRMR:0.061. Due to presence of low value of factor loadings of some of the items and high covariance estimates, some few modifications had to be made so as to improve the overall model fit. This led to the removal of five items (V302a, V304b, V402c, V601 and V606) and other items (V202d & V202e), (V401c & V401d) and (V402a & V402b) were made to co-vary resulting to 39 items of the modified measurement model.

The modifications made had a significant contribution to the improvement of the overall measurement model fit as the results of the model fit indices were as follows; CMIN/DF:1.209, CFI:0.960, RMSEA:0.035 with PCLOSE:0.999 and SRMR:0.052. Hence the modified measurement model was accepted for structural model analysis in hypothesis testing.

Table 4.17 CFA Model Fit Indices

Fit Indices	Cut off Points	Proposed Model	Modified Model
CMIN/DF	< 0.3	1.409	1.209
CFI	≥ 0.95	0.905	0.960
RMSEA	≤ 0.05	0.049	0.035
PCLOSE	> 0.05	0.577	0.999
SRMR	≤ 0.08	0.061	0.052

Source: Study findings (2019); Kline (2015)

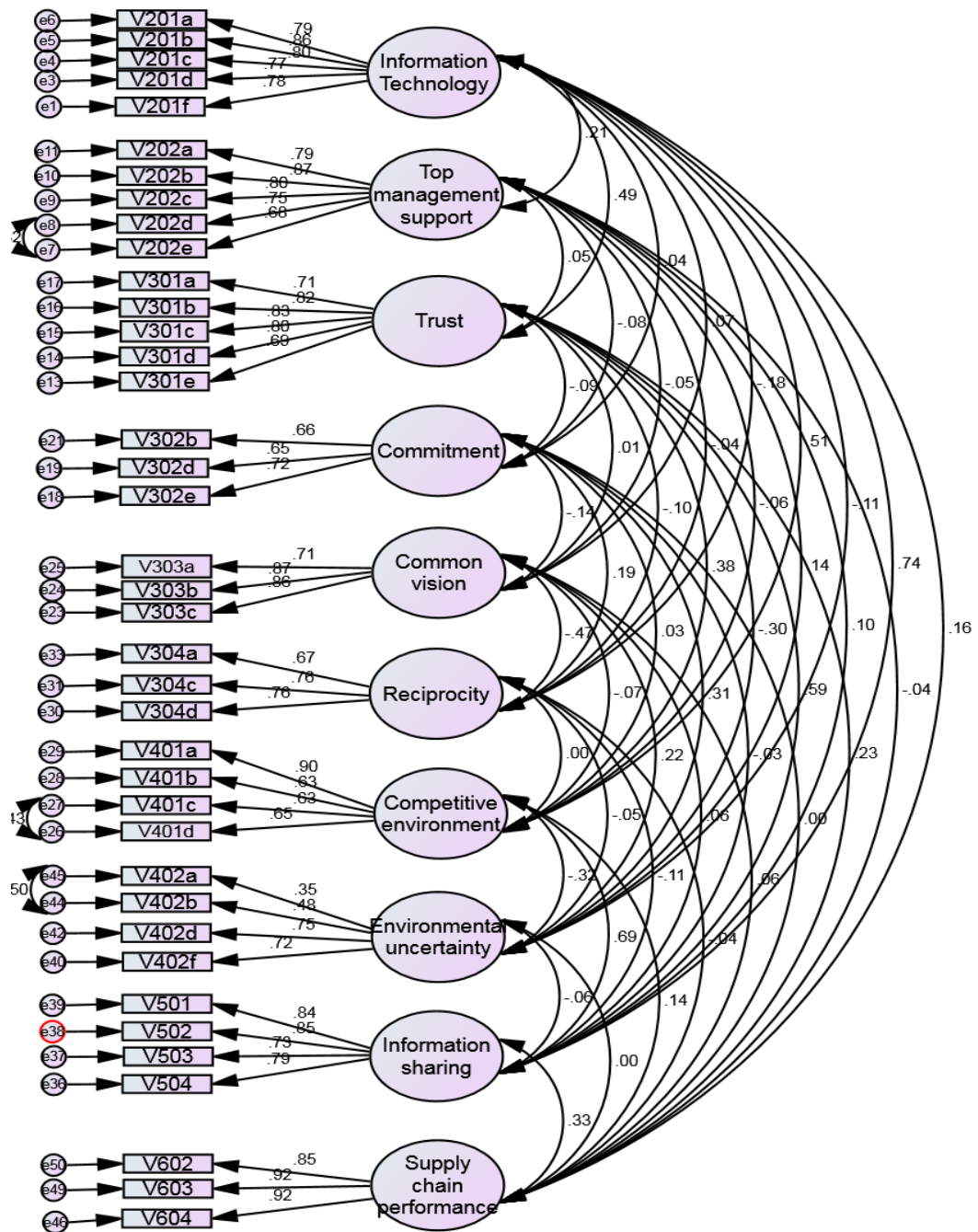


Figure 4.1 Confirmatory Factor Analysis

4.3 Structural Model

The structural model was developed from the modified measurement model as it had better model fit indices compared to the proposed measurement model. The model is comprised of direct relationships between factors influencing information sharing in the supply chain and information sharing, as well as between information sharing and supply chain performance. The model did not violate the multicollinearity assumption since the correlation of the independent variables were ranging from ($r = 0.001$) to ($r = 0.736$) which are below 0.8 cut off point as shown on the figure 4.1. For the structural model to be evaluated (hypothesis testing and interpretation of results) the model fit has to meet the set global fit indices (Kline, 2015), therefore we assessed the structural model fit before hypothesis testing.

4.3.1 Structural Model Fit

The structural model met the global fit indices as all of the fit indices adopted in the study were at acceptable values with due regard to the cut off points as recently suggested by Kline (2015). The structural model fit indices were as follows; CMIN/DF:1.201, CFI:0.961, RMSEA:0.035 with PCLOSE:0.999 and SRMR:0.054, hence the modified structural model was accepted for hypothesis testing.

Table 4.18 Structural Model Fit Indices

Fit Indices	Cut off Points	Modified Structural Model
CMIN/DF	< 0.3	1.201
CFI	≥ 0.95	0.961
RMSEA	≤ 0.05	0.035
PCLOSE	> 0.05	0.999
SRMR	≤ 0.08	0.054

Source: Study findings (2019); Kline (2015)

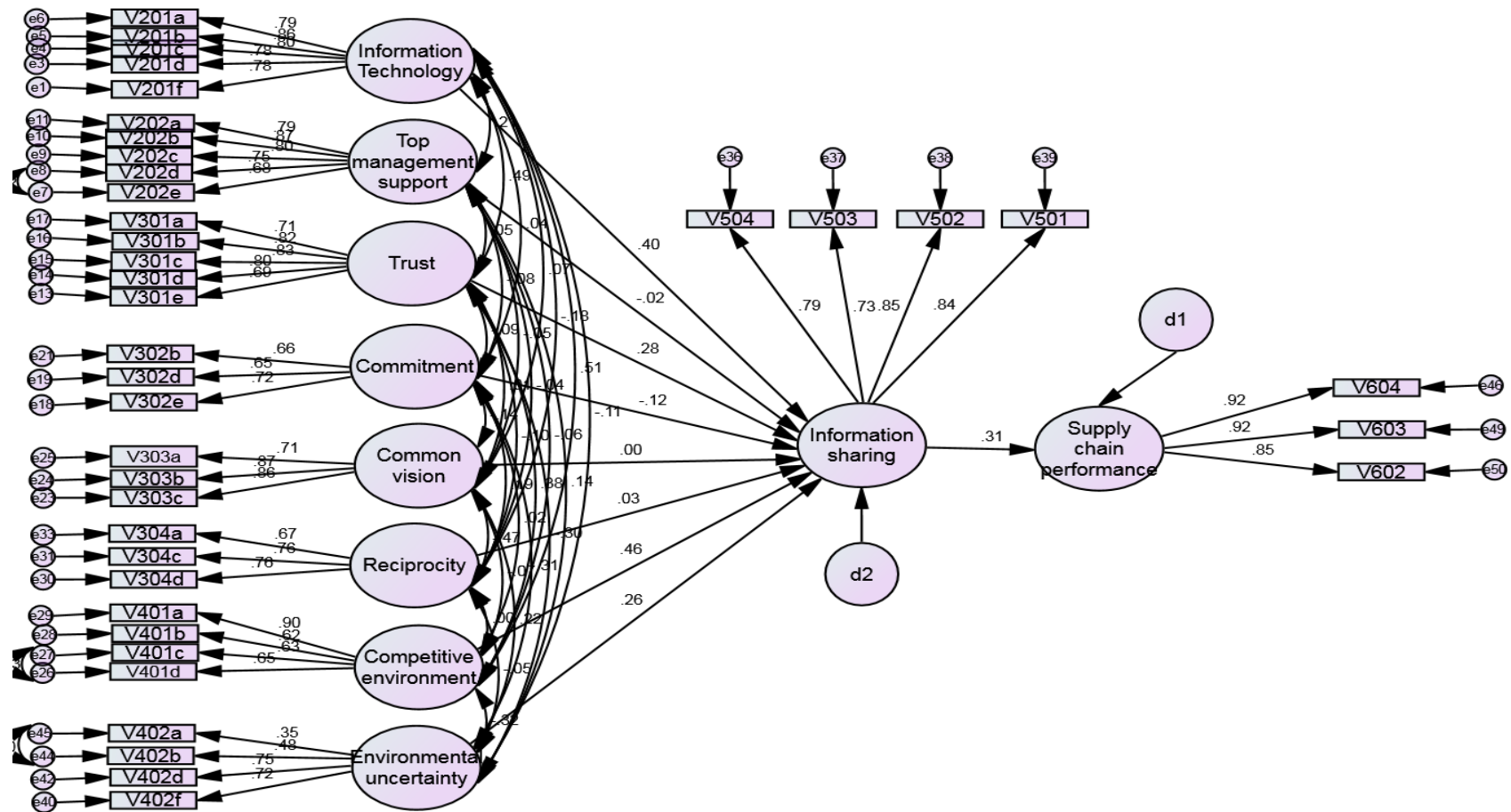


Figure 4.2 Structural model

4.3.2 Hypotheses Testing

Hypotheses were tested by using the modified structural model (path analysis) which was developed from the modified measurement model that had better fit indices compared to the proposed measurement model. Since the structural model met the global cut off points of the fit indices, hypotheses testing process was appropriate to be undertaken. The results of the tested hypotheses, were analyzed from the standardized regression weights of the structural model estimates. The study had four specific objectives as discussed in chapter one, that ended up having nine hypotheses as discussed in chapter two. The research hypotheses of the study were;

- H1: Information technology is positively related to information sharing in supply chain.
- H2: Top management support is positively related to information sharing in supply chain.
- H3: Trust is positively related to information sharing in supply chain.
- H4: Commitment is positively related to information sharing in supply chain.
- H5: Common vision is positively related to information sharing in supply chain.
- H6: Reciprocity is positively related to information sharing in supply chain.
- H7: Competitive environment is positively related to information sharing in supply chain.
- H8: Environmental uncertainty is positively related to information sharing in supply chain.
- H9: Information sharing is positively related to supply chain performance.

To determine at what extent are the changes in the dependent variables are the results of the effects in the changes of the independent variables, standardized regression weights had to be analyzed from the model estimates. The structural model regression weights discovered five significant paths out of nine as summarized on table 4.19

Table 4.19 Structural Model Regression weights

Variables Path	Std (β)	C.R	Significance (P)
Information technology → Information sharing	0.400	4.601	***
Top management support → Information sharing	-0.021	-0.339	0.734
Trust → Information sharing	0.282	3.733	***
Commitment → Information sharing	-0.120	-1.590	0.112
Common vision → Information sharing	0.003	0.036	0.971
Reciprocity → Information sharing	0.026	0.354	0.724
Competitive environment → Information sharing	0.462	5.043	***
Environmental uncertainty → Information sharing	0.256	2.906	0.004
Information sharing → Supply chain performance	0.311	3.763	***

Key: *** = P value < 0.001

Source: Study findings (2019)

4.3.2.1 Information technology and Information sharing

The structural model estimates indicated that the direct path from information technology to information sharing had a standardized regression weight of ($\beta = 0.400$, $P < 0.001$), implying that information sharing is positively influenced by the information technology. This means that when information technology goes up by 1 standard deviation, information sharing goes up by 0.400 standard deviations, hence Hypothesis one (H1) is supported.

4.3.2.2 Top management support and Information sharing

The structural model analysis found that there is no significant contribution of top management support in information sharing, since the estimates indicated that ($\beta = -0.021$, $P = 0.734$). This implies that there is a negative relationship between top management support and information sharing, however the relationship is not statistically significant since the p value is > 0.05 . In view of this results, hypothesis two (H2) was therefore rejected.

4.3.2.3 Trust and Information sharing

The structural model estimates based on standardized regression weights indicated that there is a significant positive relationship ($\beta = 0.282$, $P < 0.001$) between trust and information sharing in the supply chain. This implies that any increase in trust levels accounts for positive increase in information sharing as well, hence hypothesis three (H3) was supported.

4.3.2.4 Commitment and Information sharing

The path results between commitment and information sharing revealed that commitment is insignificantly influencing information sharing ($\beta = -0.120$, $P = 0.112$). This implies that commitment has negative impact in information sharing but it is not statistically significant as generalization of the population values cannot be made when the p-value exceeds 0.05 cut off point, hence hypothesis four (H4) was rejected.

4.3.2.5 Common vision and Information sharing

The structural model analysis found that there is no significant contribution of common vision in information sharing, since the estimates indicated that ($\beta = 0.003$, $P = 0.971$). This implies that there is a positive relationship between common vision and information sharing, however the relationship is not statistically significant since the p-value is > 0.05 . In view of this results, hypothesis five (H5) was rejected.

4.3.2.6 Reciprocity and Information sharing

The path results of the structural model between reciprocity and information sharing discovered that reciprocity is insignificantly influencing information sharing ($\beta = 0.026$, $P = 0.724$). This implies that reciprocity has negative impact in information sharing but it is not statistically significant as generalization of the population values cannot be made when the p-value exceeds 0.05 or 5% cut off point, hence hypothesis six (H6) was rejected.

4.3.2.7 Competitive environment and Information sharing

The structural model estimates indicated that the direct path from competitive environment to information sharing had a standardized regression weight of ($\beta = 0.462$, $P < 0.001$), implying that information sharing is positively influenced by the competitive environment. This means that when competitive environment goes up by 1 standard deviation, information sharing goes up by 0.462 standard deviations. Moreover, competitive environment accounts for the highest contribution to influencing information sharing compared to the rest of the independent variables since it has the highest standardized coefficient value, hence Hypothesis seven (H7) is supported.

4.3.2.8 Environmental uncertainty and Information sharing

The standardized regression weights from the structural model estimates showed that information sharing is significantly determined by environmental uncertainty ($\beta = 0.256$, $P = 0.004$). This implies that environmental uncertainty is positively related to information sharing, whereby higher levels of environmental uncertainty account for increase in information sharing within the supply chain, thus hypothesis eight (H8) is supported.

4.3.2.9 Information sharing and Supply chain performance

The structural model estimates based on standardized regression weights indicated that there is a significant positive relationship ($\beta = 0.311$, $P < 0.001$) between information sharing in the supply chain and supply chain performance. This implies that an increase in information sharing accounts for the positive increase in supply chain performance as the contribution is statistically significant, hence hypothesis nine (H9) was supported by the study results.

4.4 Hypotheses Testing Summary

The study comprised of 9 hypotheses as it was discussed in chapter 2 as a result of 4 specific objectives indicated in the chapter 1, Table 4.20 provides the general summary of all the hypotheses tested in this study. The study used SEM to test the direct effects of the exogenous variables to endogenous variables, whereby standardized regression weights were obtained from structural model estimates for analysis.

Table 4.20 Hypotheses Testing Summary

Factor(s)	Hypothesis	Independent Variable	Dependent Variable	Status
Intra-organizational Factors	H1	Information technology	Information sharing	Accepted
	H2	Top management support	Information sharing	Rejected
Inter-organizational Factors	H3	Trust	Information sharing	Accepted
	H4	Commitment	Information sharing	Rejected
	H5	Common vision	Information sharing	Rejected
	H6	Reciprocity	Information sharing	Rejected
Environmental Factors	H7	Competitive environment	Information sharing	Accepted
	H8	Environmental uncertainty	Information sharing	Accepted
Information sharing	H9	Information sharing	Supply chain performance	Accepted

Source: Study findings (2019)

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.0 Introduction

In line with the findings presented in chapter four, this chapter is hereby to make discussions pertaining the presented findings. The discussion was made to address the research objectives basing on the study findings. Therefore, the discussion was made by revising the findings presented, comparing the findings with those of other empirical studies, validating the findings with qualitative data as well as providing the theoretical implication of the findings. The main objective of the study was to assess the determinants of information sharing and the performance of supply chain, thus this chapter comprises of four sections addressing the specific research objectives namely;

- i. To determine the influence of intra-organizational factors on information sharing in the supply chain among beverage manufacturing companies in Dar es Salaam;
- ii. To ascertain the influence of inter-organizational factors on information sharing in the supply chain among beverage manufacturing companies in Dar es Salaam;
- iii. To determine the influence of environmental factors on information sharing in the supply chain among beverage manufacturing companies in Dar es Salaam;
- iv. To ascertain the influence of information sharing on the performance of the supply chain among beverage manufacturing companies in Dar es Salaam.

5.1 The Influence of Intra-organizational Factors on Information Sharing

In chapter 2, the study indicated that different scholars have used organization and its management features as a predictor of various aspects that involve organizational behavior and that's included information sharing. Whereby the study included two major factors, the information technology and top management support that resulted to have different conclusions on the influence of intra-organizational factors on information sharing as discussed in the following sections.

5.1.1 The influence of Information technology on Information Sharing

The findings as presented in chapter 4 supported the hypothesis made by the study by confirming that information technology has a significant contribution on the process of sharing information among supply chain members. The study findings are in line with the findings of Nicolaou et al., (2013), Li and Lin (2006) and Wang et al., (2013) who found that information technology is positively influencing the habit of supply chain members to share information with their trading partners. Moreover, Nicolaou et al., (2013) did not only find that information technology influences information sharing but also discovered that information technology is related to the quality of the generated and disseminated information.

The significance of information technology on influencing information sharing may be accredited by the fact that currently there is a high adoption level of information and communication technology (ICT) within the country compared to the previous years. According to Msuya, Mjema and Kundi (2018) Tanzania has risen from almost non-existence of ICT adoption in 2004 to more than 50% of adoption and use of computer, internet, website and email as a strategic tool for marketing and communication. Hence information technology plays a big role in facilitating information sharing in the supply chain.

Through interviews the respondents revealed that the beverage manufacturing companies have now invested much on the use of ICT, as most of them indicated that they use two or more of the technologies such as email, internet, mobile phones applications such as WhatsApp, electronic point of sales (EPOS) and websites to provide and receive information related to order information, inventory levels, product performances, sales and demand forecast. A respondent stated that:

We have been using a range of technologies to facilitate our communications, specifically we mostly use EPOS, ERP, emails and instant messaging applications such as WhatsApp to provide and receive information to/from our trading partners. These technologies have helped our company to increase the rate of information sharing that has a positive impact on our business performance as whole. (Respondent 2, 2019).

Another respondent stipulated that:

Due to the technological advancements that are made from with their effect on the competitive advantage, we have opted to invest much on ICT, since through it we can obtain real time information to facilitate immediate decisions that are reliable for accomplishment of our business goals. This is possible simply because we have direct means of communications to our trading partners that are fast and reliable. (Respondent 3, 2019)

Information technology advances provide opportunities for companies to integrate with their trading partners seamlessly at relative low cost. The major challenge is on how to integrate the available technologies to enhance information sharing as there are different adoption levels among them, but once full integration is enabled better exploit of information is enhanced. Moreover, Information technology does not only assist in sharing of information but also increases the ability of supply chain partners to utilize the shared information (Baihaqi & Sohal, 2013).

5.1.2 The Influence of Top Management Support on Information Sharing

Based on the hypothesis conclusion presented on chapter 4, the study concludes that top management support is not significantly associated to information sharing within the supply chain. The conclusion is unexpectedly as contrasts other findings such as Chen et al., (2014) who found that top management support was one among the major determinants of information sharing since it was found to be highly significant in influencing information sharing parallel to its quality and availability (see also: Lin & Huang, 2010; Spaho, 2011).

The insignificant relationship between top management support and information sharing within the supply chain may be explicated by the fact that most of the managers tend to hold or distort some of the information with the purpose of creating a competitive advantage over the supply chain partners that do not possess the actual information without knowing the actual benefits of sharing information accurately (Kembro & Näslund, 2014). For that case, the top management tend to decides on which kinds of information to share and not to share basing on their primary objectives of such acts. As reported by the respondent that;

The major role of top management in information sharing within our company, is to make sure that there are proper information management systems that will facilitate the gathering, processing, dissemination and use of information, however they are full responsible for deciding on the type of information to share and the extent of disclosing such information. Moreover, the decision to whom and when to share the particular information always is also determined by the top management, whereby some of the information tend to withheld for competitive gains. (Respondent 8, 2019)

Without the strong support from the top management by making a high involvement in the adoption of information systems and making all important information available to the trading partners within the supply chain without restrictions for individual competitive gains, will portray an image that top management is concerned in information sharing hence will further reassure cooperation and participation within the supply chain. Despite the results of this study of top management support being insignificant on influencing information sharing, but still top management support is regarded as a priority factor in information sharing within the supply chain.

Managers of the companies and their trading partners have to share an understanding on the specific and potential benefits of information sharing in the supply chain so as to overcome the inevitable contradictory interests among participating supply chain members. The top management should not only understand the importance of information sharing but should also provide guidance, vision and support for its implementation while creating organizational culture of sharing information timely and accurately (Spaho, 2011).

5.2 The influence of Inter-organizational Factors on Information Sharing

The inter-organizational factors used in the study were trust, commitment, common vision and reciprocity, where all of the factors are the result of SET and other empirical studies as discussed in chapter 2. With regard to the formulated hypotheses, the study had different conclusions on the factors as discussed on the following sections.

5.2.1 The influence of Trust on Information Sharing

The study has confirmed that there is a significant relationship between trust and information sharing within the supply chain, as for increase in trust levels among the trading partners the more they share information among themselves in their business

dealings. The study findings are comparable to Wu et al., (2014) who found that trust plays an influential role on determining information sharing and collaboration among supply chain members (see also: (Ebrahim-Khanjari et al., 2012; Kalyar et al., 2013; Lee & Fernando, 2015; Zaheer & Trkman, 2017)).

As more than 60% of the beverage manufacturing companies participated in the study have been in the business for more than 10 years, it means that a sense of trust between the companies and their trading partners have been generated over time. Due to their experience, these companies were possibly more capable to integrate and coordinate with the other supply chain partners that resulted to sharing of important production and market information as when trading partners stays longer in the business, trust with the members tend to increase over time, thus improving information sharing practices (Lee & Fernando, 2015).

The respondent said:

Trust is an important thing to us, as it helps us to build relationship between us and our trading partners that effective a collaborative way of executing business activities. We as the company, have employed several ways to ensure that trust is instilled by doing things such as: to provide necessary information required by our trading partners, maintaining our products quality as well as delivering and paying in time. (Respondent 9, 2019)

The respondents revealed that they consider trust as one of the important factors for them to share information within the supply chain, as once they are confident that the information provided will be of mutual benefits. They have been maintaining trust by ensuring that they fulfill the promises and agreements made in their business dealings while encouraging timely and effective communications with their trading partners.

One of the respondent's response was:

Trust is very important to us as it facilitates the achievement of improved relationship, we have to be able to rely on the information provided by our trading partners not to mention that we also have to be confident with supply chain partners on their capability to fully utilize the information obtained from us for mutual benefits. By having discovered so the process of sharing information is usually at ease. (Respondent 1, 2019)

Usually high degree of information sharing among supply chain members is built upon trust, as instead of asking trading partners to share information or relying on the shared information received from other partners, the companies have to focus on how they can build good relationships with their trading partners and thus having trust in each other which will result to sharing of information in timely manner and of good quality (Baihaqi & Sohal, 2013).

5.2.2 The influence of Commitment on Information Sharing

Based on the hypotheses testing results presented in chapter 4, the study concludes that commitment is insignificantly influencing information sharing within the supply chain. The findings are surprisingly as they are contrary not only to our hypothesis but also to the findings obtain by several other previous studies (see: Chao et al., 2013; Moshkdanian & Molahosseini, 2013; Vijayasathay, 2010; Zaheer & Trkman, 2017), who found that commitment significantly influences information sharing among supply chain partners.

The insignificance of commitment towards information sharing may be attributed to the fact that with the presence of intense competition in the beverage manufacturing industry, most of the trading partners tend to remain skeptical in maintain few long term business relationships instead they opt having multiple associations so as to be able to go with the flow once the business potentials change in a different direction. As to share strategic information brings about considerable business risks for partners, absence of commitment conveys uncertainty in the execution of continued future transactions (Lee et al., 2010).

However, through the conducted interviews it was revealed that commitment is one of the catalysts of information sharing in the supply chain though the levels of commitment were said to be quite low among supply chain members. Also, most of the respondents were associating commitment with trust but after analysis of the quantitative data the study discovered that there was no significant correlation between commitment and trust which was very surprising.

Respondent stated that: *“Information sharing is a catalyst of information sharing in our supply chain as every partner will share fully the information needed as they intend to do that so as to maintaining the existing relationship.”* (Respondent 4, 2019)

Another respondent also said: *“Yes, commitment is a catalyst of information sharing in our supply chain because it leads to trust hence achieving improve relationships”.* (Respondent 7, 2019)

Commitment also requires a long-term relationship to be developed as for trust in the supply chain. However, despite the fact that most of the companies participated in this study had experience of more than 10 years but being less committed to their partners could be caused by high levels of competition and the uncertainty in the industry which leads to supply chain partners to be more opportunistic.

5.2.3 The influence of Common Vision on Information Sharing

In our study, we surprisingly found that common vision is not a significant factor of information sharing within the supply chain. The results are in contrast to Fawcett et al., (2011) and Li and Lin (2006) findings as they found that common vision is positively influencing information sharing, since it was evident that with common vision in business relationship trading partners are encouraged to share more information.

Common vision is associated with the extent of correspondence of the configuration of values and beliefs among trading partners, where it incorporates how supply chain partners understand each other's expectations. Moreover, it needs the trading partners to precisely formulate objectives which are very clear and measurable in a mutual discourse in advance which is quite different in the context of Tanzanian beverage manufacturing industry since these acts are not so common in an extent that it has been so difficulty for trading partners to establish common vision through sufficient communication of formulated goals to enhance information sharing (Bronnenmayer et al., 2016).

The interviewed respondents revealed that most of the beverage companies do not set goals in cooperation with their trading partners, and during business transactions there

are times they do not even try to persuade the other parties to enter into collaborations that will favor both parties by taking into account the objectives of both parties. The respondent revealed that:

The emphasize in creating joint business goals in our industry is quite not common and difficulty to practice since most of the trading partners tend to have conflicting interests mainly caused by need for individual business gains. But with presence of common vision we could be able to reduce the level of uncertainty while enhancing effectiveness and efficiency in executing the set objectives. (Respondent 4, 2019)

The supply chain that is made up of partners who do not have shared vision such as the cultural and configuration of supply chain activities is likely to not only share less information but also to experience more negative behaviors and resistance that will reduce the quality of the information shared (Li & Lin, 2006). Hence despite of the insignificance of common vision on influencing information sharing in this study but still is an important aspect to be taken into consideration.

5.2.4 The influence of Reciprocity on Information Sharing

Accumulation and sharing of information has been associated with reciprocity, where it implies that the part receiving information from other parties is obliged to reciprocate so as to maintain the balance of benefits and offerings among them (Adler & Kwon, 2002; Haeussler, 2011). Surprisingly, our study found that reciprocity is not significantly influencing information sharing among trading partners in the supply chain. Unlike other studies that found reciprocity has a significant impact on the tendency of trading partners to share information among themselves (see: Bock et al., 2005; Chen & Hung, 2010; Zaheer & Trkman, 2017).

The insignificant of reciprocity on influencing the tendency of information sharing within the supply chain among the trading partners may be explained by the fact that all of the reciprocity measures used in the study except for fair policies had mean scores above 3. The equitable treatment by the company, positive contribution in the relationship and fair treatment by the trading partners had 3.2, 3.28 and 3.1 mean scores respectively. These mean scores indicated that the companies were not sure on their initiatives in the creating of strong sense of reciprocity in their business dealings in terms of having fair treatment from both sides and positively contributing on

maintaining the established relationships with the trading partners. Hence the insignificant influence of reciprocity may be attributed by the given realities. One of the respondents stated that:

The process of information sharing works very well when there is also reciprocity because both parties are assured to have something worth the risk taken to share the information. This is due to the fact that some of the information can be a source of competitive gain at individual level, however most of our companies have not formulated good policies concerning reciprocation of information resulting to low levels of information sharing. (Respondent 9, 2019)

Reciprocity can enhance the establishment of virtual business networks for both downstream and upstream that will enable the effective management of production-based activities as well distribution and marketing-based activities through access to information, thus supply chain members have to formulate good policies that will encourage information sharing among themselves (Wu et al., 2014).

5.3 The influence of Environmental Factors on Information Sharing

The Environmental factors used in the study were competitive environment and environment uncertainty, where all of the factors are the result of NT and other empirical studies as discussed in chapter 2. With regard to the formulated hypotheses, the study had conclusive conclusions on the factors as discussed on the following sections.

5.3.1 The influence of Competitive Environment on Information Sharing

In line with the hypothesis formulated in chapter 2, the study confirmed that competitive environment has significant contribution on influencing information sharing. The findings imply that higher levels of competitive environment in the supply chain results to higher levels of information sharing among the trading partners. Moreover, competitive environment was discovered to be the most important determiner of information sharing since it has the highest contribution compared to the rest of the determinants. These findings are similar to those of Huo et al., (2014), Jain et al., (2011), Zhou and Benton Jr (2007) who also found that competitive environment is one of the major drivers for enhancement of supply chain information sharing .

The study revealed that beverage industry is characterized with the presence of high competition pressure in the market, of which is neither caused by declining in customers' demand nor excess supply by the manufacturing companies but due the availability of variates of beverage products in the market. Hence the manufacturing companies have to find ways to win the market over the rivals, whereby effective information sharing is one among them. The sharing of information helps the companies to coordinate their supply chain effectively and efficiently as they are able to know the actual demand levels of the customers and their recurring changes. Moreover, with the provision of order status information and being ready to receive customers' feedback information on their products performances they have been able to make improvements on the quality and general standards of their products which helps to retain customers. The respondent had to say:

Yes, we get competitive advantage by sharing information as it is a way that our competitors use to win the market as well. Through information sharing with our trading partners, we get to know on the goods that are mostly demanded by the customers and at what levels are they needed, moreover for us to maintain our supplies from suppliers we have to provide all important information so as to smooth the execution of delivery and production activities. (Respondent 6, 2019)

Another respondent also stipulated that:

For us, sharing information is very helpful to us when it comes to creation of competitive advantage since it helps us to work as a team by focusing on achieving the same goals. We, the marketing department tend to gather information from our distributors and customers and we share them to our production department which communicates to purchasing and distribution departments so as to ensure that they take advantage of the provided information. (Respondent 2, 2019)

The competitive environment in the supply chain requires the firm to provide a high degree of customization, fast responses to the demands of the customers, short lead times and low costs in order to win the market over the rivals in which information sharing plays a big role in facilitating the same (Chiang & Feng, 2007; Li et al., 2006).

5.3.2 The influence of Environment Uncertainty on Information Sharing

The study confirmed that environmental uncertainty is significantly influencing information sharing, whereby this implies that higher levels of environmental uncertainty account for higher levels of information sharing within the supply chain. Hence the findings obtained supported the formulated hypothesis as discussed in the chapter 2 previously.

The influence of environmental uncertainty on information sharing has different opinions and conclusions, as there are previous studies that have found environmental uncertainty to have significant impact on information sharing while others found to have insignificant impact on information sharing. Hung et al., (2014) found that environmental uncertainty has significant influence on information sharing, while Chen et al., (2014) found that environmental uncertainty has insignificant influence not only on information sharing but also on information availability and quality, as well as Li and Lin (2006) who discovered that only two aspects of customer and technology uncertainty had significant influence as supplier uncertainty was found to have insignificant influence.

The respondents revealed that by sharing information it helps them to reduce the level of uncertainty in the supply chain and increase the performance, as the respondent said:

It is true that sharing information helps us to mitigate the associated challenges of environmental uncertainty, for example during demand fluctuations caused by changes in customers preferences and ordering of different products combinations we are able to cope with the changes due to the information obtained from our distributors. (Respondent 9, 2019)

The study found that the beverage industry supply chain is highly characterized with environmental uncertainty based on the presence of different products combination orders from the customers, customers preferences changes over time and rapid technological changes that have impact on the competitive advantage within the market. Hence, the companies are required to share as much information as possible in order to be able to get the details in advance on the prevailing changes so as to set plans on how to deal with those uncertainties. However, the challenge could be on

ensuring the reliability of the available information since environmental uncertainty can sometimes make information less reliable for decision making (Chen et al., 2014).

5.4 The influence of Information Sharing on the Supply Chain Performance

The findings as presented in chapter 4 supported the hypothesis made by the study by confirming that information sharing has a significant contribution on influencing supply chain performance among beverage manufacturing companies. The study findings are in line with the findings of Fawcett et al., (2007), Lotfi et al., (2013), Ajay and Maharaj (2010) who found that information sharing is positively influencing the supply chain performance.

Fawcett et al., (2007) examined the relationship between information sharing and supply chain performance by assessing two dimensions of information sharing based on willingness and connectivity, which were both found to have a significant positive influence on supply chain performance. Lotfi et al., (2013) stipulated that information sharing has a greater value in supply chain since the benefits achieved outweigh the costs involved hence improvement in the general performance of the supply chain. Furthermore, Ajay & Maharaj (2010) revealed that information sharing has a major effect on the overall cost of running supply chain, while improving the holistic management of the activities within the supply chain.

The study discovered that delivery schedule information is the most shared information by the beverage manufacturing companies for more than 40% followed by inventory levels data, demand forecasts and order status information. The significance of information sharing may be explained by the fact that information is the most important thing for companies to make decisions on their daily operations that impact their general performance. Hence, they are required to provide and receive information on different aspects so as to smoothly execute the company's activities with due regard to intense competitive environment and environmental uncertainty.

The respondents through interviews revealed that through sharing information with their distributors specifically on future demands or orders they certainly become able to reduce total production costs and increase the customer service level. They also argued that this is possible since they make a best use of their production capacities to

meet the speculated demand timely and efficiently so as to retain the given customers.

The respondent said:

Through information sharing we have been able to keep the required levels of stock hence minimizing inventory costs as much as possible while meeting the customers' demand. Moreover, it helps to maintain on time delivery to the customers and make improvements on the quality of our products through feedback so as to retain the customers we already have... (Respondent 6, 2019)

Another argued:

In our company we have a range of inventory control techniques, whereby vendor managed inventory is one among them. For this technique to work we are required to share as much information as possible not only with our suppliers but also with our wholesalers or distributors. By sharing information, we are able to reduce the bullwhip effect as a result we improve our business performance. (Respondent 10, 2019)

The other one said:

Information sharing helps us to improve our supply chain performance since it provides the basis for our company to make decisions, ensure right time delivery of customers' orders, and also helps the company to know about the changes in the market in terms of preferences and technology so as to set strategies to overcome the prevailing changes. (Respondent 5, 2019)

Different factors could influence the performance of supply chain, among those information sharing is one of the vital ones. Information is needed for members in the supply chain to plan and coordinate their activities by incorporating projections from downstream to upstream supply chain. With sharing of appropriate information that leads to coordination of replenishments, production and distribution decisions under the competitive market with risk of uncertainties, it is possible to further reduce costs and improve customer services levels (Zhao, Xie & Zhang, 2002).

CHAPTER SIX

SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

6.0 Introduction

This chapter comprises of summary of the study, conclusions based on the research objectives, and implication of the study findings to different stakeholders. The summary gives in brief on what was the study about with regard to the general and specific objectives, the methodology used to in the conduction of the study and the findings obtained at the end of the study. The conclusions will be drawn out from the specific objectives by entailing how the said research objectives were accomplished. Lastly, the study will give out insights on how the findings can be useful to different stakeholders that are directly concerned with the study.

6.1 Summary

The main objective of the study was to assess the factors influencing information sharing and the performance of the supply chain. Consequently, for this objective to be fulfilled the study had to investigate the influence of intra-organizational factors, inter-organizational factors and environmental factors on information sharing among beverage manufacturing companies, as well as the influence of information sharing on supply chain performance among beverage manufacturing companies. The study employed a mixed research design as both quantitative and qualitative approaches were used. The beverage manufacturing companies located in Dar es Salaam were the unit of analysis from whom data were collected with the use of online survey and personal interviews so as to validate the study findings. Structural equation modeling and explanation building process were used for analysis of quantitative and qualitative data respectively.

6.2 Conclusions

Based on the study findings, can be concluded that despite the insignificance of some factors in our study, all of the investigated factors have provided good explanations on the facilitation of information sharing and how information sharing among supply chain members can enhance supply chain performance as whole. Hence the findings

provide insights to supply chain members and other stakeholders on what major undertakings should be put into act so as to improve the level of information sharing and the performance of supply chain in both aspects of individual level and as whole.

6.2.1 Intra-organizational Factors and Information Sharing

The first objective was to assess the influence of intra-organizational factors on information sharing in the supply chain among beverage manufacturing companies, where information technology and top management support were adopted as major factors with regard to resource based-view theory and other empirical studies. The study provides varying conclusions with respect to the proposed hypotheses as discussed in chapter 2.

The study concludes that information technology significantly influences information sharing while top management support insignificantly influences information sharing in the supply chain. The information technology factor exhibited positive relationship with information sharing which could be attributed to high ICT adoption level by most of the SME's in Tanzania, hence high levels of information technology results to higher levels of information sharing among supply chain members.

However, the insignificance of top management support on influencing information sharing in the supply chain among beverage manufacturing companies may be explained by the fact that managers tend to withhold some of the information for competitive advantage purpose. This is due o the fact that, the top management is the one responsible for determination on the extent of sharing information in terms of what information to share and with whom to share.

6.2.2 Inter-organizational Factors and Information Sharing

The second objective of the study focused on ascertaining the influence of inter-organizational factors on supply chain performance among beverage manufacturing companies. Four hypotheses were made based on SET with four variables termed as trust, commitment, common vision and reciprocity. The study had varying conclusions with regard to the hypotheses and study actual findings.

The study confirmed that trust has significant relationship with information sharing while commitment, common vision and reciprocity were surprisingly found to have insignificant contribution to information sharing in the supply chain. The significance of trust was attributed to the business experience of the companies as majority have been in the business for more than ten years.

Moreover, the study concludes that there is no good state of relationship management between the beverage manufacturing companies and their trading partners as commitment, common vision and reciprocity were found to insignificantly influence information sharing. SET emphasizes on the creation of strong relationships among trading partners for exchange activities to take place smoothly, where things such as commitment, common vision and reciprocity can be established.

6.2.3 Environmental Factors and Information Sharing

The third objective of the study was about assessing the influence of environmental factors on supply chain performance among beverage manufacturing companies. Competitive environment and environmental uncertainty were the major factors as a result of review of network theory and other empirical studies.

The study concludes that both the competitive environment and environmental uncertainty have significant relationship with information sharing in the supply chain, since were found to exert positive influence on information sharing, implying that higher levels of competitive environment and environmental uncertainty account for higher levels of information sharing as well in the supply chain.

The significance of competitive environment and environmental uncertainty are due to the fact that the beverage manufacturing industry is characterized with high level of business competition in a sense that sharing of strategic information is required so as to foster means of being ahead of other competitors. Moreover, the habit of sharing information enables the companies to reduce the level of uncertainty and the effects of bullwhip which are mainly caused by lack of reliable information or distortion of available information.

6.2.4 Information Sharing and Supply Chain Performance

The study confirmed that information sharing is a significant determiner of supply chain performance among beverage manufacturing companies. The study concludes that information sharing is positively related to supply chain performance, implying that for every increase in information sharing level results to increase in the performance levels of the supply chain.

The significance of information sharing on influencing supply chain performance is attributed to the fact that information is the most important thing for companies to make decisions on their daily activities. Through making informed decisions, the companies are able to effectively and efficiently execute their set plans so as to achieve the short-term and long-term goals. Hence, they are required to provide and receive information on different aspects so as to smoothly execute the company's activities with due regard to intense competitive pressure and environmental uncertainty.

6.3 Implications of the Study

The study has different implications to various stakeholders of supply chain activities whether in beverage industry or other chains. The implications provide insights on both the theoretical and practical perspectives, where on theoretical part focuses on the theories used in the study while practical implications are all about the significance of the study to the policy and managerial issues to those concerned.

6.3.1 Theoretical Implications

The study has integrated three supply chain theories RBV, SET and NT and provided evidence that the explanation of information sharing and supply chain performance cannot be fully explained by a single theory in the developing countries. With the integration of the theories it was confirmed that information sharing is influenced jointly by intra-organizational factors, inter-organizational factors and environmental factors. In conclusion, this study is the first in Tanzania that has extensively investigated the explanation of the factors influencing information sharing and how that can result to improvement of supply chain performance among beverage manufacturing companies in Tanzania.

The methodology used in the study incorporated both quantitative and qualitative designs which is quite different for the same studies conducted in the developed countries as most of the studies only adopted one type of design either quantitative or qualitative only. Hence it has paved a way for other studies to be conducted under mixed research approach so as to validate the findings through the use of both designs.

In terms of empirical evidence contribution, this study has extended previous researches conducted in other countries by not only investigating the factors influencing information sharing but also examining the effect of information sharing on supply chain performance. The study has empirically confirmed the presence of relationship between information sharing and supply chain performance apart from the relationship between information sharing and its determinants.

6.3.2 Practical Implications

This section presents the implications of the study findings to various stakeholders of supply chain activities that include: beverage manufacturing companies, trading partners of beverage manufacturing companies, training institutions and policy makers.

6.3.2.1 Implications for Manufacturers

The study has concluded that supply chain performance is influenced by information sharing within the supply chain, where it has also confirmed that information sharing is a byproduct of information technology, trust, competitive environment and environmental uncertainty factors. Hence the manufacturers whether in beverage industry or other industries have to put more focus on these factors so as to be able to develop strategies that could help them to share more information as possible while ensuring its quality and reliability for better results of supply chain performance. Moreover, due to insignificance of other factors specifically the top management support, commitment, common vision and reciprocity that have been significant in other studies conducted in developed countries, means the manufacturers within the country has to invest more in good management practices as well as relationship management practices with their trading partners so as to enhance effective and

efficient provision of resources and communications that will result to more sharing of information.

6.3.2.2 Implications for Manufacturers' Trading Partners

The study has found that supply chains are usually characterized with highly competitive pressure and environmental uncertainty in which the manufacturers are in a dilemma on how to gain competitive advantage in an uncertain environment. Due to that the suppliers, wholesalers and retailers have a great chance of assisting the manufacturers through sharing of information related to order requirements, demand changes, service levels required and quality improvements. To make this happen the incorporation of the study findings is crucial to the trading partners so as to be in a better position for establishment of long-term business relationships with the manufacturers to improve the supply chain performance as a whole.

6.3.2.3 Implications for Policy Makers

The discoveries of this study should be important to the policy makers in Tanzania to establish more improvements in the development of ICT and protection of information shared in business dealings. Despite the major undertakings that have already been made by the government in ensuring data protection and privacy such as establishment of Cybercrime Act 2015, Online content regulations 2018 and Access to information Act 2016 as well as on investments made on development of ICT, still more need to be done due to the fact that there are new technological changes day by day and there could be loops on data protection that prevent trading partners from sharing sensitive information in the supply chain.

6.4 Limitations of the Study

The study had encountered some limitations of which in one way or the other could limit its generalizability. First, the study did not have a sampling framework, which resulted to the adoption of snowball sampling technique which could be subjected to some sort of biasness in the study. Moreover, the study was only conducted at one city due to time, financial and human resources. Hence the generalization of the study findings should be done with care.

6.5 Area for further Research

As for the future studies, the researcher suggests more research to be done in the study as it is first of its kind in Tanzania where there should be a use of probabilistic sampling techniques that have to geographically cover a large area (more than one city). Moreover, the study should expand its scope by taking into account the indirect effects of factors influencing information sharing on supply chain performance as they have been ignored in this study.

REFERENCES

- Adler, P. S., & Kwon, S.-W. (2002). Social capital: Prospects for a new concept. *Academy of management review*, 27(1), 17–40.
- Agan, Y. (2011). Impact of operations, marketing, and information technology capabilities on supply chain integration. *Journal of Economic and social research*, 13(1), 27.
- Ajay, A., & Maharaj, M. (2010). Effects of Information Sharing within Supply Chains. *Proceeding to SACLA*.
- Amit, R., & Schoemaker, P. J. H. (1993). Strategic assets and organizational rent. *Strategic management journal*, 14(1), 33–46.
- Baihaqi, I., & Sohal, A. S. (2013). The impact of information sharing in supply chains on organisational performance: An empirical study. *Production Planning & Control*, 24(8-9), 743–758.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of management*, 17(1), 99–120.
- Barratt, M., & Barratt, R. (2011). Exploring internal and external supply chain linkages: Evidence from the field. *Journal of Operations Management*, 29(5), 514–528.
- Basnet, C., Childerhouse, P., Foulds, L. R., & Martin, V. (2006). Sustaining supply chain management in New Zealand. *International Journal of Logistics Systems and Management*, 2(3), 217–229.
- Beamon, B. M. (1999). Measuring supply chain performance. *International journal of operations & production Management*, 19(3), 275–292.
- Bock, G.-W., Zmud, R. W., Kim, Y.-G., & Lee, J.-N. (2005). Behavioral intention formation in knowledge sharing: Examining the roles of extrinsic motivators, social-psychological forces, and organizational climate. *MIS Quarterly*, 87–111.

- Boh, W. F., & Wong, S.-S. (2015). Managers versus co-workers as referents: Comparing social influence effects on within-and outside-subsidary knowledge sharing. *Organizational Behavior and Human Decision Processes*, 126, 1–17.
- Bronnenmayer, M., Wirtz, B. W., & Göttel, V. (2016). Determinants of perceived success in management consulting: An empirical investigation from the consultant perspective. *Management Research Review*, 39(6), 706–738.
- Chao, C.-M., Yu, C.-T., Cheng, B.-W., & Chuang, P.-C. (2013). Trust and commitment in relationships among medical equipment suppliers: Transaction cost and social exchange theories. *Social Behavior and Personality: an international journal*, 41(7), 1057–1069.
- Chen, C.-J., & Hung, S.-W. (2010). To give or to receive? Factors influencing members' knowledge sharing and community promotion in professional virtual communities. *Information & Management*, 47(4), 226–236.
- Chen, J. V., Wang, C.-L., & Yen, D. C. (2014). A causal model for supply chain partner's commitment. *Production Planning & Control*, 25(9), 800–813.
- Chiang, W. K., & Feng, Y. (2007). The value of information sharing in the presence of supply uncertainty and demand volatility. *International Journal of Production Research*, 45(6), 1429–1447.
- Coote, L. V., Forrest, E. J., & Tam, T. W. (2003). An investigation into commitment in non-Western industrial marketing relationships. *Industrial Marketing Management*, 32(7), 595–604.
- Creswell, J. (1998). W.(1998). *Qualitative inquiry and research design: Choosing among five traditions*, 2.
- Denolf, J. M. (2014). *Critical success factors for implementing supply chain information systems: Insights from the pork industry*: Wageningen University.
- Ebrahim-Khanjari, N., Hopp, W., & Iravani, S. (2012). Trust and information sharing in supply chains. *Production and Operations Management*, 21(3), 444–464.

- Fawcett, S. E., Osterhaus, P., Magnan, G. M., Brau, J. C., & McCarter, M. W. (2007). Information sharing and supply chain performance: The role of connectivity and willingness. *Supply Chain Management: An International Journal*, 12(5), 358–368.
- Fawcett, S. E., Wallin, C., Allred, C., Fawcett, A. M., & Magnan, G. M. (2011). Information technology as an enabler of supply chain collaboration: A dynamic-capabilities perspective. *Journal of Supply Chain Management*, 47(1), 38–59.
- Ganotakis, P., Hsieh, W.-L., & Love, J. H. (2013). Information systems, inter-functional collaboration and innovation in Taiwanese high-tech manufacturing firms. *Production Planning & Control*, 24(8-9), 837–850.
- Gerbing, D. W., & Anderson, J. C. (1985). The effects of sampling error and model characteristics on parameter estimation for maximum likelihood confirmatory factor analysis. *Multivariate behavioral research*, 20(3), 255–271.
- Gunasekaran, A., Patel, C., & Tirtiroglu, E. (2001). Performance measures and metrics in a supply chain environment. *International journal of operations & production Management*, 21(1/2), 71–87.
- Haeussler, C. (2011). Information-sharing in academia and the industry: A comparative study. *Research Policy*, 40(1), 105–122.
- Håkansson, H., & Ford, D. (2002). How should companies interact in business networks? *Journal of business research*, 55(2), 133–139.
- Hall, H. (2003). Borrowed theory: Applying exchange theories in information science research. *Library & Information Science Research*, 25(3), 287–306.
- Halldorsson, A. (2002). *Third Party Logistics. A means to configure logistics resources and competencies*: Handelshojkolen i Kobenhavn.
- Halldorsson, A., Kotzab, H., Mikkola, J. H., & Skjøtt-Larsen, T. (2007). Complementary theories to supply chain management. *Supply Chain Management: An International Journal*, 12(4), 284–296.
- Handfield, R. B., Handfield, R., & Nichols Jr, E. L. (2002). *Supply chain redesign: Transforming supply chains into integrated value systems*: FT Press.

- Hox, J. J., & Bechger, T. M. (1998). An introduction to structural equation modeling.
- Huang, G. Q., Lau, J. S. K., & Mak, K. L. (2003). The impacts of sharing production information on supply chain dynamics: A review of the literature. *International Journal of Production Research*, 41(7), 1483–1517.
- Humphreys, P.K., Lai, M.K., & Sculli, D. (2001). An inter-organizational information system for supply chain management. *International Journal of Production Economics*, 70(3), 245–255. [https://doi.org/10.1016/S0925-5273\(00\)00070-0](https://doi.org/10.1016/S0925-5273(00)00070-0)
- Hung, W.-H., Lin, C.-P., & Ho, C.-F. (2014). Sharing information in a high uncertainty environment: Lessons from the divergent differentiation supply chain. *International Journal of Logistics Research and Applications*, 17(1), 46–63.
- Hunt, S. D., Lambe, C. J., & Wittmann, C. M. (2002). A theory and model of business alliance success. *Journal of Relationship Marketing*, 1(1), 17–35.
- Huo, B., Zhao, X., & Zhou, H. (2014). The effects of competitive environment on supply chain information sharing and performance: An empirical study in China. *Production and Operations Management*, 23(4), 552–569.
- Huong Tran, T. T., Childerhouse, P., & Deakins, E. (2016). Supply chain information sharing: Challenges and risk mitigation strategies. *Journal of Manufacturing Technology Management*, 27(8), 1102–1126.
- Jain, A., Seshadri, S., & Sohoni, M. (2011). Differential pricing for information sharing under competition. *Production and Operations Management*, 20(2), 235–252.
- Johanson, J., & Mattsson, L.-G. (1987). Interorganizational relations in industrial systems: A network approach compared with the transaction-cost approach. *International Studies of Management & Organization*, 17(1), 34–48.
- Kalyar, M. N., Naveed, T., Anwar, M. S., & Iftikhar, K. (2013). Supply chain information integration: Exploring the role of institutional forces and trust. *Journal of Business Administration and Education*, 3(1).
- Kantor, P., Muresan, G., Roberts, F., Zeng, D. D., Wang, F.-Y., Chen, H., . . . Yen, J. (Eds.) 2005. *Information Supply Chain: A Unified Framework for Information-Sharing: Intelligence and Security Informatics*: Springer Berlin Heidelberg.

- Kembro, J., & Näslund, D. (2014). Information sharing in supply chains, myth or reality? A critical analysis of empirical literature. *International Journal of Physical Distribution & Logistics Management*, 44(3), 179–200.
- Kembro, J., Näslund, D., & Olhager, J. (2017). Information sharing across multiple supply chain tiers: A Delphi study on antecedents. *International Journal of Production Economics*, 193, 77–86.
- Khan, M., Hussain, M., Papastathopoulos, A., & Manikas, I. (2018). Trust, information sharing and uncertainty: An empirical investigation into their impact on sustainability in service supply chains in the United Arab Emirates. *Sustainable Development*.
- Kilangi, A. M. (2012). The Determinants of ICT Adoption and Usage among SMEs: : The Case of the Tourism Sector in Tanzania.
- Kim, S. M., & Mahoney, J. T. (2006). Mutual commitment to support exchange: Relation-specific IT system as a substitute for managerial hierarchy. *Strategic management journal*, 27(5), 401–423.
- Klein, & Rai. (2009). Interfirm Strategic Information Flows in Logistics Supply Chain Relationships. *MIS Quarterly*, 33(4), 735. <https://doi.org/10.2307/20650325>
- Kline, R. B. (2015). *Principles and practice of structural equation modeling*: Guilford publications.
- Kothari, B. L. (2007). *Research methodology: Tools and techniques*: ABD Publishers.
- Lee, B.-C., Kim, P.-S., Hong, K.-S., & Lee, I. (2010). Evaluating antecedents and consequences of supply chain activities: An integrative perspective. *International Journal of Production Research*, 48(3), 657–682.
- Lee, H. L., & Whang, S. (2000). Information sharing in a supply chain. *International Journal of Manufacturing Technology and Management*, 1(1), 79–93.
- Lee, H. K., & Fernando, Y. (2015). The antecedents and outcomes of the medical tourism supply chain. *Tourism Management*, 46, 148–157.
- Li, J., Sikora, R., Shaw, M. J., & Tan, G. W. (2006). A strategic analysis of inter organizational information sharing. *Decision support systems*, 42(1), 251–266.

- Li, S., & Lin, B. (2006). Accessing information sharing and information quality in supply chain management. *Decision support systems*, 42(3), 1641–1656.
- Li, S., Rao, S. S., Ragu-Nathan, T. S., & Ragu-Nathan, B. (2005). Development and validation of a measurement instrument for studying supply chain management practices. *Journal of Operations Management*, 23(6), 618–641.
- Lin, H.-F. (2007). Effects of extrinsic and intrinsic motivation on employee knowledge sharing intentions. *Journal of information science*, 33(2), 135–149.
- Lin, T.-C., & Huang, C.-C. (2010). Withholding effort in knowledge contribution: The role of social exchange and social cognitive on project teams. *Information & Management*, 47(3), 188–196.
- Lotfi, Z., Mukhtar, M., Sahran, S., & Zadeh, A. T. (2013). Information sharing in supply chain management. *Procedia Technology*, 11, 298–304.
- Marczyk, G., DeMatteo, D., & Festinger, D. (2005). *Essentials of research design and methodology*: John Wiley & Sons Inc.
- Marinagi, C., Trivellas, P., & Reklitis, P. (2015). Information quality and supply chain performance: The mediating role of information sharing. *Procedia-Social and Behavioral Sciences*, 175, 473–479.
- Maskey, R., Fei, J., & Nguyen, H.-O. (Eds.) 2015. *Identifying the factors affecting information sharing in supply chain-A systematic review of the literature*.
- Mentzer, J. T., DeWitt, W., Keebler, J. S., Min, S., Nix, N. W., Smith, C. D., & Zacharia, Z. G. (2001). Defining supply chain management. *Journal of Business logistics*, 22(2), 1–25.
- Mentzer, J. T., Min, S., & Zacharia, Z. G. (2000). The nature of interfirm partnering in supply chain management. *Journal of Retailing*, 76(4), 549–568.
- Monczka, R. M., Petersen, K. J., Handfield, R. B., & Ragatz, G. L. (1998). Success factors in strategic supplier alliances: The buying company perspective. *Decision sciences*, 29(3), 553–577.
- Morgan, D. L. (1998), Practical strategies for combining qualitative and quantitative methods: Applications to health research: *Qualitative Health Research*, 8(3), 362-376.

- Morse, J. M. (Ed.). (1994). *Critical issues in qualitative research methods*. Sage.
- Moshkdanian, F., & Molahosseini, A. (2013). Impact of supply chain integration on the performance of Bahman Group. *Interdisciplinary Journal of Contemporary Research in Business*, 5(1), 184–192.
- Narayan, D., & Cassidy, M. F. (2001). A dimensional approach to measuring social capital: Development and validation of a social capital inventory. *Current sociology*, 49(2), 59–102.
- Narayandas, D., & Rangan, V. K. (2004). Building and sustaining buyer–seller relationships in mature industrial markets. *Journal of Marketing*, 68(3), 63–77.
- Ndunguru, P. C. (2007). Research methodology for social sciences. *Research Information and Publication Department, Mzumbe*.
- Nicolaou, A. I., Ibrahim, M., & van Heck, E. (2013). Information quality, trust, and risk perceptions in electronic data exchanges. *Decision support systems*, 54(2), 986–996.
- Oliver, C. (1990). Determinants of interorganizational relationships: Integration and future directions. *Academy of management review*, 15(2), 241–265.
- Omar, R., Ramayah, T., Lo, M.-C., Sang, T. Y., & Siron, R. (2010). Information sharing, information quality and usage of information technology (IT) tools in Malaysian organizations. *African Journal of Business Management*, 4(12), 2486–2499.
- Pallant, J. (2013). *SPSS survival manual*: McGraw-Hill Education (UK).
- Pituch, K. A., & Stevens, J. P. (2015). *Applied multivariate statistics for the social sciences: Analyses with SAS and IBM's SPSS*: Routledge.
- Premkumar, G., & Ramamurthy, K. (1995). The role of interorganizational and organizational factors on the decision mode for adoption of interorganizational systems. *Decision sciences*, 26(3), 303–336.
- Qrunfleh, S., & Tarafdar, M. (2014). Supply chain information systems strategy: Impacts on supply chain performance and firm performance. *International Journal of Production Economics*, 147, 340–350.

- Rashed, C. A. A., Azeem, A., & Halim, Z. (2010). Effect of information and knowledge sharing on supply chain performance: A survey based approach. *Journal of Operations and Supply Chain Management*, 3(2), 61–77.
- Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students*: Pearson education.
- Siau, K., & Tian, Y. (2004). Supply chains integration: Architecture and enabling technologies. *Journal of Computer Information Systems*, 44(3), 67–72.
- Simon, A., Kumar, V., Schoeman, P., Moffat, P., & Power, D. (2011). Strategic capabilities and their relationship to organisational success and its measures: Some pointers from five Australian studies. *Management Decision*, 49(8), 1305–1326.
- Spaho, A. (2011). Determinants of Information Sharing in Supply Chain among Manufacturing and Trading companies in Albania: A Discriminant Analysis. *EuroEconomica*, 29(3), 75–85.
- Spekman, R. E., Kamauff Jr, J. W., & Myhr, N. (1998). An empirical investigation into supply chain management: A perspective on partnerships. *Supply Chain Management: An International Journal*, 3(2), 53–67.
- Stafford, L. (2008). Social exchange theories. *Engaging theories in interpersonal communication: Multiple perspectives*, 377–389.
- Stair, R., & Reynolds, G. (2013). *Principles of information systems*: Cengage Learning.
- Suhr, D. (2006). The basics of structural equation modeling. *Presented: Irvine, CA, SAS User Group of the Western Region of the United States (WUSS)*.
- Tan, C. N.-L., & Ramayah, T. (2014). The role of motivators in improving knowledge-sharing among academics. *Information Research: An International Electronic Journal*, 19(1), n1.
- Tan, K.-C., Kannan, V. R., Handfield, R. B., & Ghosh, S. (1999). Supply chain management: An empirical study of its impact on performance. *International journal of operations & production Management*, 19(10), 1034–1052.

- Tanaka, J. S. (1993). Multifaceted conceptions of fit in structural equation models. *Sage focus editions*, 154, 10.
- Vallandingham, L. R., & Sangachhen, S. (2016). *Role of Information in an SME in a Local Food Supply Chain-Case Study of a Norwegian Craft Beer Retailer: NTNU*.
- Vijayasarathy, L. R. (2010). Supply integration: An investigation of its multi-dimensionality and relational antecedents. *International Journal of Production Economics*, 124(2), 489–505. <https://doi.org/10.1016/j.ijpe.2010.01.010>
- Wang, E. T. G. (2001). Linking organizational context with structure: A preliminary investigation of the information processing view. *Omega*, 29(5), 429–443.
- Wang, E. T. G., Hu, H.-F., & Hu, P. J.-H. (2013). Examining the role of information technology in cultivating firms' dynamic marketing capabilities. *Information & Management*, 50(6), 336–343.
- Ward, P. T., Duray, R., Leong, G. K., & Sum, C.-C. (1995). Business environment, operations strategy, and performance: An empirical study of Singapore manufacturers. *Journal of Operations Management*, 13(2), 99–115.
- Wei, H.-L., Wong, C. W. Y., & Lai, K.-h. (2012). Linking inter-organizational trust with logistics information integration and partner cooperation under environmental uncertainty. *International Journal of Production Economics*, 139(2), 642–653.
- Weston, R., & Gore Jr, P. A. (2006). A brief guide to structural equation modeling. *The counseling psychologist*, 34(5), 719–751.
- Widén-Wulff, G., & Ginman, M. (2004). Explaining knowledge sharing in organizations through the dimensions of social capital. *Journal of information science*, 30(5), 448–458.
- Wu, L., Chuang, C.-H., & Hsu, C.-H. (2014). Information sharing and collaborative behaviors in enabling supply chain performance: A social exchange perspective. *International Journal of Production Economics*, 148, 122–132.

- Wu, W.-Y., Chiag, C.-Y., Wu, Y.-J., & Tu, H.-J. (2004). The influencing factors of commitment and business integration on supply chain management. *Industrial Management & Data Systems*, 104(4), 322–333.
- Xiao, J., Xie, K., & Hu, Q. (2013). Inter-firm IT governance in power-imbalanced buyer–supplier dyads: Exploring how it works and why it lasts. *European Journal of Information Systems*, 22(5), 512–528.
- Xiao, Y., Zheng, X., Pan, W., & Xie, X. (2010). Trust, relationship commitment and cooperative performance: Supply chain management. *Chinese management studies*, 4(3), 231–243.
- Yang, J., Wang, J., Wong, C. W. Y., & Lai, K.-h. (2008). Relational stability and alliance performance in supply chain. *Omega*, 36(4), 600–608.
- Yigitbasioglu, O. M. (2010). Information sharing with key suppliers: A transaction cost theory perspective. *International Journal of Physical Distribution & Logistics Management*, 40(7), 550–578.
- Yin, R. K. (2009). Case study research: Design and methods (applied social research methods). *London and Singapore: Sage*.
- Yu, W., Jacobs, M. A., Salisbury, W. D., & Enns, H. (2013). The effects of supply chain integration on customer satisfaction and financial performance: An organizational learning perspective. *International Journal of Production Economics*, 146(1), 346–358.
- Yu, Z., Yan, H., & Edwin Cheng, T. C. (2001). Benefits of information sharing with supply chain partnerships. *Industrial Management & Data Systems*, 101(3), 114–121.
- YUROV, K. M., & MONTES BOTELLA, J. L. (2014). Trust and IT innovation in asymmetric environments of the supply chain management process. *Journal of Computer Information Systems*, 54(3).
- Zaheer, N., & Trkman, P. (2017). An information sharing theory perspective on willingness to share information in supply chains. *The International Journal of Logistics Management*, 28(2), 417–443.

- Zhao, X., Huo, B., Flynn, B. B., & Yeung, J. H. Y. (2008). The impact of power and relationship commitment on the integration between manufacturers and customers in a supply chain. *Journal of Operations Management*, 26(3), 368–388.
- Zhao, X., Xie, J., & Zhang, W. J. (2002). The impact of information sharing and ordering co-ordination on supply chain performance. *Supply Chain Management: an international journal*, 7(1), 24-40.
- Zhou, H., & Benton Jr, W. C. (2007). Supply chain practice and information sharing. *Journal of Operations Management*, 25(6), 1348–1365.
- Zissis, D., Ioannou, G., & Burnetas, A. (2015). Supply chain coordination under discrete information asymmetries and quantity discounts. *Omega*, 53, 21–29.

APPENDICES

APPENDIX I: ONLINE SURVEY QUESTIONNAIRE THE DETERMINANTS OF INFORMATION SHARING AND THE PERFORMANCE OF SUPPLY CHAIN:

A Case of Beverage Manufacturing Companies in Dar Es Salaam, Tanzania

Researcher's name: *Deus P. Kabelele*, **Phone:** 0714019026, **Email:** *dpkabelele@gmail.com*

PART I: BACKGROUND INFORMATION (V100)

The information to be provided will only be used for research purposes and confidentiality will be adhered. Please tick (✓) the most appropriate alternative

(V101) What is your gender?

- ☐ Male
- ☐ Female

(V102) Which is the category best describes your age?

- ☐ Below 20 years
- ☐ 21-40 years
- ☐ 41-60 years
- ☐ Above 60 years

(V103) Which of the following best describes your highest education level?

- ☐ Primary school
- ☐ Secondary School
- ☐ Certificate
- ☐ Diploma
- ☐ Bachelor degree/Advanced diploma
- ☐ Master's degree
- ☐ Other (specify) _____

(V104) What is your current position in the firm?

- ☐ Chief Executive Officer (CEO)
- ☐ Managing Director
- ☐ Supply chain Manager
- ☐ Logistics Manager
- ☐ Procurement Manager
- ☐ Other (specify) _____

(V105) What is the total number of employees in your firm?

- ☐ Below 50
- ☐ 51 – 100
- ☐ 101-200
- ☐ Above 200

(V106) How long has your firm been in the business?

- ☐ 1-5 years
- ☐ 6-10 years
- ☐ 11-15 years
- ☐ 16-20 years
- ☐ Above 20 years

PART II: Intra-organizational factors influencing information sharing in supply chain (V200)						
Please indicate your level of agreement or disagreement with each of the given statements. For each given statement below please circle the number that best describes your view on your firm.						
V201	Information technology	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
V201a	There is high extent of internet usage in our firm	1	2	3	4	5
V201b	There is high extent of email usage in our firm	1	2	3	4	5
V201c	There is high extent of intranet usage in our firm	1	2	3	4	5
V201d	There is extent of extranet usage in our firm	1	2	3	4	5
V201e	There is high extent of Electronic Data Interchange (EDI) usage in our firm	1	2	3	4	5
V201f	There is high extent of Enterprise Resource Planning (ERP) usage in our firm	1	2	3	4	5
V202	Top management support	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
V202a	Top management perceives the relationship between us and our trading partners as important	1	2	3	4	5
V202b	Top management is concerned in pursuing business relationship with our trading partners	1	2	3	4	5
V202c	Top management provides required resources for supply chain management	1	2	3	4	5
V202d	Top management regards supply chain management as a very important aspect	1	2	3	4	5
V202e	Top management participates in the management of the supply chain	1	2	3	4	5

PART III: Inter-organizational behavior factors influencing information sharing in supply chain (V300)						
Please indicate your level of agreement or disagreement with each of the given statements. For each given statement below please circle the number that best describes your view on you firm						
V301	Trust	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
V301a	Our trading partners are honest when doing business dealings with us	1	2	3	4	5
V301b	Our trading partners are truthful in dealing with us	1	2	3	4	5

V301c	We have great confidence in our trading partners	1	2	3	4	5
V301d	Our trading partners have high degree of integrity	1	2	3	4	5
V301e	The promises made by our trading partners are reliable	1	2	3	4	5
V302	Commitment	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
V302a	There are sacrifices that have been made for us by our trading partners	1	2	3	4	5
V302b	Our trading partners stand for agreements we have	1	2	3	4	5
V302c	We have invested much efforts in maintaining our relationship with trading partners	1	2	3	4	5
V302d	We intend to continue working with our trading partners	1	2	3	4	5
V302e	We and our trading partners always make efforts to keep each other's promises	1	2	3	4	5
V303	Common Vision	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
V303a	We have a similar understanding with our trading partners on our supply chain's objectives	1	2	3	4	5
V303b	We have a similar understanding with our trading partners on the importance of supply chain collaboration	1	2	3	4	5
V303c	We have a similar understanding with our trading partners on the significance of making improvements that benefit the entire supply chain	1	2	3	4	5
V304	Reciprocity	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
V304a	We have fair policies about dealings with our trading partners					
V304b	We are equitable in treating our trading partners					
V304c	Our trading partners positively contribute to our business relationship					
V304c	Our trading partners generally treat us fairly					

PART IV: Environmental factors influencing information sharing in supply chain (V400)						
Please indicate your level of agreement or disagreement with each of the given statements. For each given statement below please circle the number that best describes your view on you firm.						
V401	Competitive environment	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
V401a	There is an intense competition in our supply chain market	1	2	3	4	5
V401b	There is a declining demand in our supply chain market	1	2	3	4	5
V401c	There is an excessive supply in our supply chain market	1	2	3	4	5
V401d	There are lots of products' varieties in our supply chain market	1	2	3	4	5
V402	Environmental uncertainty	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
V402a	Customers order different product combinations from time to time	1	2	3	4	5
V402b	Customers' product preferences change from time to time	1	2	3	4	5
V402c	Suppliers' product quality is unpredictable	1	2	3	4	5
V402d	Supplier's delivery time is unpredictable	1	2	3	4	5
V402e	There are rapid technological changes in our supply chain	1	2	3	4	5
V402f	Technological changes provide opportunities for improving competitive advantage	1	2	3	4	5

PART V: Information sharing in supply chain (V500)						
Please indicate your level of agreement or disagreement with each of the given statements. For each given statement below please circle the number that best describes your view on you firm						
V500	What is the extent of information sharing in your supply chain	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
V501	Inventory levels data are shared throughout the supply chain	1	2	3	4	5
V502	Delivery schedules are shared to trading partners in supply chain	1	2	3	4	5
V503	Order status information are communicated to respective partners in the supply chain	1	2	3	4	5
V504	Demand forecasts are shared throughout the supply chain	1	2	3	4	5

PART VI: Supply Chain Performance (V600)

Please indicate your level of agreement or disagreement with each of the given statements. For each given statement below please circle the number that best describes your view on you firm.

V600	What is the level of your firm's supply chain performance	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
V601	Our return on investment improves	1	2	3	4	5
V602	Our production and inventory costs are low	1	2	3	4	5
V603	We improve our product's performance	1	2	3	4	5
V604	We have a good order fulfillment rate	1	2	3	4	5
V605	We deliver customers' orders on time	1	2	3	4	5
V606	We quickly respond to customers' requirements	1	2	3	4	5

APPENDIX II: INTERVIEW GUIDE

Ownership of the firm:

Company's experience:

Number of employees:

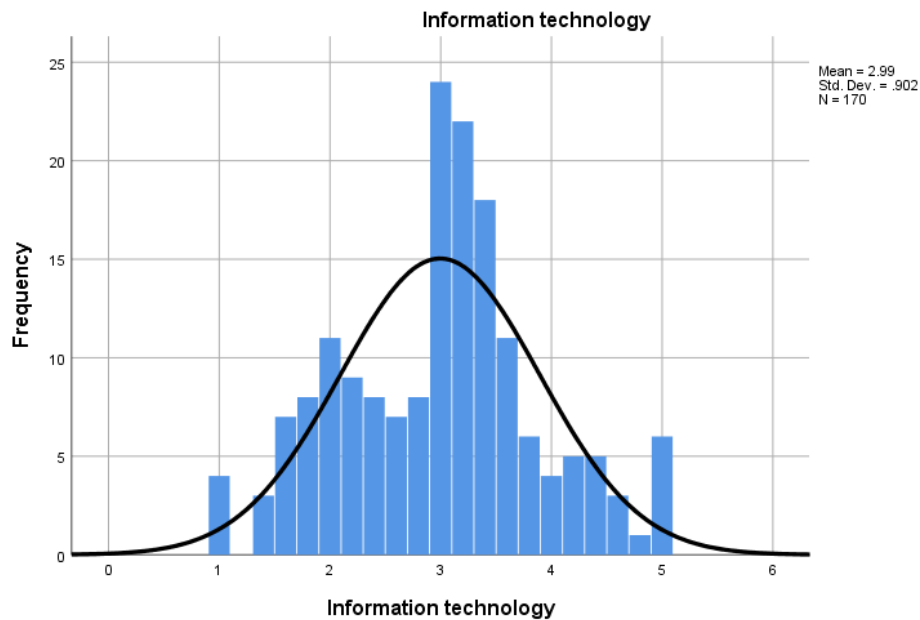
1. What types of information do you share with your trading partners in your supply chain?
2. What types of information technologies are you using in sharing information?
3. What is the role of your top management on information sharing within your supply chain?
4. How important is trust to your company in information sharing?
5. What are the aspects that your company uses to establish trust to enhance information sharing?
6. Is commitment a catalyst for information sharing in your supply chain? If yes, explain how.
7. How does common vision play a role in the process of sharing information in your supply chain?
8. Do you provide information to your trading partners in favor of your business performance or something in return?
9. Do you gain any competitive advantage by sharing information as much as possible with trading partners in your supply chain? If yes how?
10. Does information sharing help you to mitigate the challenges associated with environmental uncertainty? If yes how?
11. How does information sharing help to improve your supply chain performance?

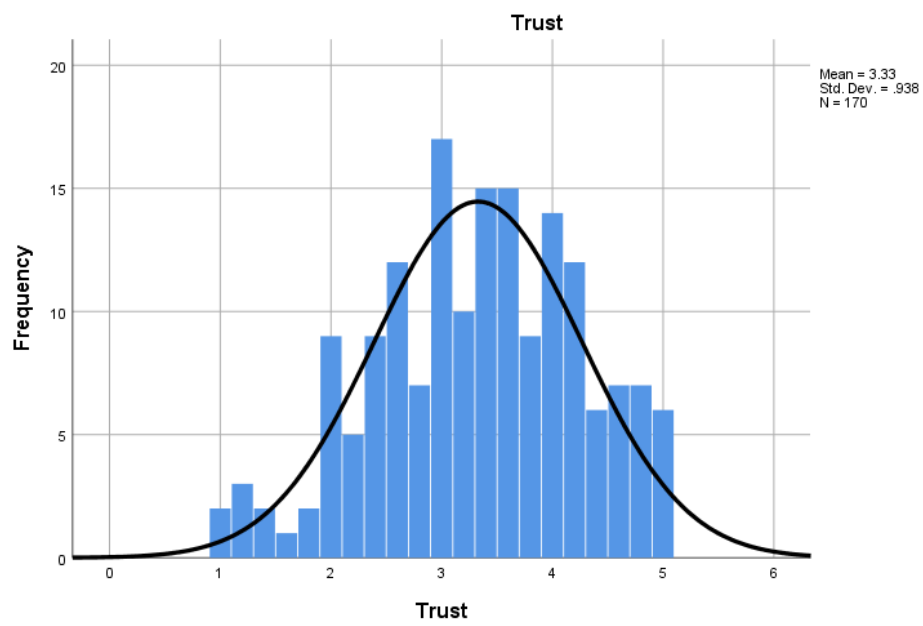
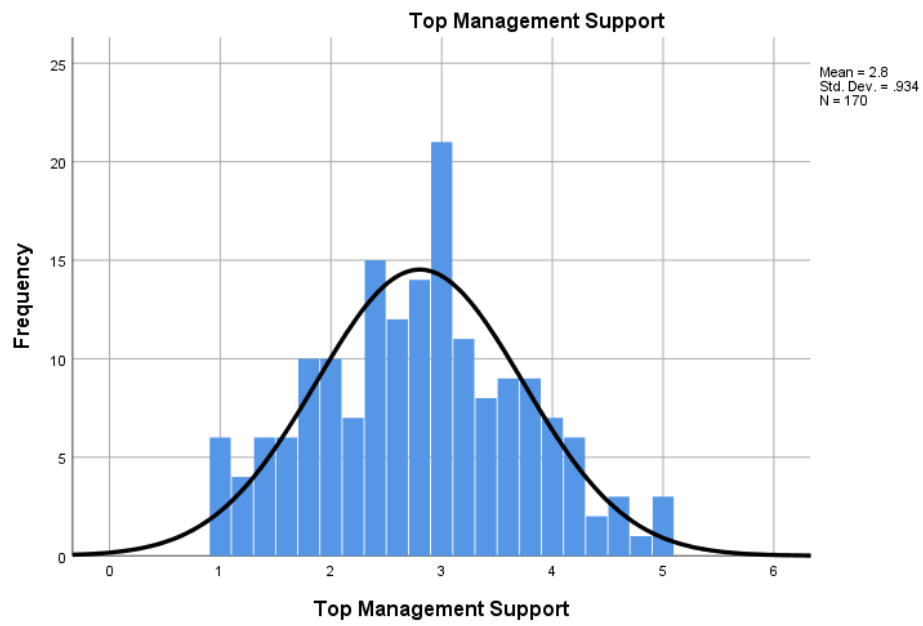
APPENDIX III: INTERVIEWEE DISCRIPTIONS

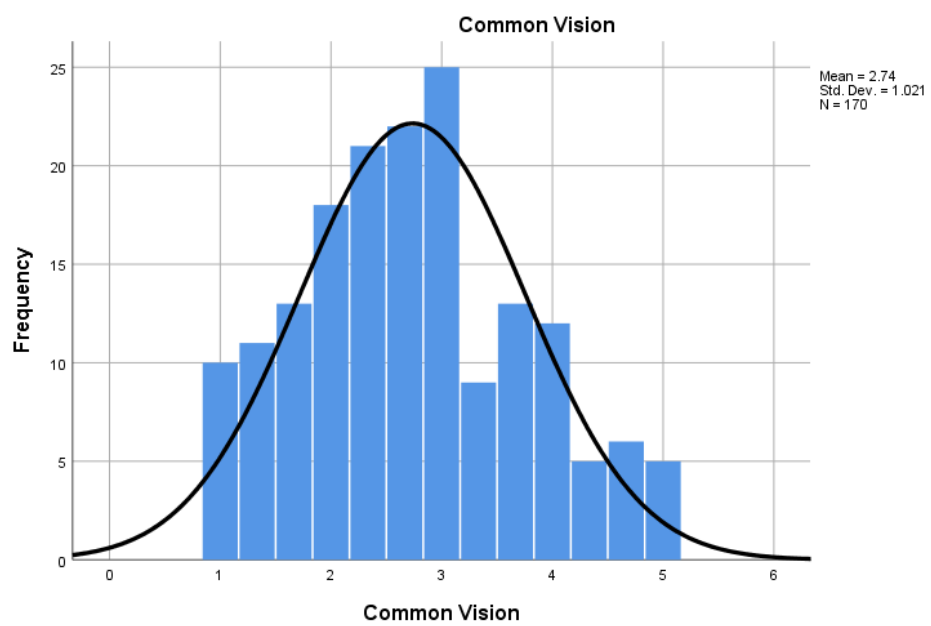
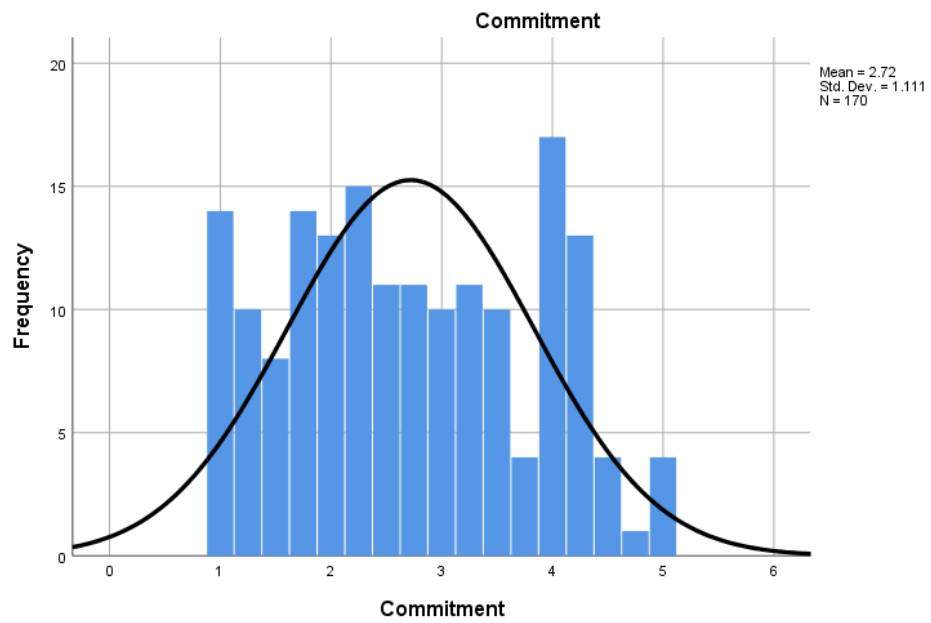
Identity	Company's Ownership	Company's Experience Category	No. Employees Category
Respondent 1	Private	Over 20 years	Over 200
Respondent 2	Private	Over 20 years	Over 200
Respondent 3	Private	6-10 years	101-200
Respondent 4	Private	Over 20 years	Over 200
Respondent 5	Private	16-20 years	Over 200
Respondent 6	Private	Over 20 years	Over 200
Respondent 7	Private	Over 20 years	Over 200
Respondent 8	Private	6-10	101-200
Respondent 9	Private	16-20	Over 200
Respondent 10	Private	Over 20 years	Over 200

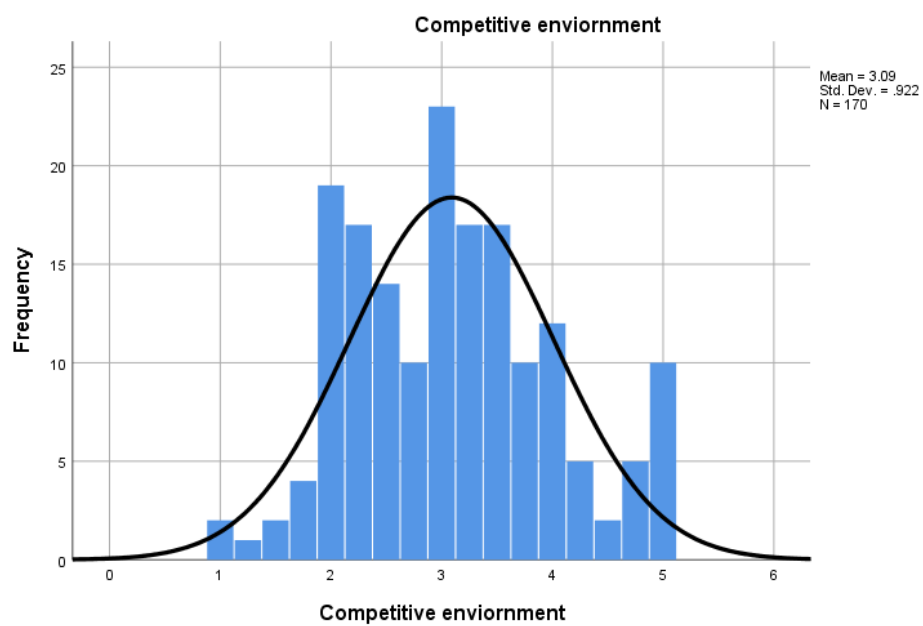
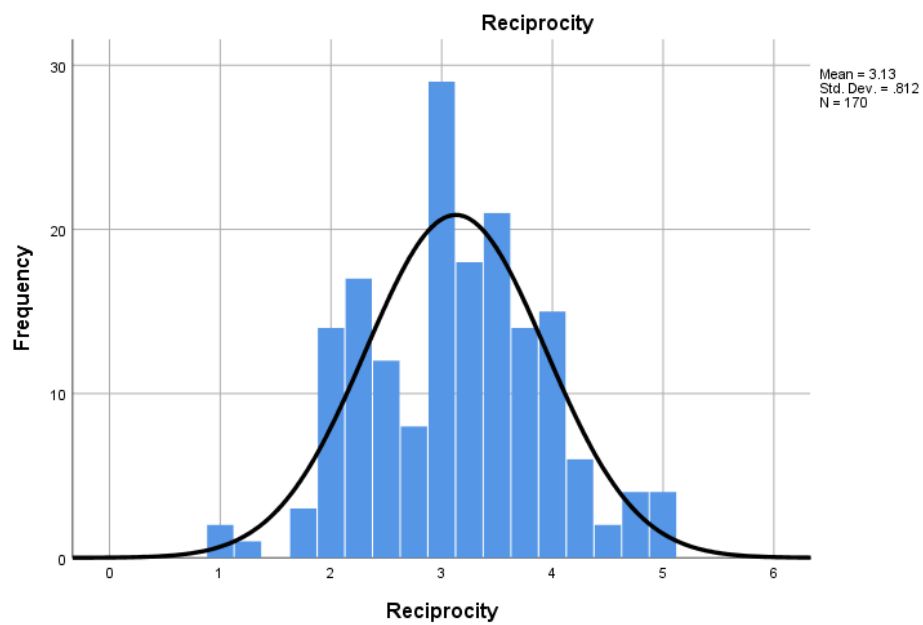
APPENDIX IV: NOMALITY TESTS

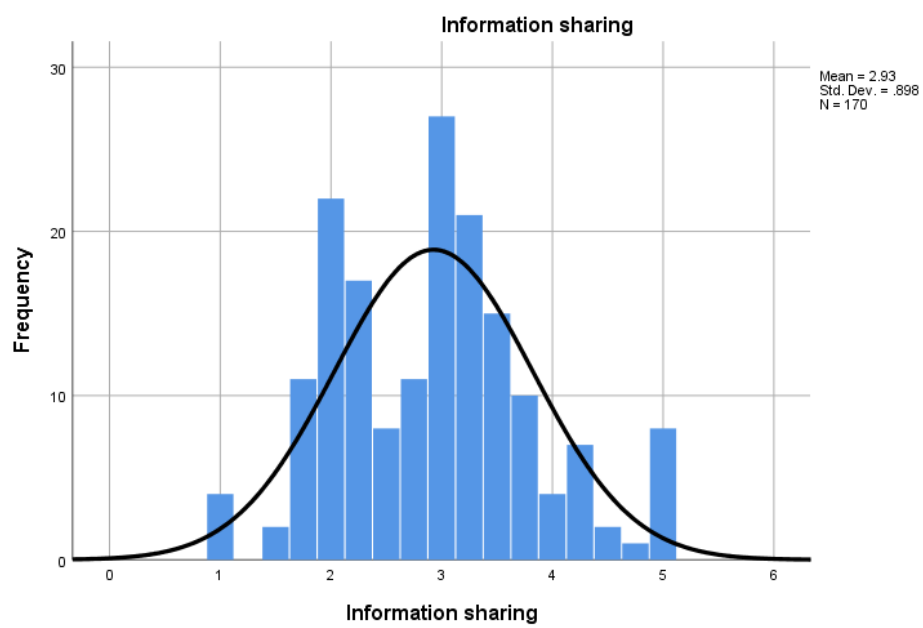
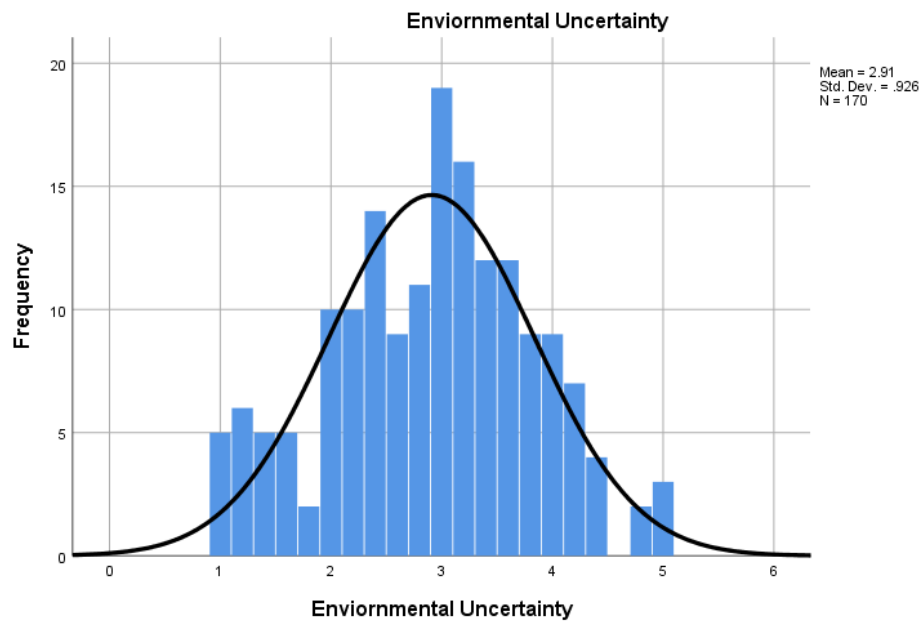
Statistics										
		Top Managem ent Support	Trust	Commite ment	Common Vision	Recipro city	Competiti ve enviornm ent	Enviornm ental Uncertaint y	Informati on sharing	Supply chain performan ce
N	Valid	170	170	170	170	170	170	170	170	170
	Missin g	0	0	0	0	0	0	0	0	0
Mean		2.80	3.33	2.72	2.74	3.13	3.09	2.91	2.93	2.86
Median		2.80	3.40	2.63	2.67	3.00	3.00	3.00	3.00	3.00
Std. Deviation		.934	.938	1.111	1.021	.812	.922	.926	.898	.852
Variance		.872	.879	1.235	1.042	.659	.850	.857	.806	.727
Skewness		.103	-.269	.154	.287	.029	.299	-.122	.329	.273
Std. Error of Skewness		.186	.186	.186	.186	.186	.186	.186	.186	.186
Kurtosis		-.452	-.430	-1.066	-.540	-.181	-.416	-.420	-.138	.290
Std. Error of Kurtosis		.370	.370	.370	.370	.370	.370	.370	.370	.370
Range		4	4	4	4	4	4	4	4	4
Minimum		1	1	1	1	1	1	1	1	1
Maximum		5	5	5	5	5	5	5	5	5

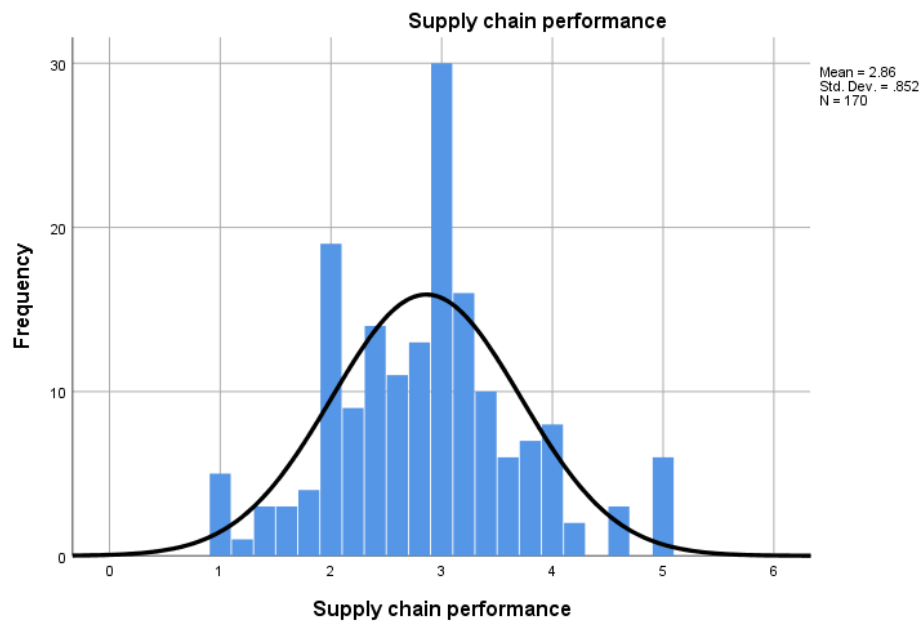




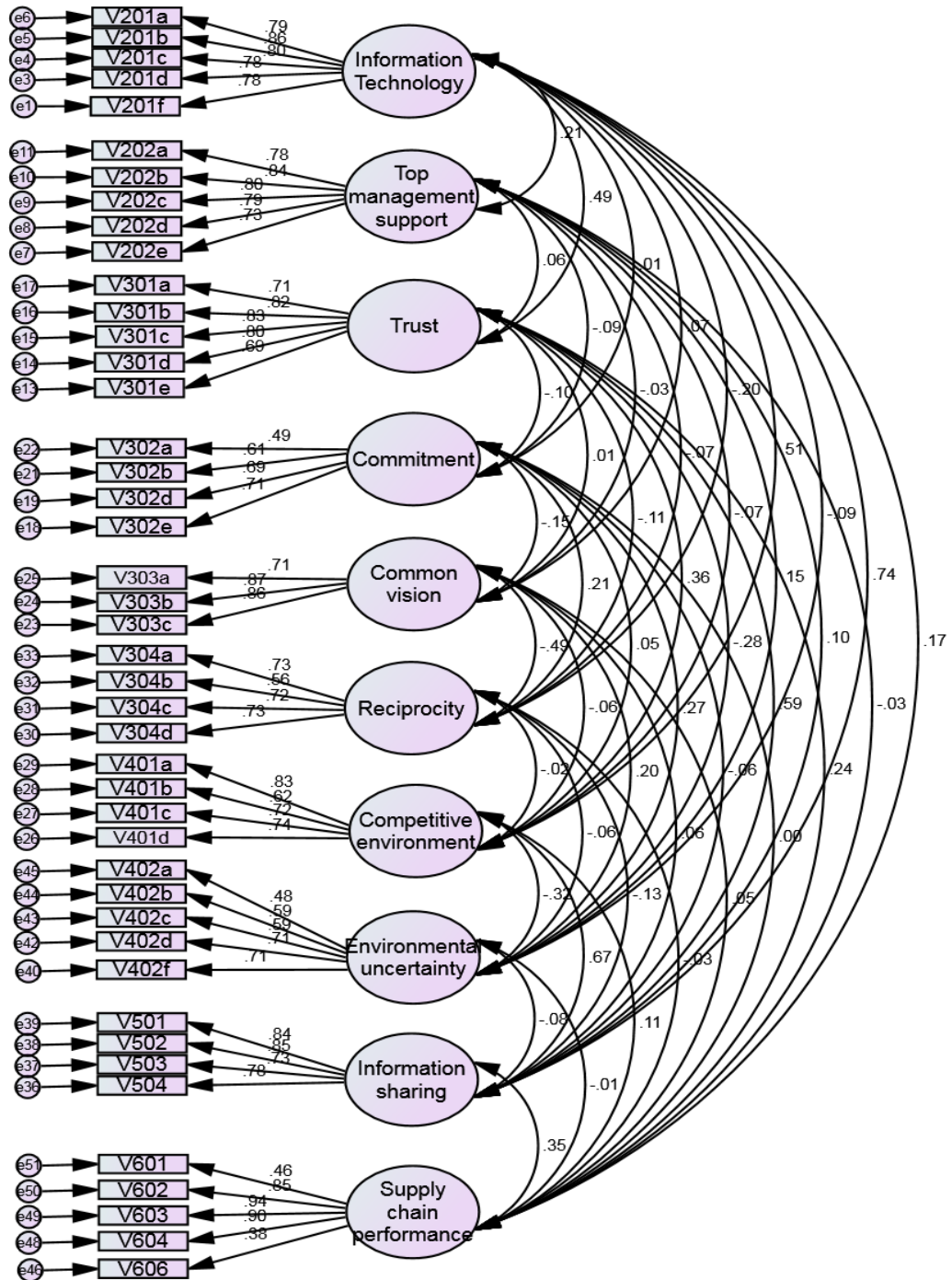








APPENDIX V: CONFIRMATORY FACTOR ANALYSIS FOR PROPOSED MODEL; STRUCURE AND INCICES



CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	133	1207.341	857	.000	1.409
Saturated model	990	.000	0		
Independence model	44	4646.154	946	.000	4.911

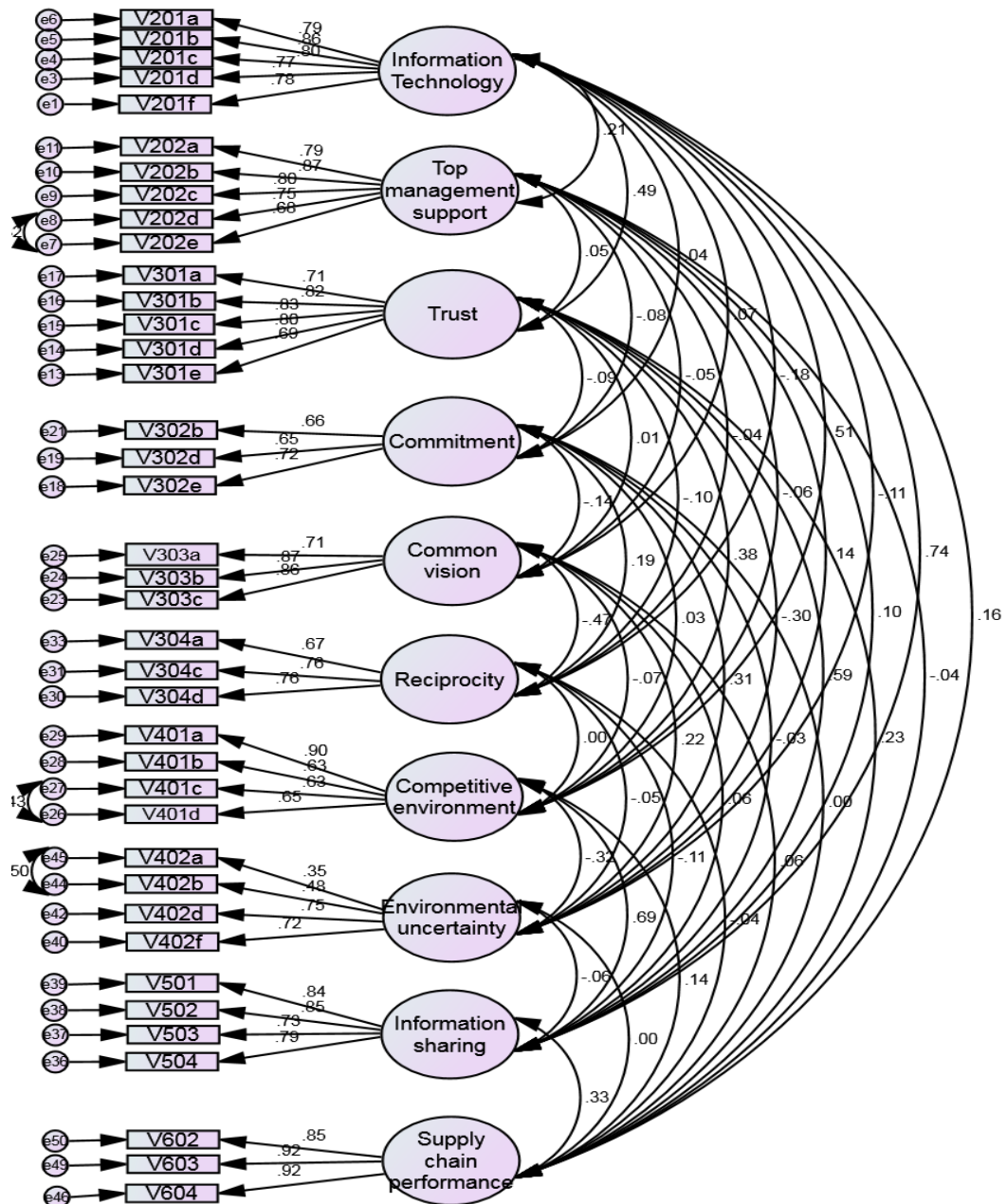
Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.740	.713	.908	.895	.905
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.049	.043	.056	.577
Independence model	.152	.148	.157	.000

APPENDIX VI: CONFIRMATORY FACTOR ANALYSIS FOR MODIFIED MODEL; STRUCURE AND INCICES



CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	126	790.487	654	.000	1.209
Saturated model	780	<u>.000</u>	0		
Independence model	39	4123.491	741	.000	5.565

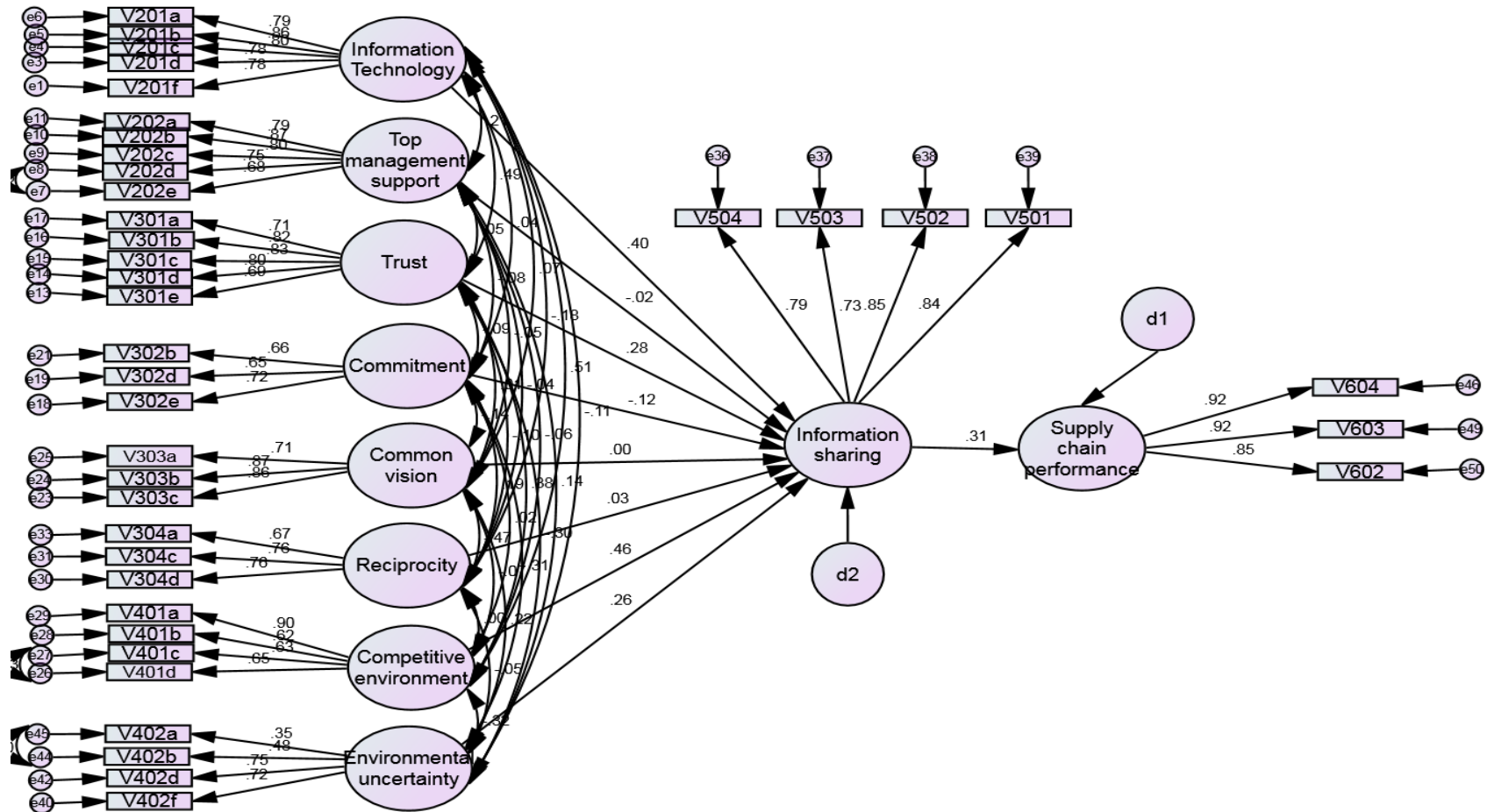
Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.808	.783	.961	.954	.960
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.035	.025	.044	.999
Independence model	.164	.159	.169	.000

APPENDIX VII: STRUCTURAL MODIFIED MODEL; STRUCURE, INCICES AND REGRESSIONS



CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	118	795.345	662	.000	1.201
Saturated model	780	.000	0		
Independence model	39	4123.491	741	.000	5.565

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.807	.784	.961	.956	.961
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.035	.024	.043	.999
Independence model	.164	.159	.169	.000

Regression Weights: (Group number 1 - Default model)

		Estimate	S.E.	C.R.	P
Information sharing	<--- Information Technology	.400	.088	4.601	***
Information sharing	<--- Top_management_support	-.021	.068	-.339	.734
Information sharing	<--- Trust	.282	.082	3.733	***
Information sharing	<--- Common vision	.003	.062	.036	.971
Information sharing	<--- Commitment	-.120	.059	-1.590	.112
Information sharing	<--- Reciprocity	.026	.084	.354	.724
Information sharing	<--- Competitive environment	.462	.112	5.043	***
Information sharing	<--- Environmental uncertainty	.256	.080	2.906	.004
Supply_chain_performance	<--- Information sharing	.311	.088	3.763	***