



THE DETERMINANTS OF INFORMATION SHARING AND THE PERFORMANCE OF SUPPLY CHAIN: THE CASE OF BEVERAGE MANUFACTURING COMPANIES

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Abstract

Due to the increasing importance of information sharing in the supply chain towards performance improvement, while there is a lack of clear framework for information sharing and supply chain performance antecedents particularly in developing countries like Tanzania, led to the conduction of this study to fill the empirical gap. The purpose of this paper was to assess whether intra-organisational factors, inter-organisational factors, and environmental factors can influence information sharing in the supply chain and whether information sharing has an impact on the supply chain performance among beverage manufacturing companies in Tanzania. The study adopted a mixed research design where quantitative and qualitative findings were triangulated. The snowball sampling technique was used to collect data from 170 respondents using an online survey while purposive sampling was used to collect data from 10 respondents through interviews. The study used structural equation modelling and content analysis technique to perform data analyses. The study findings indicated that information technology, trust, competitive environment, and environmental uncertainty had positive influence on information sharing while top management support, commitment, common vision, and reciprocity had no impact on information sharing. Moreover, the study found that supply chain performance is determined by information sharing. The results suggest that the formulation of information sharing and supply chain performance framework cannot be made and fully explained by a single theory as the study integrated three supply chain theories RBV, SET, and NT. Hence supply chain participants and policy-makers should focus on all the intra-organisational factors, inter-organisational factors, and environmental factors for improving both the information sharing and supply chain performance.

Keywords: *Information sharing, Supply chain, Performance, Beverage manufacturing companies, Tanzania*

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INTRODUCTION

Globalization has extremely changed the way businesses operate within the supply chain, the presence of new opportunities brought by the 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-organisational 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; Tran, Childerhouse, & Deakins, 2016).

The major objective of supply chains is to enhance operational efficiency by delivering the required goods and services to the final consumers on the desired time and minimal cost. The complexity of these supply chains is very enormous whilst continue to grow due to the 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, the 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, Trienekens, Wognum, Van Der Vorst, & Omta, 2015).

According to Tan, Kannan, Handfield, & Ghosh (1999) the role of information sharing was started to be recognized as a major competitive resource after the 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 the supply chain to take into consideration the effect of its activities on other stages which are 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).

While the role of information sharing among the participants of the 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. The supply chain actors seem to be sceptical of 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 limits the level of information needed to assist decision making, despite the benefits that can be realized.

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Various empirical studies have been conducted to ascertain a range of factors that influence the supply chain participants to share information, as a step towards the development of strategies for improving 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 (Chen, Wang, & Yen, 2014; Lee & Fernando, 2015; Wu, Chuang, & Hsu, 2014). Moreover, there was an exploration of other determinants like information technology, environmental uncertainty, institutional policies, external support, and level of competition (Ganotakis, Hsieh, & Love, 2013; Hung, Lin, & Ho, 2014; Tran et al., 2016). Furthermore, several 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 had a positive impact on the general performance of the supply chain (Marinagi et al., 2015; Qrunfleh & Tarafdar, 2014; Rashed, Azeem, & Halim, 2010).

However, most of the studies focused on a small number of factors 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. Moreover, most of the studies only used either qualitative design or quantitative design and not both designs for findings triangulation. Further, most of the studies were piloted in the developed countries creating 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 mechanisms for information sharing and its influence on the performance of the supply chain. Therefore, this study sought to establish a framework based on the determinants of information sharing in the supply chain and the effect of the information sharing on the supply chain performance.

THEORETICAL MODEL AND HYPOTHESES FORMULATION

Resource-based view (RBV)

The resource-based view (RBV) focuses on strategic assets, where major emphasis is put on the combination of firm's intangible and tangible resources as well as competences and capabilities which are valuable, rare, inimitable, and very well organized (Amit & Schoemaker, 1993). The great concern of RBV is on formulating and maintaining a firm's sustainable competitive advantage by creating resources that are immovable and heterogeneous (Agan, 2011). The relevance of RBV to information sharing among supply chain participants comes on the aspect of how the firm can use its resources and capabilities to ensure that it acquires the required information from the trading partners while providing the same to create a shared competitive advantage among them for the general performance of the supply chain as a whole (Halldorsson, Kotzab, Mikkola, & Skjøtt-Larsen, 2007). Information technology capabilities and top management support are among the factors that have been explained by RBV on its configuration

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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 information sharing among the supply chain participants and how it affects the companies' performance.

Social exchange theory (SET)

The social exchange theory (SET) describes how the interchange of resources is done centred on shared value and control of opportunism behaviour by creating trustworthy relationships between trading partners (Zhao, Huo, Flynn, Hoi, & Yeung, 2007). The theory helps to understand the social relations and norms that enhance certain acts done with individuals when interacting with other counterparts. The investments on social values grounded on respect, trust and mutuality could result in long term relationships and benefits (Widen, Ginman, & Widén-Wulff, 2004). For individuals 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 the cost-reward scheme that stimulates trade partners to share information, where they expect some sort of reciprocity once information is being shared. Additionally, the social exchange between individuals includes association and entails a high degree of trust as it may not be legally binding (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 had been addressed in the study.

Network theory (NT)

The performance of the organization relies not only on efficient cooperation with its trading partners but also it depends on how well these trading partners interact with their business partners considering business conditions on aspects of external influence and existing competition. NT has been widely used for the provision of analysis for the theoretical framework of reciprocity in cooperative relations, where the development of new resources depends so much on how well firms continue to interact with other key players in the business (Christy, Oliver, & Penn, 1996; Håkansson & Ford, 2002). The theory contributes significantly to describing the dynamics of relations based on inter-organisational perspective and how they are affected by external interventions particularly competitive pressure and environmental uncertainty (Halldorsson, Kotzab, Mikkola, & Skjøtt-Larsen,, 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 among 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 et al., 2007). Hence the study considered competitive pressure and environmental uncertainty as major contributors to information sharing within the supply chain.

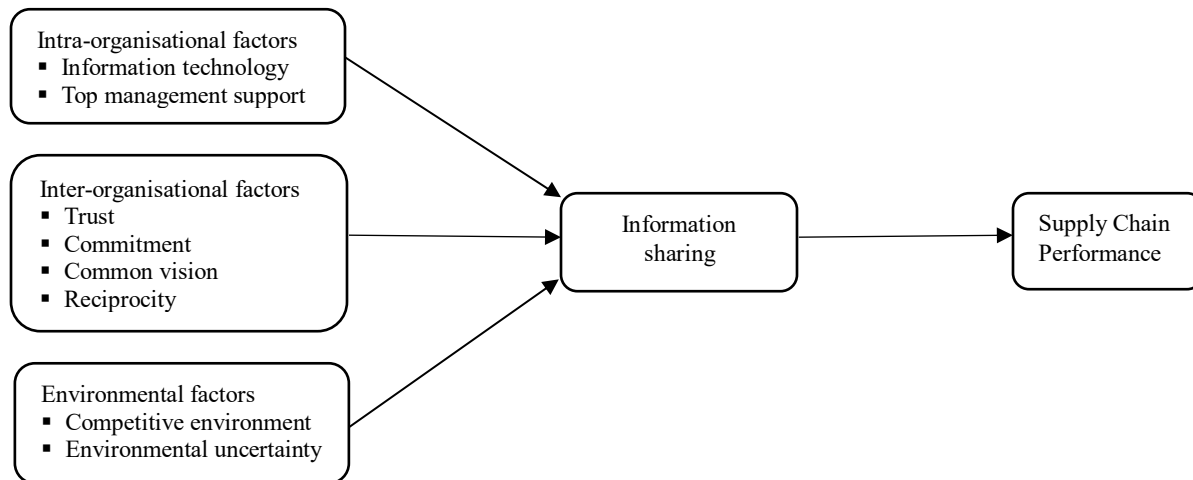


Figure 1. Research model

Hypotheses

The study had the following nine hypotheses:

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

RESEARCH METHOD

Research design

The study employed a mixed research design where both quantitative and qualitative data were collected. The quantitative data were collected from 170 respondents that were convenient due to a limited number of beverage companies, through an online survey with the use of snowball sampling technique due to lack of an established sampling frame. The qualitative data were collected from 10 respondents representing 10 companies through interviews who were



purposively selected to allow the in-depth collection of data as they were more experienced, informative, and familiar with information sharing aspects in their supply chains.

Research area

The study was conducted at the city of Dar es Salaam in Tanzania 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 in the manufacturing industry than in other regions particularly on beverage manufacturing companies where there is increasing stiff competition in the industry.

Research instrument

The study had a total of nine independent variables and two dependent variables, where one variable was both dependent and independent due to its mediating effect. The independent variables are intra-organisation factors which comprise of information technology and top management support; inter-organisational 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 (mediating variable) and supply chain performance. A five-point Likert scale of strongly agree to strongly disagree was used for all variables to ensure measurement consistency. The indicators to measure the ten variables are listed in Table 1.

Data analysis

The structural equation modelling (SEM) was used to test the study hypotheses after the validation of the measurement model using confirmatory factor analysis (CFA) whereby AMOS version 24 was deployed to run both statistical analyses. The qualitative data were analysed basing on content analysis technique, where the collected data from the respondents were organized, reviewed, categorized and re-coded to formulate and explain themes.

Measurement model validation

The 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 analysed 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 analysing the structural model except for the co-vary items (see Table 1).



Table 1. *Confirmatory factor analysis*

Constructs	Initial factor loading	Final factor loading	Sources
Information technology (V201)			
V201a There is high extent of internet usage in our firm	0.79	0.79	Li & Lin (2006)
V201b There is high extent of email usage in our firm	0.86	0.86	Kilangi (2012)
V201c There is high extent of intranet usage in our firm	0.80	0.80	Li & Lin (2006)
V201d There is extent of extranet usage in our firm	0.78	0.77	Li & Lin (2006)
V201f There is high extent of Electronic Data Interchange (EDI) usage in our firm	0.78	0.78	Li & Lin (2006)
Top management support (V202)			
V202a Top management perceives the relationship between us and our trading partners as important	0.78	0.79	Li & Lin (2006), Lee, Kim, Hong, & Lee (2010)
V202b Top management is concerned in pursuing business relationship with our trading partners	0.84	0.87	Lee et al., (2010)
V202c Top management provides required resources for supply chain management	0.80	0.80	Li & Lin (2006), Lee et al., (2010)
V202d Top management regards supply chain management as a very important aspect	0.79	0.75 (co-vary)	Li & Lin (2006)
V202e Top management participates in the management of the supply chain	0.73	0.68 (co-vary)	Li & Lin (2006)
Trust (V301)			
V301a Our trading partners are honest when doing business dealings with us	0.71	0.71	Coote, Forrest, & Tam (2003)
V301b Our trading partners are truthful in dealing with us	0.82	0.82	Coote et al., (2003)
V301c We have great confidence in our trading partners	0.83	0.83	Coote et al., (2003)
V301d Our trading partners have high degree of integrity	0.80	0.80	Coote et al., (2003)
V301e The promises made by our trading partners are reliable	0.69	0.69	Coote et al., (2003)
Commitment (V302)			
V302a There are sacrifices that have been made for us by our trading partners	0.49	Discarded	Li & Lin (2006)
V302b Our trading partners stand for agreements we have	0.61	0.66	Li & Lin (2006)
V302d We intend to continue working with our trading partners	0.71	0.72	Coote et al., (2003)
V302e We and our trading partners always make efforts to keep each other's promises			Li & Lin (2006)
Common vision (V303)			
V303a We have similar understanding on supply chain objectives	0.71	0.71	Li & Lin (2006)
V303b We have similar understanding on supply chain collaborations	0.87	0.87	Li & Lin (2006)
V303c We have similar understanding on supply chain improvements	0.86	0.86	Li & Lin (2006)
Reciprocity (V304)			
V304a We have fair policies about dealings with our trading partners	0.73	0.67	Wu et al., (2014)
V304b We are equitable in treating our trading partners	0.56	Discarded	Wu et al., (2014)
V304c Our trading partners positively contribute to our business relationship	0.72	0.76	Wu et al., (2014)
V304d Our trading partners generally treat us fairly	0.73	0.76	Wu et al., (2014)

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Competitive environment (V401)					
V401a	There is an intense competition in our supply chain market	0.83	0.90		Huo, Zhao, & Zhou (2014)
V401b	There is a declining demand in our supply chain market	0.62	0.63		Huo et al., (2014)
V401d	There is an excessive supply in our supply chain market	0.72	0.63		Huo et al., (2014)
V401e	There are lots of products' varieties in our supply chain market	0.74	0.65		Huo et al., (2014)
			(co-vary)		
			(co-vary)		
Environmental uncertainty (V402)					
V402a	Customers order different product combinations from time to time	0.48	0.35		Chen et al., (2014)
			(co-vary)		
V402b	Customers' product preferences change from time to time	0.59	0.48		Chen et al., (2014)
			(co-vary)		
V402c	Suppliers' product quality is unpredictable	0.59	Discarded		Chen et al., (2014)
V402d	Supplier's delivery time is unpredictable	0.71	0.75		Chen et al., (2014)
V402f	Technological changes provide opportunities for improving competitive advantage	0.71	0.72		Chen et al., (2014)
Information sharing (V501)					
V501	Inventory levels data are shared throughout the supply chain	0.84	0.84		Wu et al., (2014)
V502	Delivery schedules are shared to trading partners in supply chain	0.85	0.85		Wu et al., (2014)
V503	Order status information are communicated to respective partners in the supply chain	0.73	0.73		Chen et al., (2014)
V504	Demand forecasts are shared throughout the supply chain	0.78	0.79		Wu et al., (2014)
Supply chain performance (V601)					
V601	Our return on investment improves				Wu et al., (2014)
V602	Our production and inventory costs are low	0.46	Discarded		Wu et al., (2014)
V603	We improve our product's performance	0.85	0.85		Wu et al., (2014)
V604	We have a good order fulfilment rate	0.94	0.92		Wu et al., (2014)
V605	We deliver customers' orders on time	0.90	0.92		Wu et al., (2014)
V606	We quickly respond to customers' requirements	0.38	Discarded		Wu et al., (2014)

The study adopted the most recently recommended model fit indices to assess the measurement model fit as suggested by Kline (2015), whereby the results of the proposed measurement model indicated a poor fit with normed chi-square (CMIN/DF) = 1.409, comparative fit index (CFI) = 0.905, root mean square error of approximation (RMSEA) = 0.049 and its 90% confidence interval (PCLOSE) = 0.577, and standardized root mean square residual (SRMR) = 0.049. The examination of factor loadings, modification indices and standardized residuals let to the removal of five items (V302a, V304b, V402c, V601 and V606) with factor loading below 0.6 and other items (V202d & V202e), (V401c & V401d) and (V402a & V402b) were made to co-vary. The modifications had a significant contribution to the improvement of model fit indices for the measurement model as shown in Table 2.



Table 2. CFA model fit indices

Fit Indices	Recommended Values	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

RESULTS

Structural model

The structural model met the global fit indices as all 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 as indicated in Table 3 were; 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 3. 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

Hypotheses testing

The structural model estimates indicated that information technology had significant positive influence on information sharing ($\beta = 0.400$, $P < 0.001$), while top management support had no significant contribution on information sharing ($\beta = -0.021$, $P = 0.734$). The SEM results also indicated that for the case of inter-organizational behaviour factors only trust had a positive influence on information sharing ($\beta = 0.282$, $P < 0.001$), while commitment, reciprocity, and common vision had no impacts on information sharing (see Table 4). Moreover, competitive advantage and environmental uncertainty were found to have a significant positive influence on information sharing, while information sharing was also a significant positive determiner of supply chain performance (see Table 4). Hence H1, H3, H7, H8, H9 were accepted while H2, H4, H5, and H6 were rejected.



Table 4. 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	***

DISCUSSION

Information technology and information sharing

The findings supported the hypothesis by confirming that information technology has a significant positive effect on information sharing among supply chain participants. The study findings are in line with the findings reported by Nicolaou, Ibrahim, & vanHeck (2013), as well as Li & Lin (2006) who found that information technology is positively influencing the habit of supply chain members to share information with their trading partners. The significance was attributed to the high adoption level of information and communication technology (ICT) within the country compared to the previous years. According to Msuya, Mjema & 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. 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:

Due to the technological advancements and their effect on the competitive advantage, we have opted to invest much in ICT, since through it we can obtain real-time information to facilitate immediate decisions that are reliable for the 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)

Top management support and information sharing

The findings of the present study were unexpected as contrasts with other findings such as Chen et al., (2014) who found that top management support was one among the major determinants of information sharing. The insignificant relationship between top management support and information sharing within the supply chain may be explicated by the fact that most of the

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managers tend to hold or distort some of the information to create 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). This was revealed by an interviewee who stipulated that;

...The major role of the 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 fully 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 be withheld for competitive gains... (Respondent 8, 2019)

Trust and information sharing

The study findings are comparable to (Wu et al., 2014) who found that trust plays an influential role in determining information sharing and collaboration among supply chain members (see also: (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 respondents through interviews 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 fulfil the promises and agreements made in their business dealings while encouraging timely and effective communications with their trading partners.

Commitment and information sharing

Unlike other previous studies (e.g. Zaheer & Trkman, 2017) that reported a significant positive relationship between commitment and information sharing, this study found that commitment had no effect on information sharing within the supply chain. 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 sceptical in maintain few long term business relationships instead they opt to have multiple associations. As to share strategic information brings about considerable business risks for partners, the 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 even 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.

Common vision and information sharing

The study surprisingly found that common vision is not a significant determinant of information sharing. The results are in contrast to Li & Lin (2006) findings as reported 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 needs the trading partners to precisely formulate objectives which are very clear and measurable in a mutual discourse in advance (Bronnenmayer, Wirtz, & Göttel, 2016) 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 difficult for trading partners to establish common vision through sufficient communication of formulated goals to enhance information sharing. 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 favour 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)

Reciprocity and information sharing

The study found that reciprocity is not significantly influencing information sharing among trading partners in the supply chain, unlike other studies that found reciprocity had a significant impact on the tendency of trading partners to share information among themselves (Zaheer & Trkman, 2017). The respondents through interviews revealed that the insignificance of reciprocity on influencing the tendency of information sharing within the supply chain is explained by the fact that most of the companies are not sure on their initiatives in creating a strong sense of reciprocity in their business dealings in terms of having fair treatment in their business dealings and positively contributing on maintaining the established relationships with their trading partners.

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 because some of the information can be a source of competitive gain at the individual level, however, most of our companies have not formulated good



policies concerning reciprocation of information resulting in low levels of information sharing. (Respondent 9, 2019)

Competitive environment and information sharing

The SEM results confirmed that competitive environment had significant contribution to influencing information sharing similarly to the findings of Huo et al., (2014) and Jain, Seshadri, & Sohoni (2011). The study revealed that the beverage industry is characterized by the presence of high competition pressure in the market, 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.

Environmental uncertainty and information sharing

The study findings indicate that environmental uncertainty was considered as an important factor for information sharing among the supply chain participants. Similar findings were reported in previous studies in which information sharing was predicted by environmental uncertainty (Chen et al., 2014; Hung et al., 2014; Li & Lin, 2006). Through interviews, the respondents revealed that the beverage industry is highly characterized by 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 an impact on the competitive advantage within the market. Hence, the companies are required to share as much information as possible to be able to get the details in advance on the prevailing changes to set plans on how to deal with those uncertainties in advance.

Information sharing and supply chain performance

The study found that information sharing had a significant positive influence on the supply chain performance among beverage manufacturing companies. The study findings are in line with other previous studies (Fawcett, Osterhaus, Magnan, Brau, & McCarter, 2007; Lotfi, Mukhtar, Sahran, & Zadeh, 2013) who found that information sharing is positively influencing the supply chain performance. 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 to smoothly execute the company's activities with due regard to the intense competitive environment and environmental uncertainty. The respondents through interviews revealed that through sharing information with

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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.

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... (Respondent 6, 2019)

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)

CONCLUSION

Based on the study findings, it is concluded that despite the insignificance of some factors in the study, all the investigated factors have provided an essential explanation on the contributors of information sharing and how information sharing among supply chain members can enhance supply chain performance as a whole. Hence the findings provide insights to supply chain members and other stakeholders on what major undertakings should be put into the act to improve the level of information sharing and the performance of the supply chain.

The study had encountered some limitations of which in one way or the other could limit its generalisability. The study did not have a sampling framework, which resulted in the use of snowball sampling technique which could be subjected to some sort of biases in the study. Moreover, the study was only conducted in one city, hence other studies should be conducted at large geographical coverage with the use of probabilistic sampling techniques to obtain more generalised data. The study ignored the indirect effects of information sharing antecedents on supply chain performance, therefore future studies should expand the scope by taking into account the indirect effects of information antecedents on the performance of the supply chain.

Theoretical and practical 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. The integration of these theories confirmed that information sharing is influenced jointly by intra-organisational factors, inter-organisational factors, and environmental factors. Moreover, the methodology used in the study incorporated a mixed research design which was quite different from most of the previous studies. Hence it has paved a way for other similar studies to be conducted under this approach for triangulation of findings.

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The study has also several practical implications. 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 by-product of information technology, trust, competitive environment, and environmental uncertainty factors. Hence the supply chain participants whether in the beverage industry or other industries have to put more focus on these factors to be able to develop strategies that could help them to share as much information as possible while ensuring its quality and reliability for improving their performances. Moreover, due to the 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 developing countries have to invest more in good management practices as well as relationship management practices with their trading partners to enhance effective and efficient communication and provision of resources that will result to more sharing of information. Further, the study findings indicate that information technology plays a big role in the facilitation of information sharing in the supply chain. This finding suggests that policy-makers should make more emphasis on the development of ICT and protection of information shared in the business dealings, whereby the major undertakings should base on ensuring data protection and privacy.

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