COLLABORATIVE RELATIONSHIPS AND SME SUPPLY CHAIN PERFORMANCE

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Abstract: SMEs especially those in developing countries face a number of challenges that affect their performance and survival in the long run. One of the challenges that has not been widely explored is that of SME supply chain performance. This study attempts to examine the relationship between collaborative relationships and SME supply chain performance in Uganda. SME supply chain performance is an important area because SMEs account for a large percentage of the private sector. Our study established that collaborative relationships explained 29.5% of the variation in SME supply chain performance. Information sharing and incentive alignment were found to be significant predictors of SME supply chain performance while decision synchronization was not a signification predictor. These findings are important and raise implications for theory and managers of SMEs in Uganda.

Keywords: *supply chain collaboration, supply chain performance, SMEs, Uganda*

INTRODUCTION

In Uganda, small and medium enterprises (SMEs) form the majority of firms in the private sector (90% of the firms in the private sector are SMEs). Their importance in Uganda's economy cannot be under looked because of the contribution that they make to national and economic development. The SMEs employ a high percentage of the non – farming population and contribute 70% of the total GDP (BID Country Guide Series, 2008: Hategа, 2007). SMEs in Uganda however face numerous challenges which affect their performance and survival in the long run. In their study on improving information access to SMEs in Northern Uganda, Okello – Obura (2008) established that SMEs have structural and operational challenges that need to be addressed immediately if economic development is to be attained because they are the engine of growth, employment creation and socio-economic transformation. Hindrances that affect the performance of SMEs, their competitiveness and survival include limited information on financing options, inadequate and expensive supply of utilities and limited access to networks that are needed to enhance competitiveness (Hategа, 2007; Kigozi, 2006). SMEs also suffer delivery of poor quality products, late deliveries or no deliveries at all in their supply chains (Ntayi and Eyaa, 2010; Ntayi, Rooks, Eyaa and Zeija, 2010). These aspects are indicators of poor performance of SME supply chains. Given that SMEs are very important in Uganda's economy, it is vital that the performance of their supply chains is addressed. Therefore, it is therefore important to gain

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an understanding of the factors that explain the supply chain performance of SMEs in Uganda. Focus on improving SME performance has been placed on improving managerial competencies, access to finance but limited research and capacity building effort has been placed on improving or explaining SME supply chain performance in Uganda. Supply chain performance is important because chain – chain competition is slowly taking over competition between firms. In other words, a firm is as a strong as its supply chain not as an individual (Koh et al., 2006). The implication is that for SMEs to compete favorably in the market, they have to address the performance of their supply chain and also identify the factors that account for the variances in the performance of their supply chains. A study of SMEs in Thailand established that many SME owners and managers did not have sufficient knowledge on business practices as well as the capacity to assess the performance of their supply chains, explaining their low competitive advantage (Virasa and Hunt, 2008).

In this study, we examine the relationship between collaborative supply chain relationships and SME supply chain performance so that we can determine the variance in the supply chain performance of SMEs that is explained by collaborative relationships. The purpose of this paper is to increase knowledge on the factors that explain SME supply chain performance in Uganda given that few studies in Uganda have been undertaken in this area and other studies on SME supply chain performance have taken place in other countries whose contexts are very different from Uganda. It will add onto the contribution of authors who have ventured into studying SME supply chain performance in Uganda. Such studies include Eyaa and Ntayi (2010) who examined the relationship between the components of procurement practices and SME supply chain performance; Ntayi, Rooks and Eyaa (2009) studied the relationship between information technology flexibility, procurement practices, collaborative relationship and supply chain swiftness; Ntayi and Eyaa (2010) who studied the relationship between procurement practices, collaborative relationships and supply chain performance. The last mentioned study did not however address the impact of the components of collaborative relationships on SME supply chain performance. In this study, we examine the relationship between the components of collaborative relationships and SME supply chain performance.

Collaboration is about entities working together and emerges when firms come to the realization point working alone is not sufficient to resolve common problems (Matopoulos et al., 2007; Huxham, 1996; Corbett et al., 1999; Barratt and Oliveira, 2001; Wagner et al., 2002). When supply chain members integrate and act as a homogenous entity, there is an improvement in the flow of goods / services, finances and information creating improved performance (Simatupang and Sridharan, 2004). According to Simatupang and Sridharan (2002, 2005), the key dimensions of collaborative relationships are information sharing, incentive alignment and decision synchronization. Information sharing involves obtaining and disseminating timely and appropriate information to supply chain members in order to enable informed decision making. Decision synchronization focused on shared decision – making in supply chain activities / operations and incentive alignment refers to the extent to which members of s supply chain share costs, risks and benefits. In this study, we adopt the conceptualization of collaborative relationships proposed by Simatu-

pang and Sridharan and propose a model that examines the relationships between the dimensions of collaborative relationships and supply chain performance of SMEs in Uganda.

LITERATURE REVIEW AND HYPOTHESES

In this section, we provide a review of literature on information sharing, incentive alignment, decision synchronization and supply chain performance and develop hypotheses that we later test.

Information Sharing and Supply Chain Performance

Information is a key aspect of the supply chain (Aviv, 2003).Ideally, supply chain members should share information on aspects like customer demand levels, inventory levels, market trends, order levels, sales figures and trends, sales forecasts, production schedules, delivery schedules, capacity, to mention but a few in order to provide an information base that can be relied on to plan, make decisions, draft strategies for the future and control the operations of the supply chain in such a way that profit is realized (Simatupang and Sridharan, 2004; Lee and Wang, 2000). Supply chain performance is assessed in terms of quality, costs and timeliness. With relevant information available, for example, when accurate information on demand levels are provided, firms are able to project how much is desired, produce it on time, making it possible to deliver on time and eliminate the bullwhip effect, creating a supply chain with a good performance (Taylor, 2000). Availing accurate information on inventory minimizes costs incurred due to stock – outs and over – stocking and ensures that deliveries are made on time (Yao, Evers and Dresner, 2007). Information sharing shortens product and delivery lead times making products available on time to customers (Tachizawa and Ginemez, 2005). Access to information enables channel members to plan how much to stock for a given period of time (Fasanghari, Roudsari and Kamal, 2008). Information sharing further leads to improved supply chain performance through improved supply chain planning , reduced lead times, improved customer service, increased flexibility, on time delivery and improved quality of products (Lee and Whang, 2000). From this discussion, we derive our first hypothesis: *H1: Information sharing improves supply chain performance*

Decision Synchronization and Supply Chain Performance

Decision synchronization involves supply chain members coming together to make decisions concerning activities and operations in the supply chain. In this case, supply chain members are held accountable for their actions and the consequences of their actions (Simatupang and Sridharan, 2004). When entities are involved in joint decision making regarding supply chain activities, they are motivated and feel obliged to work towards realizing the objectives because they feel they are a part of the decisions made as a result of being involved. This in turn results in improved quality, reduced costs and improved delivery time, which are aspects of good supply chain performance. Joint decisions can be made in the areas of procurement, production, distribution (transport modes and courier selection), inventory management, facility location, materials flow, to mention but a few (Bagchi et al., 2005). In order for decision synchronization to succeed in collaborative supply chain relationships, issues relating to dominance, balance of power and resource sharing should be sorted out.

Decision synchronization also leads to the realization of economies of scale that lower costs ,enhance revenues, create higher customer satisfaction, lower inventory risk and improve delivery times (Das and Abdel-Malek, 2003; Simatupang and Sridharan, 2004). It enables firms in the supply chain to deliver goods to consumers at the lowest cost. From the foregoing discussion, we derive our second hypothesis: *H2: Decision synchronization improves supply chain performance*

Incentive Alignment and Supply Chain Performance

Incentive alignment is the process of motivating participating members in the supply chain to create value that benefits all the members and involves sharing costs, risks, and benefits amongst the participating members in the collaborative relationships along the supply chain (Simatupang and Sridharan, 2002). Sharing of benefits and costs motivates supply chain members to work together to realize the benefits that they look forward to sharing, in this way firm performance improves and so does supply chain performance in the long run. It should also be noted that supply chain members will be willing to share costs as long as they are sure that benefits will be shared fairly across the supply chain once they are realized (Simatupang and Sridharan, 2008). Information sharing between supply chain members is encouraged by incentive alignment because supply chain members will only share information when they perceive that the benefits of sharing that information will be shared fairly (Simatupang and Sridharan, 2002; Simatupang and Sridharan, 2005; Corbett et al., 1999; Fisher, 1997). We therefore derive the third hypothesis. *H2: Incentive alignment improves supply chain performance.*

METHODOLOGY

The study took on a cross – sectional and quantitative study design and was carried out in 2007. A cross – sectional design was adopted because the study was undertaken at one point in time and a quantitative approach was deemed fit to meet the objectives of the study. Data that was required was collected from people handling or overseeing procurement activities in the selected firms. A self – administered questionnaire was used to collect the data. Research assistants were provided with letters introducing them to the respondents. They approached the firms with the introduction letters and requested to see persons handling / overseeing procurement activities. Some respondents filled the questionnaires immediately while others remained with them and returned them after some days. Important to note is that some respondents did not return the questionnaires resulting in non – responses. The statements in the questionnaire had responses that were anchored on a four (4) point Likert scale: – 4 – strongly agree, 3 – agree, 2 – disagree and 1 – strongly disagree. We preferred not to have a mid – point response because more often than not, respondents confuse the midpoint response of "neither agree nor disagree" with "I do not know" or I am not sure. Sometimes respondent tick the mid – point response because it is convenient for them to tick, making them finish filling in the questionnaire faster. The position that we adopted is consistent with Raaijmakers et al., (2000) who assert that midpoint responses should be avoided.

The study area was Nakawa Division in Kampala District in the central region. Kampala is the capital city of Uganda. As per the record of the Uganda Small Scale Industries Association (USSIA), there were 1500

registered SMEs in Nakawa Division. However, this figure was as at 2006 and there was no updated list as at 2007, given the fact that many SMEs die and start – up on a daily basis. Since this was the documented list available, we decided to use the figure. According to Krejcie and Morgan (1970), a sample of 306 is appropriate for a population of 1500. We conveniently chose the 306 firms from Nakawa division and administered the questionnaires to the respondents. We collected 250 fully filled questionnaires, giving a response rate of 83%.

Measurement scales for the variables in the study were obtained from previous studies and revised to meet the Ugandan context in which the study was being undertaken. We assess supply chain performance from the perception of the firm and not supply chain members. Scales for information sharing, incentive alignment and decision synchronization were obtained from Simatupang and Sridharan (2002, 2005) while scales for supply chain performance were obtained from Beamon (1999). Under information sharing, we enquired on information sharing with buyers and suppliers on promotional events, demand forecasts, price changes, inventory holding costs, supply disruptions, inventory policies, order status and delivery schedules. Under decision synchronization, we considered joint decision making in the areas of product assortments to carry, promotional events, demand forecasts, pricing, stock availability levels, inventory requirements and order quantities. We considered incentive alignment in sharing savings on reduced inventory costs, allowances for product defects, agreements on order changes and subsidies for retail price markdowns. Supply chain performance was assessed in terms of cost, quality, flexibility and delivery times. Measures were tested from reliability using the Cronbach Alpha Co-efficient. The coefficient for information sharing was 0.719, decision synchronization 0727, incentive alignment 0.545 and supply chain performance 0.523. The overall Cronbach alpha co-efficient was 0.759.

There is a debate on the classification of Small and Medium Scale Enterprises with authors like Beyene (2002) and Schiffer and Weder (2001) arguing that in Africa, there is no common and acceptable classification of SMEs in Africa. We are aware that SMEs are classified basing on employee numbers, turnover and capital investment. Given that many SMEs do not avail their turnover and capital investment figures, we settled for classifying SMEs using employee numbers and based on the classification provided by the Government of the Republic of Uganda where a firm with 5 – 50 people are classified as small and 51 – 500 as medium.

The collected data was analyzed using the Statistical Package for Social Scientists (SPSS). Correlation analysis was used to determine the nature of the relationship between the variables. We used the hierarchical regression analysis to determine the variance in the dependent variable explained by adding each variable. In our analysis, we controlled for the number of years the SME has been in operation and the type of SME.

Presentation of Findings

In this section, we present the findings of the study that was undertaken. The first part of this section presents the characteristics of the respondent firms and the second and third parts present the results of the regression and correlation analysis.

CHARACTERISTICS OF RESPONDENTS AND RESPONDENT FIRMS

Firm Type / Category

97 (39%) of the firms were in the manufacturing section, 23 (9%) in the construction sector, 45 (18%) in the hotels and restaurant sector, 25 (10%) in the education sector, 49 (20%) in the wholesale and retail trade sector and 10 (4%) in the food processing sector. Majority of the firms were from the manufacturing sector.

Length of Firm Operation

11 (4.5%) has been in operation for less than a year as at the time of data collection, 35 (14.0%) had operated for 1 – 3 years, 64 (25.7%) had operated for 3 – 5 years and 139 (55.7%) for more that 5 years. Majority of the firms had therefore been in operation for more that five years.

Highest Level of Education Attained by Respondents

52 (20.7%) respondents were holders of certificate qualifications, 86 (34.4%) were holders of diploma qualification, 104 (41.4%) were holders of bachelors degrees and 9 (3.4%) were holders of masters degrees. Majority of the respondents were holders of bachelors' degrees implying that procurement is more as an operational function as opposed to a strategic function.

CORRELATION ANALYSIS

The results of the correlation analysis are shown in table 1 below. The relationships between the independent variables and dependent variables were found to be positive and significant at the 0.01 level, supporting hypotheses H1, H2 and H3.

REGRESSION ANALYSIS

We ran a hierarchical regression analysis in order to determine the variation in supply chain performance that is explained by the independent variables. The results are shown in table two below:

Table 1: Correlation Analysis Results

	Mean	S.D	(a)	(b)	(c)	(d)
Information Sharing (a)	2.58	0.53	1			
Decision Synchronization (b)	2.5	0.58	.780**	1		
Incentive Alignment (c)	2.27	0.73	.466**	.520**	1	
Supply Chain Performance (d)	2.79	0.4	.505**	.448**	.395**	1

Table 2: Regression Analysis

	Model 1		Model 2		Model 3		Model 4	
	Standardized	Standardized Error	Standardized	Standardized Error	Standardized	Standardized Error	Standardized	Standardized Error
Type of company	-0.096*	0.009	-0.079*	0.008	-0.083*	0.008	-0.075*	0.008
Length of operation	-0.006	0.019	-0.015	0.017	-0.01	0.017	-0.015	0.016
Information sharing			0.502**	0.028	0.391**	0.044	0.363**	0.044
Decision synchronization					0.142*	0.041	0.066	0.042
Incentive alignment							0.188**	0.023
F	2.627		65.061		50.715		45.888	
Sig.	0.073		0		0		0	
R Square	0.009		0.262		0.269		0.295	
R Square Change	0.009		0.253		0.009		0.026	
Adjusted R Square	0.006		0.258		0.264		0.288	
** - regression is significant at 0.01 level, * - regression is significant at 0.05 **Dependent Variable – Supply Chain Performance**								

In the first model, 1, we entered the type of company and length of operation of the firm as control variables. The purpose was to test whether out results are consistent across company types and the duration of operation. The control variables did not significantly predict supply chain performance.

In model 2, we added information sharing and the model becomes significant ($F=65.061$, sig. = 0.000, $p \leq 0.05$, $\Delta R^2 = 0.253$) implying that information sharing predicts 25.3% of the variance in supply chain performance.

In model 3, we added decision synchronization and the overall model still remained significant at the 1% level of significance ($F=50.715$, sig. = 0.000, $p \leq 0.05$, $\Delta R^2 = 0.009$) implying that decision synchronization predicts 0.9% of the variance in supply chain performance.

In model 4, we added incentive alignment which predicted 2.6% of the variance in supply chain performance and the model remained significant ($F=45.888$, sig. = 0.000, $p \leq 0.05$, $\Delta R^2 = 0.026$). It is important to note that when all the 3 variables of information sharing, decision synchronization and incentive alignment were entered into the model at the same time, decision synchronization became insignificant while information sharing and incentive alignment were significant. The overall model predicted 29.5% of the variance in SME supply chain performance.

DISCUSSION OF FINDINGS

The finding on the significant relationship between information sharing and supply chain performance agrees with the works of a number of scholars like Whipple and Russell (2007), Waller et al., (1999), Lee et al., (2007) and Daugherty et al., (2002) who assert that information sharing has been known to improve performance. According to Sandberg (2007) and Whipple and Russell (2007), the type of information shared may include production planning, inventory levels/turns, fill rate, forecast accuracy, promotion performance, price levels and pricing, sales data and on time delivery. Lee et al., (2007) argue that for information sharing to be effective, it has to be shared with both customers and suppliers. They go ahead to state that information shared with customers should focus on demand, order placement and status, prices and delivery timing while information shared with suppliers should focus on development and involvement of suppliers in product design, production planning, inventory management and levels and management of the ordering process. SMEs in Kampala share information with suppliers and customers in their chains as well as other SMEs using different avenues like internet (emails and websites), mobile phones, trade associations, seminars and workshops, umbrella bodies, to mention but a few. In some SMEs, when customers make purchases or show interest in purchasing some items, they (customers) are requested to leave behind their phone numbers in a customer contact book (which many firms now have).When there are discounts or new stock, customers are sent messages to make them aware, thereby sharing relevant information with the customers. Customers are also given the opportunity to write down what they desire, in case it is not available at the time they come to purchase. When the item is brought in, the customer is informed and he / she comes to pick it. By doing this, the SME is getting relevant information for forecasting demand, which information is in turn shared with the supplier. A good number of SMEs also have websites and they do advertise using their websites or place adverts on other websites. They are also using networking sites like face book to advertise and share information. SMEs also easily share information and keep in touch with their supplies using emails and mobile phones making it possible to improve supply chain performance. Umbrella organizations like the Uganda Small Scale Industries Association (USSIA), Private Sector Foundation Uganda (USSIA) and Enterprise Uganda provide opportunities through workshops and seminars where SMEs are able to link up with their customers and suppliers and share relevant information.

Our study revealed that incentive alignment was a significant predictor of supply chain performance agreeing with the works of Simatupang and Sridharan (2002; 2004) and Eriksson and Pesa¨maa (2007). Sharing of gains and losses increases the commitment of members towards achieving the desired end. Through the associations and buying consortiums, SMEs are able to work together and therefore, share gains and loses. However, more effort is needed to improve incentive alignment because it has the lowest mean in the descriptive statistics.

The finding on the fact that decision synchronization is not a significant predictor, however disagrees with the assertion that supply chain performance can be improved when decisions are synchronized in supply chains as proposed by Simatupang and Sridharan (2002; 2004). Decision synchronization involves making joint decisions in planning and operational context (Simatu-

pang and Sridharan, 2005). Our finding is in agreement with the position put forward by Wiengarten et al., (2010) that decision synchronization may not necessarily lead to improved performance. Given that firms are formed with different visions and missions, sometimes it is not easy to attain the benefits of joint decision making. The other aspect that downplays the impact of joint decision making is the fact that when joint decisions are made, there is need to supervise in order to ensure that what was agreed upon is implemented. It is possible that when joint decisions are made, supervision systems are not put in place to ensure that what has been decided on is followed through. If decision synchronization is to be effective, support systems need to be put in place. The third aspect that could reduce on the significant impact of decision synchronization is opportunistic behaviour amongst members because they perceive that they may not gain as much as they would have loved to gain. This is supported by the fact that incentive alignment as a lower mean (mean = 2.23) than information sharing and decision synchronization.

IMPLICATIONS OF THE STUDY

Theoretical Implications

Our study adopted Simatupang and Sridharan's (2002, 2005) model of supply chain collaboration. Collaboration has been widely studied in relation to performance and our study makes a number of contributions to the theory and study of collaboration. First and foremost, we studied collaboration and supply chain performance in the SME sector in a developing country. Out study therefore contributes to an understanding of collaboration and supply chain performance in the private sector in a developing country. Given that most collaboration studies have been undertaken in more developed countries, with few focusing on SMEs, we provide a spring board for further research in collaboration in SMEs and Uganda, in particular.

The second implication of our study is the fact that the dimensions of collaboration do not have an equal impact on supply chain performance. Information sharing and incentive alignments were found to be significant predictors of supply chain performance while decision synchronization was not a significant predictor. Wiengarten et al., (2010) admit that the issue of why the dimensions of collaboration have different impact levels has not been adequately addressed. Future studies can consider undertaking studies to determine the aspects that affect information sharing, incentive alignment and decision synchronization.

The third implication of our findings is that we provide a different view point of understanding the aspects that affect SME performance. A lot of focus has been placed on improving SME performance in Uganda, but none has specifically focused on improving the performance of the SMEs by improving supply chain performance through collaboration in the supply chain.

Managerial Implications

Our findings generally stick to the general assertion that collaboration improves performance and is a significant predictor of supply chain performance. However, it should be noted that we provide an understanding that the components of supply chain collaboration do not equally improve performance. Information sharing and incentive alignment are significant predictors of SME supply chain performance while decision synchronization is not a significant predictor. Of the two significant variables information sharing is a stronger predictor

(beta = 0.363). In the managerial area, the major contribution of our study is the provision of evidence that collaboration explains some of the variation in SME supply chain performance. Therefore, it is important for members in SME supply chains to collaborate if they are to improve the performance of their firms through better supply chain performance. Our second contribution is the understanding that much as collaboration explains supply chain performance, the individual dimensions of collaboration do not have an equal impact on performance. Information sharing and incentive alignments were found to be significant predictors while decision synchronization was not a significant predictor.

The first implication for SME managers and owners is to understand that collaboration explains supply chain performance. In order for them to improve the performance of their firms in light of high levels of competition and the fact that competition has shifted from between firms to between supply chains, they should expend efforts towards building and maintaining collaborative relationships.

In other words, systems should be put in place to support and develop these relationships. Secondly, when building the relationships, focus should be placed enhancing information sharing and incentive alignment given that they were the significant predictors of SME supply chain performance. Systems that enhance information sharing and incentive alignment should be put in place in order to better supply chain performance. Given the fact that many SMEs in developing countries are financially constrained, managers should be careful to put in place systems that are feasible and acceptable in terms of financial demands. Managers of SMEs need to realize that if they are to benefit from decision synchronization in their supply chains, incentive alignment should be addressed and improved.

LIMITATIONS OF THE STUDY AND DIRECTIONS FOR FUTURE RESEARCH

Our study is limited by a number of factors that provide opportunities and directions for studies that can be carried out in future in the area of SME supply chain performance. These factors are explained the sections that follow.

We considered supply chain performance from the perception of an individual firm in a chain, leaving out other members of the supply chain. In future, studies can consider judging supply chain performance from the perception of supply chain members and not just one firm in the chain.

The independent variables, which were information sharing, incentive alignment and decision synchronisation, explain 29.5% of the variance in SME supply chain performance. The percentage is low, implying that there are other variables that need to be included in the model to increase its explanatory power. We therefore recommend that other variables like managerial competencies, business laws and regulations, supply chain management competencies in SMEs, the investment climate in Uganda, to mention but a few be examined to determine the extent to which they affect SME supply chain practices.

Collaboration is an aspect that is built and grows over a given period of time. Collaborative relationships also evolve over time. Therefore, in order to study the nature of the SME collaborative practices, a longi-

tudinal study would have been appropriate. However, a longitudinal study on SMEs in Uganda would be limited by the fact that not many SMEs live beyond their fifth birthday.

The sample for our study was carried out in Kampala District, implying that our findings cannot be generalised to other parts of the country. A similar study should therefore be undertaken in other parts of the country to ascertain if the results are similar.

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