

Antecedents and outcomes of supply chain management in Bangladesh

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Abstract

Purpose – The purpose of this paper is to investigate the institutional and significant competences that have allowed organizations to employ supply chain management (SCM) practices, the practices of SCM and the benefits of SCM practices for both buyers and suppliers.

Design/methodology/approach – A theoretical model (including hypotheses) has been proposed regarding antecedents, SCM practices and outcomes of SCM. Using purposive sampling method, data were collected from different manufacturing, distributing, wholesaling and retailing organizations. Collected data were analyzed in a principal component analysis and structural equation modeling, including confirmatory factor analysis, and path analysis.

Findings – The empirical results provided supportive evidences in favor of the hypotheses and theoretical arguments except one hypothesis. This study did not find positive relationship between organizational compatibility and SCM practices. The study found relationships between mutual trust and SCM practices, communication and SCM practices, and cooperation and SCM practices, which were positive and significant. Again, the relationships between SCM practices and competitive advantages, and SCM practices and long-term orientation and growth were also positive and significant.

Practical implications – Practitioners could also use the findings to align SCM with business strategy and gain an insight for better utilization of the available resources and technology to perform better.

Originality/value – This study will provide guidance as to the preconditions that need to be in place in order for a company to implement SCM with its suppliers and customers. It will remind practitioners to stay focused on the ultimate goals of SCM – lower costs, increased customer value and satisfaction, and, ultimately, competitive advantage.

Keywords Outcomes, Supply chain management, Antecedents, Competitive advantages, Long-term orientation and growth

Paper type Research paper

1. Introduction

Supply chain includes all the activities related with flow and transformation of goods from raw materials procurement stage to end users consumption of those goods. Supply chain management (SCM) is integration of these activities through improved supply chain relationships, to achieve a sustainable competitive advantage (Handfield and Nichols, 2015). Organizations are turning increasingly to global assets for their production components to achieve competitive advantages. This globalization of supply chain has compelled organizations

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to look for greater effective approaches to coordinate flow of inventories within and across the organization. Key to such coordination is an orientation toward closer relationships with suppliers. Further, supply chains compete with each other on the basis of time (consistent on timely delivery) and convenience of customers. Each of those necessitates closer coordination with suppliers and customers. Bangladesh is also the part of this worldwide orientation and multiple performance-based competition of SCM. The issue of SCM in Bangladesh is new and Bangladeshi firms' performances can be accessed with respect to SCM. Only a few studies addressed the issues in our country. For instance, Asgari and Hoque (2013) conducted supply chain performance analysis on ready-made garment (RMG) industry of Bangladesh. On the other hand, Hossain and Roy (2016) reformed a research on SCM for RMG growth in Bangladesh. No study was conducted addressing the issues such as antecedents, practices and outcomes of SCM in Bangladesh. This study has addressed the issues like antecedents, practices and outcomes of SCM with respect to Bangladeshi firms.

Antecedents to SCM are the factors that decorate or hinder the implementation of a supply chain orientation philosophy. Morgan and Hunt (1994) propose that cooperation arises immediately from both relationship trust and dedication. The mutual dependence of a firm on an associate (interdependence) refers to the company's need to maintain a relationship with the companion to obtain its dreams. Recounted dependence is a top pressure in the improvement of supply chain harmony (Bowersox and Closs, 1996). In addition, this dependence is what motivates willingness to barter practical transfer, percentage key facts and take part in joint operational planning (Bowersox and Closs, 1996). Ganesan (1994) proposes that dependence of a company on every other company is definitely related to the company's long-term relationship desire. Company philosophy or policy and the management techniques of each company in a supply chain should be compatible for a proper SCM (Cooper *et al.*, 1997; Lee and Fernando, 2015). Eventually, numerous authors advise top management commitment plays an important position in shaping a business enterprise's values, orientation and course (Aloini *et al.*, 2015; Kotter, 1990). Day and Lord (1988) discover that top-level managers have a sizeable effect on organizational performance. Wang and Dai (2018) propose top-level support, leadership and dedication to trade are essential antecedents to the implementation of SCM. Aloini *et al.* (2015) identify 16 items as antecedents of SCM, but those were the combination of antecedents and practices of SCM.

The motive behind the formation of a supply chain association is to increase supply chain competitive gain. Precise objectives to enhance profitability, competitive gain and client price/delight of a supply chain, in addition to its contributors, are recommended through numerous researchers. For instance, a key goal of SCM is to decrease the expenses required to provide the vital level of customer support to a specific segment (Dubey *et al.*, 2017; Houlihan, 1988). Customer service targets also are performed through a purchaser-enriching supply system centered on developing revolutionary answers and synchronizing the glide of merchandise, offerings, and facts to create specific, individualized resources of customer service cost (Esfahbodi *et al.*, 2017; Ross, 1998). Consequently, it is proposed that the implementation of SCM enhances customer value and satisfaction, which, in flip, leads to better competitive gain for the supply chain. This, in the end, improves the profitability of the supply chain and its contributors. So, the aims of this study are, first, to recognize the institutional and significant competences that have allowed organizations to employ SCM practices; second, to recognize the practices of SCM; and, third, to identify how the benefits are achieved from SCM practices.

2. Literature review and hypotheses development

2.1 SCM in Bangladesh

SCM integrates and coordinates business activities of buyers and suppliers. SCM ensures timely delivery of products and services to end users (Chen, 2009), consequently enjoys

advantageous position among other management approaches. Buyers and suppliers build relationships to reduce uncertainty, and control the supply chain activities (Lee and Fernando, 2015). This occurs through a trust-based collaborative relationship where partners have frequent communication, cooperation and sharing of information. The issues related with SCM have attracted attention from both researchers and managers. Many researches were conducted on SCM in the context of developed countries (e.g. Aloini *et al.*, 2015; Dubey *et al.*, 2017; Esfahbodi *et al.*, 2017; Lee and Fernando, 2015; Wang and Dai, 2018), but the research on SCM in the context of developing countries like Bangladesh has received little attention.

The history of Bangladesh's involvement in SCM activities is around four decades long. The partial SCM practices were started in Bangladesh at the end of 1970s at the time of early growth period of the RMG industry (Hossain and Roy, 2016). SCM practices are not sufficient in all sectors of Bangladesh. A lack of proper market information and undeveloped infrastructure are two main reasons of an unsound supply chain system in poultry and agriculture sectors in Bangladesh (Nuruzzaman, 2015; Shamsuddoha, 2015). Haque and Islam (2018) conducted a study on pharmaceutical industry of Bangladesh and found a positive relationship of knowledge sharing and collaboration with customer satisfaction leading business competitiveness. That study was not comprehensive with respect to overall SCM practices of Bangladesh. On the other hand, some studies (e.g. Asgari and Hoque, 2013; Hossain and Roy, 2016) were conducted on the RMG industry of Bangladesh.

However, cost factors (e.g. labor, raw materials, etc.), efforts to improve business environment, services and facilities development are issues that foster an advantageous position of Bangladesh with respect to SCM. It is critical to understand the drivers, practices and outcomes of SCM practices of Bangladesh. As SCM practices are growing rapidly in Bangladesh, it is highly crucial to gauge various aspects like influencing factors of SCM, SCM practices and consequences of SCM. The upstream and downstream partners of SCM will be benefited knowing the various issues of SCM practices in Bangladesh. Moreover, there is a dearth of research conducted in SCM issues in a developing country like Bangladesh. This study is expected to add values with the current knowledge of SCM in both theoretical and empirical contexts. According to Haque and Islam (2018), Bangladeshi firms have good prospect ensuring competitive advantages through sharing of knowledge and collaboration in supply chains. Therefore, it is needed to conduct study to address the issues like antecedents, practices and consequences of SCM in Bangladesh.

2.2 Antecedents of SCM

The antecedents of SCM are crucial for successful implementation of SCM practices. Several researches were conducted regarding the drivers of SCM. Trust, cooperation, communication, commitment, collaboration, top management support, political, social environment, etc., were identified by many scholars (e.g. Aloini *et al.*, 2015; Barringer and Harrison, 2000; Blome *et al.*, 2014; Flynn *et al.*, 2017; Mentzer *et al.*, 2001; Raut *et al.*, 2017; Su *et al.*, 2008; Vargas *et al.*, 2018). Most of the studies were conducted in developed economies. This study has selected four favorable SCM drivers to test their applicability in a developing economy such as Bangladesh.

2.2.1 Mutual trust. Mutual trust between the partners is required for each relationship (Aloini *et al.*, 2015; Tomkins, 2001). Trust is a behavioral aspect of both parties in a relationship and arises step by step in the interaction of both parties (Su *et al.*, 2008). Mutual trust produces belief between the partners that one will not do anything against other. Formation of partnership to create value requires trust as a vital antecedent in partnership investment. To become trustworthy to each other, tangible or intangible trust is needed in terms of judgment, motives, character and role of competence (Mentzer *et al.*, 2000). There is always a possibility of opportunistic behavior of other party and that all ambiguity can never be removed in a supply chain relationship (Blome *et al.*, 2014; Laaksonen *et al.*, 2008).

Mutual trust is necessary to mitigate such opportunism in strategic partnering. Interdependence encompasses each partner's dependence, the magnitude of the firms' total interdependence and the degree of interdependence asymmetry between the firms (Mentzer *et al.*, 2000). In a long-term orientation, while a supply chain relationship creates dependence, the level of trust and relational norms transform dependence to interdependence and motivate in creating a value supply chain relationship (Hawkins *et al.*, 2008; Vargas *et al.*, 2018). A relationship cannot be created without trust, and a relationship without mutual trust and interdependence will continue with uncertainty. SCM practices such as information sharing, joint cost management, electronic integration, joint programs, etc., require greater extent of mutual trust and interdependence. Thus, the greater the mutual trust and interdependence, the stronger is the motivation to manage supply chain activities.

2.2.2 Communication. Understanding and communication of common goal, and disagreement resolution are done through communication among firms (Su *et al.*, 2008). A communication strategy in supply chain means to influence the negotiation process manufacturer and supplier use communication in their bargaining sessions. In marketing channels literatures, the relationship between communication strategies and behavior of firm has been greatly focused (Artz and Brush, 2000). To reduce the rate of fall in investment as perceived by suppliers and supplier frustration, the buyer can ensure increased flows of communication and information (Lettice *et al.*, 2010). Communication is essential for joint programs and performance measures; and increasing absorptive capacity as well as assimilating functional units that binds the organizations. Functional assimilation is needed to apply complex technology to accomplish organizational objectives (Tu *et al.*, 2006). Information sharing through effective communication increases the probability that it will discover new ways to enhance relational performance of the partners (Pakdeechoho and Sukhotu, 2018). The most important groups of information to share include: operations information, planning information, customer requirement information and financial information (Kelle and Akbulut, 2005). Effective communication is necessary for supply chain partners for developing cost management relationships (Raut *et al.*, 2017; Su *et al.*, 2008). Therefore, successful relationships are based on efficient communication, and communication is necessary for supply chain value creating activities.

2.2.3 Cooperation. Collaboration with others that is intended for common benefits or attaining rewards. These include attitudes and potentiality of future behavior as well as behavioral fundamentals is defined as cooperation (Blome *et al.*, 2014; Su *et al.*, 2008). To extend dealings beyond the transactional exchange toward developing a relationship, parties show willingness through cooperation, and it is a predecessor of continued relationship and performance measures. Multi-dimensional construct has been conceptualized such as joint action, resource and information sharing, harmony and flexibility (Mavondo and Rodrigo, 2001). Competitiveness in global economy requires firms to develop strong partnership relationships built on cooperation and trust with the remaining suppliers (Stuart and McCutcheon, 2000; Huang *et al.*, 2015), which facilitate sharing of information and perform joint activities (joint process, joint production design, etc.) among the partners. Uncertainty in supply and demand and more dependency on external resources justify the appropriateness of formation of a close long-term cooperative relationship in supply chain relationships (Su *et al.*, 2008). Cooperation builds a system in cooperation process, and systems made up of cooperation mutually produce more richly structures and stable social and technological networks (Flynn *et al.*, 2017; Wilkinson and Young, 2002).

2.2.4 Organizational compatibility. In a supply chain, each firm should have compatible corporate culture or philosophy and management that enable firms to be succeeded in SCM (Mentzer *et al.*, 2001). To develop supply chain relationships, a supply chain analysis of level centers may influence by focusing on organizational attributes and internal characteristics

(Vargas *et al.*, 2018). Organizational compatibility refers as corresponding goals and objectives, as well as parallel in operating viewpoint and corporate customs. The effectiveness of relationship in a supply chain alliance positively affects networking and collaboration of partners (Aloini *et al.*, 2015; Mentzer *et al.*, 2001). Value creation by using joint cost management, and sharing of information is depends on the partnering firms' capability (Barringer and Harrison, 2000). Relational governance occurs in a supply chain relationship as the consequence of joint performance measures. Joint action by the partners is viewed as governance process because of the joint responsibility for the activities of the dyad serves to protect the party with specific attests from their appropriation (Kenneth *et al.*, 2012). Compatible corporate culture is essential in long-term customer supplier relationships (Mentzer *et al.*, 2000) and, therefore, organizational compatibility is positively related to a strategic partnering orientation and value creation.

2.3 SCM practices

SCM entails efforts to achieve competitive advantages with a long-term orientation by ensuring economies of scale, sharing risk and costs reduce costs. SCM methods include some managerial and operational process or methods. These are often used as the instruments of value creation in the supply chain relational context. In SCM, some of these are used as tool for supply chain cost management and relational governance purposes (Agndal and Nilsson, 2009). In the integrated strategic management literature, the commonly used SCM methods are as discussed next.

2.3.1 Information sharing. Benefits of SCM can be achieved through cooperation and sharing of information between partners. The role of information sharing has been explored in operations management literature including new product and process development and customer satisfaction (Aloini *et al.*, 2015; Primo and Amundson, 2002). Learning through information sharing is important for the partners in supply chain relationships that facilitate to gain new skill and identify new opportunities (Coad and Cullen, 2006). By studying Japanese firms, Cooper and Slagmulder (2004) stated that information sharing enable firms to get collaborative benefits. They argued that in the joint product development process the role of guest engineers' are very crucial and they facilitate in information sharing that is an example of supply chain cost management practice. Credible information exchange in a supply chain relationship strengthens the relationship with long-term orientation and new opportunity (Ryu *et al.*, 2007). Information sharing in supply chain relationships should contain some cost and production related information (Tomkins, 2001). Sharing of information facilitates buyers and suppliers to identify the ways of effective coordination and reduce relevant costs so that ensure competitive advantages (Kulmala *et al.*, 2002). A gap may be occurred between supplier side quality of information and customer side expectations (Kulmala *et al.*, 2002). So, informal relations in networking are required to reduce complexity in sharing of information (Choi and Hong, 2002).

2.3.2 Joint cost management. The contribution of Shank and Govindarajan (1993) in strategic cost management is considered as the origin of joint cost management or supply chain cost management. Strategic cost management supports improvements in decision making and analysis, helps set priorities, improves an organization's competitive advantage and results in a better allocation of resources (Ellram and Stanley, 2008). In a supply chain relationship, to create values for both parties, cost management techniques such as target costing, internal cost management (ICM) (activity-based costing), open book method and value chain analysis (VCA) are used. In a supply chain relationship, target costing plays an important role in the cost control aspect that ensures competitive advantages (Cooper and Slagmulder, 2004). Based on market requirements, target costing starts from product planning stage so as to generate profit to the firm by satisfying customer requirements

(Ibusuki and Kaminski, 2007). The origin of ICM is also considered as the strategic cost management and ICM is considered as supportive tool for target costing. Without perfect ICM, a target costing system cannot be implemented. Open book accounting and cooperation both are interrelated; without cooperation, open book cannot be implemented, and, again, when open book is implemented, it leads toward the cooperation between the partners. In the supply chain relationship, VCA is performed jointly by buyers and suppliers. For this purpose, the cooperating firms need to share cost and performance information to make a matured relationship (Dekker, 2003).

2.3.3 Joint programs. The activities such as supplier selection, joint product design, joint process development, price revision, product and process redesign are included in joint programs (Agndal and Nilsson, 2009; Cooper and Slagmulder, 2004; Ellram and Stanley, 2008; Mouritsen *et al.*, 2001). In a strategic relationship, participating firms pursue strategic targets through ongoing, long-term joint programs, where skills and expertise of them is very crucial. In this process, firms adapt business processes of each other over time and they perform their respective roles in the relationship (Hakansson and Lind, 2007). Consequently, interdependency between firms arises and that foster long-term continuation of the relationship. By joint process and product development, participating firms control the related cost that ensures competitive advantages. Because of changes in design or changes in technology, manufacturing processes may also have to be changed. In that case, firms perform product and process redesign to continue customer satisfaction and loyalty (Agndal and Nilsson, 2009).

2.3.4 Joint performance measures. In a strategic supply chain relationship, firms apply more joint planning and controlling methods requires establishing a joint performance measures (Mentzer *et al.*, 2000). In the traditional contractual agreement, individual firms assess their own operating expenses, revenues, profits with their expectations. On the other hand, total strategic relationship system is evaluated under joint performance measuring. To create incentives for partners and safeguard against the risk of opportunistic behavior from each other, relational governance is needed in supply chain relationship (Williamson, 1979, 1985). Relational governance implies supply chain exchange, which includes considerable relationship-specific assets, shared with high level of supply chain trust (Blome *et al.*, 2014). Relational governance occurs in a supply chain relationship. Governance performs a key role to influence operation costs as well as the desire of relationship partners to engage in value construction schemes by creating relational rents (Dyer and Singh, 1998; Pakdeechoho and Sukhotu, 2018). So, we propose:

- H1. Mutual trust has a positive impact on SCM practices.
- H2. Effective communication has a positive impact on SCM practices.
- H3. Cooperation has a positive impact on SCM practices.
- H4. Organizational compatibility has appositive impact on SCM practices.

2.4 Outcomes of SCM

A supply chain relationship has some aggregate performances or outcomes. It is assumed that the implementation of value creating techniques ensures customer vales and satisfaction that in turn directs to competitive advantages for all involved partners in the relationship (Mentzer *et al.*, 2001). Competitive advantage from strategic partnering cannot be sustained automatically but must be valuable to customers, hard for the competition to find out and durable and not vulnerable. Mutual trust-based supply chain relationships result in that trust to customer's goodwill and trust to supplier's competence decrease transaction cost and increase relational effectiveness (Laaksonen *et al.*, 2008). The outcomes of value creation can be categorized next.

2.4.1 Competitive advantages. To survive and flourish in the competitive business world, each firm develops relationship with its counterparts by formal and informal communication. Communication approaches with collaboration increases sharing of resources and interdependency. This dependence results cooperative relations and gaining competitive position (Wilkinson and Young, 2002). In a strategic partnership, by exercising joint programs, firms can increase the possibility of continuing competitive advantages, and can efficiently manage with environmental uncertainty and insecurity (Ireland *et al.*, 2002). Dyer and Singh (1998) categorized the competitive advantages such as: investments in relation-specific assets, substantial knowledge exchange, the combining of complementary, but scarce resources or capabilities, and so on. Such advantages can be achieved in the mutual design and production of exclusive new products, services, or knowledge and lower operation costs than rival alliances, owing to progress an effective governance system. Joint cost management emphasizes on critical technological innovations as well as cost reduction by four primary mechanisms: lower production costs, improved conformance quality, material/location substitution and lower transaction costs to ensure competitiveness (Stuart and McCutcheon, 2000). Thus, buying firm trust in a supplier should minimize the sum of the acquisition and possession costs, thereby providing the buying firm with a perceived transaction cost advantage (Bharadwaj and Matsuno, 2006). In a supply chain relationship (buyer–supplier relationship), cost control and differentiated service assist to create a competitive advantage in both aspects of cost and service. Electronic embeddedness and integrated programs ensure efficiency through cost control and effectiveness through customer service (Mentzer *et al.*, 2001). Competitive advantage directs each partner to focus on creation of value added services through efficiency, effectiveness in operations and superior relationship performance (Mentzer *et al.*, 2000).

2.4.2 Long-term orientation and growth. In a buyer–supplier relationship, joint programs are undertaken initially by the participating firms, and partners pursue strategic goals through ongoing long-term joint programs that lead to build long-term relationship (Aloini *et al.*, 2015; Mentzer *et al.*, 2000). Credible and reliable behavior of partner (buyer or supplier) increases the long-term orientation of existing relationship. Information sharing and openness ensure mutual trust; mutual trust addresses the relation to growth and to new opportunity (Ryu *et al.*, 2007). Value creating methods are used in supply chain to improve relationship development activities, and add value for buyer and supplier (Ellram and Stanley, 2008). The social exchange theory suggests that when partners behave opportunistically, relationship related performance will suffer. But supply chain relation based on electronic networking firms will not yield their opportunistic options (Hawkins *et al.*, 2008) and, due to the presence of trust, dependency and joint performance measures, turn to long-term orientation of relationship. Supply chain collaborative approaches not only focus on long-term orientation but also open the new door of opportunity (Hawkins *et al.*, 2008). In a strategic partnering supply chain, the coordination between different divisions reoccurred and customization of electronic set is done through electronic integration. Consequently, communication of functionalities for new products in terms of customer, service and monitoring is done and new frontier for improved business practices as well as new opportunities are searched (Mouritsen *et al.*, 2001). Cooperative activities between partners make closer to each other. A win-win situation in a relationship, repetitive interaction makes easy the knowledge transfer for integrated operations because of the presence of sharing environment (Barringer and Harrison, 2000). Thus, we predict (Figure 1):

H5. SCM practices have a positive impact on cost and service competitive advantages.

H6. SCM practices have a positive impact on long-term orientation and growth of business.

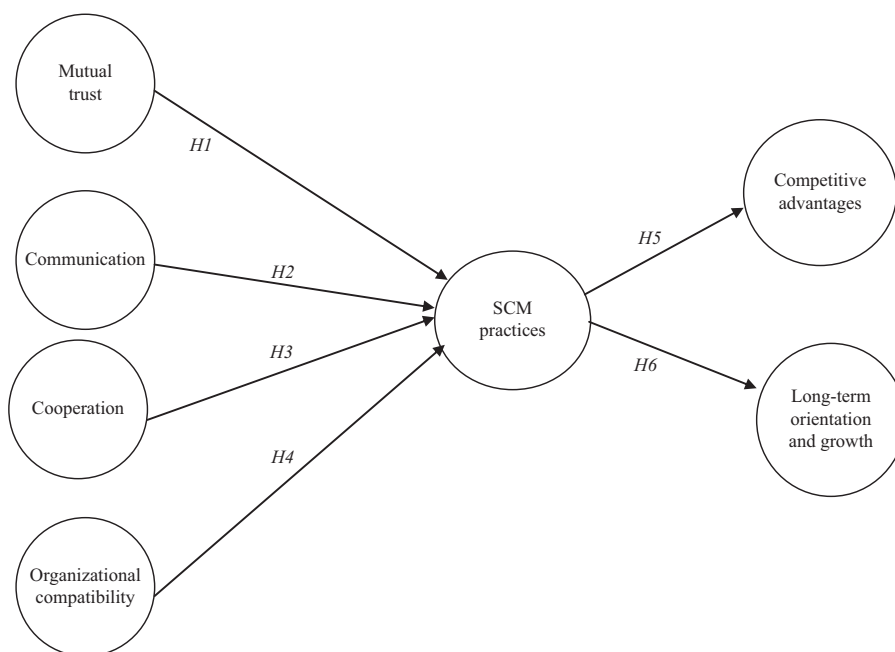


Figure 1.
Hypothesized
research model

3. Research methods

Questionnaire survey method was used to collect data. A two-rounds survey was conducted in this research. The measurement items were constructed through literature survey and interviews with SCM experts. The literature was reviewed to identify the antecedents, methods, and outcomes of SCM and then experts' opinion has been taken. Antecedents of SCM were measured through seventeen items adapted from Cao and Zhang (2011), Blome *et al.* (2014), Aloini *et al.* (2015), Lee and Nam (2016) and Banerjee and Mishra (2017). Next, SCM practices were measured through five items adapted from Aloini *et al.* (2015) and Banerjee and Mishra (2017). Finally, outcomes of SCM were measured through nine items adapted from Rao and Holt (2005), Shang *et al.* (2010), Paulraj (2011), Mitra and Datta (2014) and Banerjee and Mishra (2017). Mutual trust, communication, cooperation and organizational compatibility are exogenous variables, while supply chain practices, competitive advantages, and long-term orientation and growth are indigenous variables. We assume all others are controlled variable (e.g. sales volume, industry type, firm size, capital structure, number of employees, etc.) to prevent confounding with exogenous variables. Each latent construct encompasses at least four items, whereas minimum three items are required (Hair *et al.*, 2010). All constructs were measured using multiple items by a seven-point Likert-type scale (1 = strongly disagree, 2 = disagree, 3 = moderately disagree, 4 = neutral, 5 = moderately agree, 6 = agree and 7 = strongly agree). On several indices of reliability, validity, discriminating power and respondent preference, a seven-point scale is preferable compared to a five-point scale or less (Preston and Colman, 2000). Having seven points tends to be a good balance between having enough points of discrimination without having to maintain too many response options. The first round test was conducted with a sample of 50 respondents as pretesting of the questionnaire out of which 58 percent were male and 42 percent were female. Accuracy, practicability and content validity of questionnaire were ensured through the first round survey.

Principal component analysis (PCA) with a Varimax rotation was conducted on the preliminary and final sample. The goal of PCA is to explain the maximum amount of variance with the fewest number of principal components. The PCA was performed to understand the underlying relationship of factors data reduction and to avoid multicollinearity. Table I presents the PCA result of the first round survey. The cut-off point as 0.40 (suppress absolute value less than 0.40) was imposed in PCA.

As statistical power for data interpretation, 200 responses are enough (Hoe, 2008). In the second round, using purposive sampling method, a total of 385 questionnaires (having 95% confidence level, 5 percent margin of error and unknown population proportion, i.e. $p = 0.50$) were distributed to the target respondents (supply chain manager/supply chain officer/corporate relationship officer/management accountant), and 227 responses were received, of which 218 were complete and usable, and considered as adequate for statistical interpretations (response rate is 59 percent, whereas effective response rate is

	Mutual trust	Communication	Cooperation	Organizational compatibility	SCM practices	Competitive advantages	Long-term orientation and growth
V1	0.664						
V2	0.836						
V3	0.714						
V4	0.917						
V5		0.730					
V6		0.706					
V7		0.690					
V8		0.596					
V9			0.465				
V10			0.693				
V11			0.652				
V12			0.692				
V13			0.673				
V14				0.890			
V15				0.401			
V16				0.493			
V17				0.891			
V18					0.448		
V19					0.890		
V20					0.890		
V21					0.842		
V22					0.421		
V23						0.915	
V24						0.480	
V25						0.712	
V26						0.409	
V27						0.890	
V28							0.814
V29							0.808
V30							0.799
V31							0.692
Eigenvalue	4.382	3.586	3.030	2.712	2.445	1.812	1.644
Variance explained (%)	14.14	25.70	35.48	44.22	52.11	57.96	63.26
Cronbach's α	0.814	0.682	0.717	0.575	0.793	0.763	0.831

Table I.
Result of principle component analysis (preliminary survey)

Notes: Principal component analysis (PCA) is performed on preliminary sample; factor loadings less than 0.40 are not shown

approximately 96 percent). Incomplete responses were removed from further analysis. In total, 68 percent respondents were men and 32 percent were women; 29 percent respondents were up to 30 years; 42 percent were 31–40 years; 19 percent were 41–50 years; and 10 percent were above 50 years old. Respondents are from entry level, mid-level and top level, consisting of 22, 69 and 14 percent, respectively. In sum, 45 percent firms are manufacturing, 10 percent distributing, 26 percent wholesaling and 19 percent retailing. In order to control common method biases, it was assured to respondents that there were no right or wrong answers, and they should provide the answer as honestly as possible and no information will be shared with the other person or organization. It has been also assured that the respondents' identity will not be disclosed, i.e. for answers to be anonymous, and information of this survey will be used for the researcher's academic purpose.

4. Analysis and results

The structural equation modeling approach was used to analyze data that includes the measurement model or confirmatory factor analysis (CFA) model and structural model. The measurement model provides reliability and validity of constructs that comprises convergent validity, discriminant validity, and nomological validity. The CFA was conducted to do validity analysis, and then structural model based on the path analysis method was conducted to test hypotheses of this study. Before that, an iterated factor analysis with PCA with a Varimax rotation was conducted on formal sample. As a conservative heuristic, a cut-off point as 0.50 (suppress absolute value less than 0.50) was imposed in factor analysis. Items with a factor loading less than 0.50 (if any) were deleted (one item (V5) consists of "Communication" and two items (V9, V10) consist of "Cooperation" were deleted). It is notable that all calculated α values are above the widely recognized rule of thumb of 0.70 (Nunnally, 1978), which expresses a robust internal consistency among items within each construct applicable for the each group of sample responses also. Table II shows the rotated factor loadings and their respective eigenvalues and Cronbach's α values.

4.1 Measurement model

CFA was conducted to have a more rigorous interpretation of firm financial performance. The CFA model or measurement model was employed to identify and determine the relationships of variables within the model. To evaluate the goodness-of-fit of the model, several measures of indices are used as suggested by Hair *et al.* (2010), Iacobucci (2010) and Schumacker (1992): Chi-square/degrees of freedom (χ^2/df) ratio, root mean-square error of approximation (RMSEA), goodness of fit index (GFI), normed fit index (NFI), comparative fit index (CFI) and incremental fit index (IFI). As Table III shows, $\chi^2/df=1.325$, RMSEA=0.039, GFI=0.901, NFI=0.945, CFI=0.986 and IFI=0.986. All measures fulfill the suggested values. Therefore, the CFA model can be called a good fit model.

After achieving the well fit indices, the measurement model was further assessed for reliability and validity. The amount of variance in an item because of underlying construct is indicated by item reliability. Standardized loading greater than 0.70 demonstrates item reliability but standardized loadings ≥ 0.50 are also acceptable (Chin, 1998; Hair *et al.*, 2010). For construct reliability, a value ≥ 0.70 is required that intends to the degree to which an observed variable reveals an underlying factor. Table IV presents the item reliability and construct reliability results. Standardized loadings ranged from 0.662 to 0.982, indicating good item reliability. All values of construct reliability were above the threshold value (i.e. 0.70), indicating a high level of reliability for all the constructs.

After being assured that a scale instrument provides necessary levels of reliability, this study stepped to scale validity. Under construct validity convergent validity and discriminant validity were tested in this study. The degree to which dimensional measures of the same concept are correlated is assessed by convergent validity. To assess convergent validity,

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78

	Mutual trust	Communication	Cooperation	Organizational compatibility	SCM practices	Competitive advantages	Long-term orientation and growth
V1	0.849						
V2	0.891						
V3	0.846						
V4	0.780						
V6		0.695					
V7		0.830					
V8		0.827					
V11			0.799				
V12			0.861				
V13			0.875				
V14				0.823			
V15				0.884			
V16				0.864			
V17				0.746			
V18					0.860		
V19					0.870		
V20					0.902		
V21					0.785		
V22					0.847		
V23						0.902	
V24						0.913	
V25						0.918	
V26						0.885	
V27						0.897	
V28							0.875
V29							0.868
V30							0.849
V31							0.879
Eigenvalue	9.195	5.141	2.823	2.262	1.686	1.389	1.007
Variance explained (%)	32.84	51.20	61.28	69.36	75.38	80.34	83.94
Cronbach's α	0.880	0.837	0.958	0.949	0.933	0.962	0.942

Table II. Result of factor analysis

Notes: Principal component analysis (PCA) is performed on final sample; factor loadings less than 0.50 are not shown. Overall α value is 0.921

Table III.

Goodness-of-fit statistics for measurement model and structural model

	Suggested values	Measurement model values	Structural model values
χ^2/df	< 3	1.325	1.725
RMSEA	< 0.06	0.039	0.058
GFI	> 0.90	0.901	0.901
NFI	> 0.90	0.945	0.920
CFI	> 0.90	0.986	0.965
IFI	> 0.90	0.986	0.966

average variance extracted (AVE) is used (Fornell and Larcker, 1981; Hair *et al.*, 2010). Representation of latent constructs by items is truly denoted as higher as the AVE is higher. For latent construct the AVE should be more than 0.50 (Hair *et al.*, 2010). Table IV shows the AVE values for constructs ranged from 0.65 to 0.89 exceeded the threshold value 0.50, which is supportive evidence for convergent validity. Moreover, in a CFA setting, *t*-statistics related to factor loadings is assessed to measure convergent validity (Rao and Troshani, 2007).

Constructs and variables	Standardized loadings	<i>t</i> -statistics	Construct reliability (CR)	Average variance extracted (AVE)
<i>Mutual trust</i>				
V1	0.864	15.587**	0.88	0.65
V2	0.923	17.053**		
V3	0.750	12.605**		
V4	0.675	10.949**		
<i>Communication</i>				
V6	0.662	11.135**	0.85	0.66
V7	0.913	16.585**		
V8	0.836	14.542**		
<i>Cooperation</i>				
V11	0.936	18.410**	0.96	0.89
V12	0.982	20.251**		
V13	0.907	17.615**		
<i>Organizational compatibility</i>				
V14	0.971	18.959**	0.95	0.82
V15	0.900	16.772**		
V16	0.861	15.534**		
V17	0.891	16.492**		
<i>SCM practices</i>				
V18	0.800	13.796**	0.92	0.71
V19	0.850	15.274**		
V20	0.907	16.835**		
V21	0.868	15.695**		
V22	0.782	13.215**		
<i>Competitive advantages</i>				
V23	0.891	16.562**	0.96	0.81
V24	0.951	18.651**		
V25	0.928	17.849**		
V26	0.866	15.970**		
V27	0.869	15.961**		
<i>Long-term orientation and growth</i>				
V28	0.866	14.672**	0.93	0.80
V29	0.953	17.178**		
V30	0.823	13.904**		
V31	0.884	15.377**		

Notes: CR = $(\sum \text{Standardized loadings})^2 / [(\sum \text{Standardized loadings})^2 + \sum (\text{measurement indicator error})]$;
 AVE = $\sum (\text{Standardized loadings})^2 / [\sum (\text{Standardized loadings})^2 + \sum (\text{measurement indicator error})]$.
 **Significant at $p < 0.01$ level

Table IV.
Measurement model results

All items offer good measures to their respective latent construct because all *t*-statistics values are statistically significant at 0.01 level and confirm convergent validity of the constructs. AVE is also used to assess discriminant validity (Fornell and Larcker, 1981). The rule of thumb is that the AVE values should be greater than corresponding squared inter-construct correlation estimates (SIC) in the model. Table V shows the AVE estimates in the diagonal values and corresponding SIC values, which is supportive evidence for discriminant validity. For example, as Table V shows, AVE estimate for cooperation was 0.89 and corresponding SIC values were 0.46, 0.03, 0.02 and 0.25 for organizational compatibility, SCM practices, competitive advantage, and long-term orientation and growth, respectively, which is an indication of discriminant validity.

Table V.
Squared correlations
between constructs

	Mutual trust	Communication	Cooperation	Organizational compatibility	SCM practices	Competitive advantage	Long-term orientation and growth
Mutual trust	0.65						
Communication	0.05	0.66					
Cooperation	0.05	0.16	0.89				
Organizational compatibility	0.07	0.22	0.46	0.82			
SCM practices	0.10	0.10	0.03	0.01	0.71		
Competitive advantage	0.03	0.15	0.02	0.01	0.21	0.81	
Long-term orientation and growth	0.04	0.19	0.25	0.31	0.07	0.20	0.80

Note: Diagonal elements are average variance extracted (AVE)

4.2 Structural model

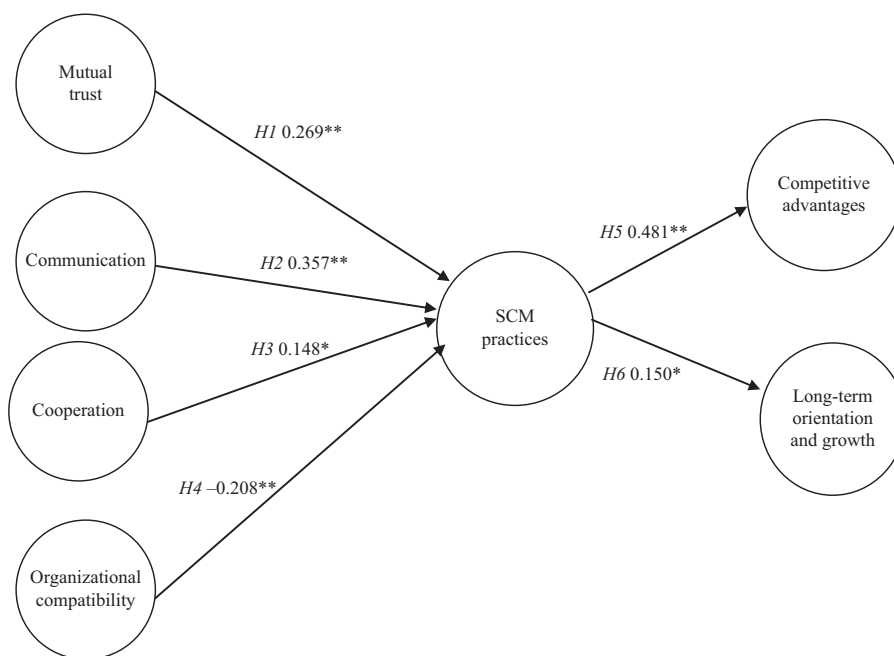
Table III shows the common model-fit indices, recommended values and results of the test of structural model fitness. As shown in Table III, comparison of all fit indices with their corresponding recommended values (Hair *et al.*, 2010; Iacobucci, 2010; Schumacker, 1992) the evidence of a good model fit was revealed. Given the good fit of the model, the estimated path coefficients of the structural model were then examined to evaluate the hypotheses.

Table VI depicts the empirical results of structural model by path analysis. The path coefficients along with hypotheses are visualized in Figure 2, where hypotheses were drawn in the solid lines. The results of structural modeling present that the intensity of mutual trust positively influences SCM practices (*H1*). The intensity of communication was positively associated to SCM practices (*H2*). Further, the cooperation positively links to SCM practices (*H3*). The results show that the organizational compatibility negatively influences SCM practices (*H4*). This result did not support the proposed positive relationship between organizational compatibility and SCM practices. Throughout these results, this research demonstrates significant relationship between antecedents of SCM and SCM practices. Regarding outcomes, SCM practices are positively linked to competitive advantages (*H5*). Again, SCM practices are positively associated with long-term orientation and growth of business (*H6*). These results also show that the outcomes of SCM practices and competitive advantages carry more importance compared to long-term orientation and growth of business (the path coefficient of competitive advantages is higher and more significant than that of long-term orientation and growth).

Table VI.
Path analysis of
structural model

Casual path	Hypotheses	Path coefficient	t-statistics	Results
Mutual trust → SCM practices	<i>H1</i>	0.269**	3.688	Supported
Communication → SCM practices	<i>H2</i>	0.357**	4.118	Supported
Cooperation → SCM practices	<i>H3</i>	0.148*	2.198	Supported
Organizational compatibility → SCM practices	<i>H4</i>	-0.208**	-2.15739	Not supported
SCM practices → competitive advantage	<i>H5</i>	0.481**	6.849	Supported
SCM practices → long-term orientation and growth	<i>H6</i>	0.150*	2.201	Supported

Notes: *,**Significance at $p < 0.05$ and $p < 0.01$ levels, respectively



Notes: * $p < 0.05$; ** $p < 0.01$

Figure 2.
Outcome of hypothesized structural model

5. Discussion and conclusion

The findings of this study provide support for the validity of the causal relationship stated in the hypotheses, in the supply chain-oriented industry. This study focused on the antecedents and consequences of the drivers of SCM practices and SCM practices among the organizations in the profit making industry. The results confirmed that mutual trust is crucial in an SCM and that members having a lack of trust and commitment in the SCM cannot attain the positive results of supply chain collaboration. Meanwhile, communication and cooperation in SCM played significant roles in improving organizational performance and competitive advantages as well. However, the members still lack certain organizational compatibility in SCM. Because of these deficiencies, participating firms in supply chain has to further improve the SCM in its operations to gain competitive advantage, and long-term growth of a business relationship. The result of this study has shown that mutual trust and SCM practices have a significant relationship and the hypothesis was supported. This finding is consistent with previous studies (Kalyar *et al.*, 2013; Su *et al.*, 2008; Vargas *et al.*, 2018) and demonstrated that trust is essential in creating supply chain collaboration to contribute to long-term cooperation. However, the relationships between mutual trust and SCM practices, communication and SCM practices, and cooperation and SCM practices were unrelated to each other. These results contradicted previous studies, which had found that trust is crucial in these two supply chain antecedents (Ebrahim-Khanjari *et al.*, 2012; Kalyar *et al.*, 2013).

This current study has found that communication has a significant relationship with SCM practices. This is consistent with previous studies (Moshkdanian and Molahosseini, 2013; Su *et al.*, 2008), which showed that communication had a positive relationship with supply chain coordination and information sharing. On the other hand, organizational compatibility was found to have a negative relationship with SCM practices, which contradicted previous studies (Barringer and Harrison, 2000; Mentzer *et al.*, 2000). Organizational compatibility also

requires a resource efficiency and top management support in a supply chain. Most of the participating firms of this study were still young. Average age of them in SCM activities is around five years. The sense of organizational capabilities and culture may not have been generated yet. Since most of the firms are new in SCM practices, these firms were perhaps not familiar with collaboration and sharing of information with other partners. When firms continue more time in SCM, integration and collaborative culture increase over time, thus enhancing SCM practices. However, the organizations that participated in this study perhaps were less supported by top management or lack of sufficient human and physical resources. The findings have proven that cooperation is inherent in the supply chains with aligns with the findings of Su *et al.* (2008). Cooperation was found to have a positive relationship with all the SCM practices: information sharing, joint cost management, joint programs and joint performance measures, and the hypotheses regarding cooperation and SCM practices were accepted. The results are consistent with previous findings (Bowersox *et al.*, 2012; Mentzer, 2004; Pakdeechoho and Sukhotu, 2018; Su *et al.*, 2008), and have shown that the members of the supply chain are interdependent and require each other in the SCM. The positive relationship between cooperation and SCM practices has also demonstrated that the members within the supply chain relationship are important to each other. Thus, the organizations within the supply chain collaborate to contribute to the growth of their respective industry.

This study found that SCM practices have a significant relationship with both competitive advantages and long-term orientation and growth. Although many previous studies have shown that supply chain collaboration has many potential advantages, this collaboration also has potential risks and does not always meet expected results for the supply chain (Betts and Tadisina, 2009). However, different businesses often have different goals. These organizations work may closely and share some common goals in SCM. The results of this study indicate that they are moving in the same direction to achieve mutual competitive advantages, which can cause a collaborative SCM practices. This study found that SCM practices are related positively to long-term orientation and growth. This finding is consistent with that of Jayaram *et al.* (2011), who found that good supply chain coordination has a positive relationship with long-term growth in the supply chain relationship. SCM requires developing a holistic view of coordination within the members of the supply chain. Functional supply chain activities such as customer satisfaction, competitive advantages, and proper coordination in supply chain manifest a long-term relationship among the supply chain partners.

This study provides practitioners with an improved understanding of the importance of the SCM the benefits that SCM can bring to their organizations. With the proposed theoretical framework, the practitioners could better form and manage their operational practices to create a better supply chain relationship with their business partners. Practitioners could also use the findings to align SCM with business strategy and gain an insight for better utilization of the available resources and technology to perform better. They could also realize the ways by which to improve overall performance for local customers and international buyers, and increase organizational profitability, competitiveness and long-term relationship formation as well. As supply chains become increasingly critical to business competitiveness, the findings of study are vital in assessing and investigating the level of supply chain implementation and the impact upon firm performance for those involved in the industry. Efficient and effective SCM is also being recognized as imperative in both competitive advantages and long-term relationship formation of an organization within a supply chain. The practitioners who are involved in the SCM will benefit by applying the lessons learnt here for improving the effectiveness of the supply chain strategy. For instance, they could better create and manage operational practices and develop a better business relationship with business partners. They could use the findings to align supply chain with business strategies and gain an insight into effective

usage of the resources or, in other words, better utilize available resources and technology to improve performance of services delivered to the local and international customers and increase the profitability, customer satisfaction and gain competitive advantages.

The study has several limitations. First, the data were collected through a close-ended questionnaire. Second, some of the organizations refused to assist in the study due to organizational policy, which restricts them from disclosing useful information. Third, this study is entirely dependent on the willingness of the respondents to participate openly. The tendency in answering the questionnaire survey may have been biased towards providing a more positive answer rather than expressing the real practices of the organization. Fourth, no specific industry was chosen; thus, the respondent population had to be developed from a mixture of industries. Industry-specific antecedents and outcomes should be considered. Responses of upstream and downstream partners of specific industry should be taken under consideration in further studies. Random probability sampling is more appropriate in survey research rather non-random sampling methods like purposive sampling. Response bias was tried to reduce in this study, but survey bias is another limitation of this study. A study on supply chain perspective is a critical area in management and business research. This paper discovered the antecedents and outcomes of SCM, which could enable further studies in SCM to explore and examine the supply chain relationship in several industries in-depth. Future researchers may consider studying such areas such as any specific industry like accommodation, chemistry and pharmaceutical, hospital, transportation, insurance, etc. Lastly, SCM deals with different suppliers in the supply chain and the changes in the economy and environment; thus identifying the risks and uncertainties in SCM is essential for implementing the necessary prevention arrangements.

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