Chapter 6

DISCUSSION AND CONCLUSION

The chapter presents the findings of the study and has put forth an applied understanding of the objectives which were previously described in the literature review section (Chapter 2). The research findings were assessed against the theoretical standpoint, and the subsequent discussions have resulted in certain theoretical and application oriented implications. In conclusion, the study limitations have been elaborated and thereby the scope which would arise from the limitations is also mentioned.

6.1 Discussion

Supply chain collaboration was found to have a statistically significant influence over supply chain collaborative advantage. The importance of supply chain collaboration measures obtained in the present study could be ascertained through the underlying items used to develop the measurement instrument. Cao et al. (2010) provided a comprehensive measurement structure which was empirically tested and was observed to provide reliable and valid statistics for the second-order construct of supply chain collaboration. The model contained all the facilitator variables such as goal congruence, decision synchronization, incentive alignment, resource sharing, joint knowledge creation, which provided insights into the indicators which enabled the presence of collaboration within the supply chain partners. However, as Oosterhuis et al. (2013) highlighted as well as observed by other related studies, the inhibitor variables played an equally important role towards the assessment of the presence of collaboration within the supply chain. Therefore, constructs such as conflicts, demand uncertainty and technology uncertainty were
deemed important to be empirically tested towards the development of a robust measurement instrument for the evaluation of the strength of the relationship between the supply chain partners. As discussed by Dyer & Singh (1998), the collaborative paradigm comprised inherent relationships which existed between the partners within the supply chain and the benefits accrued therein, were inter-organizational and symbiotic in nature. Therefore, towards the development of a successful collaboration-based partnership, the importance of relationship-based parameters was proposed to be significant. Also, since a study in supply chain collaboration meant the assessment of the viewpoints of all the partners within the supply chain, the facilitators alone might not suffice to define the nature of the relationships amongst the various partners. The introduction of the inhibitor variables such as conflicts, demand uncertainty, and technology uncertainty created the variation in the responses regarding how much the partners actually collaborated to reduce the anomalies which existed in the external business environment as well as internally. The high indicator reliability and composite reliability values for demand uncertainty and technology uncertainty, and the significant Cronbach’s Alpha value for conflicts provided substantial empirical evidence that the presence of the inhibitor variables were required to refine the construct and to better understand the influence of both the type of variables towards the establishment of a successful collaborative relationship. The present study comprised both the facilitator variables (information sharing, joint relationship effort, communication frequency, dedicated investments, and partner dependence), and also the inhibitor variables and proposed a balanced measurement instrument to adequately capture the essence of the higher order construct named supply chain collaboration and through empirical tests with independent buyer and supplier samples it was observed that the first-order constructs were reliable enough to define the higher-order variable and the same were instrumental in the development of the relationship
between supply chain collaboration and supply chain collaborative advantage which was also observed to be significant.

Supply chain competitiveness was observed to partially mediate the relationship between supply chain collaboration and supply chain collaborative advantage in the buyer group, whereas it fully mediated the relationship in the supplier group. Supply chain competitiveness (Matevz & Maja, 2013) was defined based on the inter-play between the inter-organizational relationships and the individual “relational determinants” which was identified during collaboration. The importance of relational determinants could be assessed through the theoretical underpinnings of the extended resource-based view (Lavie, 2006) and the resource advantage theory (Hunt, 1995). While the resource advantage theory provided insights into the existent comparative advantage that firms might derive though their accumulated resources to better their competitiveness, prolonged inertia in the identification and development of new unique resources could lead to competitor firms neutralizing the effect in the long period. Therefore, relationship-based assets were suggested to put forth the fact that relationship parameters and their successful application in a partnership would have considerable prolonged influence in the sustenance of competitiveness, as relationships were deemed as not that easy to be copied. Also, the involvement of relational parameters during collaboration were proposed to enhance the outcomes of the relationship for both the partnering firms in the form of an additional “relational rent” in which both the firms benefitted through the mutual understanding and sharing of each other’s resources. Therefore, in the longer period the individual competitiveness established would be transformed to supply chain competitiveness in which the partnering firms’ benefits would subsequently lead to a better positioning of the supply chain in related industry settings.
Therefore the construct of supply chain competitiveness devised by Matevz & Maja (2013) in accordance with the relational parameters were deemed important in the extant literature. Firms involved in collaboration at their supply chain level, were involved in joint processing of each of their internal as well as external activities. More than the process-related benefits gained through these shared activities the influence on the perceptions of individual competitiveness being enhanced through partnerships prevailed. Supply chain collaboration has been considered as the highest level of joint and shared functioning philosophy which prevailed through sustained relationships. However, the longevity of the relationships depended not only on the materialistic advantages derived but also on the perception that collaborative activities would lead to better competitive positioning of the firms which could be retained through further nurturing of the existent relationships. This perspective was proposed and at instances empirically tested in the aforementioned theories. The firms collaborated based on the reasoning that with temporal influence the competitive advantage derived from the sharing of tangible assets diminished or became extinct due to plausible imitability by the competitors. However, relationship-specific assets namely the type of knowledge shared, synchronized decisions, joint planning would provide additional and sustainable competitiveness for the individual firm and the supply chain, since the uniqueness of the relationship would be difficult or impossible for the opponents to replicate and deliver. Also, with the perception of competitiveness imbibed through better collaboration the advantages derived out of these perceptions would be higher, since collaborating firms would better integrate and align their resources which would lead to enhanced competitive positioning as well as greater outcomes derived from the relationships, such as improvement in quality, higher process efficiency, faster innovation cycle.
In the present study, for the buyer firms it was observed that the level of mediation were partial; the possible reason for the same could be attributed to the fact that the buyer firms sampled for the above study were all established manufacturers with more than 20 years of industry presence. In the manufacturing industry setting, the competitive positioning of each of these firms has been well defined in their years of existence and therefore, their perception of competitiveness would have been imbibed in their concern for sustained stability. Consequentially, the importance of competitiveness might have been deduced as elusive by the buyer firms. For the supplier firms, the situation was different. The buyer firms were asked to select their third highest supplier based on their annual contract value. Therefore, the supplier firms would still possess the notion that through better collaborative activities, their competitive positioning as against their related suppliers would be improved. The perception of this enhancement would have led the supplier firms to value competitiveness higher in comparison to their buyer counterparts.

Supply chain collaborative advantage was observed to have a significant influence on the performance outcomes related to satisfaction with relationships. Nyaga et al. (2010) empirically suggested that satisfaction based on the relationship-specific parameters such as information sharing and dedicated investments could be enhanced due to the development of trust and commitment within the relationship. The collaborative advantage gained from a particular relationship has been detailed with regard to process efficiency, innovation, flexibility, quality, and business synergy (Cao & Zhang, 2010). However, with perceptions of better tangible gains, the perceptions related to higher intangible benefits could also be ascertained. Therefore, as was observed in the buyer and the supplier responses in the present study, perceptions related to better joint benefits also substantially influenced the satisfaction derived of the relationship in terms of coordinated activities, participation levels, commitment level, and specifically the
degree and type of information shared. With synchronized internal and external process, the benefits derived would lead to higher levels of coordinated activities and with better quality induced iteratively through the skill of the intellectual forces of both the partners the commitment level would also be highly enhanced in the longer periods.

Supply chain collaborative advantage was also observed to positively influence satisfaction with results. Satisfaction with results (Nyaga et al., 2010; Daugherty et al., 2006; Whipple & Frankel, 2000) have been defined as the operational outcomes that could be achieved through the better collaborative activities and were measured through the parameters of market share, sales growth, market share, return on investment, growth on return in investment, and profit margin on sales. Collaborative advantages derived from the joint planning and execution of activities of activities would facilitate streamlined processes, with higher performance levels, reduced wastage and defects, lead time reduction in the introduction of newer products and variants in the market and flexible schedules to better the asset utilization ration. Therefore with all the above parameters synchronized, the partnering firms would garner higher productivity with a reduced cycle and lead time. With faster product conceptualization to introduction rate, the partnering firms would have the opportunity to position their product within the concerned consumer segment even before related introductions by the competing firms. With the additional shelf life, the probability of increased sales would be higher which would further increase the growth on the return on investments and improve the existent market share. In the present study it was found with the buyer and the supplier samples that the relationship between supply chain collaborative advantage and satisfaction with results were positive and significant. However, in the buyer scenario, the introduction of perception of competitiveness did not have any indirect effects on the satisfaction with results constructs, which again reiterated the fact that for established and
well categorized manufacturing market segment in India, the competitiveness perspective would not prevail as a catalyst. While on the supplier sample, considerable improvement was obtained after the mediator was introduced. This could be attributed to the reason that with better perceptions of competitiveness, the supplier firms were interested to better collaborate towards the coordination of internal and external processes, to align their practices with those of the buyer firms. Consequentially, as the supplier activities got better orchestrated with the buyer activities the operational returns equaled the percentage of the level of engagement put forth by the supplier firms with higher satisfaction metrics.

Supply chain collaborative advantage was also observed to have a positive and significant influence on supply chain responsiveness. Responsiveness (Williams et al., 2013; Reichhart & Holweg, 2007) of a supply chain have been defined as the rate of response provided by the partners within a supply chain in order to mitigate changes in the external environment such as upgradation in the existent technology, or upward or downward surges in demand. The influence of collaborative advantage could be easily viewed in such instances where the level of alignment or less friction in the existent processes could lead to better response times. However, it was interesting to note that the internal consistency reliability statistic which was relatively low with the buyer sample whereas it was still high with majority of the items of the supplier sample. For instance, the item “Our firm can operate efficiently at different levels of output” obtained an internal reliability score of 0.395 for the buyer sample (which was below the cutoff value of 0.5) whereas a value of 0.667 was obtained for the supplier sample, which indicated that the supplier firms were more flexible towards the change in the demand pattern and the subsequent production pattern and were better equipped to response to the changes. This could be evident since the supplier sample might be the source of supply for multiple buyers at a single time.
interval, which would determine that their internal process layout were superiorly equipped to handle deviations as compared to the buyer group. Also, it could be further explained that since the buyer sample comprised firms with higher existence in the concerned manufacturing segment with more stabilized demand patterns, the requirement for flexible internal processes were deemed to be less important. However, even the low level of consistency in the buyer sample posited that, with collaborative activities in place, the underlying firms have invested to a certain extent towards enhancement of the flexibility levels to further better responsiveness.

6.2 Theoretical Contribution:

The present study has contributed to the extant literature in supply chain collaboration, supply chain competitiveness, and supply chain performance outcomes as mentioned below:

I. The study developed a comprehensive measurement instrument for supply chain collaboration which comprised both the facilitator and the inhibitor variables as well as empirical tested the instrument across separate buyer and supplier samples. The study findings illustrated that supply chain collaboration was not only influenced by the facilitator variables but was also impacted by the presence of the parameters which were perceived as potential hindrances to collaboration. This highlighted the fact that through the identification and reduction in the degree of influence of the inhibitors, with related investments in planning, decision making, relevant information sharing, higher levels of collaboration could be achieved which would further enhance the competitiveness of the firm and the subsequent advantages derived.

II. The relationship between supply chain collaboration, supply chain competitiveness, and supply chain performance outcomes were not considered in earlier studies. Hence the
statistical significance observed in this study highlighted the role of competitiveness in strengthening the relationship between supply chain collaboration and the performance outcomes. Therefore, this mediation would further induce future researchers to consider competitiveness while modeling supply chain collaboration.

III. The establishment of the relationship between supply chain collaborative advantage and performance outcome parameters suggested that, through proper collaboration, satisfaction achieved through relationships and results as well as responsiveness could be further enhanced. This finding could be considered as a substantial contribution as the operationalization of the three performance constructs was tested on a single model (in the presence of collaboration).

6.3 Managerial Contribution:

The construct of supply chain collaboration as defined in the extant literature is a conceptual phenomena with very few indices developed with few restricted variables (Kumar & Banerjee, 2012; Ramanathan & Gunasekaran, 2014; Simatupang & Sridharan, 2005b). The philosophical nature of the construct along with the nature of the underlying indicators have often been considered as hypothetical rather than applied. The exception was the Collaborative Planning, Forecasting, and Replenishment (CPFR) model developed in 1995 jointly by Wal Mart, and Benchmarking Partners, which have been widely used by the firms to plan and execute the order delivery process within a particular supply chain. Though the entire process involved activities related to strategy development and subsequent planning, management of the existent and future demand and supply, execution of the orders received, and the analysis of the deficiencies in the extant process, however the requirement for the identification of the parameters which could drive the collaboration perspective was prevalent and substantial.
The present study has provided an opportunity to the managers of a particular buyer or supplier firm to study the pattern of understanding of their related partners in parameters which could be both facilitating or hindering the partnership level. Based on the responses collected from their “trusted” counterparts in their partnering firms, the managers could assign individual weights to the parameters based on their importance, and eventually compare the responses with their own firm-level response. The analysis would determine the pattern of the relationship specific variables as was perceived by the focal firm and also the partnering firm at a single point in time. At situations of discrepancy, the firms could assign individual weights to the parameters based on their level of importance within the relationship, and then could discuss the same amongst themselves to reduce the disturbance level as much as possible.

The introduction of competitiveness as a potential proponent of the performances delivered by the partnering firms could also be captured through the competitiveness portion of the questionnaire. The assessment of the responses by the focal firm could provide a picture of the partner firm’s ideologies about the competitive positioning envisioned by the latter, and in instances of mis-judgements or scope for improvements, the focal firm could invest in relevant resources to make the partner firm more comfortable in the relationship, coupled with enhanced productivity for both. It could also portray the difference in opinions of each of the partnering firms and subsequently could lead to a thorough revisit of the extant processes and align them wherever necessary.

The present research could be also utilized to development internal performance outcomes metrics for the firms involved in a specific supply chain. Moreover, the indicators related to supply chain responsiveness could be quantified in terms of process parameters such as throughput rate, cycle time, periodic product mix, coupled with the available metrics related to
the actual values of market share, return on investment, replenishment cycle, inventory turnover, so as to evaluate and map the point-of-optimality to better each of the parameters. Also, the items related to collaborative advantage and satisfaction with results could be assessed separately to compute the percentage of satisfaction derived in the financial results and the quantity invested during the collaboration process. Large differences in the values would provide the managers with an opportunity to reduce or modify the investment level in accordance to the level of satisfaction actually gained.

6.4 Limitations

I. The sample frame which has been considered for this study was restricted to only five National Industrial Classification (NIC) codes which comprised certain specialized manufacturing portfolios and the underlying firms as respondents. Since the ratio of the sampling frame to the total industry size was small, the results derived could be skewed towards those industry perspectives. Therefore the results of the study could not be generalized.

II. The relationship based studies should majorly be carried out over temporal settings, to better assess the importance and enhancement of the relationship between the partners within a supply chain. A perspective captured at a single period in time would be less influential in the actual determination of the pros and the cons of the relationship.

III. The data collected was small in comparison to the underlying items which impacted the robustness of the results in both the buyer and the supplier sample.
IV. The buyer-supplier data collection was carried out at the senior manager level only, while the middle and the lower management were completely ignored; which, if considered, might have increased the variability in the study.

V. The firms under the respective NIC codes were considered based on their listings in CMIE-Prowess; other similar listings should be considered as well.

VI. The control variables were not introduced into the study due to complexity posed by the structural model.

VII. The study was carried out in a developing nation where the aggregate information assimilation related to supply chains has been nominal and unorganized. The study findings, if replicated, might yield different results in other emerging/developed nations may be due to minimal information asymmetry.

6.5 Future Research

I. The relationships which were hypothesized could be empirically tested in the other emerging/developed nations. Further the results could be compared to observe whether the relationship amongst the three different constructs (collaboration, competitiveness, and collaborative advantage) would behave in a similar manner as projected in the study.

II. Power as a construct has often been used in the supply chain literature, and the influence of power towards the relationship-based variables have often been studied. However, the presence of power as a facilitator/inhibitor of supply chain collaboration and thereby the
competitiveness parameters should be studied, with regard to the various forms of power that have been defined in the literature.

III. Supply chain competitiveness has been defined as a formative construct in the present study. However, competitiveness could also be described in terms of underlying reflective parameters through the review of related extant literature and the same could also be empirically studied to ascertain its singular influence on the performance outcomes.

IV. Supply chain responsiveness has been defined as an outcome variable and has been co-tested with satisfaction with relationship and satisfaction with results in the study. However, the influence of collaborative activities over the responsiveness should be studied in the context of service-based supply chains. Thereby, the responsiveness in services quantified widely through the turn-around-time should be minutely modeled to ensure better and shorter response times through increased and improved levels of decision making.

V. Longitudinal study of the relationships amongst supply chain collaboration, supply chain collaborative advantage and supply chain competitiveness should be carried out to assess the difference in the responses regarding the 3 variables over the concerned time period. This would demonstrate whether perceptions of the respondents vary when exposed to situations pre- and post-collaboration.

VI. Further studies should collect data from individual industries and empirically test the model in each of the different settings to assess the validity as well as the generalizability of the model.
VII. Indices for supply chain collaboration along with the theoretical model should also be developed for individual industries to test the strength of the relationship parameters and to establish the optimal and unique collaboration value for the firms within the industries to benchmark.