CHAPTER 7
SUMMARY AND CONCLUSIONS

7.1 Introduction

Over the last few years, supply chain management has emerged as a potential source of competitiveness and value creation. A number of perspectives on supply chain available in the literature have motivated the researcher to study further on it. Earlier studies reported in Indian context were either restricted to the case of large organizations or investigated the issues like quality management, IT application, competitive priorities, product development and technology management etc. Very few studies have focused on Indian SMEs and strategic issues of supply chain management like coordination and responsiveness. Small and medium enterprises (SMEs) represent the largest proportion of the manufacturing sector in every country. They have always played a key role in the economies of all major industrial countries. India is no exception of this. SMEs are the life blood of Indian economy. After the beginning of economic reforms in India from 1991, improvement in competitors’ capabilities have shortened product life cycles, elevated product complexity and expanded accessibility to new technical breakthroughs. Indian SMEs are facing global competition in terms of wider range of innovative products, on time delivery, reduced cost with global competitive quality. As most of Indian SMEs work as suppliers for larger organization therefore they have to keep themselves update on all fronts to stay in competition.

Keeping in mind the global competition and local priorities of modern time for SMEs, current study has made an attempt to study coordination and responsiveness issues of SCM in Indian SMEs. The main objectives of this research were to gain insight into coordination and responsiveness issues of SCM in Indian SMEs. The specific objective of this research were to

- Study the literature on coordination and responsiveness issues of SCM in SMEs for gaps identification.
- Identify major priorities while forming supply chain strategy for SMEs.
• Identify the problems faced by SMEs during implementation of SCM.
• Identify the risks SMEs feel while working in supply chain.
• Identify the importance of different factors for improving coordination in supply chain of SMEs.
• Identify the importance given by SMEs while selecting & evaluating the key/preferred suppliers.
• Identify the level of involvement of key suppliers with SMEs in decision making on different issues.
• Identify the level of involvement of key customers with SMEs in decision making on different issues.
• Identify the different issues, which lead to distortion of actual demand in supply chain of SMEs.
• Identify the level of IT applications in different functions of supply chain of SMEs.
• Identify the level of use of modern technologies /tools used by SMEs.
• Identify the critical success factors (CSF) for implementation of SCM in SMEs.
• Analyze the effect of different SCM issues on performance of SMEs on certain criterions of customer service and satisfaction, innovation and growth, financial and internal business.
• Analyze coordination and responsiveness issues of SCM in Indian SMEs through select case studies.
• Develop a structural relationship model for critical success factors of coordination and responsiveness.

In this study, empirical research methodology is used to analyze various issues related with coordination and responsiveness issues of SCM in Indian SMEs. About one thousand five hundred organizations from different sectors, categories and regions were contacted for collecting responses. These organizations were selected from directories available at Confederation of Indian Industries, Auto Component Manufacturers Association, Federation of Indian Chambers of Commerce and Industries and Directorate
of Industries (Government of national capital territory (NCT), Delhi). For this study, respondents were selected fulfilling the criteria of SMEs and those belonging to manufacturing sectors. In spite of continuous e-mails, telephones, reminders and personal visits to plants, only two hundred and fifty one complete responses could be obtained. Two case studies were developed. These companies were from auto component and electronic/electric sector. On the basis of survey observations and case studies critical factors for coordination and responsiveness were identified. Then interpretive structural modeling was done for these factors.

This chapter presents summary of research findings and major contributions of the research. Furthermore, implication of the study for managers and academics are stated and limitations and scope for further research are also given.

7.2 Summary of the work done

In brief the work done in this thesis can be summarized as given below:

- A literature survey was conducted to identify contemporary research issues and their relevance in context of Indian SMEs. For this purpose more than three hundred research papers were reviewed from different leading international journals. On the basis of this extensive literature review major gaps identified are as given below:
  - There have been very few empirical studies on coordination and responsiveness issues of SCM in Indian SMEs.
  - Few studies on comparison of SMEs with LSEs and different manufacturing sectors in terms of various strategic issues have been carried out in Indian context after globalization.
  - Different dimensions of both, coordination and responsiveness have not been explored in previous studies.
- On the basis of gaps identified from literature and discussion with industry professionals, a comprehensive questionnaire was prepared to collect response of Indian SMEs on several issues.
Lack of committed resources, involvement of middlemen in supply chain, insufficient knowledge of SCM, over dependence on bigger supply chain partners and lack of competency in using modern technologies were identified as main problems faced by Indian SMEs during implementation of SCM.

Political instability, fluctuating prices of raw materials, interstate policy differences, terrorist attacks and volatile fuel prices were taken as main risks which Indian SMEs feel while working in supply chain.

Cost reduction, quality improvements, delivery on time, reducing lot size and integrated data-base were identified as major priorities while forming supply chain strategies.

Networking with suppliers and customers, information sharing with all members, agreed vision and goals of members, supply chain risk/reward sharing and reliable logistic system were identified as main strategies adopted by Indian SMEs for improving coordination.

Various dimensions of performance measurement were identified from balance score card approach.

Market share, sales turn over, return on investment, net profit and export share were identified as measures for financial performance.

Executives were asked to rate the intensity of each attribute for their respective organization on a five-point Likert scale (1 – lowest, 5 – highest).

Survey response was analyzed in two parts i.e. descriptive analysis and testing of research propositions.

Descriptive analysis was done in context of Indian SMEs to identify major factors of strategy formation for supply chain, problems, risks, coordination improvement, suppliers selection and evaluation, suppliers and customers involvement in decision making, IT application, type of IT tools, performance on criterion of customer service and satisfaction, innovation and growth, financial and internal business.
To analyze coordination and responsiveness issues and survey results in depth, two case studies were developed.

Based on survey results and observations from case studies critical factors for coordination and responsiveness were identified. These factors were top management commitment, development of effective SCM strategy, devoted resources for supply chain, logistics synchronization, use of modern technologies, information sharing with supply chain members, forecasting of demand based on point of sales (POS), trust development in supply chain partners, developing JIT capabilities in system, development of reliable suppliers, higher flexibility in production system, focus on core strengths and long-term vision for survival and growth.

A structural relationship model was developed using ISM, for critical success factors of coordination and responsiveness. With the help of ISM, driving power and dependence power for different factors were also determined.

7.3. Research findings

Research finding of this study can be classified in three parts. First part discusses the findings from descriptive analysis, second part discusses about findings from case studies and finally third part discusses finding from ISM based model for coordination and responsiveness.

7.3.1 Finding from descriptive analysis

The survey responses were analyzed to identify major issues related with coordination and responsiveness issues of SCM in Indian SMEs. Major research findings are as follows:

- Uncertainty of customer order/demand, insufficient knowledge of SCM and involvement of middlemen in supply chain are the main problems faced by Indian SMEs during implementation of SCM.
• Fluctuating prices of raw materials, sharing of sensitive information and seasonality of demand are main risks which Indian SMEs feel while working in supply chain.

• Quality improvements, delivery on time and cost reduction are the major priorities while forming supply chain strategies.

• Follow-up with customers for feedback, networking with suppliers & customers, periodic interdepartmental meetings, reliable logistic system and information sharing with all members are main strategies adopted by Indian SMEs for improving coordination.

• Cost effectiveness, commitment to quality and on time delivery capability, are the main criterions of supplier selection and evaluation.

• Inventory management, logistic management and application of new technologies/IT tools are key areas of supplier’s involvement in decision making.

• Product design and development, marketing and sales decisions, customer relationship management (CRM) are key areas of customer’s involvement in decision making.

• Information delay and distortion, supply shortages and price fluctuations, conflicting objective of each stage (each stage has own profit plan) are main factors leading to actual demand distortion (Bullwhip effect).

• Interacting with customers, product design and development, interacting with suppliers are main areas of IT application in SMEs.

• E-commerce, own web sites, enterprise resource planning (ERP)/SCM software are main IT tools used by SMEs.
• Ability to resolve customer complaints, ability to deliver product on time, ability to follow up customer inquiries are main performance criterions for SMEs in term of customer service and satisfaction.

• Ability to implement new technology, ability to respond well to customer demand for new features, ability to compete based on quality are main performance criterions for SMEs in terms of innovation and growth.

• Indian SMEs have better performance in terms of net profit, return on investment and revenue growth.

• Level of teamwork and coordination among internal departments, use of modern quality control techniques and development of cross functional team are main performance criterion for SMEs in terms of internal business parameters.

• Top management commitment, long-term vision for survival and growth, focus on core strengths, devoted resources for supply chain and development of effective SCM strategy are main critical success factors (CSFs) for implementation of SCM in Indian SMEs.

Finally in this section research propositions formation and testing was done. Total of fourteen research propositions were developed and tested. Major finding forms testing of research proposition are summarized in Table 7.1.

**Table 7.1 Summary of research propositions testing and implications**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Research Propositions</th>
<th>Status</th>
<th>Remarks/Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>There is a significant relationship between problems and priorities of supply chain</td>
<td>Rejected</td>
<td>Priorities depends on market requirement and changes from organization to organization</td>
</tr>
<tr>
<td></td>
<td>strategies.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>There is a significant relationship between risks and priorities of supply chain</td>
<td>Accepted</td>
<td>Risks directly affect priorities of SMEs for developing supply chain strategies.</td>
</tr>
<tr>
<td></td>
<td>strategies.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>There is a significant relationship between priorities of supply chain strategies and coordination strategies.</td>
<td>Accepted</td>
<td>Priorities for supply chain strategies directly affect coordination of supply chain.</td>
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<tr>
<td>4.</td>
<td>Coordination strategies will be positively correlated with business performance.</td>
<td>Accepted</td>
<td>SMEs have started realizing the long term benefits of supply chain coordination.</td>
</tr>
<tr>
<td>5.</td>
<td>Supplier selection and evaluation practices have significant impact on business performance.</td>
<td>Accepted</td>
<td>Supplier selection and evaluation practices can improve financial performance of SMEs.</td>
</tr>
<tr>
<td>6.</td>
<td>Involvement of key suppliers in decision making have significant impact on business performance.</td>
<td>Accepted</td>
<td>Supplier’s involvement in areas like new technologies application, logistics, inventory management etc. improves performance of SMEs.</td>
</tr>
<tr>
<td>7.</td>
<td>Involvement of key customers in decision making have significant impact on business performance.</td>
<td>Accepted</td>
<td>Customer’s involvement in CRM, marketing and sales decisions and product design and development etc. improves performance of SMEs.</td>
</tr>
<tr>
<td>8.</td>
<td>Use of IT tools for different functions within organization have significant impact on business performance.</td>
<td>Accepted</td>
<td>SMEs should use modern IT tools for different functions to excel in global competition.</td>
</tr>
<tr>
<td>9.</td>
<td>Use of any particular type of IT tool has significant impact on business performance.</td>
<td>Rejected</td>
<td>Indian SMEs have yet to develop competencies for effective IT applications.</td>
</tr>
<tr>
<td>10.</td>
<td>There is a significant relationship between CSFs and SMEs performance in terms of customer service and satisfaction.</td>
<td>Accepted</td>
<td>Abilities to follow up customer inquiries, resolve customer complaints, on time delivery of product etc. improved significantly.</td>
</tr>
<tr>
<td>11.</td>
<td>There is a significant relationship between CSFs and SMEs performance in terms of</td>
<td>Accepted</td>
<td>Abilities to deliver new features, quality, implement new</td>
</tr>
</tbody>
</table>
innovation and growth criterion. technology etc. improved significantly.

12. There is a significant relationship between CSFs and SMEs performance in terms of financial performance.

13. There is a significant relationship between CSFs and SMEs performance in terms of internal business parameters.

14. Factors responsible for bullwhip effect have significant negative impact on business performance of SMEs.

7.3.2. Finding from case studies

For analyzing different issues of coordination and responsiveness in depth, two case studies were developed. First organization was a manufacturer and supplier of automotive parts. Second organization was a manufacturer and supplier of different electrical and electronic items. Coordination and responsiveness issues of these organizations were analyzed with the help of SAP-LAP framework. Major research finding from these case studies are as follows:

- Both the organizations were facing very tough competition due to globalization of Indian market. A strong need of networking with suppliers and customers were felt. Orders from customers were uncertain. Middlemen were taking lots of share of margin. These organizations were having awareness about supply chain management issues but knowledge was insufficient to implement it successfully. Availability of committed resources was also creating problem in implementing
SCM successfully. These organizations were over depending on bigger partners of their supply chain for major changes. These findings are supported by survey results.

• While working in global market both organizations were facing different type of risks like prices fluctuation of raw material, information sharing risk, delay in transportation from suppliers and vendors, risk of changing global/domestic market and demand fluctuation due to seasons etc. To cope up with these risks case organizations have to keep lots of inventory as safety stocks. Again scarcity of resources create problem here. Similar types of finding are also observed during survey data analysis.

• Main focus of both the case organizations was toward cost reduction, quality improvement and resources development. Survey results were also observed that Indian SMEs are more focused toward resources development, feel continuous pressure of cost reduction and quality improvement. They are more focused on short term goals. They are devoting very less efforts toward implementation of supply chain management.

• To work as active member of a bigger supply chain, there should be a clear hierarchy of decision making and information flow. But in both the organizations all major decision were taken by top management. There was a core team of middle management, managers and employees in both the firms. Core team was authorized to take regular meeting with vendors and other employees. But all major decisions were finally taken by top management. This type of functioning causes delay and biasing in the decision making process.

• To face global challenges these organizations should focus more on, timely delivery, innovativeness, flexibility of manufacturing system, location of suppliers and customers, management of transportation system while forming supply chain management strategies.
• Different IT tools such as ERP software, e-commerce and own website were used by these organizations from last few years. These types of practices given an edge in information sharing and in coordination to both the firms. They were able to form linkages with bigger leaders of Indian automobiles markets. So these finding supports survey results.

• In last three years, performance of these organizations were observed and found improvement in ability to resolve customer complaints, product delivery on time, follow up customer inquiries, and order fill rate. These finding supports survey results.

• Performance was also improved, on parameters of innovation and growth like ability to implement new technology, response to customer demand for new features and ability to compete based on quality.

• On parameters of finance, performance of these organizations has improved in terms of sales turn over, market share, return on investment and net profit.

7.3.3 Finding from interpretive structural modeling

On the basis of survey results, inputs from case studies and literature review, critical success factors were identified for coordination and responsiveness. Total seventeen factors were identified. ISM based model was developed to analyze the interaction among the coordination and responsiveness factors in this section. It identifies the hierarchy of actions to be taken by management in order to enhance the coordination and responsiveness of organization. Major finding of this study were as follows:

• Top management commitment, strategy development, resource development, trust development, information sharing, risk and rewards sharing, collaborative decision making and planning and use of IT technology were at the bottom of the model having strong driving power. These variables will help organizations to achieve a coordinated and responsive supply chain and are classified as independent variables or drivers.
In ISM model factor of coordinated supply chain leads to accurate forecasting of data, integrated inventory management, lead time reduction, agility in supply chain and finally to responsive supply chain. This finding implies that coordinated supply chain will help in reducing lead time, product cost and delivery time. It will also improve accurate forecasting of data and agility in supply chain. Finally, all these factors will lead to responsive supply chain.

It was also tried to find levels for different variables. From model, it was observed that responsiveness is at top. Agility in supply chain, lead time reduction, inventory management and forecasting of data were at lower levels respectively. Lower factors leads to higher factors respectively.

Top management commitment was at bottom level with highest driving power, it implies that in SMEs, top management is the highest authority in decision making.

7.4 Contributions of the study

The contribution to knowledge recorded in this thesis is four fold. Firstly, comprehensive literature review on SMEs is done and classification scheme is suggested. Review of literature on SMEs shows that there has been little work reported on study of coordination and responsiveness of SMEs in Indian context. Secondly, an extensive multi sector survey of Indian SMEs from different parts of country is conducted to investigate various issues related with SMEs coordination and responsiveness. Two hundred and fifty one organizations belonging to different sectors such as auto component, plastic, electronic etc. have participated in this study. This sample size is significantly higher than many other empirical studies (Ward et al., 1995, Nagabhusna and Shah, 1999, Li, 2000, Dangayach and Deshmukh, 2003, Singh et al., 2006) in this area. The third contribution to knowledge is made through development of two case studies to obtained insight into SMEs coordination and responsiveness issues and of different sectors. Fourth contribution to knowledge is made by developing ISM based model, which will be very helpful for developing supply chain strategies by Indian SMEs.
7.5 Implications of the study

Mainly keeping practicing managers, government agencies and academia under consideration following implications and benefits of the research can be outlined.

- It will help to SMEs management in understanding coordination and responsiveness issues of supply chain management in Indian Scenario.
- Knowledge of these findings will help them to frame their strategies.
- Strategic planning by Indian SMEs in area of coordination and responsiveness of supply chain will hopefully give an edge while working in global scenario.
- ISM based model will help them in integrating different strategic areas for supply chain implementation.
- Questionnaire developed can be further improved and used to examine linkage with other business functions and other issues of supply chain coordination and responsiveness.
- This research will specifically benefit contemporary researchers in a way that it has tried to capture different issues and hence further research efforts could be directed to replicate the study for other context.
- Researcher can compare different sectors SMEs on similar guideline for their coordination and responsiveness practices.

7.6. Limitations and scope for future work

Organizations from different manufacturing sectors such as auto component, plastic, electronic and electrical and light engineering participated in this study. These are growing sector in Indian economy. Organizations from all parts of countries participated in this study. Total of two hundred and fifty one complete responses were received. Sample size was higher than other reported studies (Ward et al., 1995, Nagabhusna and Shah, 1999, Li, 2000, Dangayach and Deshmukh, 2003, Singh et al., 2006).

However, this study has some limitations. Majority of respondents were from north and central part of India. Therefore this study can be further extended on cluster or region
basis for other sectors. For future scope of study coordination and responsiveness strategies of SMEs can be compared with coordination and responsiveness strategies of large scale enterprises (LSEs). Researchers can also analyze these issues in context of other developing/developed countries for bringing out significant differences of SMEs in different scenario as a future scope for the study.

7.7. Closing remarks

SMEs are considered as engine for economic growth of India. But due to unavailability of sufficient literature and different hurdles in collecting data form SMEs, very few extensive empirical studies could be conducted on SMEs coordination and responsiveness in spite of their significant contribution in Indian economy. Therefore present study will be first of its own kind, conducted exclusively on SMEs coordination and responsiveness in Indian context.

For collecting responses, questionnaires were mailed to about one thousand five hundred organizations. As most of SMEs did not have professional management in their functioning and were not interested to provide detailed information, getting sufficient response from them was a challenge. Therefore total duration for collecting response was about one year. In spite of continuous efforts through e-mail, post, telephone, personal visits to industries and many reminders, only two hundred and fifty one complete responses could be received. Data was analyzed as per size and sector of organizations. Case studies were developed to understand coordination and responsiveness issues in detail. On the basis of observations from survey, learning from case studies and discussion with other experts, ISM model was also developed. This model will help SMEs in developing strategies for improving coordination and responsiveness.

Looking into significance of SMEs in Indian economy, this study may be a small step in direction of improving SMEs coordination and responsiveness in global market but surely it will work as strong foundation for other researchers to pursue this cause further.