

A Study of Impact of Supply Chain Strategy on Supply Chain Performance: An Empirical Investigation on Automobile Industry in India

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ABSTRACT

Supply chain management practices are proven to be one of the major strategic tools in development of competitiveness and enhancing performance of the firm. The objectives of this research is to find appropriate type of supply chain management practices needs to be adopted in order to enhance the organizational performance. This research also shows the connection link between Supply Chain Strategies (SCS) and Supply Chain Performance (SCP) and thereby investigate the direct impact of dimensions of supply chain strategy on SCP and its impact on firm's performance. A quantitative research survey was conducted among 311 small and medium owners/managers of automobile organizations. SPSS 23.0 was used to analyze the data. Structural Path Modeling (SEM) was conducted to assess the proposed model analysis and to test the statistically significant relationship of the hypothesis. This research is an attempt to bridges the gap and deficiency in the research done previously on this issue and particularly about the relationship between supply chain strategy dimensions on SCP. The first and foremost objective of this study is to find how SCS dimensions are related with SCP dimensions. The basic idea behind this research is taken from previous research done by Fantazy et al. in 2009. In his research he suggested that further investigation can be made on his research in a different geographical region. To further widen understanding on this topic and following recommendation of the preceding research, this research closely relate to Fantazy et al.'s 2009 research. This research is done on the Indian automotive industry, which currently is having high importance. The findings of the research revealed that chain strategy positively impacted performance of supply chain and thereby influencing the business performance.

Keywords: Supply Chain Strategy (SCS), Supply Chain Performance (SCP)

INTRODUCTION

To compete in today's immense competitive and global marketplace, automobile manufactures need to manage their supply chain to achieve strategic competitiveness through effective and efficient implementation of Supply Chain Management (SCM) practices. In today's market customers demand quality products at competitive price with faster delivery schedule. Researchers and academician are giving ever increasing attentions to supply chain management that has become fast-growing area in management and despite so much attention, the chances of failure in effective implementation of best practices of SCM still exists (Donlon, 1996; Malik et al., 2011). Previous research in field of SCM

clearly show that there is a definite correlation between implementation of effective and efficient supply chain management practices like supply chain strategy on firms performance (Souresh Bhattacharya; Giri et al., 2014). The integration of SCM practices with manufacturing is the most crucial aspect. The various crucial dimensions of SCM practices (Strategy, Flexibility and Performance) will provide free hand to business executives to take decisions that are beneficial for the performance of firm. With increasing competition and scarcity of resources the firms must develop understanding of better application of SCM and thereby offer better value to customers and improve the performance of the organization (Chow et al., 2006). The industry will developed an improved supply chain network that can manage long-term growth along

with better supply chain strategy. The SCM network is much responsive to handle any short term volatility. The industry is changing rapidly due to shorter product life-cycle, new customers, and product customization. This research identifies the impact of major dimensions of supply chain strategy on the SCP. India's economic growth is greatly influence by the automobile industry that has shown significant growth and proven to be one of the strongest drivers of technology, growth, and employment (Gottschalk & Kalmbach, 2007). Due to rapid advancement and emerging trends in automobile sector a new era has started for developing country like India (Choudhary & Goyal, 1997). After economic liberalization the Indian automobile industry has shown a consistent market growth. In the current scenario implementation of proper supply chain management strategy can improve operational efficiency and profit. This research highlights the impact of application of effective and efficient supply chain strategy on performance. It helps in identifying future trends in the automotive supply chains and matching contemporary SCM practices. The Indian automobile industry is facing a challenge to match its supply chain standards with developed countries (Chang-Tai et al., 2009) and the Indian automobile industry is having a tremendous potential for integration of supply chain (Park et al., 2012). This research is based on impact of major dimensions of supply chain strategy on the SCP.

LITERATURE REVIEW AND HYPOTHESES

In today's fast growing market the supply chain management is facing tremendous challenges on a daily basis which require direct attention and quick response. With supply chain being at the core of business operations, these challenges can directly affect the industry in substantial ways. The practice of supply chain management in India is growing rapidly, and at the same time facing bigger concern. In today's competitive market the choice of effective and efficient SCS are necessary to build competitiveness and position in the market. Business strategies companies must focuses on supply chain strategy which is more likely to build position of company in competitive market. Supply chain strategy varies from product to product, as every product is unique for the company and required specific SCS. Supply chain strategy for any product/service depends on supply and demand uncertainty, product life cycle, and manufacturing strategies. Due to these uncertainties different SCS emerged (Lee, 2002). Hence, setting the accurate supply

chain strategy is necessary for companies so that they can compete in the market. For taking competitive advantages, customer convenience strategies such as customized logistics and agility increase demand side capabilities while operational strategies and lean network increases supply side capabilities (Morash, 2001). In their study, Fantazy et al. (2009) used a strategy classification, which he labeled as following:

- Innovative strategy
- Customer-oriented strategy
- Follower strategy

Many previous researches identified that there is a link between supply chain strategy and SCP. Gupta and Somers (1996) established that business strategy has direct impact on the manufacturing flexibility, manufacturing flexibility has direct impact on organizations performance. A conceptual model is shown in Figure 1 on relationships among supply chain strategy, supply chain flexibility, and SCP as proposed by Fantazy et al. (2009).

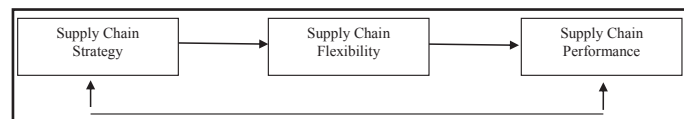


Fig. 1: Basic Model (Fantazy et al. 2009)

Based on the research model Fantazy et al. (2009) in this research following hypotheses developed.

H1: Supply chain strategy dimensions have direct relationship on the SCP dimensions.

H2: Deals with impact of adoption of proper supply chain strategy on SCP.

Based on above literature review, the following research framework can be drawn which is shown in Fig. 2.

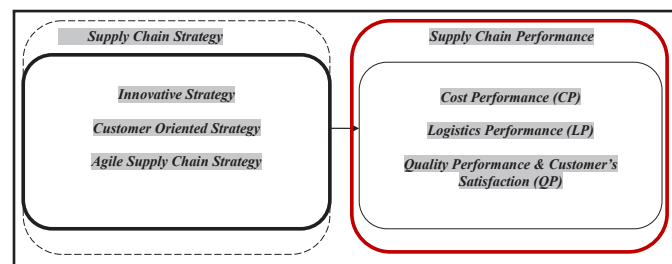


Fig. 2: Research Model

SAMPLING AND DATA COLLECTION

There is diversity in collection of data as there are different methods that can be used for collecting data viz. using a survey strategy, such as structured observation, interviews and questionnaires (Saunders et al., 2007). In statistically testing the enormous amount of structured data is needed from different respondent who fill the questionnaire. Hence, large number of respondents therefore should be contacted and the small information available from respondents, the questionnaire is selected to collect the data needed to test the above hypotheses (Cooper & Schindler, 2003; Saunders et al., 2007). Besides this (Cooper & Schindler, 2003).

- A questionnaire allows to get in touch with other-wise inaccessible contacts.
- It is less expensive (it costs less time and money to reach a large sample).
- A questionnaire is perceived as more unspecified.
- It gives ample time to respondents to think about the questions.
- The data can easy be worked on for analyzing and testing.
- Although a questionnaire is the most common choice to collect the data needed in this thesis, it also has some disadvantages.

RESULT ANALYSIS

Reliability Analyses

The Cronbach’s alpha was conducted to assess the reliability of each scale. Cronbach alpha values over 0.7

indicate that all the date can be considered consistent (Nunally, 1978). This value is presented in Tables 1 and 2.

Table 1: Reliability of Each Construct of Supply Chain Strategy

Dimensions of Supply Chain Strategy	Items	Cronbach’s alpha (α)
Innovative Strategy (INS)	4	0.869
Customer Oriented Strategy (COS)	4	0.838
Agile Supply Chain Strategy (ASCS)	5	0.888

Table 2: Reliability of Each Constructs Supply Chain Performance

Dimensions of Supply Chain Performance (SCP)	Items	Cronbach’s alpha (α)
Cost Performance (CP)	4	0.874
Logistics Performance (LP)	4	0.778
Quality Performance & Customer’s Satisfaction (QP)	3	0.887

Descriptive Statistics

The next analysis of reliability is descriptive statistics and measurement items which are useful for describing the basic features of data, in a research study with large data, these statistics may help us to manage the data and present it in a summary for supply chain strategy dimensions. The descriptive statistics with mean, standard deviation are listed in Table 3.

Table 3: Descriptive Statistics on Item Level SCS

Dimensions	Types	Item	Item Description	Mean	St. Dev.
Supply Chain Strategies (SCS)	Innovative Strategy (INS)	INS1	New product advancement/innovation	4.36	0.782
		INS2	Providing high value service along with the core products or services already being offered	4.36	0.782
		INS3	Developing core competencies by new knowledge and research	4.49	0.75
		INS4	Using power of existing knowledge, ability and resources to develop innovative product	4.43	0.79
	Customer Oriented Strategy (COS)	COS1	Providing quality products and services to customer	4.44	0.638
		COS2	Offering modular parts in competitive price	4.43	0.831
		COS3	Using power of existing knowledge, ability and resources for customer’s benefit	4.49	0.752
		COS4	Using Standard accessories and parts	4.35	0.647

Dimensions	Types	Item	Item Description	Mean	St. Dev.
	Agile Supply Chain Strategy (ASCS)	ASCS1	Adopting latest SCM concepts and tools	4.36	0.821
		ASCS 2	Effective planning of long-term MPS and MRP	4.26	0.815
		ASCS 3	Design of supply chain across and outside the production system	4.53	0.639
		ASCS 4	Close partnership with suppliers with technological support	4.43	0.683
		ASCS 5	Appropriate mode of transportation	4.32	0.687

The descriptive statistics with mean, standard deviation are listed in Table 4, which indicate the three construct of SCP at individual item level for cost performance, logistics

performance, and quality and customer satisfaction performance.

Table 4: Descriptive Statistics on Item Level SCP

Dimensions	Types	Item	Item Description	Mean	St. Dev.
Supply Chain Performance (SCP)	Cost Performance (CP)	CP1	Return on investment	4.38	0.677
		CP2	Return on investment growth rate	4.64	0.597
		CP3	Market share	4.46	0.614
		CP4	Share growth	4.58	0.704
	Logistics Performance (LP)	LP1	Reduced warehouse costs.	4.23	0.723
		LP2	Reduced obsolescence.	4.12	0.673
		LP3	Faster order processing speed.	4.53	0.686
		LP4	Reduced inventory at all sites of supply chain.	4.40	0.632
	Quality Performance (QP)	QP1	Response time to customer query time	4.50	0.615
		QP2	Level of customer perceived value of product	4.27	0.718
		QP3	Level of service systems to meet particular customer needs	4.47	0.731

SMART-PLS RESULTS

This section deals with Smart Partial Least Squares (PLS) results. The PLS is an alternative method over Ordinary Least Square (OLS) regression, canonical correlation, or covariance-based Structural Equation Modeling (SEM)

of systems of independent and response variables. PLS is sometimes called “composite-based SEM”, “component-based SEM”, or “variance-based SEM”, in contrast to “covariance-based SEM”, which is the usual type (e.g., implemented by Stata, SAS, Mplus, LISREL, Amos EQS and other software packages used in statically analysis). Fig. 3 shows the smart-PLS 2.0 results.

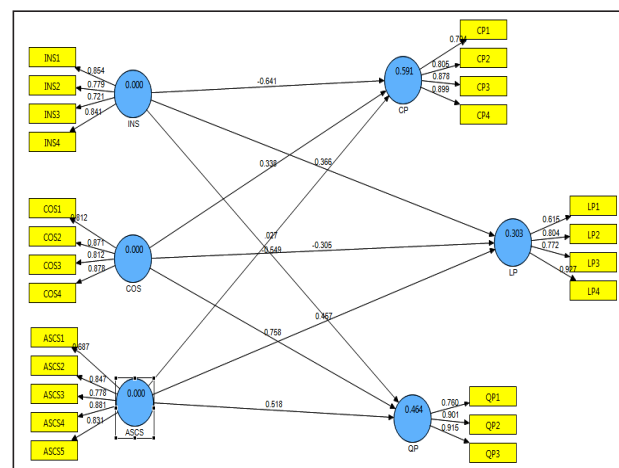


Fig. 3: Research Model Tested Using Smart PLS 2.0

FINAL RESULTS

The empirical results of the model using Smart PLS are presented in Tables 5, 6, and 7. The research has found a relationship of supply chain strategy constructs with SCP construct. The finding of result shows that broad point of view is required by companies to determine which type of SCS is required in a particular situation to

accomplish a predetermined goal. To find the relationship of SCS on SCP parameters, such as cost performance the results of current research show that Innovative Strategy (INS) have very strong negative relationship with Cost Performance (CP) because innovation always involve cost to companies while Customer Oriented Strategy (COS) shows weak positive relationship on cost performance and Agile Supply Chain Strategy (ASCS) have very weak relationship with cost performance shown in Table 6.

Table 5: Relationship of SCS with Cost Performance

Impact	Coefficient	t-value	Conclusion	R ²
INS-CP	-0.641	1.429	H1 Not supported	0.59
COS-CP	0.338*	4.223	H1 and H2 supported	
ASCS-CP	0.027	1.891	H1 supported	

Path significance: * p < 0.05
(t-value > 1.96 (for 2-tailed) which is equivalent to p < 0.05).

To find the relationship of SCS on SCP parameters such as cost performance the results of current research shows that innovative strategy (INS) have weak relationship with logistic performance (LP) while customer oriented

strategy (COS) have weak negative relationship on logistic performance and agile supply chain strategy (ASCS) have very weak relationship with logistic performance shown in Table 6.

Table 6: Relationship of SCS with Logistic Performance

Impact	Coefficient	t-value	Conclusion	R ²
INS-LP	0.366	1.701	H1 Supported	0.30
COS-LP	-0.305	1.855	H1 Not Supported	
ASCS-LP	0.366	1.819	H1 Supported	

Path significance: * p < 0.05
(t-value > 1.96 (for 2-tailed) which is equivalent to p < 0.05).

To find the relationship of SCS on SCP parameters such as cost performance the results of current research show that innovative strategy (INS) have negative relationship with quality performance (LP) while customer oriented

strategy (COS) have strong relationship on quality performance and agile supply chain strategy (ASCS) have moderate relationship with quality performance shown in Table 7.

Table 7: Relationship of SCS with Quality Performance

Impact	Coefficient	t-value	Conclusion	R ²
INS-QP	-0.549	1.759	H2 Not Supported	0.46
COS-QP	0.758	1.395	H2 Supported	
ASCS-QP	0.518	0.804	H2 Supported	

Path significance: * p < 0.05
(t-value > 1.96 (for 2-tailed) which is equivalent to p < 0.05).

DISCUSSION AND IMPLICATIONS

The most important issue faced by organizations is to apply the appropriate strategy in any organizational practices. Research conclusion shows that supply chain

management strategy is having relationship to SCP. Supply chain strategy is key factors and have impact on SCP. To efficiently managing the supply chain, organizations need to adopt proper SCS and flexibility into supply management chain practices (Sufian, 2010). Effective and

efficient supply chain management is vital determinant in building and sustaining competitive advantage at the marketplace. The research hypotheses are tested by using Smart-PLS models. The result of this study contributes to the supply chain management knowledge in several ways. This study adds to the knowledge on supply chain management performance by finding the impact of supply chain management strategy and supply chain management performance.

LIMITATION AND FUTURE RESEARCH

There are a number of limitations that influence the generalizability of this study.

- (i) This study limited only to Indian automobile industry. One of the limitations of this single-sector study is that the conclusions may not be generalizable to other sectors. Future studies replicating this research across various industries and sector would enhance the understanding of SCP.
- (ii) The sample choice was based on a convenience sample, which is often used for exploratory work (Zikmund, 2003), rather than a random probability sample. Further research could be conducted using a random probability sample.
- (iii) The sample represented a limited number of companies in one sector only.
- (iv) The study is based on a questionnaire. Therefore, there is a possibility of respondents answering questions in a way that is perceived to be more desirable or acceptable than what is actually experienced or believed.

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