



# Impact of Supply Chain Management Practices on Operational Performance in Micro, Small and Medium Pharma Enterprises (MSMEs) in India

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## ABSTRACT

*In the era of globalization and extreme competition, companies are continuously trying to expand their business efficiency by re-evaluating their internal business processes. The concept of Supply Chain Management facilitate the companies in collaborate with customers and suppliers by sharing vision, knowledge and information to build a mutual supply chain that can achieve competitive advantage. The present research is conducted to study the impact of Supply Chain Management practices on operational performance and to examine the role of supply chain management inhibitors on operational performance in Micro, Small and Medium Enterprises (MSMEs) in India. The research design was descriptive in nature. The sample consisted of 138 MSMEs in India. Factor analysis and regression analysis were employed to establish the relationship between predictor variables and independent variable. The results of the study highlights that Supply Chain Management (SCM) practices have a Positive and significant impact on the operational performance however, there was found to be strong and negative relationship between Supply Chain Management (SCM) inhibitors and operational performance in Micro, Small and Medium Enterprises (MSMEs) in India.*

**Key words:** Globalization, Supply Chain Management, Competitive advantage, vision, inhibitors.e

## 1. INTRODUCTION

Supply Chain Management as a concept plays a decisive role in developing competitive advantage for products and services offered by firms in dynamic global). Companies whose products and services penetrate diversified cultures and boundaries are faced with the intricate task of synchronising resources and strategies to serve international markets in profitable manner SCM has become an important tool since it helps to create high-value products and services for

end-consumers by establishing a strong link among several successive elements of the value chain, from suppliers to assembling manufacturers to ultimate manufacturers to distributors to end customers in differentiated, effective and efficient manner. Supply chain management is 'the management of the interconnection of firms relating to each other through upstream and downstream linkages between the diverse processes that produce value in the form of products and services to the final consumer'.

SCM practices refer to certain set of actions carried out in an organization to encourage efficient management of firm's supply chain. Past researchers concluded that SCM practices are dependent on factors such as nature of industry, company size, length and type of supply chain. Attaining integration in supply chain is a complex task. The process includes material, land and product flow from suppliers to end consumers and involves different organizational entities i.e external suppliers, as well as internal functions. Employees have to carry different tasks performing in different ways. Customers require realizing the value of newly designed services and pricing along with suppliers and partners sharing a common vision. Companies might have to build or reconfigure their infrastructure across networks such as information systems, distribution centers, manufacturing units and other support organizations. Recent studies found that companies are spending huge resources in terms of time and money to reduce operating costs and increase customer satisfaction. In addition, companies are using techniques such as Manufacturing Resource Planning (MRP II), Enterprise Resource Planning (ERP) and Just-In-Time concept (JIT) to eradicate damaged materials, defect rates, scrap, returns, delivery, lead-time and unnecessary costs. Numerous studies concluded that high levels of SCM practices resulted in improving overall organizational performance. Operational performance can be defined as the capability of a firm in reducing cycle time, ordering time, inventory costs, management costs and increasing efficiency of using raw material and distribution competences. Operational performance helps to increase effectiveness of manufacturing activities, utilization of capital and creating quality output. Further, help companies to increase profits, revenue and market share and total firm value. A study by Chong et al., (2011) found by developing a management tool that SCM practices have a direct impact on operational performance among these firms when measured against a structured model of performance applied across many industries.

The Indian micro, small and medium enterprises (MSMEs) sector has become highly dynamic and vibrant in last few years. MSMEs sector which consists of manufacturing, service industry, food processing, infrastructure, chemicals, packaging, and IT industries has become a vital segment of the Indian economy and

plays crucial role in nation's development by increasing domestic production, providing employment, helping in industrialization of backward and rural areas, expanding entrepreneurial base and generating significant export earnings.

The Micro, Small and Medium Enterprises (MSME) sector has emerged as a highly vibrant and dynamic sector of the Indian economy over the last five decades. It contributes significantly in the economic and social development of the country by fostering entrepreneurship and generating large employment opportunities at comparatively lower capital cost, next only to agriculture. MSMEs are complementary to large industries as ancillary units and this sector contributes significantly in the inclusive industrial development of the country. The MSMEs are widening their domain across sectors of the economy, producing diverse range of products and services to meet demands of domestic as well as global markets. As on 04.01.2023 a total number of 65,23,067 were classified, consisting of 36,75,597 enterprises registered under Manufacturing category and 94,18,101 enterprises registered under Service sector. According to the Annual Report of the Ministry of micro, small and medium enterprises (MSMEs) 2021-22, the MSMEs sector consistently contributes 45% to the India's total manufacturing output, 40% of country's exports and 31% towards India's GDP. Currently around 111 million people find employment in 36.2 million SMEs that exist in India. MSMEs are found to have noteworthy influence on supply chain performance, since they serve the role of suppliers, producers, distributors, and customers. MSMEs primarily need to have information and access to new technology, adequate financial resources and adaptability

to changing trends and incorporate latest technology and integrated supply chain in their production. MSMEs should consider operational performance as a way to leverage competitiveness by improving overall business operations. The present study attempts to study the impact of supply chain management practices on operational performance in Micro, Small And Medium Enterprises (MSMEs) in India and also to examine the role of supply chain management inhibitors on operational performance of Micro, Small and Medium Enterprises (MSMEs) in India.



## 2. REVIEW OF LITERATURE

**Chen et al., (2021)** Therefore, the adopted postponement strategy by the supply chain highlights the forecast and order-driven attributes while the main purpose is to ensure cost efficiency and customer service level. In this field, modularity practices for product development and manufacturing are considered as a core structure design to enhance mass customization strategy.

**Gumte et al., (2021)** Nationwide supply chain setup to optimally determine the operational and design decisions mixed integer linear programming model biomass feed supply, demand, and import product price.

**Lissillour, R., and D. Bonnet Fernandez. (2021)** In addition to presenting papers selected after the RIRL conference, this issue also features two additional papers that meet the others' concerns. Building on the Australian case, Sonia Sadeghian Esfahani, Stephen Cahoon, Shu-Ling Chen, Sayed Sajadi Mojtaba and Hilary Pateman provide useful guidelines as to how to prioritise sustainable activities depending on how they affect logistics performance. Raphael Lissillour and Dominique Bonnet Fernandez join us as they go beyond boundaries to tackle an unusual but useful topic regarding the importance of maritime transport: the balance of power in the global maritime safety.

**Nitsche, B., F. Straube and M. Wirth. (2021)** providing very practical information this is precisely what are up to when they consult a large sample of firms to question where automation will be located tomorrow: at what stages of the supply chain or which tasks could most probably be automated. They open new perspectives help to identify the perimeter of future SC automation and guide developers in prioritizing their work to keep-up streamlined SCs. They also look into the antecedents of automation, to better understand firm maturity regarding the topic. This contribution helps target specific actions such as upgrading, training or financial support to companies insufficiently mature to maintain the industrial level.

**Das Roy and Sana, (2021)** Due to the close relationship between members of the supply chain, many of the decisions that one member makes affect the cost indicators of the other member; sustainable practices investment of one member like other decisions influences the profitability of the other PSC members and the whole channel. Therefore, joint/centralized decision approach through considering a central

decision maker that makes decisions on behalf of channel members can enhance the profitability of the total supply chain.

**Gorji et al., (2021)** Therefore, the green supply chain/environment management, reverse logistics (RL), and closed-loop supply chain (CLSC) can be considered as part of the broad definition of sustainability that caught high consideration in most industries with recyclable products;

**With the example of DSCSA, according to Kevin A. Clauson et al (2020)**, each regulatory component should map to block chain capabilities for it to be a viable solution. In the case of the pharmaceutical supply chain, possible DSCSA-block chain policy and technology alignment is illustrated.

**Camcode (2020)** the financial flow involves credit terms, payment schedules, and consignment and title ownership arrangements.

**Perin E. (2020)** various international and national health organizations, including the American Medical Informatics Association, expressed the urgent need for health organizations to have information systems that improve the quality, cost-effectiveness and safety in patient.

**Esmailizadeh et al., (2020).** According to Figure 2, the global production rate of PET bottles was 485 billion bottles in 2016, a trend projected to reach 583.3 billion bottles per year by 2021. Iran's annual plastic consumption tops 2.5 million tons (over 31 kilograms per capita). Moreover, according to Figure 3, Plastics and PET constituted 11% of Iran's MSW composition (2009-2019), which means that after organic and food wastes (68%), it has the largest share in the beta MSW composition.

**Zamanian (2020)** have raised an opinion that the existing research literature has taken a surge in the recent times on the topic of sustainability in the SC. Keeping the environmental focus the experts need a more ecologically centred approach and with a vision on utilization of least resources under current circumstances. Some deep insights are still necessarily required which will aid the decision capability of the SC managers in the dynamic environment with the competitive edge. The flow over the years in SSCM has been presented in figure 5 highlighting the key progresses.

**Yadav et al. (2020)** In recent times researchers have highlighted on the viewpoint for better efficacy of SC top management and experts need to ascertain on implications of sustainable practises across their firms for better utilization of natural resources;

### 3. OBJECTIVES OF THE STUDY

1. To study the impact of Supply Chain Management (SCM) practices on performance in Indian MSMEs.
2. To examine the impact of Supply Chain Management (SCM) practitioners on operational performance in Indian MSMEs.

### 4. HYPOTHESIS

**H<sub>01</sub>:** There is significant relationship between Supply Chain Management (SCM) practices and operational performance in Indian MSMEs

**H<sub>02</sub>:** There is no significant relationship between Supply Chain Management (SCM) practioners and operational performance in Indian MSMEs.

### 5. RESEARCH METHODOLOGY

The research is descriptive in nature the primary objective of which was to verify the dimensions of Supply Chain Management (SCM) practices in MSMEs in India. The target population consists of all kinds of MSMEs that are related to manufacturing of any kind of goods such as agricultural products, pharmaceuticals, biotechnology, printing, publishing, machine tools, food products and beverages. Scale developed by Bayraktar et al., was used to collect data from 138 MSMEs located in Hyderabad. The MSMEs included in the present study was chosen with the definition of MSMEs given by the Ministry of Medium, Small, and Micro Enterprises of India. Data for the research was collected personally with the structured questionnaire. Data analysis has been carried out in two stages in order to test the framed

hypothesis. At the first stage, exploratory factor analysis has been conducted to extract dimensions for two constructs i.e. SCM practices and SCM inhibitors separately. The relationships between Supply Chain Management (SCM) practices, Supply Chain Management (SCM) practices and operational performance have been established using regression techniques separately. Here the SCM practices, SCM practioners were taken as predictor variables and operational performance as dependent factor.

### 6. DATA ANALYSIS AND INTERPRETATION

#### 6.1 Factor Analysis

Factor analysis was conducted to explore the factors, thereby establishing the relationship between the latent factors and the observed variables. The objective was to reduce the number of variables and determine the number of factors underlining the construct. Firstly, visual inspection of the correlation matrix and anti-image matrix was done to find suitability of data for factor analysis. This is done by computing Bartlett's test of sphericity and the KMO measure. For items generated for SCM Practices, the KMO value comes out to be 0.772, which is greater than 0.5 and value of Bartlett's test of Sphericity statistic is 77.072 with 21 degrees of freedom, which is significant at 0.05 level. The results concluded appropriateness of factor analysis for data analysis. Principle component factor analysis with a Varimax rotation was employed to obtain the key dimensions. After deleting those items that did not load strongly on any factor (below 0.5) or had cross loading, the factor analysis generated two factors that accounted for 72.379% of the total explained variance in SCM practices. The outcome of the factor analysis i.e the variables along with respective dimension/factor, factor loading, eigen value, % variance explained and cumulative variance (%) are presented in Table

**Table1: Results of factor analysis (of SCM Practices)**

Factors	Factor Loading	Eigen value	% Variance Explained	Cumulative variance (%)
Procurement and Supplier Practices (SCM1)	0.504	2.186	46.368	46.368
Outsourcing/ subcontracting 3rd party logistics	0.632			



Close partnership with suppliers	0.785			
Close partnership with customers	0.583			
Strategic Collaboration and Lean Practices (SCM2)	0.694	1.274	26.011	72.379
Strategic Planning				
Holding Safety Stock	0.733			
JIT Supply	0.498			

which is also found to be significant at 0.05 level. For items generated for SCM inhibitors, the KMO value comes out to be 0.632, which is greater than 0.5 and calculated value of Bartlett's test of Sphericity is 110.040 with 21 degrees of freedom, Principle component factor analysis with a Varimax rotation was used to develop the underlying key dimensions for SCM Inhibitors. After deleting items that did not load strongly on any of the

factors (below 0.5) or cross loading, the factor analysis generated three factors that accounted for 69.117% of the total explained variance in SCM Inhibitors. The outcome of the factor analysis i.e the variables along with respective dimension/factor, factor loading, Eigen value, percentage variance explained and cumulative variance (%) are presented in Table.

**Table 2: Results of factor analysis (of SCM practioners)**

Factors	Factor Loading	Eigen value	% Variance Explained	Cumulative variance (%)
Integration with Supplier's System	0.732	2.174	27.137	27.137
Integration with Customer's System	0.61			
Integration with Existing System	0.382			
Resistance from Employees	0.626	1.794	22.423	49.56
Resource Shortage	0.43			
Skill Shortage	0.692			
Insufficient Vendor Support	0.423	1.629	19.557	69.117

In the second step, to identify the impact of two dimensions i.e. Procurement and Supplier Practices, Strategic Collaboration and Lean Practices on the operational performance of Micro, Small and Medium

Enterprises (MSMEs) in India, step-wise regression model was run. In the model, two dimensions consisting of seven items served as the independent variables and operational performance as the dependent variable.

**Table 3: Relationship between Operational Performance and Supply Chain Management practices**

Independent Variable		Standardized Regression Coefficients	T-value	Significance Probability	TV	VIF
Constant		3.103(.255)	6.571	0.000		
Procurement and supplier practices (SCM1)		0.652	8.928	0.000	0.721	1.624

Strategic collaboration and lean practices (SCM2)		0.504	6.896	0.000	0.739	1.52
F	45.927			0.000		
Multiple R	0.636					
Adjusted R <sup>2</sup>	0.396					
R <sup>2</sup>	0.405					
Durbin- Watson Test	1.7					
Sample Size	138					

The model appeared to be significant at  $p < 0.05$  level. The calculated value of the adjusted  $R^2$  is 0.405. Table 3 shows the betas which indicated predictor's explanatory power of the predictor variables. The two dimensions i.e. Procurement and Supplier Practices (SCM1) Strategic Collaboration and Lean Practices (SCM2) were noted to be significant (at  $p \leq 0.05$  level) in explaining increase in operational performance in MSMEs in India. The importance of the constructs is indicated by their beta coefficients. The dimension of Procurement and Supplier Practices (SCM1) ( $\beta=0.652$ ) has the primary role in increasing the operational

performance of the firm followed by the dimension of Strategic Collaboration and Lean Practices (SCM2) ( $\beta=.504$ ). All of the coefficients are in the accepted direction. Also, the calculated value of tolerance value is towards the upper side and VIF does not surpasses the theoretical recommending limit. Two factors were significant (at  $p < 0.05$  level) in explaining Operational Performance in Micro, Small and Medium Enterprises (MSMEs) in India. There found to be strong positive relationship between SCM Practices and Operational performance. The results support the hypotheses H1.

**Table 4: Relationship between Operational Performance and SCM PRACTITIONERS**

Independent Variable		Standardized Regression Coefficients	T-value	Significance Probability	TV	VIF
Constant		3.108(.243)	12.779	0.000		
Integration Related Inhibitors (INH1)		-0.658	-8.896	0.000	0.621	1.821
Organization Related Inhibitors (INH2)		-0.462	-7.105	0.000	0.873	1.612
Support Inhibitors (INH3)		-0.256	-3.514	0.014	0.678	1.936
F	37.343			0.000		
Multiple R	0.675					
Adjusted R <sup>2</sup>	0.443					
R <sup>2</sup>	0.455					
Durbin- Watson Test	1.7					
Sample Size	138					

To establish the relationship between SCM Inhibitors and Operational Performance in Micro, Small and Medium Enterprises (MSMEs) in India, step-wise regression was performed. In the model, three dimensions which consisted of seven variables treated as

the independent variables and operational performance as the dependent variable. The model was found to be significant at  $p < 0.05$  level and the calculated value of adjusted  $R^2$  was 0.455. Table 4 shows the beta values of explanatory variables. The three dimensions of SCM Inhibitors i.e Integration Related Inhibitors (INH1);

Organization Related Inhibitors (INH2); Support Inhibitors (INH3) were significant (at  $p \leq 0.05$  level) in explaining the decrease in operational performance in Micro, Small and Medium Enterprises (MSMEs) in India. These constructs, based on their importance in as indicated by their beta coefficients, are Integration Related Inhibitors (INH1) ( $\beta=0.658$ ), Organization Related Inhibitors (INH2) ( $\beta=.462$ ) and Support Inhibitors (INH3) ( $\beta=.256$ ). Their results illustrate that there is negative relationship between SCM Inhibitors and Operational performance in Micro, Small and Medium Enterprises (MSMEs) in India. Also, the calculated value of tolerance value is towards the upper side and VIF does not surpass the theoretical recommending limit. The results support the hypothesis H2.

## 7. CONCLUSION

The present research attempted to empirically investigate the relationships among SCM practices, SCM related inhibitors and operational performance in MSMEs in India. The findings of the research study established that number of MSMEs have embraced supply Chain management practices to enhance operational performance by collaborating with suppliers, maintaining customer relationship, adopting efficient Information Technology system, outsourcing and logistics solutions. The results of the study signify that Supply Chain Management practices have a positive and significant impact on the operational performance in Micro, Small and Medium Enterprises in India. Also, the results indicated that there is a strong and negative relationship between SCM practioners and operational performance in Micro, Small and Medium Enterprises in India. To improve operational performance in MSMEs, managers should focus on developing relationship with suppliers and customers. There is a need to work out strategic plans to eliminate prospective barriers to the effective use of SCM practices. MSMEs can implement Just in time ERP and MRP system. Moreover, there is needed to carefully monitor the holding of inventory. The operational time and cost can be reduced by implementing the processes such as outsourcing, subcontracting and third party logistics Managers in MSMEs should identify Supply Chain Management practioners and try to eliminate and/or at least lessen the effect of these inhibitors on the supply chain and operational performance. There is a need to have clarity

about the accurate nature of SCM inhibitors. This will enable the managers to draft an action plan to prioritize their supply chain strategies. Prudence, however, should be kept in mind while interpreting the results of the study. The limitation of this study was relatively small sample size. The results might not be generalized. Thus, future research should include large sample size of Micro, Small and Medium Enterprises (MSMEs) in India. Future studies should try to investigate the relationships by considering more variables into the conceptual model. The study should be conducted across type of industry, supply chain structure and country of origin. Despite these limitations, the present research will be beneficial to the academicians and practitioners so as to help them in comprehending the positive impact of supply Chain management practices on operational performance in Micro, Small and Medium Enterprises in India.

## Conflict of interest statement

Authors declare that they do not have any conflict of interest.

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