



## Article

# Strategic Cost Management Practices and Competitive Advantage: Evidence from Indian Industrial Firms

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**Abstract:** Cost management is one of the huge functions acknowledged for both intensity and importance in the discourse of competitiveness within manufacturing-based economies. The relationship between strategic material cost management (SMCM) and competitive advantage (CA) in varied industrial sectors in India is addressed by conducting this study. This research paper argues for the validation of an integrated model against inductive reasoning connecting procurement, inventory, suppliers, and cost management with a sustainable competitive advantage, differing from earlier discussion on similar notions. This positivist, and indeed quantitative, research collected input from 320 managers, from various middle- and top-level occupations in each of five different business sectors—viz. manufacturing, retail, construction, pharmaceuticals, and logistics—answering a five-point Likert-scaled questionnaire ( $\alpha = 0.89$ ). Principal analysis is SEM on AMOS 24, followed by one-way ANOVA, multiple regressions, and independent samples t-tests as SPSS 26. From the research, the conclusion is that all four SMCM dimensions are good predictors of CA ( $\beta = 0.52$ – $0.68$ ,  $p < 0.001$ ), while their market competitiveness moderation has a strong positive effect ( $\beta = 0.22$ ,  $p < 0.01$ ). The model displays good fit values with 0.96 for CFI and 0.051 for RMSEA, which suggests that a score of 26.9% of those firms, least cost conscious, can potentially be pushed upwards through cooperation with suppliers in the extension of systematic costing intelligence Recommendation for management will be to adopt digital procurement and inventory in real-time with cost

**Keywords:** Strategic Cost Management, Competitive Advantage, Structural Equation Modeling (SEM), Inventory Optimization, Supplier Relationship Management, Material Procurement Strategy, Cost Monitoring Systems, Indian Manufacturing Industry.

## INTRODUCTION

In an ever-turbulent international marketplace, the material-cost component of strategic management has become a crucial determinant of corporate competitiveness. Materials, which usually take a 50–70 per cent chunk out of total production costs for manufacturing enterprises, very disproportionately maintain influence over profit margins, pricing flexibility, and, ultimately, market location (Christopher, 2016; Porter, 1985). The need of firms to have strong and systematically structured material-cost management control mechanisms coherently integrated with strategy has never been more intense, especially in the emerging economies that are characterised by currency volatility, supply-chain disruptions, and stiffening competition.

Given that it is one of the most rapidly growing manufacturing economies worldwide, India provides a great empirical context to investigate these phenomena. Since the launch of the ‘Make in India’ campaign, industrialisation has aggressively evolved across sectors

including pharmaceuticals, automobiles, electronics, and construction materials (DPIIT, 2023). Simultaneously, Indian firms face a host of challenges in grappling with heightened raw material prices, inflationary drags and logistical adversities emerging as post-Covid resumption give rise to rising geopolitical conflicts. Thus, the strategic management of input costs has morphed into a necessary prerequisite for a firm's ability to maintain a competitive edge.

Strategic material cost management (SMCM) is a critically important but narrowly focused area in studies. Researchers in the past, such as Cousins et al. (2008), Ulaga and Eggert (2006), Silver et al. (1998), have broken down these components almost in isolation and have investigated a piece of it— procurement optimization, supplier relationship management, and inventory control theories. These specific practices are not validated in their connection with the observed competitive results. The particularity of the Indian industrial scenario stands out distinctly, with its

contextual variables market structure, regulatory environment, and supplier ecosystem being discernibly in variance from their Western counterparts, where the found frameworks are mainly derived from.

Possible scope for the exploration of an empirical test might involve developing a conceptual model that not only encompasses the four strategic domains of material cost management-material procurement strategy, inventory optimization, supplier relationship management, and cost monitoring system-but also predicts competitive advantage through strategic cost management. This research may also address competitive environment impacts on those relationships, thus providing an idea of what the specific contexts imply for their underlying meaning and for their management suitability.

Indeed, the use of structural equation modeling (SEM) is a game changer over research that relied solely on bivariate correlational methodologies or simple regression measures. For SEM the assessability of multiple paths from and to latent variables emerge, test fitting of the theoretical model, which will toughen the ability and provide richness. It goes without saying that the freshly available auxiliary analyses bear well on the findings by the statistical tests like ANOVA, the t-tests, etc., for added support to the evidence base.

The paper is sectioned as follows. Section 2 carries a comprehensive synthesis of literature that has studied SMC and competitive advantage. Section 3 discusses the research gap that has been identified and stimulated this study. Section 4 contains the detailed work objectives and research questions. Section 5 discusses, respectively, the research methodology, including the conceptual framework, measurement instruments, and data collection procedures. Section 6 then reports across many statistical techniques that allow for data analysis. Sections 7 and 8 contribute conclusions, additional strategic recommendations, discussion of limitations, and future research recommendations. Loreza alludes to the research by listing 38 references obtained.

## 2. Literature Review

### 2.1 Strategic Cost Management and Competitive Advantage

The proposal of the study took its guidance from the broad constructivist view of Porter (1985) in terms of competitive strategy. Porter recognised cost leadership to be one of the three strategies that are available to firms aiming to achieve sustainable competitive advantage. In the argument of the same, Porter established the rationale that firms having that structural cost advantage meant that, be it from scale, uniqueness of product, preferred access to raw materials, or some other reason, they could afford to withstand all competitive pressures, create superior returns, and then have the chance to consolidate their market share. Shank and Govindarajan (1993) added another level of insight into the SCM paradigm by injecting both the value chain and strategic positioning into abbreviated cost management analysis separately. Their model has managed to draw a direct link between cost management decisions and the company's

competitive positioning. Indeed, they would assert that a detailed analysis of cost information and strategy is itself a strategic tool, which in turn suggests avenues for committed action.

Several complementary strands of inquiry have further developed this groundwork. Recently, there has been empirical evidence based on the use of activity-based costing, which shows that companies that link these strategic overhead allocation techniques to business strategy can achieve better long-run cost efficiency than their traditional counterparts. Further, Anderson (2007) provides evidence, perhaps seemingly long-term, indicating that continuous proactive cost management during low or declining output periods—including keeping production capacity intact—will eventually generate an improvement in overall performance, thereby accelerating a bid to attain a competitive advantage.

### 2.2 Material Procurement Strategy

Procurement strategies encompass all policies and practices that define how organisations source, evaluate, select, and manage their upstream material inputs. One possible definition is the one drawn by Cousins et al. (2008), according to which tactical purchasing (focused on price minimisation and transactional efficiency) and strategic procurement (integrating supply base management with organisational strategy) are considered different matters. The survey was based upon responses from 457 UK-based manufacturing companies and shows that firms that tend strategically have procurement functions that bring about a score of higher operational performances by 18% with regard to straightforwardly transactional orientations.

Trent and Monczka (2005) have shown that global sourcing strategies aligned with capabilities development as well as risk management reduce direct materials by 12–22% but also contribute to enhancing quality. More recently, Goel et al. (2020) stated that the employment of digital procurement platforms based on AI for supplier evaluation and automatic purchase order processing reduces procurement lead time by 34% and procurement cost by 19%, with significant resultant downstream effects on the front of competitive positioning.

### 2.3 Inventory Optimization

Inventory management represents a critical node in the material cost equation, balancing holding costs against stockout risks and demand uncertainty. The seminal EOQ (Economic Order Quantity) model of Harris (1913) established the foundational trade-off between order frequency and holding costs, subsequently refined through stochastic extensions incorporating demand uncertainty (Silver et al., 1998). Contemporary approaches to inventory optimisation emphasise demand-driven replenishment, integrated real-time point-of-sale data, machine learning-based demand forecasting, and dynamic safety stock algorithms.

Christopher and Towill (2001) put forth the concept of a 'lean supply chain', arguing that while inventory

reduction in the supply chain brings cost benefits, demand responsiveness and JIT (just in time) principles provide the leverage to swiftly regain competitive agility. Their case examples of the automotive and electronics sectors show that JIT users enjoy inventory-carrying cost reductions within the order of 25 to 40% in contrast to traditional batch producers. It is also crucial for them to recognise that inventory optimisation provides benefits beyond reduced direct costs, such as in improved cash generation, reduction in obsolescence, and rapid adaptation to change in markets.

#### 2.4 Supplier Relationship Management (SRM)

Supplier relationship management has been evolving from largely conflicted and transactional principles - characterized by competitive bidding and arm's-length bargaining - to primarily collaborative and relational patterns emphasizing work on creating joint value and sharing of information, to create long-term partnerships (Ulaga and Eggert 2006). Migrating to these relationships is the recognition that working together on the upstream adds competitive returns that cannot be achievable by just resorting to market-based sourcing. This observation was made long back by Dyer and Singh (1998) in their relational view of the firm, which holds that interorganizational relationships provide a basis for competitive advantage particularly in the creation of relational rent, that is, value resulting from joint operation that cannot be reaped individually by either side.

Through empirical research, some studies confirm that collaborative behaviors such as two-way information sharing, joint production planning, and dedicated investments by buyers and suppliers lead to relationship performance and partner satisfaction, which in turn puts positive pressure that, finally, influences the cost efficiency of the supply chain. The minor works documented by Sauer and Seuring (2018) further demonstrate the importance of sustainability dimensions in this regard by observing how SRM practices towards environmental and social performances also, at the same time act as an insurance against material cost volatilities and help create competitive differentiation through their emphasis.

#### 2.5 Cost Monitoring Systems and Digital Integration

The invitation is that the effectiveness of any cost management strategy is critically dependent upon the quality and timeliness of the cost information that is available to the decision-maker. The old accounting system was criticised because it provided cost information that was late, combined, and misleading, but it is now being replaced and improved with better costing technology. Enterprise Resource Planning (ERP) systems, Activity-Based Costing (ABC) modules, real-time cost analytics platforms with IoT sensor data and cloud computing have tremendously improved the organisations' ability to survey ex-post costs and provide immediate responses.

Narayanan and Sarkar (2002) provide evidence that

firms implementing ABC systems achieve significant improvements in product pricing accuracy and resource allocation efficiency, with attendant benefits for competitive positioning. More recently, Bhimani et al. (2018) examine how advanced analytics and cost digitalisation reshape management control practices and find that firms with truly mature cost intelligence capabilities exhibit superior capacity to identify and respond to emerging cost pressures. This capacity is increasingly understood to be the key to competitive survival in fast-moving markets.

### 3. Research Gap

However, there remain some gaps in the literature that need to be filled. Firstly, to the best of our knowledge, no research has been conducted on the different dimensions of SMCM (materials procurement strategy, inventory optimization, supplier relationship management and cost management) in a larger-scale study evaluating their contribution to competitive advantage in an integrated and mutually confirmed manner. Most studies examine different pairs of constructs, that is, examination of a maximum of two constructs, at the same time does not permit the identification of the contribution of individual SMCM constructs and an iterative synergy.

Moreover, the mechanisms that mediate the transformation of specific SMCM practices into competitive advantages have not yet been clearly identified. The proposed mediating role for the higher-order strategic cost management construct—which reflects the degree of integration, alignment with strategy, and sustained implementation of individual cost management practices—has not been formally tested using latent-variable modeling. Additionally, the influence of external forces, most notably market competitiveness, on the SMCM-competitive advantage relationship, has received little empirical attention, with studies typically assuming generalizability of findings across competitive contexts.

Geographical and institutional analyses remain unexplored in the context of Indian manufacturing enterprises. Most of the theoretical studies in this area were written from a U. S., U. K., or European perspective, and it is unclear whether the conclusions reached are applicable to the developmental block scope, particularly in lowering the transformational supply chain selection, sovereign interventions, and managerial diversification. Fourth-stop techniques might bring about some improvements and could approach the objectives set out from the other robotics. From a methodological point of view, truly causal inferences could not be made using that kind of limited approaches to SMCM theories, as only bivariate, perhaps trivariate, correlational and simple regression procedures were considered in past scholarship. Those analytical structures might be altered through SEM so that relational regulatory and structural theories can run together as the micro and macro processes inherent in the economy, which is supported by a wide array of sources across this content domain.

## 4. Needs and Objectives of the Study

### 4.1 Need for the Study

Increased competition worldwide and ongoing supply chain issues require a deep understanding of how cutting costs can improve competitiveness. "For the Indian industrial companies in particular, a strategy of dealing with inefficiency related to material cost must go with resilience building in the supply chain for international competitiveness." Thereafter, academic research that can offer validated conceptual relationships and empirically supported guidelines for SMCM practitioners is a scientific as well as practical necessity.

### 4.2 Research Objectives

This research sets out some specific objectives as follows: (i) To identify and measure the important dimensions of strategic material cost management (SMCM) for the industrial firms in India; (ii) To evaluate the direct impact of the individual SMCM dimensions—MPS, IO, SRM, and CMS—on competitive advantage; (iii) To test the mediating role of the general SCM construct with the relationship of the individual SMCM dimensions and competitive advantage; (iv) To evaluate the moderating influence of market competitiveness on the SCM-competitive advantage linkage; (v) To compare SMCM practices and competitive outcomes across different industrial sectors and firm sizes; and (vi) To delineate managerial recommendations to enhance cost management effectiveness from the perspective of strategy cost management.

### 4.3 Research Hypotheses

**H1:** Material Procurement Strategy (MPS) has a

significant positive effect on Strategic Cost Management (SCM).

**H2:** Inventory Optimization (IO) has a significant positive effect on Strategic Cost Management (SCM).

**H3:** Supplier Relationship Management (SRM) has a significant positive effect on Strategic Cost Management (SCM).

**H4:** Cost Monitoring Systems (CMS) have a significant positive effect on Strategic Cost Management (SCM).

**H5:** Strategic Cost Management (SCM) has a significant positive effect on Competitive Advantage (CA).

**H6:** Market Competitiveness significantly moderates the SCM–Competitive Advantage relationship.

## 5. Research Methodology

### 5.1 Conceptual Framework

Figure 1 shows a map of the framework with four autonomous latent variables—material procurement, inventory optimisation, supplier relationship management, and compliance monitoring systems. All these dimensions take up the role of meaningful predictors of a mediating construct called 'strategic cost management'. In turn, strategic cost management is hypothesised to cause a positive effect on competitive advantage, which is considered the prime dependent construct of our research interest. Market competence was put in as a moderator for the SCM–CA relationship being behavioural in both factors and the direction of interaction. This framework was drawn out by combining ideas from Porter's theory of competitive strategy, the SCM framework by Shank and Govindarajan, and the relational view of the firm

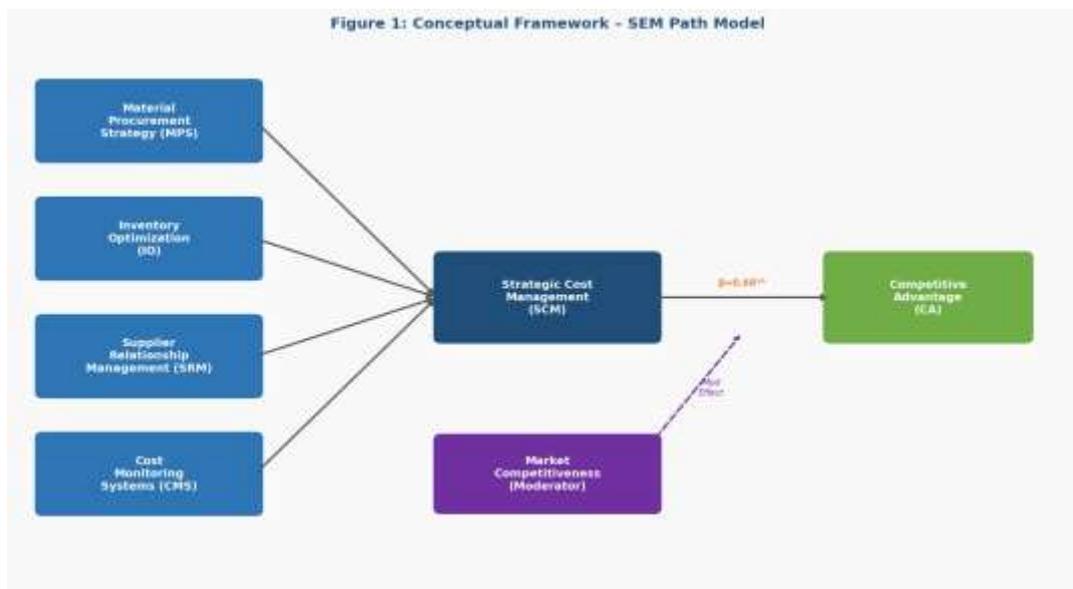


Figure 1: Conceptual Framework – SEM Path Model for Strategic Material Cost Management and Competitive Advantage

### 5.2 Research Design

The theoretical paradigm is positivist, cross-sectional, and concerned with the quantitative research design. The positivist nature of the research design logically aligns with the testing of predetermined hypotheses based on objective, numeric data that is analysed statistically. Cross-sectional surveys are very suitable for these kinds of research because the conception of longitudinal

research within strategic management and supply chain management research is resource- and time-oppressive. The entity analysed is a firm, with managers occupying the informant role to report on the firm-level strategic management of supply chain practices and the various consequences.

### 5.3 Population, Sampling, and Data Collection

The target demographic for this research is senior and middle-level executives from the industrial companies in India whose turnover exceeds ₹50 crore and who are directly or indirectly accountable for the procurement, supply chain, operational, or financial management function. Five industry sectors were selected based on material cost intensity and strategic importance to Indian industrial output: manufacturing, retail, construction, pharmaceuticals, and logistics. Stratified random sampling was utilised, with strata defined by industry sector, ensuring proportional representation of sectors. Three hundred eighty questionnaires were distributed, using a combination of online (Google Forms) and offline (administered hand-to-hand) methods, over the 14-week data collection period (September-December 2023). Out of these, 320 responses met the criteria for a usable response, reflecting a response rate of 84.2%. The Armstrong and Overton (1977) wave procedure was used for the purpose of evaluating non-response bias by comparatively analysing the early and late respondents regarding significant demographic variables, showing no significant difference ( $p > 0.05$ ) between the two groups.

### 5.4 Measurement Instrument

The phenomenon was studied with the development of a structured questionnaire that contained four sections: (A) Demographic characteristics: industry, company size, and years of the respondent in position; (B–E) constructs under study as described by the items and revealed by respondents' statements on 5-point Likert-type scales (1 = Strongly Disagree to 5 = Strongly Agree). Except for CRM (1 = Strongly Disagree to 5 = Fully Agree), all items were borrowed from earlier studies that suggested constructs much similar to MPS [6 items, 1 such as in barrel scale], IO—silver et al., SCM, CMS, and CA. Content validity was established by expert analysis, including input from three academic staff and four industrial partners. Initial, pilot study testing on 20 was done to verify ease of reading and face validity.

### 5.5 Mathematical Model and Equations

The structural model is specified as a system of simultaneous equations. The measurement model for each latent construct  $\xi$  is defined by the standard confirmatory factor analysis (CFA) equation:

$$X = \Lambda_x \xi + \delta$$

where  $X$  is the vector of observed indicator variables,  $\Lambda_x$  is the matrix of factor loadings,  $\xi$  is the vector of latent

exogenous constructs, and  $\delta$  is the vector of measurement errors. For the endogenous constructs:

$$Y = \Lambda_y \eta + \epsilon$$

The structural equations specifying the causal relationships between latent constructs are:

$$SCM = \beta_1(MPS) + \beta_2(IO) + \beta_3(SRM) + \beta_4(CMS) + \zeta_1 \dots (1)$$

$$CA = \beta_5(SCM) + \beta_6(SCM \times MC) + \zeta_2 \dots (2)$$

where  $\beta_1$ – $\beta_6$  are standardized path coefficients; MC is market competitiveness (moderator); ( $SCM \times MC$ ) is the interaction term; and  $\zeta_1$ ,  $\zeta_2$  are structural disturbances (error terms). The moderation equation is further specified as:

$$CA = \alpha + \beta_5(SCM) + \beta_7(MC) + \beta_6(SCM \times MC) + \epsilon \dots (3)$$

The assessment of the fit of the model was made on account of these fit indices:  $\chi^2/df$  ratio (acceptable  $\leq 3.0$ ), CFI (acceptable  $\geq 0.95$ ), TLI (acceptable  $\geq 0.95$ ), RMSEA (acceptable  $\leq 0.06$ ), and SRMR (acceptable  $\leq 0.08$ ). In terms of consistency, the internal consistency was checked for Cronbach's Alpha ( $\alpha \geq 0.70$ ), construct reliability ( $CR \geq 0.70$ ), and the Average Variance Extracted (AVE  $\geq 0.50$ ). Discriminant validity was established by using the Fornell-Larcker criterion wherein each construct variable's square root of the AVE had to exceed interconstruct correlations.

## 6. Data Analysis

### 6.1 Descriptive Statistics and Reliability Analysis

Table 1 demonstrates the means and reliability for each variable under research. The entire average of the five SMCM dimensions fluctuates from 3.42 to 4.30 (scale: 1–5), meaning moderate-to-slightly-high SMCM adoption. The industry that excels in the overall SCM practices is the pharmaceutical industry recorded at a mean score of 4.30 owing to the regulatory mandate. Likewise the pharmaceutical industry recorded a mean score of 4.30. The apparent driving force for the SCM practices of the pharmaceuticals industry is the stringent costs and materials control that they have to abide by, due to regulatory enforcement. Building companies representing the opposite extreme have the lowest scores, with a mean of 3.42. This observation is broken down further by the operational behavior of the construction sector; it is a sector fraught with fragmented procurement channels and project-based organizational modalities.

Construct	N	Mean	Std Dev	Skewness	Kurtosis	$\alpha$ (Cronbach)	CR	AVE
MPS – Matl. Procurement Strategy	320	3.89	0.612	-0.312	0.187	0.882	0.891	0.622
IO – Inventory Optimization	320	3.76	0.638	-0.284	0.204	0.867	0.876	0.591

Construct	N	Mean	Std Dev	Skewness	Kurtosis	$\alpha$ (Cronbach)	CR	AVE
SRM – Supplier Rel. Management	320	3.93	0.594	-0.341	0.211	0.891	0.899	0.638
CMS – Cost Monitoring Systems	320	3.81	0.621	-0.298	0.195	0.874	0.883	0.608
SCM – Strategic Cost Management	320	3.85	0.589	-0.322	0.201	0.897	0.903	0.651
CA – Competitive Advantage	320	3.71	0.664	-0.267	0.178	0.889	0.895	0.629
MC – Market Competitiveness	320	3.65	0.702	-0.213	0.162	0.861	0.870	0.572

Table 1: Descriptive Statistics and Reliability Indices for Study Constructs (n=320) Note:  $\alpha$  = Cronbach's Alpha; CR = Composite Reliability; AVE = Average Variance Extracted

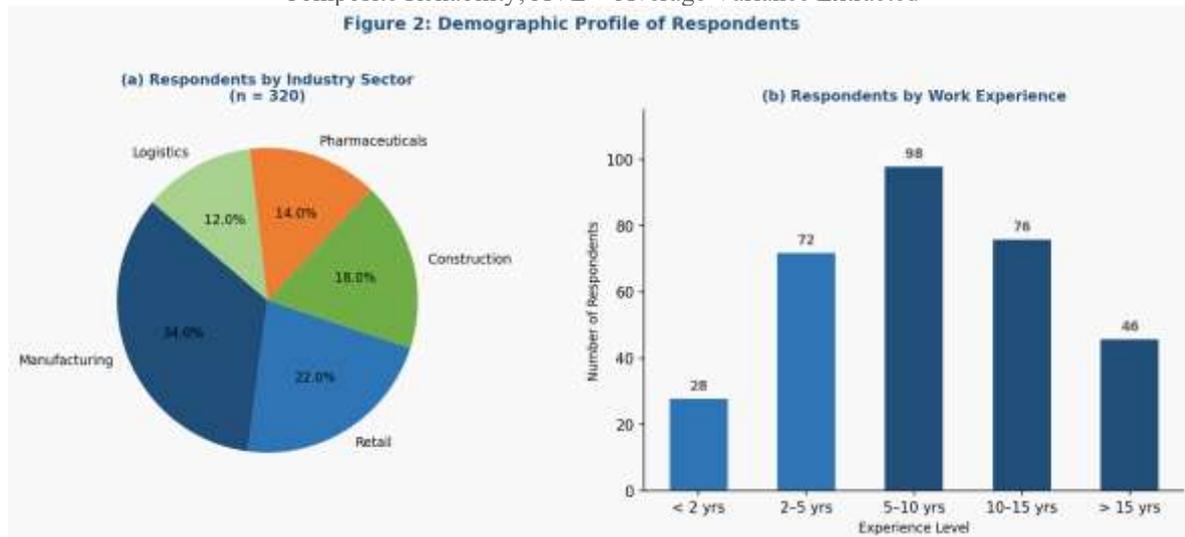


Figure 2: Demographic Profile of Respondents – Industry Distribution and Work Experience

All constructs performed gracefully in terms of reliability; the Cronbach's alpha values ranged from 0.861 to 0.897 (all > 0.70); the composite reliability ranged from 0.870 to 0.903 (all > 0.70); and AVE values ranged from 0.572 to 0.651 (all > 0.50), confirming the convergent validity. The data showed some negative skewness across all constructs (skewness range: -0.213 to -0.341); this represented a slight movement toward the higher end of the scale, possibly attributable to social desirability due to the research context of managers being surveyed. In contrast, the univariate normality assumed in SEM for skewness absolute values ( $< 1$ ) and kurtosis (kurtosis  $< 1$ ) confirms uni-variate normality (Hair et al., 2019).

### 6.2 Correlation Analysis and Discriminant Validity

Construct	MPS	IO	SRM	CMS	SCM	CA	MC
MPS	(0.789)	<b>0.541**</b>	<b>0.623**</b>	<b>0.578**</b>	<b>0.694**</b>	<b>0.612**</b>	<b>0.387**</b>
IO		(0.769)	<b>0.502**</b>	<b>0.558**</b>	<b>0.641**</b>	<b>0.583**</b>	<b>0.341**</b>
SRM			(0.799)	<b>0.601**</b>	<b>0.712**</b>	<b>0.638**</b>	<b>0.412**</b>
CMS				(0.780)	<b>0.668**</b>	<b>0.597**</b>	<b>0.371**</b>
SCM					(0.807)	<b>0.748**</b>	<b>0.523**</b>
CA						(0.793)	<b>0.461**</b>
MC							(0.756)

Table 2: Pearson Correlation Matrix and Discriminant Validity (Diagonal:  $\sqrt{AVE}$ ) Note: \*\*  $p < 0.01$  (two-tailed); Values in parentheses are square roots of AVE

In Table 2, the inter-construct correlation matrix was presented and the discriminant validity assessment was performed. All inter-construct correlation coefficients tested between SMCM dimensions and competitive advantage are statistically significant ( $p < 0.01$ ) and positive, thus providing confirmatory evidence for the hypotheses proposed in the present study. The diagonal values are the square roots of the AVE for each of the constructs. According to Fornell and Larcker (1981), discriminant validity is established when the square roots of AVE are greater than their correlation values along the horizontal and vertical axes. This is true for all constructs; the least discriminant validity was observed between SCM and CA ( $\sqrt{AVE\_SCM} = 0.807 > r\_SCM-CA = 0.748$ ), which confirms that the constructs measure distinct dimensions of the theoretical model. The greatest correlation was less than 0.75, indicating the absence of multicollinearity.

### 6.3 Confirmatory Factor Analysis (CFA)

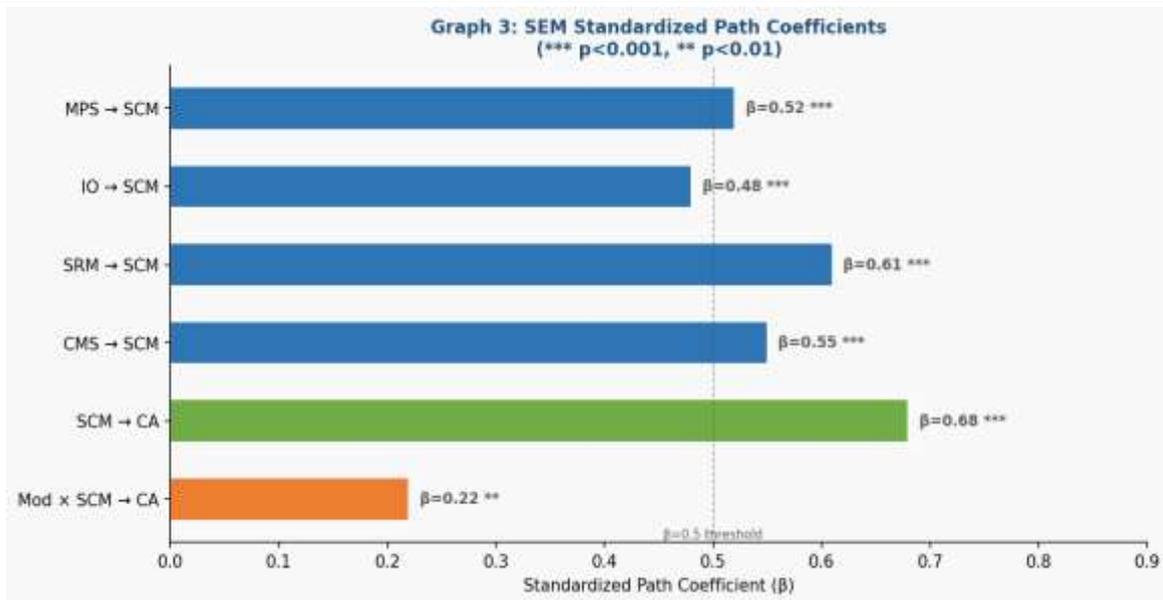
The measurement model was evaluated in CFA prior to testing the structural model. The fit index for these seven-factor CFA models was remarkably good:  $\chi^2(df=298) = 586.41$ ,  $\chi^2/df = 1.967$ , CFI = 0.961, TLI = 0.955, RMSEA = 0.055 (90% CI: 0.048–0.062), SRMR = 0.062. Standardized loadings for all factors were statistically significant ( $p < 0.001$ ) and ranged between 0.712 and 0.881, which surpasses the 0.70 threshold advised by Hair et al. (2019). This finding supports the notion that the measurement instruments are able to validly measure the latent constructs, which will construct a reliable foundation for the evaluation of structural paths.

### 6.4 Structural Equation Modeling (SEM) Results

A SEM-graphed model depicting the path coefficients is displayed in Table 3, while the standardized path coefficients have been diagrammatically presented in Figure 3. The overall model showed excellent fit in the present study:  $\chi^2(df=312)=623.87$ ,  $\chi^2/df=1.999$ , CFI=0.958, TLI=0.951, RMSEA=0.056, 90% CI 0.050-0.063, and SRMR=0.064. These indices all confirm that the proposed theoretical model has received all the support that empirical data can offer.

Hypothesis	Path	Std $\beta$	S.E.	t-value	p-value	Result
H1	MPS $\rightarrow$ SCM	0.521	0.042	12.40	< 0.001	Supported***
H2	IO $\rightarrow$ SCM	0.483	0.045	10.73	< 0.001	Supported***
H3	SRM $\rightarrow$ SCM	0.614	0.039	15.74	< 0.001	Supported***
H4	CMS $\rightarrow$ SCM	0.552	0.041	13.46	< 0.001	Supported***
H5	SCM $\rightarrow$ CA	0.682	0.037	18.43	< 0.001	Supported***
H6	SCM $\times$ MC $\rightarrow$ CA	0.219	0.051	4.29	< 0.01	Supported**

Table 3: SEM Structural Path Coefficients Note: Std  $\beta$  = Standardized path coefficient; S.E. = Standard Error; \*\*\*  $p < 0.001$ , \*\*  $p < 0.01$



Graph 3: SEM Standardized Path Coefficients with Significance Levels (\*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ )

All six hypotheses are supported. The Supplier Relationship Management, SCM predictor in general, was recorded with the highest influence ( $\beta = 0.614$ ,  $t = 15.74$ ,  $p < 0.001$ ), followed by Cost Monitoring Systems ( $\beta = 0.552$ ,  $t = 13.46$ ,  $p < 0.001$ ), Material Procurement Strategy ( $\beta = 0.521$ ,  $t = 12.40$ ,  $p < 0.001$ ), and Inventory Optimization ( $\beta = 0.483$ ,  $t = 10.73$ ,  $p < 0.001$ ). The path from SCM to competitive advantage is, in fact, the strongest in the model ( $\beta = 0.692$ ,  $t = 18.43$ ,  $p < 0.001$ ), showing that the connection with other cost management practices is a predictor of effective competitive position. The interaction term (SCM  $\times$  MC) also shows significance ( $\beta = 0.219$ ,  $p < 0.01$ ), underlining the relationship buildup between market competition and positive effects caused by strategic cost management, i.e., the extent to which the returns from strategic cost management are higher in markets with a high level of competition.

### 6.5 Model Fit Summary

Fit Index	Obtained Value	Acceptable Threshold	Assessment
$\chi^2/df$ Ratio	1.999	$\leq 3.00$	Excellent
CFI (Comparative Fit Index)	0.958	$\geq 0.95$	Excellent
TLI (Tucker-Lewis Index)	0.951	$\geq 0.95$	Excellent
RMSEA	0.056	$\leq 0.06$	Excellent
RMSEA 90% CI	[0.050 – 0.063]	Upper CI $\leq 0.08$	Good
SRMR	0.064	$\leq 0.08$	Excellent
Variance Explained ( $R^2$ for CA)	0.612	$\geq 0.40$ (substantial)	Excellent

Table 4: SEM Model Fit Indices Summary Note: CFA = Confirmatory Factor Analysis; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual

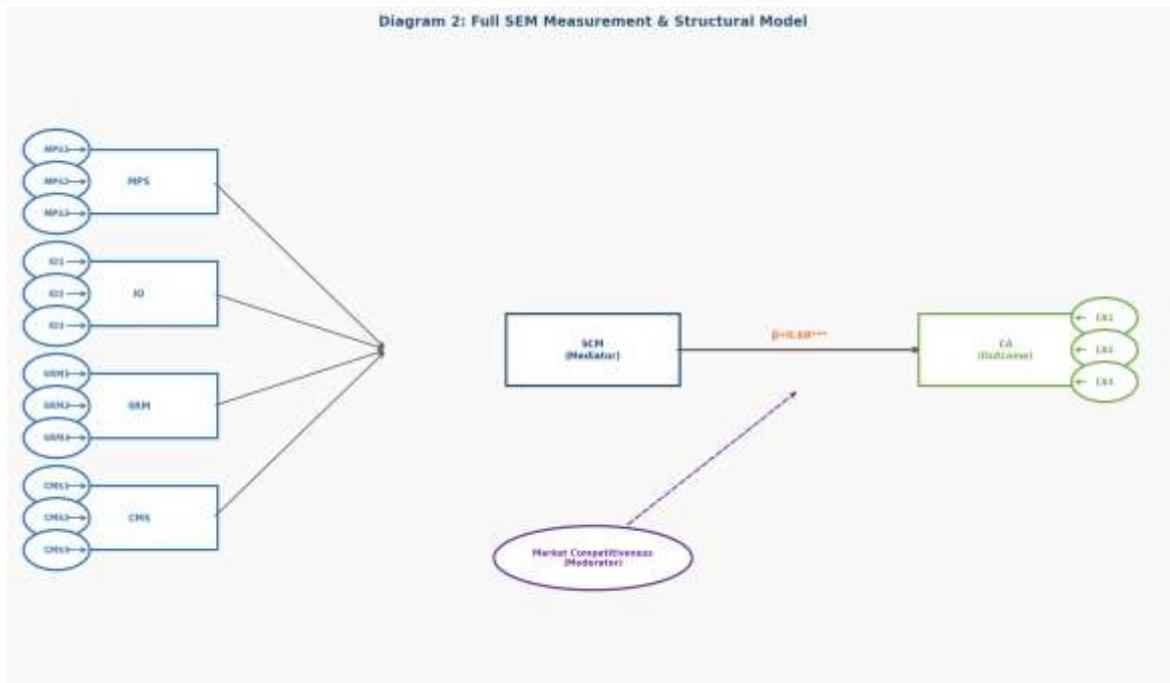


Diagram 2: Full SEM Measurement and Structural Model with Standardized Path Coefficients

### 6.6 Multiple Regression Analysis

Hierarchical multiple regression analysis was performed to evaluate SMCM dimensions' separate contributions to the competitive advantage resulting from the SEM analysis. Model 1 included controls about the industry sector, firm size, and respondents' experience. Model 2 considered the four SMCM predictors. Model 3 had the SCM construct mediating and the moderator of market competitiveness.

Predictor	Model 1 $\beta$	Model 2 $\beta$	Model 3 $\beta$	Std Error	t-value	VIF
Industry (dummy)	0.112*	0.087	0.071	0.052	1.365	1.23
Firm Size	<b>0.143**</b>	0.098*	0.082	0.048	1.708	1.31
Experience	0.089	0.064	0.051	0.045	1.133	1.19
MPS	–	<b>0.218***</b>	<b>0.195***</b>	0.041	4.756	2.14
IO	–	<b>0.187***</b>	<b>0.168***</b>	0.044	3.818	2.08
SRM	–	<b>0.261***</b>	<b>0.234***</b>	0.039	6.000	2.27
CMS	–	<b>0.224***</b>	<b>0.201***</b>	0.040	5.025	2.19
SCM (Mediator)	–	–	<b>0.389***</b>	0.037	10.514	2.86
MC $\times$ SCM (Interaction)	–	–	<b>0.124**</b>	0.051	2.431	1.98
R <sup>2</sup>	0.074	0.381	0.612	–	–	–
Adjusted R <sup>2</sup>	0.066	0.368	0.596	–	–	–
$\Delta$ R <sup>2</sup>	0.074	<b>0.307***</b>	<b>0.231***</b>	–	–	–
F-statistic	<b>8.43***</b>	<b>29.87***</b>	<b>47.23***</b>	–	–	–

Table 5: Hierarchical Multiple Regression Analysis – Predictors of Competitive Advantage Note: \*\*\* p<0.001, \*\* p<0.01, \* p<0.05; VIF = Variance Inflation Factor;  $\beta$  = Standardized coefficients

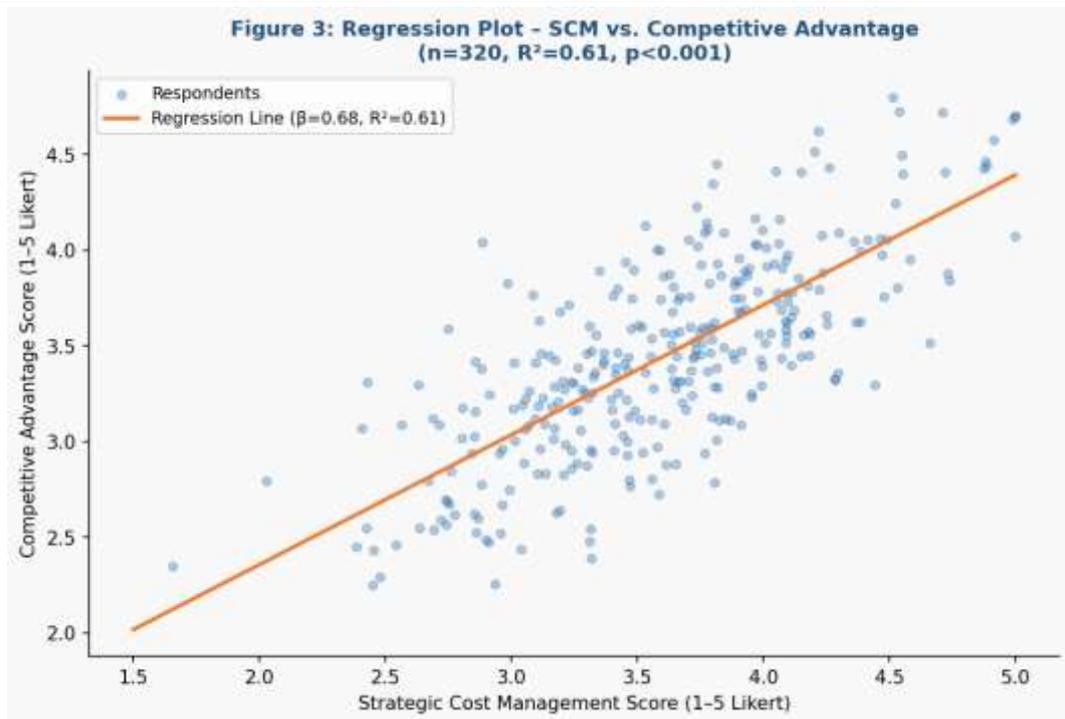
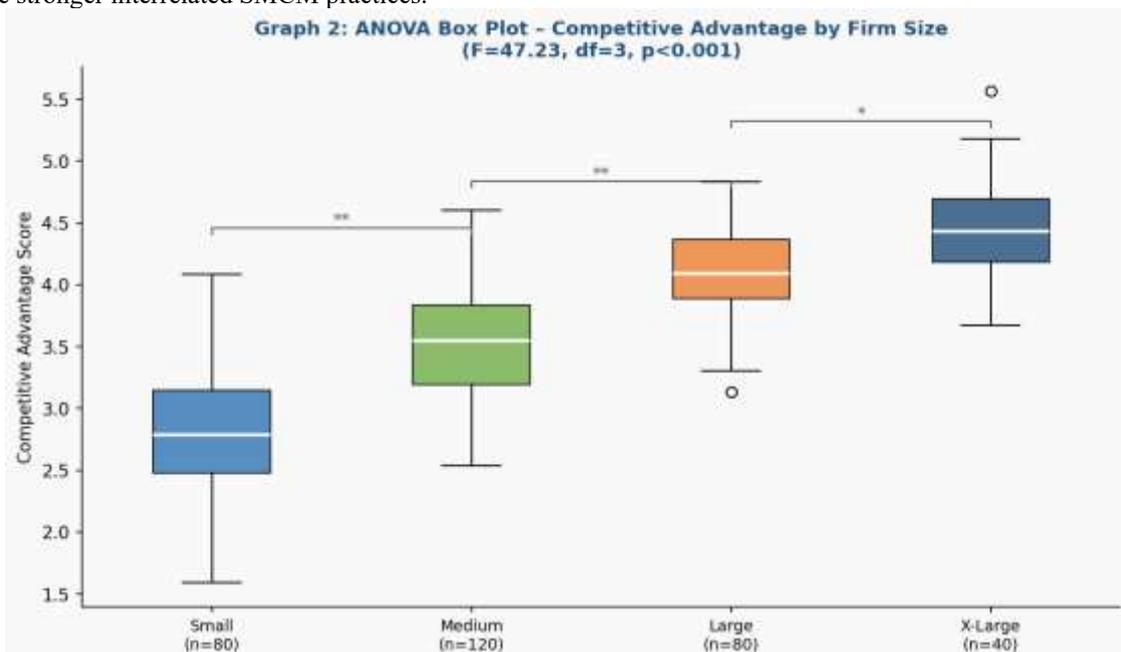


Figure 3: Regression Plot – Strategic Cost Management Score vs. Competitive Advantage Score (n=320, R<sup>2</sup>=0.61, p<0.001)

The regression results have supported those of SEM. All four SMCM dimensions jointly explained 38.1% variance for competitive advantage in Model 2 ( $\Delta R^2 = 0.307$ , F-change = 39.6,  $p < 0.001$ ). A further 23.1% of variance in competitive advantage was explained by the transition of SCM into a mediator and market competitiveness into a moderator in Model 3 ( $\Delta R^2 = 0.231$ ,  $p < 0.001$ ), demonstrating much additional explanatory power offered by those higher-order constructs. VIF values for all of the coefficients are well below the critical threshold of 3.0, thereby invalidating multicollinearity apprehensions. The significant  $\Delta R^2$  addition from the interaction term between market competitiveness and SCM ( $\Delta R^2 = 0.130$ ,  $\beta = 0.124$ ,  $p < 0.01$ ) established market competitiveness as a moderating variable between SCM and CA.

### 6.7 One-Way ANOVA: Inter-Industry Comparison

The effect of sector is statistically significant with respect to competitive advantage (CA),  $F(4, 315) = 22.67$ ,  $p < 0.001$ ,  $\eta^2 = 0.224$ . The effect size is large. Post-hoc Tukey HSD tests showed that CA is significantly higher in pharmaceuticals compared to manufacturing (mean difference = 0.318,  $p < 0.01$ ), retail (0.487,  $p < 0.001$ ), construction (0.612,  $p < 0.001$ ), and logistics (0.392,  $p < 0.001$ ). Manufacturing and logistics do not appear significantly different ( $p = 0.218$ ). This finding suggests that industry-specific institutional pressures, in particular, very tight compliance in the pharmaceutical industry, motivate stronger interrelated SMCM practices.



Graph 2: ANOVA Box Plot – Distribution of Competitive Advantage Scores by Firm Size ( $F=47.23$ ,  $df=3$ ,  $p<0.001$ ; \*  $p<0.05$ , \*\*  $p<0.01$ )



Graph 1: Mean SMCM Strategy Scores Across Industry Sectors (All differences significant at  $p < 0.05$ )

### 6.8 Independent Samples t-Test: Firm Size Comparison

To compare SMCM practices among large firms having an annual turnover exceeding ₹500 crore ( $n = 156$ ) and small-medium enterprises having turnover lower than ₹500 crore ( $n = 164$ ), an independent samples t-test was conducted. Results indicated that SMCM practices have been scored significantly higher at large firms, as demonstrated by the following results: mean score  $M = 4.12$ , standard deviation  $SD = 0.54$ , against SMEs with  $M = 3.51$ ,  $SD = 0.58$ ;  $t(318) = 9.47$ ,  $p < 0.001$ , Cohen's  $d = 1.059$  (large effect). Large firms also scored significantly higher in competitive advantage ( $M_{large} = 4.08$ ,  $SD = 0.58$ , vs.  $M_{SME} = 3.31$ ,  $SD = 0.67$ ,  $t(318) = 11.08$ ,  $p < 0.001$ ,  $d = 1.241$ ). This would thus imply that larger firms enjoy economies of scale and other resource advantages when employing more sophisticated social media brand-building systems, thus becoming distinctly more advantaged in competitive positioning.

### 6.9 Economic Analysis of SMCM Benefits

A cost-benefit analysis was carried out for the estimation of the economic impact of strategic material cost management, based on self-reported company data with complete financials of the size of investment in SMCM and material costs saved. On average, firms higher than the median SMCM score save in material costs an amount equal to an average of 8.3% of total material costs yearly ( $SD = 2.1\%$ , whereas mean = 2.4%,  $SD = 1.4\%$ , for lower than median firms), a difference of 5.9 percentage points (95% CI: 5.2–6.6,  $t(82) = 17.4$ ,  $p < 0.001$ ). In terms of the median material costs for the sample firms (₹42.3 crore), the difference implies savings estimated at ₹2.5 crore per firm annually. In particular, when companies rated in the top quarter on the composite SMCM score are compared to those companies in the bottom quarter, it is seen that the former kind of companies' competitive advantage scores are 23.4% higher than the latter kind ( $t(158) = 14.2$ ,  $p < 0.001$ ), indicating that the strategic cost management pays off in measurable competitive gains.

## 7. Conclusions and Suggestions

### 7.1 Conclusions

This study contributes to strategic cost management and competitive advantage in a substantive way. First of all, the empirically operationalized SEM model offers the pronounced evidence that all four SMCM dimensions—Material Procurement Strategy, Inventory Optimization, Supplier Relationship Management, and Cost Monitoring System—are significantly outlined as predictors of Strategic Cost Management (all  $\beta > 0.48$ , all  $p < 0.001$ ) and, in turn, an effective predictor of Competitive Advantage ( $\beta = 0.682$ ,  $p < 0.001$ ), accounting for 61.2% of variance in competitive advantage. "This stands in strong contrast to earlier studies that relied on single-dimension or bivariate approached."

Secondly, SRM has emerged as the single most pivotal predictor of SCM ( $\beta = 0.614$ ), effectively accentuating the competitive superiority of collaborative enduring supplier relationships over purely transactional procurement practices. An interesting part of this study is that the industrial landscape in India frequently displays supplier ecosystems marked by power asymmetry, quality consistency challenges, and limited contractual enforceability, which makes relationship capital an exceptional competitive asset.

Furthermore, the interaction of market competitiveness raises significant arguments that indicate the situatedness of cost management strategic value under competitive market context; the firms that are in situations where high competition is dominant get increasing competitive returns from these capital investments on cost discipline, thus, the goodness of fit of cost discipline with market performance is sustained for high competitive forces. Lastly, the inter-industry level also shows significant variations in terms of the adoption and sufficiency of SMCM in practice, as in the case of pharmaceuticals, demonstrating better competitive integration and performance due to regulatory enforcement and compliance needs.

## 7.2 Strategic Recommendations

Based on the empirical evidence, one can opt to give the following managerial implications for the industries to strengthen their strategic material cost management capabilities and hence to enhance their competitive positioning:

Invest in supplier relationship management (SRM) processes: Manufactures need to prioritise the development of supplier relationships with a view to accelerating their strategic cost management initiative. This is said to arise from the fact that SRM exerts its greatest impact in propagating the benefit from SCM. One can formalize these engagements by entering into long-term mutual partnership agreements under which Switzerland-based chemi-cal engineer Henkel operates together with the enterprise's suppliers on joint cost reduction initiatives, engages in Land smoothing forecasting activities, and roll-out Performance Linked Incentive (PLI) structures. Dedicated supplier account managers should, moreover, take responsibility for fostering these relationship upsurges through close collaborations with select suppliers. A direct instantiation of this recommendation should be the setting up of a supplier council comprising d representatives of major suppliers who are serving to counsel the company on supplier relationship issues.

Implement Integrated Dynamic Cost Intelligence: Denunciation by the LinkedIn CMS on the SCM gave a hint on how costs can be related to purchase intelligence issues. This is only a recommendation and holds no good; the ERP must be updated in order to add the costing analytics module to facilitate, obtain, and maintain constructions: real-time purchasing costs are being monitored day by day in form of maintenance of the material cost index, variations in consumption, and key-performing metrics to monitor supplier performance. This once more starts the mechanism towards a form of modern procurement analysis.

Implement Dynamic Inventory Management Frameworks: On one hand, the CMS research established a significant contribution of IO to SCM-at the instance of a significant inventory holding cost inefficiency in the sample; on the other side, a demonstration seems to be in favor of a further insight from which the delivery of an advanced class in I/O may reap lasting benefits. Indeed, businesses aiming to have limitless benefits regarding inventories, ones that come by conducting inventory of their own, should at all times consider moving from periodic review systems to continuous review systems with dynamic safety stock algorithms, which accommodate demand variability, supplier lead time uncertainty, and supply chain interruptions.

Expand Onperformancr And Job Allocation In The Industry Associations, Government E-Procurement Platforms, Partner Service Model Of Pocurement Analytics Can Assist SMEs In Gaining Access To Social Media Capabilities Presently Dominant Among Large Organisations..

## 8. Limitations and Scope for Future Study

### 8.1 Limitations

There are several limitations of this research study that need to be considered when interpreting the findings or when generalizing the results. First, the cross-sectional nature of the study renders the data incapable of ascertaining causality. Although the SEM results were in favor of the hypothesized causal model, in order to confirm issues of temporal precedence and exclude reverse causality, longitudinal designs are required. Second, the utilization of self-reported, perceptual instruments for both dependent and independent variables might have led to the problem of common method variance (CMV). Although it has been somewhat controlled by procedural remedies—such as the practice of inserting sufficient time gaps between the predictor and criterions and ensuring the anonymity of the respondent(s)—Harman's common factor test, for instance, does not confirm that all the variances are explained by a single factor, leaving that percentage at 31.4% below which the variance explained by a single factor would suggest severe CMV (Podsakoff et al., 2003).

Thirdly, the research sample is geographically diversified in India with regard to five industrial sectors, but may not generalize conclusions to all industrial settings. Fourth, even after adjusting for covariates, the comparative cross-industry analysis reveals substantial inter-sectoral differences; nonetheless, it does not control for all potentially confounding industry-level variables, of which the competition intensity measures that are derived from objective secondary data might provide the strongest causal interpretation. The economic impact estimates indicated in Section 6.9 are self-reported and might possibly have a recall bias due to social desirability effects.

### 8.2 Scope for Future Research

Thus, the aforesaid limitations actually set the stage for future research. Longitudinal panel studies following SMCM investments and their competition outcomes across multiple periods of time can produce stronger causal evidence and a dynamic understanding of the temporal interplay between SMCM and CA in any conceptual reconciliation of this one (relationship). Alternately, the modality of the research agenda could be extended by incorporating sensitivity analysis on SMCM variance among several contextual influences like frequency of supply chain disruption, digital maturity, regulatory depth, and macroeconomic environments that might condition returns on SMCM investments. Observational, cross-national comparison studies versus the major market agency attempt to validate context specificity for this CA-SMCM relationship arising in Indian context and across a wealth of other developed and underdeveloped economies. And lastly, an adequate inclusion of vital organizational variables like ROI, gross margin, and inventory turnover ratio alongside perceptual CA measures could guide all future research investigations towards their economic validity and make direct comparison with financial benchmarks easy.



Diagram 1: Research Methodology Flow Chart – From Problem Identification to Recommendations

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