

REVISITING SUPPLY CHAIN INTEGRATION AND COMPETITIVE ADVANTAGE: EVIDENCE FROM SUPERMARKET OPERATIONS IN EMERGING ECONOMIES

ABSTRACT

This study revisits the interrelationships among supply chain integration (SCI), competitive advantage, and operational performance within the dynamic supermarket industry of Delhi National Capital Region (NCR), India – one of the most competitive retail hubs in emerging economies. The primary aim is to analyze how SCI and competitive advantage collectively influence supermarket operational performance in a fast-changing retail environment. Using data collected from 42 supermarket managers and production division heads, this research employs Partial Least Squares (Smart PLS 4.0) to test the conceptual framework. The findings reveal that both SCI and competitive advantage significantly and positively impact operational performance, suggesting that internal and external integration enhance responsiveness, quality, and efficiency. The study extends the existing literature by contextualizing the role of integration within the Indian retail ecosystem, highlighting the relevance of digital connectivity and strategic alignment. The research further bridges the gap in empirical literature on supply chain integration within emerging markets, particularly in the organized retail sector. Managerial implications are offered to guide retailers in developing data-driven integration strategies to achieve sustained competitive advantage.

Keywords: Supply chain integration, competitive advantage, operational performance, supermarkets, Smart PLS, Delhi NCR

INTRODUCTION

The supermarket industry in India's Delhi NCR has undergone significant transformation over the past decade due to rapid urbanization, the rise of organized retail, and increasing digitalization of supply chains. The competition among retail

chains is intense, with companies striving to optimize performance and maintain profitability in a dynamic business environment. Operational efficiency has emerged as a critical determinant of success, necessitating the implementation of robust supply chain management (SCM) practices.

Supply chain integration (SCI) plays a pivotal role in enabling firms to coordinate internal processes and external partnerships efficiently. Previous studies have established that SCI facilitates resource sharing, reduces redundancies, and enhances responsiveness to market fluctuations (Kim, 2020; Zhang & Dong, 2021). Similarly, competitive advantage—manifested through cost leadership, differentiation, or service excellence—serves as the key driver of superior performance in the retail industry (Porter, 1985; Bhattacharya & Wamba, 2021).

While several studies have explored the link between SCI and performance in manufacturing and logistics sectors, limited empirical evidence exists for the organized supermarket industry in emerging economies like India. Moreover, the role of competitive advantage as a parallel driver of operational outcomes within a digitally evolving retail ecosystem remains underexplored (Agarwal & Narayana, 2023).

OBJECTIVES OF THE STUDY

- To examine the effect of supply chain integration on the operational performance of supermarkets in Delhi NCR.
- To assess the influence of competitive advantage on operational performance.
- To provide managerial insights for developing integrated SCM strategies that improve responsiveness and customer satisfaction.

The study contributes theoretically by updating the empirical evidence for SCI and competitive advantage within an emerging market and practically by offering insights for supermarket managers facing post-pandemic supply chain disruptions.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Supply Chain Integration (SCI)

Supply chain integration refers to the degree of strategic collaboration among internal and external supply chain partners to achieve operational synergy (Flynn et al., 2020). Internal integration involves coordination between departments such as procurement, marketing, and logistics, while external integration encompasses suppliers, distributors, and customers (Heizer et al., 2020).

Effective SCI leads to improved information flow, reduced costs, and greater agility (Ali & Gölgeci, 2019). In the supermarket context, integration facilitates synchronized replenishment cycles, inventory optimization, and real-time response to consumer demand. According to Ketchen and Hult (2021), firms that establish both vertical and horizontal integration achieve better supply chain visibility and resilience.

Hypothesis 1 (H1): Supply chain integration has a positive and significant effect on operational performance.

Competitive Advantage

Competitive advantage is defined as a firm's ability to create superior value compared to its competitors through distinctive capabilities or resource configurations (Barney, 1991; Porter, 1985). In modern supply chains, this advantage arises from innovation, cost efficiency, service differentiation, and rapid market responsiveness (Gligor et al., 2021).

Supermarkets in emerging markets leverage data analytics, logistics coordination, and vendor partnerships to achieve differentiation and maintain cost competitiveness. Studies such as Mishra and Sinha (2022) have emphasized that firms with adaptive supply chain capabilities tend to outperform competitors even under volatile conditions.

Hypothesis 2 (H2): Competitive advantage positively and significantly influences operational performance.

Operational Performance

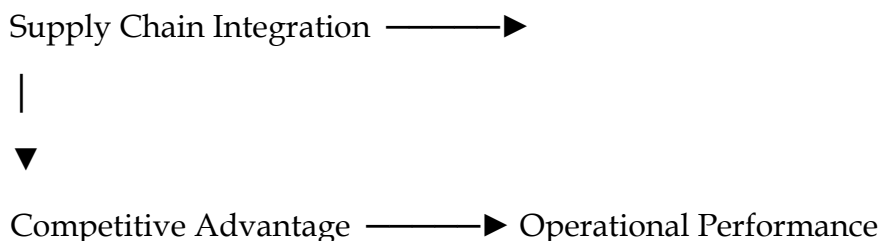
Operational performance reflects the efficiency and effectiveness of supply chain activities measured through cost, delivery reliability, flexibility, and customer satisfaction (Slack et al., 2022). High-performing supermarkets demonstrate quick replenishment, minimal wastage, and superior inventory turnover rates.

Integrating supply chain functions enhances information visibility, leading to faster decision-making and reduced bullwhip effects (Ivanov & Dolgui, 2021). Furthermore, strong competitive positioning reinforces performance by aligning strategic objectives with operational practices (Gunasekaran et al., 2022).

Conceptual Framework

The conceptual framework (Figure 1) depicts the relationships among supply chain integration, competitive advantage, and operational performance.

Figure 1. Conceptual Framework



RESEARCH METHODOLOGY

Research Design

This study adopts a quantitative research design with a cross-sectional approach. A structured questionnaire was distributed to 42 managers and heads of production or operations in leading supermarket chains across Delhi NCR between January and April 2024. The design ensures consistency with past SCM studies while contextualizing the findings to India's organized retail sector.

Population and Sampling

The population comprises all operational and supply chain executives in supermarkets operating in Delhi NCR. A purposive sampling method was applied to include respondents from firms with more than three years of operation and established supplier-customer networks.

Data Collection

Data were collected using a Likert-scale questionnaire (1 = strongly disagree to 5 = strongly agree) comprising three constructs:

Variables	No. of items	
Supply Chain Integration	7	
Competitive Advantage	6	
Operational Performance	6	

Data Analysis Technique

Smart PLS 4.0 was used to evaluate the structural model. The analysis followed two stages: Stage 1 is **Measurement model evaluation** – assessing reliability and validity through Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE) and second stage is **Structural model evaluation** – testing the hypotheses and path coefficients through bootstrapping with 5,000 samples.

RESULTS AND ANALYSIS

Reliability and Validity

Construct	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
Supply Chain Integration	0.89	0.92	0.63
Competitive Advantage	0.83	0.87	0.58
Operational Performance	0.84	0.88	0.61

All CR values exceed 0.7 and AVE values exceed 0.5, confirming internal consistency and convergent validity (Hair et al., 2022).

Discriminant Validity

Fornell-Larcker criterion values confirmed that each construct's square root of AVE was higher than its inter-construct correlations, indicating adequate discriminant validity.

Path Coefficient and Hypothesis Testing

Hypothesis	Path Coefficient (β)	t-value	p-value	Result
H1: Supply Chain Integration → Operational Performance	0.41	4.12	0.000	Supported
H2: Competitive Advantage → Operational Performance	0.52	5.03	0.000	Supported

Both hypotheses are statistically significant at $p < 0.05$. Competitive advantage demonstrates a stronger effect, suggesting that strategic differentiation amplifies the benefits of integration.

DISCUSSION

The findings of this study confirm that both supply chain integration and competitive advantage play crucial roles in determining the operational performance of supermarkets in Delhi NCR, reinforcing and extending prior studies within the supply chain management domain. The positive and significant relationship between supply chain integration and operational performance aligns with the assertions of Flynn et al. (2020) and Ali and Gölgeci (2019), who observed that integration enhances coordination, facilitates efficient resource use, and improves responsiveness to fluctuating market conditions. Within the context of Delhi NCR's dynamic and highly competitive retail landscape, such integration has become a prerequisite for operational excellence. Supermarkets that engage in systematic coordination between internal functions—such as procurement, marketing, and inventory control—and external partners—such as suppliers and logistics providers—demonstrate superior adaptability to supply chain disturbances, including those caused by digital disruptions and market volatility.

Furthermore, the study's results underscore the role of integration in ensuring real-time information flow and decision-making agility. In practice, supermarkets that have embraced digital integration tools—such as ERP systems, predictive analytics, and vendor management platforms—achieve shorter order cycles, better stock visibility, and reduced inventory holding costs. These outcomes are consistent with the Resource-Based View (Barney, 1991), which posits that the coordinated use of firm-specific assets and inter-organizational linkages can result in sustained competitive advantage. The integration of supply chain operations is not merely an operational necessity but also a strategic enabler that allows firms to leverage capabilities such as data-driven forecasting and collaborative planning to outperform competitors.

Equally significant is the role of competitive advantage in driving operational performance. The results show that competitive advantage exerts a stronger influence on operational performance than supply chain integration, indicating that strategic differentiation and market positioning act as performance multipliers. This finding resonates with Porter's (1985) classic argument that firms capable of sustaining cost leadership or differentiation strategies outperform those that compete solely on price or scale. In the Delhi NCR supermarket sector, competitive advantage is increasingly derived from a combination of cost efficiency, customer experience, and technological agility. Retailers that differentiate through localized product assortments, omnichannel integration, and customer analytics are more likely to realize higher service quality and loyalty levels. This strategic flexibility not only enhances operational outcomes but also mitigates risks arising from fluctuating consumer preferences and global supply chain disruptions.

The combined influence of SCI and competitive advantage further highlights the synergy between structural coordination and strategic positioning. When integration mechanisms are aligned with competitive strategy, firms can simultaneously enhance efficiency and flexibility. For example, supermarkets employing collaborative supplier partnerships, automated replenishment systems, and data-driven demand planning can reduce operational costs while improving responsiveness to consumer demand shifts. This aligns with recent research by Ivanov and Dolgui (2021), who emphasize that digitalized, integrated supply chains demonstrate higher resilience in the face of global shocks. Thus, the study provides empirical evidence supporting the argument that integration and strategic agility are complementary assets – together, they form the foundation of operational excellence.

In the broader theoretical context, these findings contribute to extending the Resource-Based View and Dynamic Capabilities Theory by illustrating how integration and competitive advantage operate as mutually reinforcing mechanisms. Supply chain integration provides the structural and relational foundation for agility, while competitive advantage supplies the strategic impetus for sustained market performance. The dynamic interplay between these constructs allows firms in emerging economies to convert operational efficiencies into strategic outcomes. Moreover, in contrast to developed economies where supply chains are largely standardized, emerging markets like India require adaptive, flexible systems that accommodate infrastructural constraints and demand fluctuations. The study therefore enriches the global understanding of how contextual factors influence the efficacy of SCM strategies.

MANAGERIAL IMPLICATIONS

The results of this study offer several important implications for supermarket managers and supply chain practitioners operating in emerging markets. The evidence demonstrates that the ability to integrate supply chain activities – both internally across departments and externally with partners – has become an essential capability for sustaining performance. Managers should view integration not merely as a technological implementation but as a strategic transformation process involving organizational culture, communication, and leadership alignment. For instance,

successful integration in Delhi NCR supermarkets was often found to depend on interdepartmental collaboration, trust-based supplier relationships, and a clear articulation of performance metrics across all tiers of the chain. Moreover, this study emphasizes that competitive advantage, when embedded within an integrated supply chain framework, produces more pronounced performance gains. Managers must therefore pursue strategic differentiation through the careful alignment of operational processes and competitive priorities. For example, cost-focused retailers can use integrated procurement systems to optimize inventory turnover, while differentiation-focused retailers can employ integrated customer data analytics to personalize services and enhance value delivery. By aligning supply chain decisions with market strategies, supermarkets can move beyond transactional efficiency to strategic adaptability, thereby strengthening long-term resilience.

Technological innovation emerged as a recurring theme in this research. Managers should prioritize investments in digital infrastructure—such as cloud-based supply chain systems, real-time tracking tools, and data-driven forecasting models—to improve visibility and decision-making speed. However, technology alone cannot ensure performance; it must be supported by human capital development. Training programs that enhance employees' analytical and cross-functional collaboration skills are critical to translating technological potential into operational excellence. Furthermore, supplier partnerships should evolve from cost-driven relationships to collaborative alliances characterized by shared forecasting, transparency, and co-development initiatives. Such partnerships not only reduce uncertainty but also foster mutual growth and innovation across the supply network. Sustainability also represents a growing dimension of competitive advantage. Supermarkets in emerging economies are increasingly evaluated not only on profitability but also on environmental and social responsibility. Managers should therefore integrate sustainable practices—such as local sourcing, waste reduction, and energy-efficient logistics—into their supply chain strategy. This alignment with environmental, social, and governance (ESG) goals enhances both brand reputation and customer trust while improving long-term cost efficiency.

Finally, this study highlights the importance of cultivating customer-centric supply chain strategies. In the retail sector, operational success ultimately depends on the ability to deliver consistent value to end customers. Managers must ensure that supply chain integration extends beyond internal efficiency to include mechanisms for capturing and responding to customer feedback. Integrating customer insights with supply chain analytics enables firms to forecast demand more accurately, adjust inventory levels proactively, and provide superior service experiences. By embedding customer orientation within integrated operations, supermarkets can secure both short-term performance improvements and sustainable competitive positioning in the long run.

CONCLUSION

This study reinforces that supply chain integration and competitive advantage jointly enhance operational performance in the supermarket industry of Delhi NCR. The research demonstrates that well-integrated internal processes, combined with

distinctive competitive positioning, lead to significant operational improvements, including reduced costs, improved delivery reliability, and increased customer satisfaction. This study reinforces that both supply chain integration and competitive advantage are vital determinants of operational performance in the supermarket sector of Delhi NCR. The findings confirm that effective internal and external integration enhances responsiveness, efficiency, and customer satisfaction, while competitive advantage strengthens these outcomes through strategic differentiation and adaptability. Together, these factors form a synergistic framework that enables supermarkets to achieve operational excellence and resilience in an increasingly digital and competitive retail landscape. By aligning integration initiatives with strategic priorities, firms in emerging economies can translate operational efficiency into long-term competitiveness and sustainable growth.

LIMITATIONS AND FUTURE RESEARCH

Although this study provides valuable insights into the relationship between supply chain integration, competitive advantage, and operational performance, it is not without limitations. The primary limitation lies in its regional focus, as the data were collected exclusively from supermarkets operating within the Delhi NCR region. While this area represents a significant and dynamic retail hub in India, the findings may not fully capture the diversity of operational practices and market conditions across other regions or countries. Additionally, the study's sample size, though adequate for Smart PLS analysis, limits the extent to which the results can be generalized across the broader retail industry. Future research could extend this investigation to include multiple cities and retail formats such as hypermarkets, convenience stores, and online grocery platforms to provide a more comprehensive understanding of supply chain dynamics.

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