

**DETERMINANTS OF SUPPLY CHAIN RISK
MANAGEMENT EFFECTIVENESS IN
PAKISTAN'S RETAIL SECTOR: THE
MODERATING ROLE OF ORGANIZATIONAL
CULTURE**

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EFFECTIVENESS IN PAKISTAN'S RETAIL SECTOR: THE
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SHAHID AZIZ

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ABSTRACT

This study explores the determinants that shape the effectiveness of supply chain risk management (SCRM) within Pakistan's retail industry. In light of the growing uncertainty and complexity of global business operations, robust SCRM practices have become essential for strengthening organizational resilience and maintaining a sustainable competitive edge. Quantitative data were collected through structured questionnaires administered to 328 supply chain professionals working in major retail firms across Pakistan, while qualitative insights were gathered via semi-structured interviews with senior management personnel. Regression analysis, factor analysis, and moderated regression techniques were applied to the quantitative data, while thematic analysis was used to interpret qualitative findings. Findings reveal that top management commitment, information sharing, technological integration, supplier collaboration, and risk assessment capabilities are significant drivers of effective SCRM implementation. Conversely, the study highlights regulatory constraints, inadequate technological adoption, and infrastructural limitations as major obstacles to achieving optimal SCRM performance. By offering a context-specific understanding of SCRM within an emerging economy, this research enhances both theoretical and practical knowledge in the field. The results provide actionable insights for policy-makers, practitioners, and academics seeking to strengthen supply chain resilience through strategic, collaborative, and technology-enabled risk management frameworks.

Keywords: Supply chain risk management, retail business, Pakistan.

APPROVAL

This is to certify that this thesis conforms to acceptable standards of scholarly presentation and is fully adequate, in quality and scope, for the fulfilment of the requirements for the Degree of Doctor of Philosophy.

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DECLARATION

I hereby declare that the thesis submitted in fulfilment of the requirements for the Degree of Doctor of Philosophy is my own work and that all contributions from any other persons or sources are properly and duly cited. I further declare that the material has not been submitted either in whole or in part, for a degree at this or any other university. In making this declaration, I understand and acknowledge any breaches in this declaration constitute academic misconduct, which may result in my expulsion from the programme and/or exclusion from the award of the degree.

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LIST OF ABBREVIATION

AI	Artificial Intelligence
AMOS	Analysis of Moment Structures
API	Application Programming Interface
APICS	Association for Supply Chain Management
AVE	Average Variance Extracted
CAGR	Compound Annual Growth Rate
CFA	Confirmatory Factor Analysis
CI	Competitive Intelligence
CRM	Customer Relationship Management
CSCP	Certified Supply Chain Professional
DCT	Dynamic Capability Theory
DV	Dependent Variable
EDI	Electronic Data Interchange
ERP	Enterprise Resource Planning
FBR	Federal Board of Revenue
GDP	Gross Domestic Product
HTMT	Heterotrait-Monotrait Ratio
ICT	Information and Communication Technology
ISO	International Organization for Standardization

IT	Information Technology
MCAR	Missing Completely at Random
MIS	Management Information System
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
PLS	Partial Least Squares
RBV	Resource-Based View
RFID	Radio Frequency Identification
RMSEA	Root Mean Square Error of Approximation
SBP	State Bank of Pakistan
SCM	Supply Chain Management
SCOR	Supply Chain Operations Reference
SCRM	Supply Chain Risk Management
SEM	Structural Equation Modeling
SME	Small and Medium Enterprises
SPSS	Statistical Package for the Social Sciences
SRM	Supplier Relationship Management
SRMR	Standardized Root Mean Square Residual
TCE	Transaction Cost Economics
TLI	Tucker–Lewis Index

VIF	Variance Inflation Factor
WMS	Warehouse Management System

CHAPTER 1

INTRODUCTION

1.0 Introduction

The implementation of an effective Supply Chain is essential for achieving a competitive advantage and optimizing overall value through the effective allocation of resources in modern commercial organizations, where Supply Chain management plays a crucial role. Suppliers, manufacturers, distributors, retailers, and customers are all parts of the fundamental Supply Chain. The Supply Chain is the entire procedure of converting raw materials into finished goods and distributing those goods to the final consumer (Sukati et al., 2020). For smooth operations, it is essential for all Supply Chain partners to integrate. Qryméleh and Tarafdar (2015) state that the use of cutting-edge technological solutions is required in order to achieve effective Supply Chain integration.

These and many other changes in the processes of Supply Chain are brought about by technology advancements and the effects of recent international occurrences such as geo-political tensions and disruption to trade. These events have affected retail businesses a great deal not only in the way goods are bought but also their delivery to the end users (Madhani, 2021). Improving Supply Chain practices is becoming a necessity for businesses to gain a competitive advantage and thus remain solvent in the market as the retail industry becomes more saturated (Afshan & Motwani, 2021).

As observed by Soares et al. (2017), the customer-centric approach is gaining traction amidst retailers on one hand due to its ability to improve financial results and on the other hand contributes to customer retention. Nevertheless, retailers have encountered severe challenges posed by inventory shortages and improper movement

because of some circumstances experienced globally in the recent past like the conflict between Russia and Ukraine and trade wars.

They have led to the disruption of global Supply Chains, which has had far reaching impact on global economic activity. The imposition of sanctions by many countries, closure of trade routes, logistics challenges have all led to slowdown in the customs clearance processes and also international trade. Due to this, there have been major shocks in both the local and the global Supply Chains (Hedwall, 2022). Lochan, et al. (2021) assert that retailers have come to the realization that implementing Supply Chain Risk Management strategies is very vital because they will help retailers to effectively address the challenges and risks caused by these disruptions.

The risk lies in the fact that it is always hard to tell what will be experienced when all the facts are pointing to a certain direction. The uncertainty, which continuously arises and forms risks, is a recurring challenge despite the fact that cutting edge software and methods of analysis are used. The retailers are exposed to various risks that are related to logistics, environmental, financial, regulatory, and legal risks among others (Lochan et al., 2021). Considering the significance of developing strong integration among partners in the supply chain, the objective of the study is to understand how digital supply chain, system integration, and knowledge and skills of the employee's impact risk management in supply chain in the case of retail sector of Pakistan, and also check the moderating influence of organizational culture.

1.1 Background of the Study

The weaknesses and challenges that face the management and standardization of Supply Chains and especially those in the retail industry have been brought home with recent dynamics in the world. The insufficiency of an organizational frameworks has often hindered stakeholder teamwork leading to an inventory imbalance, slow-downs

and breakdowns. To a retailer, the need to satisfy the expectations of customers and achieve or sustain competitive advantage would require efficient Supply Chain operations. Nevertheless, Supply Chains remain vulnerable to unexpected events and can be affected by geopolitical tensions, natural and climatic disasters, fluctuations in the economy on local and international levels, which can present challenges to the delivery of goods and services (Jones, Smith & Kumar, 2022; Patel & Wang, 2021).

Supply Chain Risk Management (SCRM) is an underrated practice in retailing industry in Pakistan to overcome regional risks namely political instability and natural disasters (Mumtaz et al., 2019; Khan & Qian, 2019). Making sure that the Supply Chain is well managed is instrumental to managing the inventory, customer satisfaction, cost reduction, and managing demand highs stages according to Shahbaz et al. (2018) and Rahman et al. (2017). The Russia-Ukraine conflict and trade wars were recent global events that have highlighted the need to have robust SCRM practices. As Abid, 2020; Patel and Gupta, 2023, argue these processes can help mitigate risks related to the reliability of suppliers as well as exogenous shocks, meaning that a more resilient Supply Chain will be achieved.

Online shopping is altering the retail environment in Pakistan and retailers are even at risk of disruption because of these supply chain risks. The evolution to digital platforms has created imperatives related to the improved technologies, stronger partnerships, skilled workforces and flexible organizational cultures. Some obstacles to technology adoption include lack of finance and insufficient IT expertise and among the supply chain partners exist communication and cultural barriers to co-operation. Meanwhile, the large percentage of employee turnover and the inability to form ample training programs impedes the formulation of essential proficiencies related to risk identification and mitigation. All these drawbacks make retailers susceptible to shocks

and place emphasis on digital preparedness, system integration, and human capital. The best way to fill these gaps is to develop organizational culture to promote innovation, coordination, and responsiveness towards the customers. This is directly related to the current study which refers to the role that digital supply chains, system integration, employee knowledge and skills, and organizational culture play with respect to risk management in the retail industry of Pakistan.

Retailers should invest resources in the training of personnel, solicit government assistance with the adoption of technology as well as promoting effective communication and building of robust networks within the industry to effectively eliminate these obstacles. Successfully bringing in practice Supply Chain Risk Management (SCRM) practices, disruptions in the supply chain can be minimized, performance can be enhanced, and long-term success within the competitive retail sector can be guaranteed (Prakash et al., 2020). Ghani (2005) and Khan et al. (2014) report that the retail trade has expanded impressively in Pakistan and a robust and well-structured Supply Chain should be developed to ensure that the customer needs and demands were met comprehensively.

To sum up, the retail industry in Pakistan has to address all sorts of provisions issues associated with the disruption management, inventory, customer satisfaction, cost-efficiency, and demand fluctuation. Managing the risks posing the threat to effective supply chain performance will entail its systematic identification and mitigation with the help of proactive approaches (Christopher, 2016; Delic and Eysers, 2020). On the part of Pakistani retailers, this translates into a need to focus on system integration, enhance skills and knowledge of its employees, and develop a positive organizational culture. Also, improving communication, establishing strategic alliance, and investing in Digital technologies are key in developing resilience

(Euromonitor International, 2023; Khan & Yu, 2022). SCRM practices will enhance the performance, stability and long-term growth in a highly competitive retail environment.

1.1.1 Retail Sector in Pakistan

Table 1.1 illustrates the growth trajectory of Pakistan's retail sector between 2020 and 2024. Since its decrease in 2020 caused by disruptions in the global settings, retail sales started growing rapidly, and the trend is expected to continue positively at least until 2024. The CAGR is positive, which implies continued growth prospects of retailers (Euromonitor International, 2023). Excessive growth leads, however, to even greater strains on the supply chain since retailers not only have to discharge high sales volumes, but also cover complicated logistic conditions, and satisfy enhanced customer demands. The increase in the volume of sales is coupled by the increase in risk involved in inventory management, distribution as well as service quality. The need to have an effective SCRM, especially in their digital adoption, system integration, workforce readiness, of course, comes into question to make sure the growth reflects into sustainable competitiveness and resiliency within the retail business.

The retail business in Pakistan has undergone a radical change during the last ten years and is currently one of the fastest growing and most dynamic industries in the country that has been driven by both population increase and urbanization, improved connectivity, and a changing consumer behaviour as evidenced by industry and market analyses (Euromonitor International, 2023; MeitisGlobal, 2022; State Bank of Pakistan, 2022). Incorporating about 18 per cent of the national gross domestic product and providing a significant percentage of the working population, retail forms the cornerstone of the Pakistani economic system, and plays an influential role in

determining the habits of consumption, promoting commercial innovation, and jump starting entrepreneurship. The industry is distinguished by a nonhomogeneous combination of the traditional brick-and-mortar stores, small family-owned businesses, wholesale businesses, and the growing modern retail segment that involves the supermarkets, hypermarkets, shopping centers, specialty stores or boutiques, and e-commerce. The trend of growth that is experienced in 2020 to 2024 shows the resiliency of the sector and its vulnerability to external shocks. It is worth noting that following a contraction in 2020, which can be ascribed to the disruption of global supply chains and the impact of the pandemic along with the resulting lockdowns and general instability in the economy, the sector is still recovering, with a positive compound annual growth rate recorded since 2021 and rising sales volumes and a more pronounced transition to digital channels and structured forms of retailing. But this growth has also been accompanied by the escalation of strains on the supply-chain systems that already face structural weaknesses, including the reliance on imported products, the lack of logistics infrastructure coherence, the disaggregated vendor base, and the existence of bureaucratic regulatory processes. Global geopolitics and the Russia-Ukraine conflict, oil fluctuations, regional security issues, and trade barriers are increasingly shaping the retail environment in Pakistan, contributing to the creation of the procurement delays, high transportation expenses, inflation, and unstable inventory cycles. The high reliance of the retailers on global sourcing has exposed them to uncertainties in the lead times, port congestions, and also currency fluctuations hence making supply-chain risk management an urgent strategic issue. With the continued rise of consumer demands through global retailing influence, increased digitalization, and heightened expectations of convenience, speed, and product differentiation, businesses are under increasing pressure to be updated through

technology integration, better forecasting, effective warehousing and more control across the supply-chain. Rapid development of e-commerce which has been aggravated by the COVID-19 pandemic has re-invented retail operations in Pakistan, creating new dilemmas related to order fulfillment, last-mile delivery, inventory balancing, and cybersecurity threat. Despite the fact that digital transformation has enabled access to customers who are situated geographically far apart, most of the retailers are faced with poor IT infrastructure, inaccessibility to technology upgrades funding, and low rates of technical skills among the staff. The fact that SMEs represent the majority of the Pakistan retail landscape has complicated this transition yet other factors that make this transition harder are that SMEs often lack standardized processes, integrated systems or formal risk-mitigation mechanisms. Also, the implementation of new tools, such as ERP systems, RFID-based tracking, real-time analytics, blockchain-based transparency, and artificial intelligence-driven demand forecasting are now seen as a necessity in improving the sustainability of competitiveness and resilience because of cultural barriers, resistance to change, and limited organizational learning abilities. The workforce context remains a constant threat to the industry; high turnover, the lack of training opportunities, and the illiteracy of the digital platforms drain the operational effectiveness and reduce the ability of retailers to control the disruptions before their impact. In this context, the organizational culture gains an increased importance. Retail companies that are able to develop collaborative culture, adaptive culture, and innovation oriented culture are more likely to implement modern supply-chain systems, encourage employees to engage in risk identification as well as encourage cross-functional coordination during disruptions. On the other hand, cultures that are rigid and hierarchical suppress the sharing of information and the process of decision making and hence make