



# STUDY ON OPERATION RISK MANAGEMENT WITH REFERENCE TO TEXTILE INDUSTRIES

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*Abstract:* The textile industry is a vital component of the global manufacturing sector, playing a pivotal role in the production of various textile products, including clothing, home furnishings, and technical textiles. This industry operates in a dynamic and complex environment, facing numerous challenges and risks that can impact its operations, reputation, and financial performance. Operational risk management is a critical aspect of ensuring the sustainability and resilience of textile companies.

## INTRODUCTION

For Operational risk refers to the risk of loss resulting from inadequate or failed internal processes, systems, people, or external events. In the context of the textile industry, operational risks can manifest in various ways:

- 1. SUPPLY CHAIN DISRUPTIONS:** The industry relies on global supply chains, making it vulnerable to disruptions due to factors like natural disasters, political instability, or transportation issues.
- 2. QUALITY CONTROL:** Ensuring consistent product quality is essential. Any lapses in quality control can lead to defects, recalls, and damage to brand reputation.
- 3. ENVIRONMENTAL COMPLIANCE:** Textile manufacturing has significant environmental impacts. Failure to comply with environmental regulations can result in fines and reputation damage.
- 4. LABOR ISSUES:** Labor disputes, safety violations, or workforce shortages can disrupt operations and harm a company's image.
- 5. TECHNOLOGICAL CHALLENGES:** As technology evolves, textile companies need to adapt. Cyberattacks, system failures, or inadequate IT infrastructure can pose operational risks.
- 6. MARKET VOLATILITY:** Fluctuations in raw material prices, currency exchange rates, and consumer demand can affect profitability.

## Literature Review:

The study of SCRM emerged after the 1990s and increased rapidly after 2000. SCs are largely exposed to very similar risks: according to, among others, 34% of SC interruptions result from processes within the company itself, 15% from suppliers, 13% from customers, 4% from nature, 4% from governments, and 6% from the chain relationships. There are a variety of risks that may cause interruptions in SC operations. For a disaster relief SC, Peng et al. use the SD model by simulating interrupted road and communication networks damaged by an earthquake. SCRs can be categorized into three types: internal, chain, and external. Internal risks result from in-house operations or from the operations themselves (c.f.). These include accidents, machine and equipment (M&E) breakdown, the failure of information technology system, human error,

quality, and errors in management decisions such as the determination of the lot size, secure stock levels, financial problems, and delivery plans. Chain risks are those outside the institution but inside the SC. These result from insufficient coordination and the lack of information exchange between SC actors. Safety, the suitability of the material, time of supply, delivery problems, strike, lock-out, etc., are supplier-related risks, whereas issues related to variable demand, payments, and order processing are customer-related risks. External risks result from an interaction between the SC and the environment, such as accidents, severe weather conditions, laws and regulations, natural disasters, and wars. Bradley analysed the differences between frequent and rare risks that cause an interruption in the SC and suggested a new risk measurement and prioritization method that explains the features of rare risks.

There also exist studies on cost minimization and profit maximization in the SCRM literature. For example, to mitigate demand uncertainty in SC planning, Gupta and Maranas suggested a stochastic programming-based planning model that reacts to the demand over time. Yu and Goh investigated the visibility of SC and the effects of SCRs on SC performance. Wieland suggested a model that ensures the selection of SC strategy based on risk probability and impact. The literature also includes studies investigating the effects of cooperation and integration, which have significant roles in the success of SCRM. Braunscheidel and Suresh highlighted the impact of market tendency and learning tendency on SC agility. They also found that internal integration, external integration with the main suppliers and customers, and flexibility positively affect the SC's agility. Chen et al. explored the relationship between three different types of risks—supply, demand, and process. In another study, from the perspectives of uncertainty, variability, and trust, Chen et al. showed that supply risk could be mitigated by building trust in the buyer-supplier relationship in addition to information knowledge sharing. Glock and Ries studied risk due to lead time variability for an SC multiple-supplier, single-buyer integrated inventory problem. Kull et al. analyzed the risk of failure that results from a second-level supplier using stock and source dependence theories and reported that the supplier's excessive stock sometimes increases the risk of supply rather than decreasing it. Chen and Lee suggested a multi-product, multi-stage, and multi-period model to fulfil more than one aim in multi-stage supply networks with uncertain demand and product price.

Depending on the context, SCRM is tailored according to the definition of risk used and the type of risk assessment tools available for decision-making. To that end, ample discussion of SCRs exists in the literature. For example, Kern et al. developed a model for managing risks related to the supplier by attributing the risk definition, risk assessment, and risk-reducing processes to risk performance in a detailed empirical study. The effects of constantly redefining risk, its assessment, and its reduction were also modelled. Tummala and Schoenherr studied SCRM processes and suggested techniques for risk assessment and management. Hallikas et al. explained the risk analysis concept from both producer and supplier perspectives and investigated two approaches as computer-aided cause-effect analysis and internal audit for the risk analysis using case study and qualitative information. Trkman and McCormack researched new techniques for estimating and defining supply risk. Their approach of assessing and classifying suppliers is based on suppliers' qualities, performance, and characteristics of the suppliers and modified according to the specific environmental conditions.

The degree of sensitivity of the SC to risks is a significant determinant for risk management strategies. Foroughi et al. focused on the risks in the supplier part and investigated the reasons behind the increase in the SC sensitivity and investigated the processes of defining and evaluating threats and charting precautions to be taken in an SCRM process. Using probability theory, Grötsch et al. identified conditions enabling proactive SCRM practices: The bankruptcy of past suppliers was chosen to indicate the organization's level of sensitivity. It was determined that a management control system, a logical cognitive style, and a good supplier-buyer relationship positively affect the proactive management of the bankruptcy risk of the supplier. Wagner and Neshat defined SC sensitivity and comparatively measured it for companies in different categories using graph theory. In this empirical study, the authors found a negative relationship between SC sensitivity and performance but a positive relationship between SC sensitivity and risk management. After investigating the main reasons for the sensitivity and risks of SCs in the general sense, Thun and Hoenig defined the possibilities and potential effects on the SC. The results were investigated separately as internal and external risks in the probability-effect matrix. Therefore, the effect of the SCRM on performance was tested. The performance difference between the companies that apply reactive and proactive risk management was shown.

SD, pioneered by Forrester, is a powerful modelling and simulation methodology for obtaining insights about complex systems, especially for long-term decision-making in dynamic industrial management problems. SD

has been a modelling approach used to study systems' structure and behaviour with dynamic qualities that consist of interactive feedback cycles. SD modelling (SDM) aims to simulate the complex relationships within a system over a certain period and then identify possible worst-case scenarios. Furthermore, SDM helps analyze how the system reacts to external effects within a given period. The SD approach emerged from the need to understand better and analyze industrial processes and the complex structure of these processes by top decision-makers and stakeholders. With a heightened interest recently, the SD approach has been used to investigate various social, economic, and environmental systems in which the integrative idea and feedback cycles are critical to understanding the relationship between variables. The system dynamics model (SDM) can be a tool for analyzing the behaviours of complex socio-economic systems to show how organizations and politics affect actions and as a powerful means for analyzing manufacturing systems. Kim and Park, for example, successfully employed SD to investigate otherwise highly intractable inventory decisions for SC coordination. Although alternative SCRM tools exist, SD as an analytical method has been widely preferred by researchers for studying various operational environments.

### **Background study:**

A background study is essential for any research project, including a study on operational risk management in the textile industry. This phase of research involves gathering information, reviewing existing literature, and understanding the context and significance of the study. Here's a background study to provide you with an overview. The textile industry is one of the oldest and largest sectors in the world, with a history dating back centuries. It encompasses the production, processing, and distribution of textiles and textile-based products. The industry contributes significantly to global economic growth, employment, and trade. Textiles are integral to daily life, serving as raw materials for clothing, home furnishings, technical textiles, and more.

Operational risk is a fundamental concept in risk management, particularly within the context of business and finance. It refers to the risk of loss resulting from internal processes, systems, people, or external events. Operational risk is pervasive and can impact any organization, regardless of its industry or size.

### **Problem Statement /Rationale / of the Study:**

- 1. ASSESSMENT OF KEY OPERATIONAL RISKS:** What are the primary operational risks faced by textile companies, and how do these risks vary across different segments of the industry, such as apparel, home textiles, and technical textiles?
- 2. EFFECTIVENESS OF RISK MITIGATION STRATEGIES:** How effective are the risk mitigation strategies employed by textile companies in managing operational risks? Are there best practices that can be identified and shared within the industry?
- 3. ENVIRONMENTAL COMPLIANCE AND SUSTAINABILITY:** To what extent do textile companies comply with environmental regulations, and how does non-compliance impact their operations and reputation? What strategies can be implemented to enhance environmental sustainability while minimizing operational risks?
- 4. SUPPLY CHAIN RESILIENCE:** How do textile companies ensure the resilience of their supply chains, especially in the face of global challenges like natural disasters, geopolitical tensions, or pandemics? What strategies and technologies are employed to mitigate supply chain disruptions?
- 5. QUALITY CONTROL AND PRODUCT SAFETY:** What are the common issues related to quality control in textile manufacturing, and how do these impact product safety and consumer trust? How can quality control processes be improved to reduce operational risks?

### **Objectives of the Study:**

- 1. IDENTIFY KEY OPERATIONAL RISKS:** To identify and categorize the primary operational risks faced by textile companies, including supply chain disruptions, quality control issues, labor-related challenges, and environmental compliance.
- 2. ASSESS CURRENT RISK MANAGEMENT PRACTICES:** To evaluate the risk management strategies and practices currently employed by textile companies, including risk assessment methodologies, risk mitigation measures, and risk transfer mechanisms.

**3. ANALYZE COMPLIANCE WITH ENVIRONMENTAL REGULATIONS:** To examine the extent to which textile companies comply with environmental regulations and standards and assess the impact of non-compliance on their operations and reputation.

**4. EVALUATE SUPPLY CHAIN RESILIENCE:** To assess the resilience of supply chains in the textile industry and identify strategies used to mitigate supply chain disruptions, such as those caused by natural disasters or geopolitical tensions.

**5. EXAMINE QUALITY CONTROL PROCESSES:** To investigate the quality control processes within textile manufacturing and their effectiveness in ensuring product quality and safety, with a focus on reducing operational risks.

### **Hypothesis:**

#### **1. IDENTIFY KEY OPERATIONAL RISKS:**

- Null Hypothesis: There is no significant difference in the types and categories of operational risks faced by textile companies in terms of supply chain disruptions, quality control issues, labor-related challenges, and environmental compliance.

#### **2. ASSESS CURRENT RISK MANAGEMENT PRACTICES:**

- Null Hypothesis: There is no significant difference in the risk management strategies and practices currently employed by textile companies across risk assessment methodologies, risk mitigation measures, and risk transfer mechanisms.

#### **3. ANALYZE COMPLIANCE WITH ENVIRONMENTAL REGULATIONS:**

- Null Hypothesis: There is no significant difference in the level of compliance with environmental regulations and standards among textile companies, and non-compliance does not significantly impact their operations or reputation.

#### **4. EVALUATE SUPPLY CHAIN RESILIENCE:**

- Null Hypothesis: There is no significant difference in the resilience of supply chains among textile companies, and the strategies used to mitigate supply chain disruptions have no significant impact on overall operational performance.

#### **5. EXAMINE QUALITY CONTROL PROCESSES:**

- Null Hypothesis: There is no significant difference in the effectiveness of quality control processes within textile manufacturing, and these processes do not significantly affect product quality, safety, or the reduction of operational risks.

### **Research Methodology:**

#### **Research Design:**

**Descriptive research:** Descriptive research aims to accurately and systematically describe a population, situation or phenomenon. It can answer what, where, when and how questions, but not why questions. A descriptive research design can use a wide variety of research methods to investigate one or more variables.

#### **Source/s of Data:**

**Primary data:** The primary data were collected based on the structured questionnaire with the help of google form.

#### **Data Collection Method:**

**Survey Research:** is a quantitative research method used for collecting data from a set of respondents. It has been perhaps one of the most used methodologies in the industry for several years due to the multiple benefits and advantages that it has when collecting and analyzing data.

**Population:** Management professionals assessing risks in textile industries. There are 200 respondents who have helped us provide their feedback to find out risks involved in operations management of Textile industries.

### **Sampling Method:**

The sampling technique used for this study is simple random sampling. Simple random sampling is a type of probability sampling in which the researcher randomly selects a subset of participants from a population. Each member of the population has an equal chance of being selected. Data is then collected from as large a percentage as possible of this random subset.

**Sampling Frame:** Management professionals assessing risks in textile industries. There are 50 random samples which we have used to find out risks involved in operations management of Textile industries.

**Data collection Instrument:** The questionnaire is a survey instrument comprised of a set of questions to ask the participants in the survey. The questions are used to elicit ideas and behaviors, preferences, traits, attitudes, and facts. A questionnaire is a data collection tool or instrument, while a survey is an overarching research method that involves collecting and analyzing data from people using questionnaires.

### **Findings:**

Value of any enterprises is maximized when management sets strategy and objectives to strike an optimal balance between growth and return goals and related risks, and efficiently and effectively deploys resources in pursuit of the entity's objectives. Internal control is an integral part of enterprise risk management. This enterprise risk management framework encompasses internal control, forming a more robust conceptualization and tool for management.

The use of ERP system to manage processes across various units is very common these days but due to this the overall objective and scope of an internal audit does not change. However, the use of computer changes the processing, storage, retrieval and communication of date and information and the interplay of processes, systems and control procedures. Thus, this would affect the internal control systems employed by the entity.

India's strong performance and growth in the textile sector is aided by several key advantages that the country enjoys, in terms of easy availability of labour and material, buoyant and large market demand, presence of supporting industries and supporting policy initiatives from the government.

Risks associated in the nature of operations of an organization in absence of controls are known as 'Inherent Risk'. Auditor should also try to know the reasons for existence of adverse conditions or highly favorable conditions such as, sudden increase in the budget of department or acquisition of high value capital items. Assessment of inherent risk depends on auditor's professional judgment and may be judged at two levels, i.e., macro level (environmental factors) and micro (account balance) level.

### **Limitations of the study:**

Organizations do not have sufficient resources to invest in operational risk management or ERM.

Lack of communication and education around the importance of operational risk management and the consequences of operational failures on a company's bottom line.

Lack of awareness, interest, or appreciation across boards and C-suite executives regarding operational risk management.

Establishing standard risk terminology to be used moving forward, which is conducive to successful Risk and Control Self-Assessments (RCSAs).

Processes are varied and complex due to changes in technology.

ORM is often consolidated into other functions, such as compliance and IT, preventing ORM from receiving appropriate attention.

Operations risk management programs can be manual, disjointed, and over- complicated, mostly because ORM developed as a reactive function in response to regulations and compliance.

### **Suggestions:**

Integrate Risk and Control Self-Assessment programs into your operational risk initiatives.

Establish a standard risk terminology and consistent methodologies to measure and assess risk.

Develop a complete view of risks and controls — this will be important for later analysis.

Incorporate a trend analysis methodology into your (Risk and control self-assessment)RCSA to identify patterns in risk as well as potential control failures.

Incorporate a method for identifying non-financial risks that may have impacts harming your bottom line.

Use your RCSA to budget for operational risk management initiatives.

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