

# NAVIGATING SUPPLY CHAIN RISK: EXPLORING THE INFLUENCE ON SUPPLY CHAIN INTEGRATION AND AGILITY PERFORMANCE IN SRI LANKAN APPAREL MANUFACTURING COMPANIES

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## ABSTRACT

*The ever-changing and volatile nature of today's economic climate places a significant strain on supply chain management. Manufacturing organizations, particularly in developing nations like Sri Lanka, are exposed to a number of hazards that could impair overall performance and disrupt supply chain operations. Utilizing the Resource Based View (RBV) and Dynamic Capability View (DCV), this study sought to determine the effects of supply chain risk on supply chain integration and agility performance. The study is quantitative and cross-sectional, with data collected by a standardized questionnaire. 165 apparel manufacturing plants registered under the Board of Investment (BOI) in Sri Lanka were selected for the survey with the systematic random sample. Data analysis was performed using SPSS 20.0 and Structural Equation Modeling with Smart PLS. The findings show that supply chain risk has a significant positive impact on supply chain integration. Furthermore, Supply chain integration impacts on the agility performance. The results support the presence of mediation of supply chain integration on the supply chain risk and agility performance. These findings point to a positive and significant relationship between supply chain risk and supply chain integration. In addition, supply chain integration has a positive effect on the agility performance. The findings corroborate the existence of a mediating effect of supply chain integration on supply chain risk and agility performance. The results of this study indicate that organizations mitigate supply chain risk by fostering customer and supplier partnerships that boost agility and flexibility. Moreover, supply chain integration can assist businesses lessen the negative effects of supply chain risk on their agility performance by enhancing coordination, communication, and responsiveness across the various phases of the supply chain.*

**Key words:** Supply Chain Risk, Supply Chain Integration, Agility performance, Resource Based Theory (RBV), Dynamic capability view (DCV)

## 1. Introduction

The company's ability to foresee and manage the actions of its supply chain partners is being challenged by rising globalization, rapid advancements in technology, and advancing competitive edge (Tang and Musa, 2011; Tang, 2006). Therefore, supply chain

management is essential for companies to thrive in today's fast-paced business environment. The inability of an organization to predict and positively impact the behavior of the different actors within its supply chain has resulted in supply chain risk (Ritchie and Brindley, 2004, Tummala and Schoeberlein, 2011). Being a network of interconnected businesses, supply chains are especially vulnerable to the risks of the internal as well as external environment setting in which they operate. Business failures occur when the supply chain risks aren't identified and assessed in a timely manner.

Today, Sri Lanka's apparel industry is well-represented in the world's leading outsourcing centers for apparel. Being an island and tropical nation, Sri Lanka is susceptible to detrimental consequences of many kinds of climate change, issues with infrastructure, supply and customer base issues, and regulatory system, among others (Abeysekara & Wang, 2019). This has made it difficult for organizations in the apparel sector to meet customers' deadlines for order fulfillment, which has had an unfavorable effect on the livelihoods of employees (EIU, 2016). Therefore, mitigating the possible risks in the SC, leads to improve the efficiency of the apparel manufacturers' business processes and associated tasks, which in turn benefits their customers and boosts morale among workers (Chen & Fung, 2013).

Therefore, Agility performance can be a way to lessen the effects of risk in the supply chain. Organizations can more effectively reduce supply chain risks, lessen the impact of disturbances, and keep supplies moving without interruption whenever they incorporate agility into their supply chain management processes (Christopher and Peck, 2004, Lee, 2004, Braunscheidel and Suresh, 2009, Wieland and Marcus Wallenburg, 2012, Abrahamsson et al., 2015, Gligor et al., 2016). Organizations with high levels of agility have the capacity to reach decisions quickly, respond to unpredictable situations, and provide products and services which fulfill the ever-evolving requirements of customers (Sangari and Razmi, 2015; Das, 2001).

Businesses throughout the supply chain must effectively collaborate with their primary vendors and consumers in order to sustain, contend, and thrive in today's global economy because of the increased complexity and time sensitivity caused by risk within the supply chain (Bowersox et al., 1999; Zhao et al., 2013; ; Frohlich and Westbrook, 2001; Flynn et al., 2010). Involving and collaborating with key customers throughout product development and shared decision-making can help businesses better address customer concerns and meet their expectations (Zhao et al., 2013). Integration makes it easier for supply chain participants to coordinate with one another and handle risks collaboratively. Organizations can improve their agility and response time to supply chain disruptions when they integrate the efforts of all the departments and partners engaged in meeting customers' needs. Therefore, firms vulnerable to supply chain risk may find response mechanisms to improve their agility performance through supply chain integration.

Researchers explore associations between a company's supply chain integration, supply chain risk, and agility performance using Resource Based View (RBV) with a spotlight on Dynamic Capabilities View (DCV) (Wernerfelt, 1984; Teece, 2007). The DCV determines that a business operating in a changing environment and confronted with supply chain uncertainties must build up the resources and skills necessary to mitigate the associated risk. In light of DCV's perspectives, researchers propose that companies with vulnerabilities try to mitigate supply chain risk by strengthening the integration of important aspects both within and outside the company. Moreover, DCV argues that agility performance is enhanced by customer, supplier and internal integration capabilities.

This study hope to provide a fresh and in-depth rationale for how the existence of supply chain risk could inspire businesses to create supply chain integration strategies in order to improve their agility performance. In accordance to the previously stated investigations, the researcher determines that there have been limited studies that are conducted on analyzing the risk of supply chain on the agility performance in apparel industry of Sri Lanka, whereas supply chain integration is given significance since it affects the supply chain process and risks associated with this process. (Wang & Jie, 2019; Şahin, et al. 2017; Basheer, et al. 2019). Consequently, the researcher concludes that there is a clear research gap for studies of the supply chain risk to supply chain integration and agility performance in the Sri Lankan context, after performing a comparison with the studies conducted in the context of the apparel industry. Moreover, this study aims to bridge the aforementioned research gaps by investigating the impact of supply chain risk on the agility performance of the apparel industry's leading firms and the mediating role played by supply chain integration.

## **2. Literature Review**

### **2.1. Supply chain risk**

Globalization and the inability of companies to deal with trends and business consolidation have both lead to the growth of supply chain risks (Hewage et al., 2021). Complex business networks are more susceptible to supply chain risks due to the increased number of interconnections between nodes (Jayawardhana, 2016). In today's extremely volatile and unpredictable environment, firms have to control supply chain risks to promote supply chain agility (Braunscheidel and Suresh, 2009). Several recent developments highlight the significance of supply chain risk management (Trkman and McCormack, 2009; Zsidisin and Henke, 2019; Olson and Wu, 2011). A number of distinct categories are mentioned in the literature, and there is no generally agreed-upon dimension of supply chain risks. Supply chain risk, as described by Ho et al. (2015); Jüttner et al. (2003); Zhao et al. (2013), is the probability and severity of problems that arise when a company's supply, internal-manufacturing, and distribution processes are interrupted. Supply chain risks can be broken down into two categories, as described by Tang (2006): disruption risk and operational risk. Supply risk, demand risk, process risk and technology risk are some of the other types of supply chain risks (Tang and Tomlin, 2008; Bogataj and Bogataj, 2007). In this study, supply risk and demand risk are combined to form a company's total supply chain risk.

## *2.2. Supply Chain Integration*

Supply chain partnerships are becoming increasingly common as a result of the rise of global competition (Wisner and Tan, 2000). In order to accomplish efficient and effective movement of goods and services, information, data, money, and decisions with the intention of offering greatest customer value at lowest possible cost with excellent speed, companies must work together effectively with their supply chain partners while handling both intra- and inter-organizational procedures (Zhao et al., 2008). While certain scholars continue to use single-dimensional measures of supply chain integration (Cousins and Menguc, 2006), others are beginning to look at supply chain integration as a multi-dimensional construct (Whipple et al., 1999; Morash and Clinton, 1998; Stank et al., 2001). Numerous studies (Narasimhan and Kim, 2002; Narasimhan and Jayaram, 1998; Swink et al., 2007; Koufteros et al., 2005; Flynn et al., 2010) recognize customer integration, supplier integration and internal integration as the three most important types of supply chain integration.

### *2.2.1. Internal integration*

Internal integration is defined as "the degree to which a manufacturer structures its own organizational strategies, practices, and processes into collaborative, synchronized processes, in order to fulfill its customers' requirements and interact efficiently with its suppliers" (Flynn et al., 2010). Ellinger et al. (2000) identify two primary characteristics of internal integration: (1) the sharing of information and (2) the making of decisions jointly among functional units or departments.

### *2.2.2. Customer integration*

Customer integration requires expertise in coordinating with key customers, while supplier integration requires expertise in coordinating with key vendors (Flynn et al., 2010). The scope of clients' involvement might extend from ideation to coordination of manufacturing and shipping. There are many methods that businesses use to learn about their customers and involve them in the creation of new products and procedures (Lau et al., 2010).

### *2.2.3. Supplier Integration*

Confidence and dedication between the buyer and the supplier are essential components of supplier integration (Vijayasarathy, 2010). Other elements of supplier integration include the information and product flow, planning and controlling, and actively participating partnerships. These supplementary skills are put to use during the design, manufacture, and distribution of the final product. Mechanisms for sharing data on product development, marketing strategies, manufacturing schedules, stock levels, and distribution networks are established and refined by both parties (Devaraj et al., 2007; Lau et al., 2010).

## *2.3. Supply Chain Agility Performance*

Performance in supply chain agility is evaluated by how well a supply chain adapts to market and customer demand shifts, as well as other external circumstances. This involves being flexible enough to adjust to fluctuations in demand and supply, as well as the

aftermath of natural disasters. Supply chains that perform well in terms of agility are flexible enough to respond to shifting demands and capitalize on emerging possibilities. Improved customization of products, shorter new product development and lead time, lower system transition cost and time, and effective scaling both upward and downward operations are all examples of performance outcomes and metrics associated with agility (Das, 2001; Narasimhan et al., 2006 ; Sarkis et al., 2007; Paulraj and Chen, 2007). Researchers in the past have attempted to characterize agility performance using a wide range of measures (Narasimhan et al., 2006). Paulraj and Chen (2007) identify delivery, adaptability, responsiveness and timeliness as the four most important aspects of agility performance in the field of logistics management. Agility performance has also been linked by other researchers (Prince and Kay, 2003; Das, 2001; Brown and Bessant, 2003; Narasimhan et al., 2006) to factors like delivery speed, cycle time and dependability, new product introduction, customization, and adaptability. Therefore, according to the existing literature, agility performance in this study is defined as a set of measures reflecting an organization's receptivity to market needs in terms of delivery, design and flexibility (Sangari and Razmi, 2015; Yauch; 2011, Narayanan; et al., 2015). These facets of performance are crucial to an organization's ability to adapt its operations in the face of varying and unpredictable demands (Yauch, 2011; Narasimhan et al., 2006).

## *2.4. Theoretical underpinnings*

### *2.4.1. Resource Based View (RBV)*

RBV contends that entities are comprised of a collection of resources which are distributed heterogeneously within them, and that these differences in distribution endure as time goes on (Wernerfelt, 1984). RBV also posits that a company's extraordinary competitive advantage may originate from its scarce, high-value assets that cannot be easily replaced (Eisenhardt and Martin, 2000). The idea that a company's environment is static and unchanging is used as a criticism of RBV (D'Aveni, 1994). Some have argued that RBV's underlying assumptions fall apart in dynamic markets due to reasons like unclear market boundaries, non-linear and unpredictable fluctuations, a lack of visibility into successful business models, and an increase in the number of both new entrants and established competitors. Thus, the theoretical foundations of DCV can be found in the extensions of RBV (Teece et al., 1997).

### *2.4.2. Dynamic Capabilities View (DCV)*

The Dynamic Capability View (DCV) is an extension of RBV that focuses on the capability-building activities that can give an organization a sustainable competitive advantage over the long term (Eisenhardt and Martin, 2000; Teece et al., 1997). A Dynamic Capability (DC) is a company's capacity to incorporate, construct, and restructure internal and external resources in response to an environment that is constantly shifting (Teece et al., 1997). In an uncertain ecology, DCV believes, a company must constantly reinvent itself in order to survive (Teece, 2007). In this way, the company is able to cultivate dynamic skills that equip it with the means to channel its internal and external resources in a way that is in line with the demands of the market (Teece et al., 1997; Eisenhardt and Martin, 2000; Helfat et al., 2009).

## 2.5. Conceptual Framework



Figure 1: Conceptual Framework

## 2.6. Hypothesis development

### 2.6.1. Supply chain risk impacts on supply chain integration

DCV theory contends that businesses confronting supply chain risk, viewed as an unavoidable result of ecological dynamism and unpredictability (Trkman and McCormack, 2009, Jüttner, 2005), build supply chain integration practices - a collection of dynamic capabilities to create, propagate to applicable functionaries, as well as react to market intelligence (Allred et al., 2011, Vickery et al., 2013). It has been stated that supply chain risk encourages businesses to collaborate closely with their most important suppliers in order to better understand the supply market and to keep their supply functions flexible. As demand's future is unclear, businesses are looking for long-term contracts and steady revenue from their most valuable customers (Koufteros et al., 2007). Therefore, it is reasonable to claim that supply chain risk compels businesses to create methods and platforms for exchanging knowledge and creating value together with strategic customers (Paulraj and Chen, 2007; Danese et al., 2013). Hence, the following hypothesis is formulated:

H1: Supply Chain Risks impacts on Supply Chain Integration

### 2.6.2. Supply Chain Integration significantly impacts on agility performance

Companies can benefit from sharing information about supply chain risks and developing contingency plans with their supply chain partners if the supply chain is integrated to increase communication and collaboration among supply network partners and reduce the likelihood of supply chain disruptions (Narayanan et al., 2015). Although RBV theory appears to be a well-established framework for investigating the connection between supply chain integration and performance, it is unable to explain how supply chain integration might contribute to performance in a highly dynamic and unpredictable setting. As a result, dynamic capability valuation (DCV), an offshoot of RBV, is predicated on the idea that in order for businesses to stay competitive, they must adapt by changing the way they conduct business and fostering closer ties with their suppliers, customers, and employees. Hence, the following hypothesis is formulated:

H2: Supply Chain Integration significantly impacts on agility performance

### 2.6.3. Supply Chain Integration mediates the relationship in between supply chain risk and agility performance

Integration of the supply chain can enhance its capacity for managing risks. The influence of supply chain risks on agility performance can be mitigated through collaboration amongst supply chain partners (Gligor et al., 2016, Christopher and Peck, 2004). Companies can improve their approach to controlling supply chain risks by sharing the responsibilities of risk management amongst them. In addition, supply chain integration can improve visibility throughout the whole supply chain, allowing businesses to identify potential supply chain risks sooner and take corrective action. Firms can better anticipate and prepare for supply chain risks when they integrate with their partners in the supply chain to gain insight into their operations, inventory levels, and transportation networks (Paulraj and Chen, 2007; Hoyt et al., 2007; Li et al., 2008; Christopher, 2000). According to above facts, it can hypothesize,

H3: Supply Chain Integration mediates the relationship between supply chain risk and agility performance

## 3. Methodology

The study is positivist in nature (Saunders et al., 2009). The study's hypotheses and conceptual framework heavily reference literature and theories, which forces the study to adopt a deductive methodology (Saunders et al., 2009). The study is cross-sectional since it concentrates on the sample's agility performance over a predetermined time (Saunders et al., 2009). The study used a survey research design using a standardized questionnaire to gather data (Saunders et al., 2009). The population of this study comprised 825 apparel manufacturers registered under the Board of Investment's (BOI) laws and regulations (Board of Investment of Sri Lanka, 2021). Sample consists with 165 supply chain professionals in apparel manufacturing plants who have registered under the Board of Investment (BOI). A five-point scale, ranging from "1=strongly disagree" to "5=strongly agree," was used to develop the questions. Prior to implementing the questionnaire for the final survey, a pilot survey of 12 participants was conducted. Participants represented both academic and professional disciplines.

According to the findings of the pilot survey, we made a few minor changes to the questionnaire statements to make them more readable and understandable. Prior to the completion of the survey, the questionnaire's readability, clarity, and content validity were all confirmed. In order to maximize response rates from the limited sample size, we administered our online questionnaire to all sample firms by e-mail. The study employs a systematic random sampling technique. This is due to the fact that the BOI keeps an up-to-date list of every registered garment producer in Sri Lanka. This list can function as a sample frame for implementing the systematic random sampling method, which guarantees that each member of the population has an equal probability of being selected. As a consequence, 165 surveys were sent out, and 139 responses were returned for a response rate of 84.3 percent. For the data analysis for the study (Hair et al., 2019), a partial least squares structural equation model (SEM) was employed. Data cleansing was

ensured after dealing with the data set's outliers and missing values. Due to time and resource restrictions, only a small sample size was available for data collection; therefore, SmartPLS 3.0 (Wong, 2013) was used to do the SEM computation.

## 4. Data Analysis

### 4.1. Measurement model

Current study's measurement model is comprised of reflective measurements. Therefore, as stated by Hair et al. (2009), the internal consistency reliability, indicator reliability, convergent validity, and discriminant validity are evaluated. One item of supply chain risk and one item of supply chain integration were eliminated before assuring the convergent validity and composite reliability, taking into account the indicator loading or reliability values which had less than 0.7 (Hair et al., 2019). A composite reliability of over 0.7 (Hair et al., 2019) guaranteed the variables' internal consistency reliability. Cronbach's alpha values weren't taken into account because they are less accurate than the composite reliability (Hair et al., 2019). The average variance extraction (AVE) value, which is more than 0.5, was used to guarantee convergent validity (Hair et al., 2011a). Given that the heterotrait-monotrait (HTMT) ratio value is less than 0.9 (Henseler et al., 2015), discriminant validity of the study's variables was ensured.

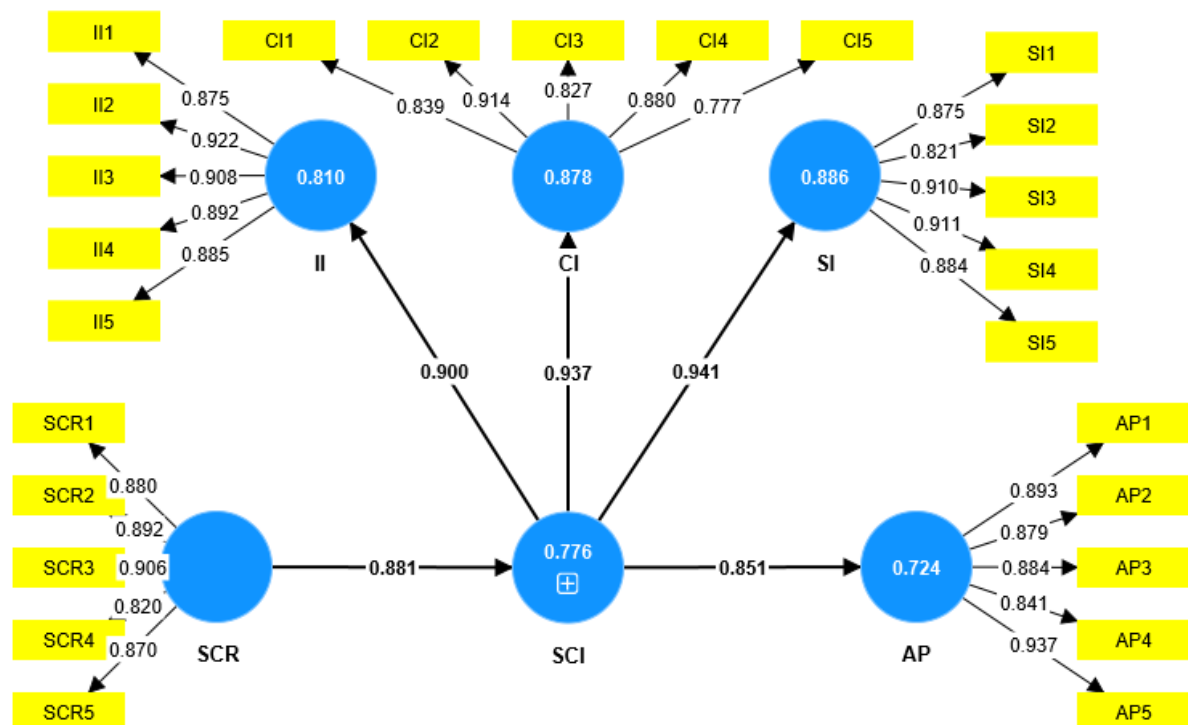


Figure 2: First order measurement validated model



**Table 01: Indicator Loadings**

	SCR	SCI	AP
SCR1	0.880		
SCR2	0.892		
SCR3	0.906		
SCR4	0.820		
SCR5	0.870		
II1		0.875	
II2		0.922	
II3		0.908	
II4		0.892	
II5		0.885	
CI1		0.839	
CI2		0.914	
CI3		0.827	
CI4		0.880	
CI5		0.777	
SI1		0.875	
SI2		0.821	
SI3		0.910	
SI4		0.911	
SI5		0.884	
AP1			0.821
AP2			0.769
AP3			0.736
AP4			0.741
AP5			0.818

Survey data: 2023

*Table 02: Reliability of Validated measurement model*

Variable	Composite reliability	Average (AVE)	variance	extracted
SCR	0.864	0.756		
SCI	0.754	0.712		
AP	0.770	0.699		

Survey data: 2023

*Table 03: Fornell and Larcker criterion of Validated measurement model*

	SCR	SCI	AP
SCR	<b>0.765</b>		
SCI	0.671	<b>0.709</b>	
AP	0.838	0.754	<b>0.865</b>

Survey data: 2023

*Table 04: HTMT of Validated measurement model*

	SCR	SCI	AP
SCR	-		
SCI	0.691	-	
AP	0.890	0.787	-

Survey data: 2023

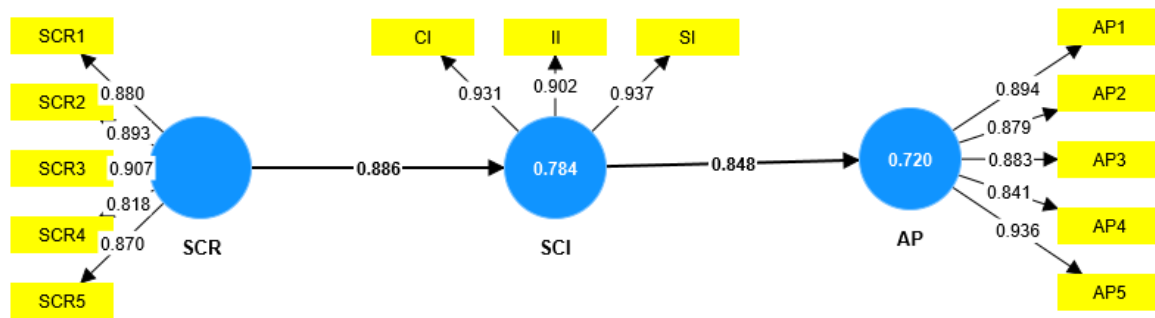


Figure 3 : Validated path model

#### 4.2. Structural model

Multicollinearity was computed using the variance influence factor (VIF) to ensure the pre-requirement analysis of the structural model, and no multicollinearity issues were found. Another prerequisite was the calculation of the coefficient of determination (R<sup>2</sup>) value of the endogenous variables, with a threshold value of 0.25 maintaining the model's explanatory power at an acceptable level (Hair et al., 2014; Hair et al., 2019). In addition, the predictive accuracy of the endogenous variables was ensured through a Q<sup>2</sup> value that was higher than zero (Hair et al., 2014). F<sup>2</sup> effect size and q<sup>2</sup> effect size were used to determine the impact of removing a certain exogenous construct on the endogenous construct (Hair et al., 2014). The study's hypotheses were investigated while taking the path coefficient values and significance levels into account. The first hypothesis (H1) of the study, which proposes that supply chain risk impacts supply chain integration was tested. Since the p-value is less than the critical value of 0.05 at a 95% confidence interval, the H1 hypothesis is supported.

The impact of supply chain integration on agility performance is proposed in the second hypothesis (H2). Since the p-value is zero at a 95% confidence interval, hypothesis (H2) is supported. The third hypothesis (H3) proposes that supply chain risk has an impact on agility performance, with supply chain integration acting as a mediating factor. The hypothesis H3 is supported at a 95% level of confidence because the p value is less than the threshold of 0.05.

In recent years, numerous academics have tested the mediation effect using the Bootstrap approach. It is simpler and more accurate to use, as it does not require normality or vast sample sizes. This study employs the Bootstrap method to examine the supply chain mediation effect with a confidence level of 95%, utilizing 5,000 times of repeated Bootstrap sampling. Since supply chain integration has an effect value of 0.375 and has a mediating role in the relationship between supply chain risk and agility performance. Supply chain integration serves as a full mediator because supply chain risk has no direct impact on agility performance. It follows that supply chain integration fully mediates the link between supply chain risk and agility performance.

Table 05: Predictive Relevance

variable	R-square	R-square adjusted	Q <sup>2</sup> predict
SCI	0.780	0.789	0.780
AP	0.678	0.658	0.623
SCR	0.724	0.752	0.721

Table 06: Analysis of Hypotheses

	Original sample (O)	Standard deviation (STDEV)	T statistics	P values	Decision
SCR -> SCI	0.795	0.054	14.656	0.000	Supported
SCI -> AP	0.900	0.024	37.069	0.000	Supported
SCR -> SCI -> AP	0.375	0.101	3.199	0.001	Supported

## 5. Discussion and findings

The study mainly examines the impact of supply chain risk on supply chain integration and agility performance of the manufacturing industry in Sri Lanka. Results of the study concluded that supply chain risk have a significant positive impact on supply chain integration. and supply chain integration have a significant impact on agility performance. And finally, supply chain integration have a mediating effect in between supply chain risk and supply chain integration.

### 5.1. Supply chain risk and supply chain integration

Supply chain risk may be reduced by incentivizing supply chain integration (Riley et al., 2016). In this regard, additional supplier linkages, improved supplier communication and collaboration, and stronger risk management are all options (Blos et al., 2009). Supply chain risk may push organisations to update their supply chains (Gligor et al., 2016; Stonebraker and Liao, 2004; Wong and Boon-itt, 2008), which may increase supply chain integration. According to Zsidisin and Ritchie (2009), supply chain concerns may encourage organisations to invest in supply chain integration to improve risk management. Supply chain risk and integration have been connected, although other research suggests a complex relationship. Chen et al. (2013) found that supply chain risk hindered supply chain integration in the complex and unpredictable Australian manufacturing industry.

Although supply chain risk is an issue for Sri Lanka's apparel production sector, it may be helping supply chain integration by encouraging companies to invest in supply chain management. Historically, Sri Lanka's apparel manufacturing sector was fragmented, with several small and medium-sized enterprises operating independently. Supply chain inefficiencies and dangers might result, especially during disruptions. Improving supply chain integration may help solve some of these issues by increasing interaction and cooperation between supply chain actors and creating economies of scale, which can cut costs and boost efficiency. This DCV study suggests that supply chain-vulnerable companies are more likely to implement integrative internal and external practises, strengthening ties with important suppliers and consumers. The study we did shows that supply chain risk makes companies collaborate more with their key vendors and clients.

The study we conducted confirms that when companies are exposed to supply chain risk, they become more collaborative with their most important vendors and clients.

### *5.2. Supply chain integration and Agility performance*

The integration of supply chains increases the agility of numerous industries, including apparel manufacturing. Williams et al. (2013) investigated the effect of supply chain integration on the agility performance of 206 distinct organisations. According to the research, supply chain integration improves delivery dependability and decreases delay times, enabling organisations to respond to fluctuating demand. Additionally, supply chain integration enhanced participant collaboration and interaction, thereby boosting adaptability and efficiency. According to the findings of Brusset et al. (2017), supply chain integration increases the agility of supply chains in Western Europe. The study found that supply chain integration assisted organisations in responding to fluctuating demand and enhancing product quality, thereby increasing profits and consumer satisfaction. The empirical evidence supports the claim that supply chain integration enhances agility performance within the apparel manufacturing sector of Sri Lanka. Improved agility can result from supply chain coordination, communication, and responsiveness to changes in demand or the market.

### *5.3. Supply Chain Risk, Supply Chain Integration, and Agility Performance*

There is evidence to suggest that supply chain integration may act as a mediating variable in the relationship between supply chain risk and agility performance in the apparel manufacturing industry in Sri Lanka. Integration may serve as a mediator between supply chain risk and agility performance, according to a number of studies. According to the study conducted by Brusset et al. (2017), the relationship between supply chain risk and agility performance among supply chain managers in western Europe is mediated by supply chain integration. Jajja et al. (2018) state that the association between supply chain risk and agility performance in American manufacturing is mediated by supply chain integration. The findings of this research suggest that organizations that are subject to supply chain vulnerabilities could potentially improve their operational outcomes through increased collaboration with their most important consumers and suppliers. A business entity that is exposed to supply chain risk could potentially attain a competitive edge through the combining of suppliers and customers. The apparel manufacturing sector shows that supply chain integration mediates supply chain risk and agility performance. Supply chain integration improves cooperation, communication, and responsiveness across the supply chain, reducing the impact of supply chain risk on agility.

## **6. Conclusion**

This study attempts to explore the impact of supply chain risk on supply chain integration and supply chain performance of Sri Lankan apparel manufacturing companies. The study highlights the significant relationship that exists among supply chain risk, integration, and agility. This highlights the necessity for robust risk management strategies by considering the positive impact that risk has on integration. It also emphasizes how supply chain integration greatly increases the agility of Sri Lanka's apparel industry.

The significance of finding lies in the mediation role of integration in the relation between risk and agility, demonstrating its ability to strengthen this supply chain relationship.

This study supports to the theory as well to the practice in several ways. First, the findings of the study confirm the theory. The major theoretical underpinnings of this study were, Resource Based View (RBV) and Dynamic capabilities View (DCV). The study employed RBV and DCV to investigate how Sri Lankan apparel manufacturers make use of their resources and the dynamic reconfiguration capabilities of their supply chains to gain and maintain a competitive advantage in the face of supply chain risks and market instability. This study can offer insights unique to this market because it focuses on Sri Lanka's apparel manufacturing industry. This targeted strategy guarantees an in-depth understanding of the unique supply chain dynamics in this sector. The study attains an in-depth understanding in accordance with standard practices through an extensive examination of the supply chain architecture, encompassing supplier networks, distribution channels, and logistics. The study provides practical insights applicable to similar contexts by validating its findings within a developing economy, such as Sri Lanka. Developing economies frequently face distinct challenges like infrastructure constraints, regulatory frameworks, and socio-economic factors that affect supply chain operations. The study captures all of this complexity and provides context-relevant insights and solutions by confirming findings in such an environment.

Furthermore, there are several ways in which this study contributes to practice. The results of the study are intended to assist Sri Lankan apparel manufacturing facilities in streamlining their supply chains. Organizations can gain important insights by realizing how supply chain risks and integration in this specific industry are clearly related. By focusing on collaborative efforts across supply chain partners, businesses can use these data to proactively control risks. It focuses especially on how distributors, suppliers, and logistics companies may collaborate to increase the responsiveness and effectiveness of the supply chain. Sri Lankan manufacturers need to use strategies that lower risk and improve the responsiveness and coordination of their supply chain in order to address the unique problems facing the apparel sector. The managerial implications of this study offer managers in Sri Lanka's apparel sector a roadmap for overcoming these obstacles. It outlines the actions that must be taken in order to integrate the supply chain to increase agility performance and lower risk. This study provides novel insights into how different supply chain components might be integrated to efficiently reduce risks. Managers consequently have a greater understanding of the ways in which stakeholder collaboration affects performance. Moreover, it underscores the pivotal function of policymakers in formulating regulations that foster cooperation and communication among stakeholders in the supply chain, thereby fostering an environment conducive to effective risk mitigation. The management insights outlined above are tailored to address the particular needs of the industry, offering a unique perspective on the best methods for reducing risk and fostering collaboration in Sri Lanka's apparel manufacturing sector.

There are several future research directions. The findings from the research and implementation apply only to Sri Lankan apparel companies. They may not apply to other manufacturers in the country. Therefore, Future research involving all domestic manufacturers and constructors is needed to address this shortcoming. Survey data was the only main data utilized to test hypotheses. Mixed data can expand future research. A mixed-method approach to data collection can increase a study's internal consistency and generalizability. According to studies, these characteristics can be measured using multiple dimensions. Thus, study variable dimensions are limited. The impact of each dimension can be considered for future research to assess if adding dimensions improves the model's exploratory power. Therefore, scholars can avoid this restriction by taking findings from many sources.

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