

Influencing Factors of Resilience of Construction Supply Chains: A Case of SMEs in Sri Lanka

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Abstract - This research paper aims to explore the factors influencing supply chain resilience in Small and Medium-sized Enterprises (SMEs) operating within Sri Lanka's construction industry during economic crises. The study employed a qualitative approach. Data were collected using purposive sampling with a sample size of eight SMEs in the construction sector registered under the National Enterprise Development Authority of Sri Lanka. Using structured interviews, data were collected, and the responses were analysed using the Manual Thematic analysis procedure. The study findings states that collaboration, entrepreneurial orientation, internal integration, and outsourcing have been the main factors that have contributed to making the Sri Lankan construction supply chains resilient during Economic crisis. Therefore, it is recommended for the construction firms to focus and improve the presence of these factors in their respective supply chains, to make the supply chains more resilient. This study's significance lies in its focus on construction SMEs in Sri Lanka, offering insights from the perspective of manufacturers, which has been relatively unexplored in existing resilience related research. Although some research articles do touch upon this area, mostly these studies have been conducted in developed nations. Thus, this study contributes to the scant Sri Lankan supply chain resilience literature. Sri Lanka is making strong efforts to support its economy to combat the economic downturn and stabilize. Therefore, the findings of this paper will undoubtedly be useful for the Sri Lankan construction sector while aiding the country to flourish again.

Keywords: Construction Industry, SMEs and Supply Chain Resilience.

I. INTRODUCTION

Over the past decade, the supply chain resilience concept has gained more interest among current researchers. The concept suggests that organizations adopting a resilient approach are more likely to recover from unexpected or unforeseen situations (Gligor et al., 2019). In today's business environment, disruptions are frequent and can result from both external and internal factors. External factors, such as natural disasters and man-made events like terrorist attacks or wars, impact these disruptions. Because of these reasons, organizations want to become more resilient to continue their business operations without any distractions (Al-Hakimi et al., 2022b). This study specifically examines the influencing factors of construction SMEs supply chain resilience: a case of developing nation during economic crisis focusing on the post-pandemic period. Collaboration, Entrepreneurial Orientation, Internal Integration, and Outsourcing are identified as the key elements of supply chain resilience by authors, which have including according to the past literature by scholars as Madhavika et al. (2022), Goail and Al-Hakimi (2021), Tarigan et al. (2021) and Manathunge et al. (2021) respectively. Despite numerous studies on natural disasters, political disruptions, and other interruptions, limited research has

been conducted on the post-pandemic economic crisis and its impact on supply chain resilience in developing countries. Moreover, scholars Sugathadasa et al. (2020) have elaborated that there has been limited attention given to supply chain resilience in Sri Lankan context.

Meanwhile, the COVID-19 pandemic has caused extensive global damage, affecting various aspects of economic activities, including production, supply chains, logistics, and numerous industries. Within the Sri Lankan context, the economic crisis has profoundly affected a wide range of industries involving traditional or physical activities, such as agriculture services, imports, and export sectors. Particularly, the construction industry, which cannot be shifted offsite or online, has experienced severe supply chain disruptions including logistics and shipment delays due to social distancing measures, lockdowns, port closures, and other related factors. Consequently, these disruptions have caused significant local and global-level disturbances. In addition to the above, supply chain resilience in the construction industry aims to minimize disruptions in construction operations and infrastructure development, particularly during times of a pandemic crisis.

The construction sector plays a significant role in supporting the country's GDP and infrastructure growth. However, it has faced various disruptions over the years, affecting its growth and performance. While past challenges included labor shortages and material scarcity, the current economic crisis has introduced new problems that require government intervention. These challenges include rising material costs, payment delays due to foreign currency shortages, project suspensions, increased exchange rates, import restrictions, and higher interest rates (Daily FT, 2021). These issues have a substantial impact on the cash flow of construction firms, which already operate on narrow profit margins of 4% - 9%. Moreover, some suppliers have taken advantage of the situation to unjustifiably raise their profit margins, further exacerbating the challenges faced by the construction sector. Despite a 1.9% increase in construction value-added in 2021, the industry's recovery has been hindered by raw material shortages. Although building material imports and bank credit for construction activities have grown, the third wave of the pandemic and disruptions to supply chains have negatively affected construction operations. Shortages of key raw materials like cement, steel, and tiles have impeded the industry's full potential. However, mining, and quarrying activities experienced growth, benefiting from the recovery compared to the contraction in construction activities during 2020.

Historically, Sri Lanka's construction sector has been renowned for engineering marvels. After the civil war, the industry experienced significant growth, with the development of high-end residential, commercial, office, and infrastructure projects. In 2014, the construction industry achieved remarkable growth of over 20%, overtaking the country's GDP growth of approximately 7%. The industry's contribution to the country's GDP in 2014 accounted to 9.6%, exceeding that of many other Asian countries.

Therefore, this study focuses on examining the factors influencing supply chain resilience in the Sri Lankan construction sector during the economic crisis. Specifically, it investigates the components of Collaboration, Entrepreneurial Orientation, Internal Integration, and Outsourcing as contributors to supply chain resilience. Additionally, the study explores how construction SMEs in Sri Lanka have leveraged their supply chain resilience capabilities to navigate through the economic crisis. By addressing the existing research gap, this study provides valuable insights into the impact of these variables on supply chain resilience.

Ultimately, the findings of this study inform the development of more robust and resilient supply chains that can effectively withstand and overcome unforeseen disruptions, such as economic crises, enabling construction SMEs to navigate through challenging times successfully. However, research on supply chain resilience among SMEs is limited, as it only considers a few industries. Future studies should focus on monitoring, preventing, and controlling disruptions to improve SMEs, as many studies focus on select industries with a wide research gap.

II. LITERATURE REVIEW

A. Supply Chain Resilience

Supply chain resilience is crucial for organizations in uncertain and volatile business markets. It involves the ability of supply chains to prepare for unexpected events, respond to disruptions, and recover from them while maintaining continuity of operations (Al-Talib et al., 2020). Disruptions can come from various sources, such as pandemics, natural catastrophes, cyber-attacks, political instability, or supplier insolvency. These issues can negatively impact business continuity, resulting in lost sales, damage to the company brand's reputation and customer satisfaction, and even company failure. Therefore, to mitigate the effects of interruptions and guarantee business continuity, organizations must build resilience in their supply chain, and this was also proven by the scholars (Al-Hakimi et al., 2022a). Supply chain resilience is crucial for the development of economies, especially for SMEs in countries like Sri Lanka which is recognized as a developing country in the world (Bayraktar & Algan, 2019). These businesses face unique challenges in building resilience due to their smaller size and limited resources. They may have fewer options for diversifying suppliers, building relationships, and implementing risk management strategies. Additionally, they may have limited access to technology and resources. However, SMEs can build resilience through collaboration, strategic partnerships, and flexibility and agility in their operations. Collaboration with larger organizations can help to share resources and spread risk across multiple partners, making the supply chain resilience concept essential for organizational success (Alshahrani & Salam, 2023).

B. Supply Chain Resilience and SMEs

SMEs significantly impact the Sri Lankan economy, contributing to employment and economic growth. Sri Lanka National Enterprise Development Authority has established a framework to classify SMEs based on employee numbers and annual revenue, allowing researchers to differentiate large-scale enterprises from SMEs. SMEs contribute significantly to the GDP of the country and employ a significant percentage of the labour force (Samarasinghe et al., 2021). Furthermore, SMEs frequently operate in regional communities and can encourage economic activity there. Due to limitations like travel bans, lockdowns, and other laws, the Covid 19 epidemic has made it more difficult for SMEs, particularly in developing countries (Kaur et al., 2023). According to the researchers, Moretto and Caniato (2021), the economic crisis has had a severe impact on SMEs, which are often viewed as the foundation of an economy. Due to their disadvantaged position and fragile financial state, SMEs have been among the worst affected. They employ a large percentage of the workforce and operate in local communities, stimulating economic activity. There are different defining criteria for SMEs in various destinations around the world. According to Mishra and Singh (2022), SMEs resilience is defined as an essential component of a modern business environment,

integrating adaptability, sustainability, responsiveness, and competitiveness. Supporting the growth and development of SMEs is essential for the nation's economic growth and well-being (Mishra & Singh, 2022).

C. Supply Chain Resilience and Collaboration

Collaboration is a method where entities work together to achieve mutual objectives in supply chain management (Scholten & Schilder, 2015). It involves organizations working together to improve their collective performance and achieve shared objectives. As per the researchers, Katsaliaki et al. (2022), collaboration can take various forms, such as information sharing, joint planning, and coordinated decision-making. It can help organizations achieve greater efficiency, reduce costs, and improve the quality of their products and services. Collaboration can be used to cooperate efficiently in areas such as forecasting, postponing, and risk sharing (Shekarian & Parast M, 2021). According to Madhavika et al. (2022), collaboration has also been portrayed as a result of the development of inter-firm partnerships in which the parties involved work together and share data as well as connectivity, coordination, integration, visibility, and a certain amount of risk to achieve shared organization's goals.

Furthermore, researchers Scholten and Schilder (2015) discovered that collaboration is one of the vital characteristics that have a beneficial effect on establishing supply chain resilience. Three factors can be used to evaluate the level of supply chain collaboration. They are organizational relationships, information integration, and resource coordination and sharing (Banomyong, 2018). Collaboration in supply chain refers to the ability of two or more independent businesses to successfully plan and carry out activities to accomplish shared objectives (Scholten & Schilder, 2015). Collaboration and supply chain resilience are two essential elements that can aid organizations in maintaining competitiveness in the chaotic and unpredictable economic environment of today. While there is an ongoing debate about how to balance these factors and the research suggests that collaboration can increase supply chain resilience by enhancing information sharing, decision-making, and coordination between partners. However, scholars Christopher and Peck (2004) elaborated that in order for organizations to succeed in the long run, it is crucial that they carefully examine their particular circumstances and the trade-offs involved in balancing these aspects.

D. Supply Chain Resilience and Entrepreneurial Orientation

Entrepreneurial orientation is a strategic approach that identifies new opportunities and offers unique products, helping businesses become more resilient in the face of environmental uncertainty and disruptions (Al-Hakimi et al., 2022a). It is distinguished by a propensity for innovation, market opportunity creation, risk-taking, and value creation. To assess entrepreneurial orientation, Goail and Al-Hakimi (2021) identify three dimensions: innovativeness, proactiveness, and risk-taking. Lukito-Budi et al. (2022) emphasize the importance of entrepreneurial thinking and work for SMEs to face challenges and maintain resilience. Owners play a crucial role as business leaders, and a strong business leader with high entrepreneurial orientation can effectively regenerate and adapt to changing environments. The connection between entrepreneurial orientation and supply chain resilience has been extensively studied, with scholars highlighting the direct impact of enhancing a company's performance on its ability to handle supply chain disruptions (Al-Hakimi & Borade, 2020; Goail & Al-Hakimi, 2021). Entrepreneurial orientation increases organization resilience, as it enhances their ability to adapt to

changes in a dynamic business environment. SMEs with entrepreneurial orientation are more resilient to environmental changes, and this has a significant influence on supply chain resilience in the dynamic business context (Goaill & Al-Hakimi, 2021). In conclusion, entrepreneurial orientation is a key concept for SMEs, as it facilitates the use of updated and existing market opportunities.

E. Supply Chain Resilience and Internal Integration

Internal integration is the process of aligning an organization's internal tactics, practices, and operations into cohesive, cooperative processes to meet customer demands (Ganbold et al., 2021). It involves a shared sense of values, objectives, and collaborative conduct within the organization (Mandal, 2017). Internal integration facilitates collaboration with suppliers and customers, synchronizing logistics activities and real-time communication (Tarigan et al., 2021; Zhang et al., 2018). This integration improves performance and competitive advantage by enabling departments and divisions to operate together. Improving internal integration and working closely with external partners, such as suppliers and distributors is essential for streamlined processes and maximizing opportunities for material acquisition (Steven & Hotlan, 2022). Supply chain integration refers to the quality of connections within an interconnected business, involving collaboration between a company and its supply chain partners (Tarigan et al., 2021). It involves managing intra-organizational and inter-organizational processes to efficiently integrate various flows, such as tangible, financial, and informational (Tiwari, 2021). Supply chain integration is a major area of focus, focusing on aligning strategic responsibilities and processes within a company and among its supply chain partners. It consists of supplier, customer, and internal integration, which can be identified as external and internal integration (Steven & Hotlan, 2022). It can reduce operating costs and create stakeholder value by linking enterprises in the flow supply chain (Tarigan et al., 2021). Supply chain resilience can be increased by routinely coordinating internal integration across business functions, including purchasing, production, marketing, and finance (Piprani et al., 2020). Integration between the purchasing and manufacturing departments can also speed up the evaluation, development, and selection of suppliers, lower supply risk, improve output and logistics planning, reduce inventory obsolescence, and ensure a responsive and effective supply chain, all of which improve business performance (Zhang et al., 2018).

F. Supply Chain Resilience and Outsourcing

Outsourcing is a crucial business tool for SMEs in today's competitive market, facilitating the development of an effective supply chain (Manathunge et al., 2022). It is a powerful management tool with numerous benefits, especially in reducing expenses and focusing on core areas (Smogavec & Peljhan, 2017). According to Bak et al. (2020), outsourcing can enhance supply chain resilience, as internal and external partners must work together. However, it also enhances supply chain flexibility, supporting firms in their ability to respond to unexpected situations. Outsourcing has become increasingly popular for SMEs to reduce expenses, enhance revenues, and improve owner and manager satisfaction (Smogavec & Peljhan, 2017). However, many large-scale organizations have not used outsourcing in the SME context, highlighting the need for commitment from both external and internal parties context (Bak et al., 2020). Outsourcing provides access to specialized knowledge and skills, especially for those lacking resources to hire and educate specialized workers. However, outsourcing can lead to issues with quality control,

communication, and cultural differences. SMEs should carefully choose outsourcing partners and establish open communication lines to maintain expectations and maintain high standards. According to previous research, it has been established that supply chain interruptions caused by problems with upstream supplies might be regarded as more important than those caused by problems with other supply chain components. Authors can therefore recognize that the outsourcing notion establishes a connection between internal and external stakeholders inside organizations (Manathunge et al., 2022).

III. RESEARCH METHODOLOGY

This study is aimed at exploring the factors affecting supply chain resilience of construction SMEs in a developing country during the economic crisis through the SME database of National Enterprise Development Authority of Sri Lanka. For that, one-on-one structured interviews were conducted on eight participants from the purposive sampling, which was derived from the SMEs that are registered under the National Enterprise Development Authority database. The results of these interviews established the reliability of subcomponents collaboration, outsourcing, entrepreneur orientation and internal integration which derived from the critical literature review which got grouped under five themes and ten codes, and two codes for each theme. Meantime, upcoming sections outline the methodologies employed in this research, including sampling, data collection, structured interviews, data analysis, and brief interview outcomes and results and discussions obtained during the study.

A. Sampling

Given that this research study is based on qualitative data, the researchers employed a purposive sampling method to select respondents for the sample. The scholars Guest et al. (2006) suggest that conducting 6-12 interviews is sufficient to generate insightful themes and valuable interpretations. Following this guidance, the researchers determined the final sample size for the qualitative analysis to be eight well-established SME construction firms registered under the National Enterprise Development Authority. These firms are widely recognized as reputable within the SME construction sector.

B. Data Collection

After recognizing the required sample, authors conducted eight structured interviews via physical meetings and Zoom meetings. Past researcher Turner (2010) has emphasized that employing structured interviews is an appropriate method for collecting accurate and reliable data, particularly for gaining in-depth insights into the study. The authors conducted interviews with the respondents via the Zoom platform, with each interview lasting more than 40 minutes. Additionally, a few face-to-face meetings were also held depending on the respondent's request. By utilizing both Zoom interactions and physical meetings, the trustworthiness and value of the gathered data were ensured.

C. Data Analysis

The data collected was analyzed using manual thematic analysis, as described by scholars (Braun & Clarke, 2006). Thematic analysis involves the identification, reporting, and organization of themes and codes within a dataset. In this study, the unit of analysis was the top-level management of SMEs in the construction field who possess adequate knowledge of the overall supply chain processes within their organizations.

D. Interview Outcomes Briefly

After completing eight interviews during the research period, the authors observed that most of the firms were making significant efforts to enhance their resilience in the face of the economic crisis. This led to the authors reaching a point of saturation in terms of conducting interviews, as the gathered data provided comprehensive insights. The interviews were conducted both through Zoom platform and physical meetings, with each session lasting for over 40 minutes. The decision to use the Zoom platform was driven by the fact that many respondents had busy schedules and were unable to allocate specific time during office hours. Conducting online interviews through Zoom allowed for greater convenience and flexibility. Additionally, visiting the firms in person to collect data through interviews was restricted in most cases due to organizational policies.

IV. RESULTS AND DISCUSSIONS

As authors have mentioned in the previous topics' authors were able to conduct eight insightful and informative interviews with SME construction firms which are registered under the National Enterprise Development Authority. From the interviews, the authors were able to derive 10 initial codes that are useful for the study, and they are presented in. Table 1.

Furthermore, after reviewing the codes authors were able to originate themes that are related to the codes in exploring that, how the variables are influence on supply chain resilience concept with the using of Thematic analysis. After reviewing of the codes that have obtained authors have appropriated organized the themes (Figure 1) according to the six step procedure of the according to the scholars Braun and Clarke (2006) which have developed for the qualitative analysis.

Table 1. Codes derived from the interviews

Codes	Respondents							
	R1	R2	R3	R4	R5	R6	R7	R8
Code 1: SCR Implementation	✓	✓	✓	✓	✓	✓	✓	✓
Code 2: Recovering from Disruptions	✓		✓	✓	✓		✓	✓
Code 3: Information Sharing	✓	✓	✓	✓	✓	✓	✓	✓
Code 4: Expert's Direction and Consultation	✓		✓		✓	✓	✓	✓
Code 5: New Market Opportunities	✓		✓	✓	✓		✓	✓
Code 6: Risk-Taking Ability	✓	✓		✓	✓		✓	✓
Code 7: Customer Feedback		✓	✓	✓	✓		✓	
Code 8: Interconnection Between Departments	✓	✓	✓	✓	✓	✓	✓	✓
Code 9: Supply Chain Performance	✓	✓		✓	✓		✓	✓
Code 10: External Parties' Involvement	✓	✓		✓	✓	✓	✓	

Source: Authors' compilation.

Figure 1. Themes and codes derived

Themes and codes derived from the Thematic Analysis				
Theme 1 – Adaptability of Supply Chain	Theme 2 – Supply Chain Collaboration	Theme 3 – Introducing Innovations	Theme 4 – Organizational Functions	Theme 5 – Involvement of Subcontractors
Codes SCR Implementation	Codes Information Sharing	Codes New Market Opportunities	Codes Customer Feedback	Codes Supply Chain Performance
Recovering from Disruptions	Experts' Direction and Consultation	Risk Taking Ability	Interconnection Between Departments	External Parties' Involvement

Source: Authors' compilation.

A. Adaptability of the Supply Chain

After the completion of interviews, researchers have understood that in the construction sector, SMEs are trying to adopt the resilience concept for their organizations, and this theme has been considered the main area of the study. In the beginning days, these firms didn't adapt to this resilience concept due to there are less number unexpected situations or disruptions that occurred in the market and society. Also, the challenges that businesses are faced are also less. Moreover, with the recent COVID-19 pandemic and current economic crises in the country, most of the firms are looking to be more resilient in their field because day by day these firms are facing many disruptions and challenges. According to detailed information obtained from the respondents, they have specifically mentioned statements about the resilience practices. *“Actually, you know the word resilience, and now it comes into play because it's a scientific word that refers to rebounding”* (respondent # 01). *In this economic crisis, everyone is aware of the positive side of resilience. The crisis affects not only the economy but also the social aspect, as we have seen in Sri Lanka”* (respondent # 02). So, these organizations have used several measures to use this supply chain resilience concept for their organizations to become safer in their continuous operations. *“We cannot find relevant suppliers in Sri Lanka so now with this crisis, we were always connected to the overseas suppliers. Overseas suppliers and, but earlier we were dealing with limited selected suppliers. So that we must know sort of big selection of suppliers right. So that's one of the major changes or major moves that we did during this period. So doing that, we were able to, you know, minimize,*

I mean, minimize the delays towards the customers and become more resilient of supplying raw materials for our construction industry," according to another respondent (respondent # 07). Thereby, authors can determine how the resilience concept has been incorporated within the construction of SMEs in Sri Lanka.

B. Supply Chain Collaboration

When focusing on collaboration, researchers have understood that most of the respondents are given more priority to collaboration because it facilitates interconnection among their organizations and plays a major role within the supply chain of the organization. Also, collaboration helps to work successfully together in the organization to execute the plans successfully and to achieve common goals. As per the responses from the interviews that have conducted throughout the study, respondents have mentioned that information sharing during this economic crisis is a vital factor that we all should considered. It also identified that Without having proper information sharing it is difficult to maintain proper coordination among the related parties within the organization and outside the organization. Most of the respondents have come up with this indicates this through the statements as: *"Information sharing is one of the most important aspects of a business because without sharing the information among the other parties it is difficult to maintain proper communication between other parties"* (respondent #01) and *"for this information sharing, we openly discussed with the staff. actions we must take, so in that case, what we have done was we collaborated with the staff and workers by understanding the situation"* (respondent # 04). Because of that researchers were able to identify that collaboration among the organizations is more than useful for the continuous performance of the organization.

In the meantime, most of the respondents have conducted management conferences and Zoom meetings with the intention of becoming more resilient in this type of crisis by minimizing the unwanted and unnecessary expenses for the organization, *"The main point was in the crisis, we had to minimize our costs, right"? The admin cost, operational cost all there, right. So, we had a lot of meetings with our management team, and we discussed how to reduce operational cost* (respondent #03 and respondent # 05). According to the information form (respondent #01), *"the getting meetings and sharing information we had a lot of meetings like Zoom meetings, the group chats, right. So, sharing the information helps to reduce our main cost. So that's the way we reduce the operational cost, right"*.

When identifying about the experts' opinions and consultation authors have determined that most of these construction firms can get the influence of the organizational and industry experts to become more resilient and overcome this catastrophic crisis period without any damage to their organization *"The consultants and engineers' parties or the client parties are very mature, and they are well-experienced in situations like this. It is the first time Sri Lankans facing a situation like this. That is what we have discussed with the experienced people, and they have given some advice"* (respondent # 06). It also identified that rarely some firms haven't got these expert opinions and consultation for their organization because the number of the firms that have been affected throughout this crisis period is high. Thereby according to the ideas of the respondents' authors can identified that most of the firms are expecting expert opinions for consultation and for the success of the organizations.

C. Introducing Innovations

With the influence of innovations for organizations, the most of SMEs in the construction sector were able to increase their resilience throughout this period of economic crisis. The introduction of innovations, new market opportunities, and the ability to take risks have all been noted by the authors as being crucial for the organization to become more resilient in the face of the current economic crisis. When considering the new market opportunities for the organization, respondents have detailed that information from the mentioned statements: *“Our management formulated an Innovation Committee, which consists of young engineers and general managers, to come up with innovation not only in production but also in processes”* (respondent #08). In this economic crisis, training and education are crucial, as human capital is essential for the survival of any country. We encourage innovation within our organization, and it is a continuous process. Innovations should be less costly and viable. *“Management must give directions to encourage innovation, whether it is a government body or private enterprise. We have encouraged officers and workers to come up with new innovative solutions, especially during this crisis period, and come up with new market opportunities”* (respondent #03).

Furthermore, most of the companies are willing to take risks, even though the SMEs in the construction industry believed that it would be difficult, according to the organization's point of view, to exist in the market without taking risks. This was another finding made by the authors throughout the interview process. The top management of the relevant organizations at the supply chain level commented on this based on the statements listed below. (Respondent #05) elaborated on the same opinion by stating, *“I think to perform continuously, we have to take the risk. Without having risk, we can't go ahead and do business. You must take risks other than I mean, you can do business without taking risks. So, it's a part and crucial of our company as well.”* Moreover, as per the (respondent #08) it has elaborated the statement that *“you know by taking risks we have some what we think by taking risk we can maximize our gain also maybe profit also and vice versa. So, but we always try to take risks, and by taking risks, we try to maximize our gains as well”*. Because of these points that have already been explained, authors can identify that risk-taking ability and introduction of innovations should be mainly focused on being resilient in this critical time.

D. Organizational Functions

When focusing on organizational functions which are related to internal integration such as customer feedback, the interconnection between departments is also considered an essential for the SMEs construction sector during this economic crisis period. Throughout the interview process researchers have investigated that these factors are also critical to become more resilient for these industries. With the use of internal integration within the organization, it will be able to measure how well a business can coordinate its operational strategies, policies, and behaviors to meet customer expectations. Also, interconnection between departments, help to identify the inventory availability, and main supplier information and maintain the relationship among with other departments. The authors have identified these facts throughout the interviews and have illustrated above mentioned statements about how customer feedback was used to manage the resilience of the organization, as stated below.

“I think during the crisis, a lot of disruptions were there. I can't remember any example anyway; customer feedback is very important otherwise can't continue the business” (respondent 02). *“We must ensure that our clients are happy with our services,*

and we receive their feedback. Therefore, it was crucial to interact with them and keep them informed about the crisis. We arranged many meetings with clients and even had to go and meet ministers to explain our problem and find a solution. In a nutshell, interacting with clients and suppliers is essential during a crisis. Misunderstandings can occur, but clear communication can help to solve the problem” (respondent 03).

According to the respondent 04 it has showed that *“I mean, customer feedback is one of the most important aspects in the business. Objective for our goal is towards the customer is to satisfy the customer according to satisfaction. So that is the most important, aspects in any kind of business, because without satisfying the customer, we cannot survive. To know whether the customer is satisfied or dissatisfied or maybe partially kind of satisfied. So, it's important to have the customer feedback, right?”*. *“Yeah, whatever the job completed as the management level we contact customer and get customer feedback regarding the workmanship and the services. Right. So based on that if they, if they need any other the supply or the service additional services, we are willing to provide, we were willing to provide that right”* (respondent 05). *“So, what we are doing is, as I inform you, once we get the feedback from the clients, we will work separately, and we integrate it. How we should change, or we should go with our own way, so that helps a lot to share the resources”* (respondent 07). Therefore, according to the explanations that have been mentioned above, researchers can determine how customer feedback and interconnection between departments are more useful for organizations to become more resilient during this economic crisis period.

E. Involvement of Sub-Contractors

Most of the chosen SMEs in the construction sector are using outsourcing as a key component of their operations. Authors have identified that because of the economic crisis, many firms are giving priority for the outsourcing of their activities, while only a small number of organizations fail to use the outsourcing concept for their organizations. With the use of this outsourcing tactic, firms can reduce the number of employees they have, which helps to reduce the costs for business activities. They can also maintain proper supply chain performance, increase efficiency, and be more flexible when performing tasks, and avoid spending more money on internal capital because operations are carried out by third parties. Most respondents have elaborated this as evidenced by their answers to such questions as: *“Outsourcing is also one of the important aspects of our business, we consider price in the financial pathway. We measure it in terms of that, you know project-wise and quarterly, annually we measure all these financial things”* (respondent # 04 and respondent #08).

Moreover, it has been identified that from the clarification of two respondents, some of the companies also reduce the use of outsourcing, according to the researchers' questions. The main cause, which was determined that during the crisis, people are unwilling to outsource their activities due to a shortage of funds and reserves. Instead, they prefer to run their businesses internally and anticipate a decrease in the amount of money that leaves the organization for third parties. Because of this, firms participate in internal operations rather than outsourcing as a resilient technique. And few respondents have illustrated this in the following manner: *“So, as a cardinal rule in the economic crisis, we never went with outsourcing. Wherever possible, we always try to do it in-house. The main reason for this was that even our fleet and staff were redundant, so there was no point in outsourcing business when we were paying them more”* (respondent #06 and respondent # 08). Moreover, by understanding the above explained statements, it can be

understood that many of the SMEs in the construction sector are using outsourcing as a key variable for the organization, and few companies are not willing to use outsourcing as a key variable.

V. CONCLUSION

In this study, the authors explored the Influencing factors of construction SMEs supply chain resilience: a case Sri Lanka during economic crisis. The primary objective of this paper was to investigate the influence of collaboration, entrepreneurial orientation, internal integration and outsourcing on the supply chain resilience of SMEs in the construction sector in Sri Lanka, specifically during the economic crisis in 2022. Throughout the study, the authors have clearly emphasized how collaboration, entrepreneurial orientation, internal integration, and outsourcing will be influenced by business activities and how those factors will contribute to organizations. Therefore, successful implementation of the factors will lead to overcome the unexpected disruptions for the construction sector SMEs and become more resilient during the pandemic situations and in unexpected situations. Finally, by maintaining proper supply chain resilience practices along with the factors of collaboration, entrepreneurial orientation, internal integration, and outsourcing, it will be able to perform continuously in the market of SMEs which belong to the construction sector for many years significantly without any problems.

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