Impact of sustainable supply chain management on performance of SMEs amidst COVID-19 pandemic: an Indian perspective

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Abstract: The disruption caused by COVID-19 along the rapidly changing business environment coupled with the supply network complexity may trigger unforeseen disruptions and make supply chains vulnerable to financial losses and in extreme cases, it leads to a firm shut down. The research is an effort to introduce a conceptual model to evaluate sustainable practices and dynamic capabilities to ensure performance in a disruptive environment. Determinants were identified from the literature for the study of Sustainable practices and capabilities during disruption and uncertain business environment and are based on the concept of the triple bottom line. A research survey collected data from 153 consumer goods SMEs. structural equation modelling (SEM) has been used to analyse the structural model proposed. The analytical outcomes of this research contribute to the existing literature and enable practitioners to design and implement sustainable supply chain activities and monitor and evaluate the impact of such activities on business sustainability among Indian firms.

Keywords: firm sustainability; supply chain disruptions; developing countries; survivability; sustainable supply chain management; COVID-19; India.

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1 Introduction

Due to the prolonged effect of the COVID-19 pandemic, SMEs had severely faced difficulty in operating routine business and supply chain activities. Variety of operational challenges includes liquidity crunch, delay, or halts in production activities due to long time shutdown of production sites, resizing the labour workforce, non-availability of raw material, and low demand. SMEs are not able to meet the market targets and delivery schedules. These issues have brought SMEs into a critical situation towards the right balance between survivability and sustainability, from a long-term perspective. Various governments have initiated financial remedies including subsidy and tax exemptions to bring back SMEs to normalcy. The COVID-19 caused disruptions in value chains that do not only affect the demand-supply equilibrium but have a far-reaching consequence with a negative impact on finances, operations, and the firm's reputation (Karmaker et al., 2020; Bui et al., 2021; Luthra et al., 2021). The supply chain risks generated due to the disruption have rubbed off on other functions and the global competitiveness of a company now largely depends on an efficient supply chain (Joshi, 2015a, 2015b; Joshi and Sharma, 2018). Thus, the assessment of risks and taking necessary actions to manage

them has become inevitable to have survivability and sustainable growth (Joshi and Sharma, 2021c; Sharma et al., 2020). Thus, the amidst COVID-19 era demands that the businesses should acknowledge the inter-influence of supply chain risk management and sustainability and should view them together and not as disjointed pursuits (Juergensen et al., 2020; Karim et al., 2021; Zhang et al., 2019). In developing countries like India, the rapid disruptions challenge can be faced by an SME that having limited access to resources, markets, and information, though essential for growth, does not guarantee sustainable development (Joshi et al., 2017, 2020b; de Moura and Saroli, 2021). Thus, the supply chain needs to build up internal flexibilities to adjust to the disruptions based on a variety of disruption management techniques (Singh et al., 2020; Joshi and Sharma, 2018). The worldwide expansion and technological advancements have transformed the conventional supply chains into a more advanced multi-tier complex system (Ruel et al., 2021; Joshi, 2015a; Joshi et al., 2020a). The global distribution and supply base along with competitive advantages has also exposed the companies to a notable set of risks. SMEs' Supply Chain continuously facing new challenges due to uncertainty caused by COVID-19 disruption, which challenges route supply chain operations like economic recessions, pandemic situations like COVID-19 (Rana and Joshi, 2020; Alam et al., 2021; Sarkis, 2021; Shanker et al., 2021). As the disruptions occur abruptly, many times without forewarning, so special know-how is required to sense the disruptions, strategize and plan to put the things together, and develop Sustainable Supply Chain management practices that configure and reconfigure the assets to achieve sustainability (Bag et al., 2021a; Baral et al., 2021; Bodenheimer, and Leidenberger, 2020; Chowdhury et al., 2021; Dolgui and Ivanov, 2021; Joshi and Sharma, 2021a). From a long-term perspective, strategic planning needs to integrate relevant information, comprehensive ideas, intra-organisational, and inter-organisational behaviour, and business goals involved in developing sustainable supply chain practices (Bag et al., 2021b; Bui et al., 2021; Canhoto et al., 2021; Chowdhury, and Paul,2020; Joshi, 2013; Joshi, 2015b). The past studies have demonstrated that non-adherence to sustainable practices (SSCMP) has led to the wrong decision, which adversely affects the competitive advantage, and results in a decrease in shareholder value (Bag et al.,2021c; Corrales-Estrada et al., 2021; Dyduch et al., 2021; Joshi and Joshi, 2016; Joshi, 2018). Udofia et al. (2021) discussed the impact of the supply chain disruption on organisational productivity, customer satisfaction, and overall organisational performance. As expounded by triple bottom line (TBL) phenomenon, a sustainable firm has to associate its operations to maintain profits, ecology, and social sustainability. During COVID-19, firms are planning to continuously engage themselves in social sustainability (Eikelenboom, and de Jong, 2019; El Baz and Ruel, 2021; Foo et al., 2018; Gupta et al., 2021). Across the world, the industries are suffering the economic distress caused due to long-run industrial lockdown. In both developing and developed countries, Lockdown virtually creates temporary shutdowns of most of the industries; obtaining sustainability is not only a course of action to achieve cost reduction, to survive amidst COVID-19, and to gain subsequent profits. In addition, it becomes a source of long-lasting profitability due to the value maximisation of stakeholders (Gregurec et al., 2021; Handfield et al., 2020; Joshi et al., 2018, 2021). Thus, Sustainable Supply Chain Management practices amidst COVID-19 need to be more comprehensively based on environmental and societal aspects along with economic indicators to facilitate sustainable development (Haneberg, 2021; Hazen et al., 2015;

Hong et al., 2018; Joshi et al., 2020; Kumar et al., 2020). Particularly, in developing countries firms can sustain through supply chain disruption caused by COVID-19 by synergistic integration of SCM and SSCMP (Karmaker et al., 2020). The business environment is ever-changing and largely influenced by disruptions and brings disequilibrium in demand and supply and adversely affects sustainability (Karmaker et al., 2021; Prakash et al., 2020; Sharma and Joshi, 2019a). Thus, operational planning and supply chain practices are required to be performed in such a way that the safety, security, and sustainability of the organisation remain unaffected (Shahi et al., 2021; Sharma and Joshi, 2019b).On the contrary, the organisation's risk and associated factors are critically important and require regular monitoring of existing operational strategies and contribute to the consistent development of management abilities to handle the existing and the new generated risks (Sharma and Joshi, 2019b; Robertson, et al., 2021; Ramos et al., 2021; Ju et al., 2016; Kamble et al., 2019). Thus, the dynamic capacities of the firm can help it to build resilience to survive against risk (Hernández-Linares et al., 2021; Kusrini and Maswadi, 2021; Lu et al., 2021; Prasad et al., 2015). In amidst COVID-19 world, firms must attempt to experiment with a wider category of the new form of strategies and procedures for long-range survivability and risk management practices (Yang et al., 2021; Sharma et al., 2021d; Sharma et al., 2020b; Stekelorum, 2020; Tondolo et al., 2014; Tripathi and Joshi, 2019). During the extreme uncertainty situation, a responsive organisation should develop a mechanism of generating, storing new information (both internally and externally), understanding customer dynamics, introducing innovative products and processes, increasing supply chain coordination, and enhancing network relationships to deal with the internal and external vulnerabilities (Mckinsey, 2020). Allied industries including SMEs should invest their resources to enhance survivability for uncertain business environments. For SME's performance from a long-term sustainability perspective, it is important to understand external disruptions and to develop a variety of dynamic capabilities (DC) including collaboration, technology adoption, and knowledge creation through strategic planning to reshape and promote awareness among supply chain stakeholders (Sharma and Joshi, 2019c; Sharma et al., 2020a, 2020c; Teece, 2014). Thus, SME firms must develop special strategies and perform business model innovation to cope with the market challenges. This special knows how is termed as Dynamic Capability of a firm (Mathivathanan et al., 2017; Sharma and Joshi, 2020a; Sharma et al., 2021e; Teece, 2021). Recent studies have indicated that firms adopting SSCMP, and dynamic capability have accomplished improved firms' socio-economic and ecological performances during the uncertainty that arises due to pandemics (Tripathi, and Joshi, 2019; Queiroz et al., 2020). To generate responsive and sustainable supply chains, a firm needs to enhance its risk management and spend more resources to build DC to survive and trim down the effect of disruptions (Sharma and Joshi, 2020b; Schleper et al., 2021; Prasad et al., 2015; Udofia et al., 2021). Although the subject can grab attention from researchers, however, the studies co-joining the risk management and sustainability are very few. COVID-19 has adversely affected the economic and social component of the SMEs ecosystem and has brought huge pressure on their supply chains to develop and adopt for 'new-normal'. The paper aims to address the research questions below:

RQ1　What is the level of acceptance of sustainable practices in SMEs amidst COVID-19?

RQ2　How DC can enhance the sustainability and survivability of SMEs?

Thus, the research paper is an attempt to investigate the level of acceptance of SSCMP in SMEs in their supply chain considering COVID-19 and also explore how DC enhance the survivability of SMEs in developing countries. The study also highlights that for countries like India, how this adoption has led to enhanced performance of the firm aiming to achieve economic accomplishments, environmental protection, and more social responsibility. Thus, the present research is contributed to the theory, research methodology, and practice by exploring a new research dimension in context to survivability for SMEs post-COVID-19 situation. The structure of the paper includes Section 2 explained existing literature work on sustainable supply chain management and uncertainty. Section 3 theoretical framework related to supply chain sustainability and performance during COVID-19 and research hypothesis. Section 4 explains PLS-SEM techniques deployed in the study. Section 5 discussed the insinuations of the study. Section 6 explores the outcome of the study and its limitations.

2   Review of literature

This section describes important constructs of SSCM practices and performance during times of uncertainty that may help develop survivability strategy and also in developing resilience amidst pandemics. Past research in the area of SSCMP and performance and key factors that enhance the survivability of supply chain operations and overall operational performance through DC amidst the COVID-19 pandemic are also discussed in this section. Thus, a variety of factors that accumulate affect the sustainable performance of supply chains are determined through existing literature. Questions were framed related to the 'Sustainable Supply Chain Management practices', 'Disruptions' and 'Survivability strategies' during COVID-19. The 'Scopus', and 'IEEE explore' databases were explored for the process of systematic literature review. Following Tranfield et al. 2003, a systematic literature review was conducted to know the development and performance of SME supply chains during COVID-19. Various search combinations were carried out using various keywords including, 'small and medium enterprise' and 'sustainable supply chain management' and 'disruption' and 'COVID-19' and 'sustainable business performance'. Only 'article' document types were selected. The time selected for the systematic literature review is '2010–2021'. The study is the study on SMEs during the COVID-19 pandemic from the viewpoint of a developing economy. Since the study aims to focus on SME's sustainability potential during the COVID-19 duration, thus both primary and secondary data are collected during the time since the pandemic starts till July 2021. From the selected papers, constructs for a sustainable supply chain during uncertainty were determined. The procedure involved experts in the domain to authenticate the key constructs followed by an evaluation of each construct to recognise the impact of sustainable supply chain practices in the performance of SMEs amidst COVID-19. The literature on 'sustainable supply chain management' and 'uncertainty' has systematically grown in the last few years (Bentahar and Benzidia, 2018; Govindan et al., 2020). In the initial research on the subject, there was a focus on thematic discussions and the development of conceptual and theoretical frameworks (Pu et al., 2021; Sharma and Joshi, 2021c; Sharma et al., 2021a; Moretto and Caniato, 2021; Namdar et al., 2021; Sharma et al., 2020). Gradually few research focused on
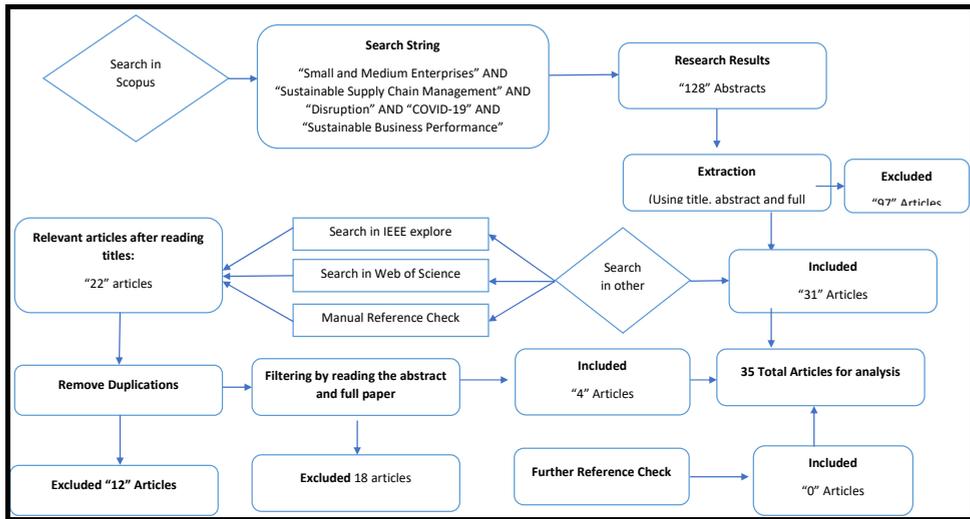
decision making during uncertainty using case study analysis (Al-Haidous and Al-Ansari, 2020; Hendiani et al., 2020). Studies ranged discussed various dimensions of sustainability and the impact of uncertainty. Namely, Environmental Sustainability (Chen et al., 2010; Yi et al., 2019; Sharma et al., 2021f; Nasir et al., 2021), economic sustainability (Yu et al., 2019; Sharma et al., 2021g), social sustainability (Persis et al., 2021; Wang et al., 2021) and in combination (Sharma et al., 2021g). Few studies focused on thrust issues and challenges of SMEs in developing economies (He et al., 2020; Mani et al., 2020; Sabuj et al., 2021). Recently there has been a focus on empirical studies on sustainability risk triggered by the COVID-19 endemic (Nayal et al., 2021; Papadopoulos et al., 2020; Patma et al., 2021). Flexibility planning during the operations makes supply chains sustainable, agile, and more responsive (Ramos et al., 2021; Singh et al., 2020).

2.1 SMEs during COVID-19 pandemic: a developing economy perspective

In India, SMEs contribute towards nurturing equitable economic growth, but also in employment generation, to reduce regional disparities, and enhance the export potential of the parent company (Ding et al., 2021; Rana and Joshi, 2020). But COVID-19 has caused massive losses to SMEs and compelling critical actions for the revival (Ghosh et al., 2021). The COVID-19 has brought new threats to the SME sector with a variety of insuperable challenges including liquidity crunch, low motivated workforce, and supply chain disruption, adverse effect on import and export perspectives, and so on (Gupta et al., 2021; Sharma et al., 2020a). Considering the severe impact of COVID-19 spread on SMEs' supply chain, researchers have increasingly started paying attention to this topic since the inception of the pandemic (Chowdhury and Paul, 2020). Baral et al. (2021), determined survivability as a significant indicator for firm-level strategies by SMEs. Nasir et al. (2021) explained contextual relationships among various constructs including digitalisation for the supply chain viability of SMEs in an emerging economy. Further, Papadopoulos et al. (2020) highlighted the role of digital technology in enhancing competitiveness, productivity, and performance in small and medium enterprises. Adoption of technologies including Artificial Intelligence, Internet of things, blockchain, big data analytics, SSCMP to enhance overall productivity, cost reduction, and improvement in customer satisfaction (Sharma and Joshi, 2021; Sharma et al., 2021a; Sharma et al., 2021b; Kamble et al., 2019). Few adoptive measures strategic planning, innovations in SMEs to counter the pandemic situations successfully and to achieve reasonable sustainability (Shanker et al., 2021; Sharma and Joshi, 2020). Attaining incremental innovation in existing supply chains for long-term growth and sustainability considering the post-pandemic situation shall provide SMEs various abilities including visibility, transparency, network abilities, and creation of trust among parties, through co-creation, process integration (Joshi and Sharma, 2021; Joshi et al., 2018). SMEs requires suitable support and guidance by researchers, professional, and practitioners in the manufacturing and distribution, in the direction of developing strategic roadmaps for survivability and sustainability amidst the COVID-19 pandemic. At the same time, SMEs have to create momentum through robust and appropriate processes that ensure sustainable supply chain operations to meet post- pandemic business requirements through crisis management and business continuity plans.

Table 1 SSCMP constructs for sustainable Supply chain performance of SMEs amidst COVID-19

Constructs	Sustainable supply chain performance of SMEs amidst covid-19	References
Sustainable coordination and trustworthiness among supply chain partners	Managing supply chain disruptions caused due to covid-19 through stakeholder involvement and adoption of crisis communication strategies. Identification of suitable communication resources by SMEs to interact with focal firms and other partners for flawless real-time information, knowledge, and exchange of strategic plans related to supply chain decisions. SMEs can initiate Collaborative innovations and co-creation for 'customized' value-added products to fulfil the changing demand during emergencies raised by covid-19.	Sharma et al. (2021a), Bodenheimer and Leidenberger (2020), Bui (2021) and Handfield et al. (2020)
Sustainable learning amidst a covid-19 situation	SMEs should develop themselves as a sustainable learning organisation and keep disseminating the knowledge to their partners to bring harmony in SC activities. The deployment of industrial innovations and business model transformation may allow SMEs to survive in a highly changing business situation. SMEs should reinvent, invest and co-create their enablers to adopt digital technologies.	Baral et al. (2021), Gregurec et al. (2021), Sharma et al. (2021b) and Schepers et al. (2021)
Sustainable strategic orientation	For creating a balance between sustainability and survivability during uncertainty, SMEs should develop strategic thinking among decision-makers. It will help the firm to maintain continuous improvement in supply chain performance.	Gregurec et al. (2021), Pu et al. (2021) and Patma et al. (2021)
Risk management and sustainable supply chains	Practices to ascertain and manage supply chain-related risks in SMEs are essential as they play a vital role in nurturing resilience and agility in the supply chains. Amidst covid-19 SMEs are focused on experimenting with various ways of survivability of the supply chains. Covid-19 disaster caused disruptions in supply chain activities and their management through flexibility, mitigation measures, and forecasting.	Baral et al. (2021), El Baz and Ruel (2021) and Moretto and Caniato (2021)
Supply chain continuity	Resilience strategies for SMEs are identified under four dimensions viz., expectancy, planning, Sturdiness, and recovery measures. Technological integration in SMEs plays a vital role in sustainable supply chain resilience and ensures continuity.	Sharma et al. (2021c), Namdar et al. (2021) and Wang et al. (2021)
Supply chain dynamic and disruption management capabilities	Variety of methodologies SMEs use a variety of techniques including optimization, network analysis, theory of constraints, resource-based view, etc Amidst covid-19 pandemic viability in the supply chain, restructuring, and reconfiguration of the existing supply chain. Viability in the supply chain emerged as the key concept and practice among SMEs during and after the covid-19 situation.	Dolgui and Ivanov (2021), Ruel et al. (2021) and Yang et al. (2021)

Figure 1 Flow diagram for study selection and characteristics

Under Section 2, the literature review is further classified into various aspects of supply chain management, disruption, and SSCMP.

2.2 Supply chain survivability and risk management

Conceptually, supply chain management (SCM) is the systematic movement of material, information, and money across the industry partners (Erboz and Szegedi, 2020; Turken and Geda, 2020). Various authors in the recent past investigate and discuss various issues related to sustainability and its influence on the Supply Chain performance of the firm (Sharma et al., 2021c; Erboz and Szegedi, 2020; Yang et al., 2020). The uncertainty generated due to the COVID-19 pandemic and disruption generated across Supply Chain Management is being discussed by Matos et al., (2020). The researchers synergistically combined the Supply Chain Survivability framework with theories and goals of sustainability and referred to it as Sustainable Supply Chain Management (Carter et al., 2020). The amidst COVID-19 supply chain structure can be viewed considering long-term sustainability with a simultaneous focus on trio dimension of social, economic, and ecological aspects give rise to the much-referred sustainable supply chain survivability (Majumbar et al., 2020). Thus, sustainability of the supply chains is a key prerequisite for achieving competitive benefits post COVID-19 (Joshi and Sharma, 2021a, 2021b; Juergensen et al., 2020; Karmaker et al., 2021; Kusrini and Maswadi, 2021). The stakeholders expect sustainable products and practices from management (Machek et al., 2021; Joshi et al., 2020). During uncertainty, the supply chain managers need to practice such strategies for production, procurement, and distribution which is not only cost-effective bringing in monetary benefits, but practices should include environmental sustainability and social responsibilities (Padhi et al., 2018). A Sustainable Supply Chain Management must lead through SSCMP to overcome challenges imposed by emanating risks of environmental concerns (viz., energy consumption, pollution emissions, waste management, carbon footprints) and social matters (viz., working conditions, wages, employee benefits, labour relations, corruption, gender parity (Padhi

et al., 2018). Considering the high vulnerability in a business environment, the abuse of any factors of the three pillars of sustainability can trigger many risk events affecting its long-term viability (Shahed et al., 2021).

2.3   *Dynamic disruption management capabilities (DDMC)*

The consistently changing environment is earmarked with the occurrence of diverse disruptive uncertainties (Bui et al., 2021). These catastrophic events cause disruptions to the supply chain and the chain must anticipate these vulnerabilities and practice daily management of these risks to eventually overcome the threat imposed (He et al., 2020). The dynamic capability of the firm aims to improve continuously through routine actions during uncertain business environments (Nayal et al., 2021; Padhi et al., 2018; Ramos et al., 2021; Robertson et al., 2021). Firms focusing on SSCMP in the supply chains cannot have static positioning. To maintain sustainability, firms have to regularly build up competencies to take into account the ever-changing market dynamism (Teece, 2014, 2021; Tondolo and Bitencourt, 2014; Tranfield et al., 2003) and change, adapt and reconfigure themselves to continuously adjust to market complexity and unpredictability (Ketchen and Craighead, 2020). The recent literature has pointed towards the positive significance of DC of Supply Chains in sustainability and the overall performance of the firms (Bocken and Geradt, 2020; de Moura and Saroli, 2020; Isnaini et al., 2020).

2.4   *Supply chain sustainability and performance amidst COVID-19*

The existing approach to managing supply chain disruptions are cost-intensive (Sharma et al., 2020a; Udofia et al., 2021). Although, recent studies have updated the fact that for long-term improved sustainability it is essential that social accountability and ecological conservation should not be ignored and ought to be given equal weightage in the normative world (Mani et al., 2020). Traditionally, firms make afford to focus on financial performance, however, with the advancement of sustainability, it became critical to include paradigm of social equitability and ecological balance as well. Therefore, to have a more meaningful and reliable measure of firms' performance in terms of long-term sustainability is imperative to synthesize all three dimensions, which is commonly referred to as TBL performance (Turken and Geda, 2020). Few types of research have taken into account the triple dimensional performance measure (Majumdar et al., 2020; Patma et al., 2021).

For sustainability in a Supply Chain, the significance of social inclusion and firm-level social responsibility plays a vital role. During turbulent times, Supply Chain reconfiguration can enhance communication, stakeholder awareness, information transparency, and goodwill of the firm (Finsterwalder and Kuppelwieser, 2020). It also helps the firm to troubleshoot challenges related to equilibrating resources due to a shortage of material, labour, and fund supply for performing operating activities. The health and safety of the workforce and customers are emerging as the key concern for the firms engaged in supply chain activities during the COVID-19 pandemic (Gregurec et al., 2021). The existing literature on resilience has practically very few studies that have linked risk management to sustainability (Dolgui and Ivanov, 2021; Ruel et al., 2021). The combined effect of sustainability and DC in managing disruptions to generate sustainable performance has received scarce attention. The study of the literature revealed that mostly the studies in sustainable performance and DC had focused on only one

dimension of Sustainability at one time (Hammervoll et al., 2012; Hong et al., 2018; Kumar et al., 2018; Shan et al., 2020). There is a shortage of research concentrating on all three perspectives of the TBL concept. Although the uncertainty arises due to Supply Chain Disruption, every dimension of Sustainability should be focused equally (Udofia et al., 2021; Shahed et al.,2021). The review further highlights the dearth of empirical research especially in the context of emerging economies. The present research picks up the missing links as identified in the review of the literature and attempts to study the level of implementation of SSCMP in the Indian SMEs' supply chains during the COVID-19 situation and to further analyse the combined effects on survivability and sustainable performance of the firm.

3 Theoretical frameworks for the dynamic capability of SME firms, their supply chain sustainability and performance during COVID-19

The term DC can be explained as the ability of a firm to reconfigure in the competition and fluctuating environments. It increases the firm's competencies through identification, achievement, and transformation. A firm's strategic potential can help to achieve DC (Teece, 2014). Past research show inter-linkage between business activities, resources, and DC to create competitive advantage (Tondolo et al., 2014; Zhang et al., 2019). The COVID-19 bring supply chain disruption and there is an emerging need to create resilience capability among SMEs from the viewpoint of the dynamic capability theory (Teece, 2021), as an extension of Resource-based view (Wu, 2020) through DC for effective enhancement using competitive advantages in a highly disruptive environment. Nayal et al. (2021) used the dynamic capacity theory as a coping mechanism for stakeholders of SMEs for digitalization, and sustainability. Past studies indicate that supply chain DC positively influence the operational performance of SMEs (Ju et al., 2016; Stekelorum et al., 2018; Joshi, 2013). Sustainable Supply Chain performance is demarcated amongst operational capabilities, substantive capabilities, and DC. The DC enhance the sustainability of supply chains and SMEs performance (Mathivathanan et al., 2017; Hong et al., 2018). Although, various themes for Sustainable Supply Chain Management practices (SSCMP) during uncertainty were identified through the extensive review of the literature (Baral et al., 2021; de Moura and Saroli, 2020; Dyduch et al., 2021). Amidst COVID-19, For developing countries, SME's ability to maintain sustainable supply chains is depending on its dynamic capability's efficacy. Recent research argue that DC can bring competitive advantage to an SME by developing flexibility, integration, and agility during the post- COVID-19 era (Ramos et al., 2021). A few studies have focused on the development of a dynamic strategic plan to periodic evaluation of the Survivability and sustainability of SMEs in post- COVID-19. Sarkis (2021) discussed that SMEs should focus more on environmental sustainability in short and mid-range organisational activities, although the long-range planning towards sustainability is still a challenge. According to Sharma et al. (2020), Supply Chain Network viability has become an important element for sustainable buyer-supplier relationships that can enhance the survivability of SME's supply chain amidst COVID-19. Whereas, in another study by Karmakar et al. (2021), various drivers are explored that improve the supply chain sustainability of firms in developing countries. Financial sustainability is determined as the key driver among supply chain actors for effective information and material flow during the COVID-19 situation. Kusrini and

Maswadi (2021) discussed key indicators that can ensure the sustainable performance of SMEs, namely, adaptability, improvement in employee health, and sustainable supplier management. Based on the exclusive literature review on dynamic capability for firm-level survivability and sustainable supply chains, the themes for the SSCMP constructs for the present were obtained.

3.1   Supply chain DDMC

Sustainable development in light of complexity and vulnerabilities calls for a certain level of abilities of an SME firm that are not static but are dynamic enough to withstand the challenges thrown by the ever-changing business ecosystem (Baz et al., 2021; Ruel et al., 2021). Yu et al. (2019) have explained dynamic ability as the operational ability of a firm to readjust with demand volatility, that results in sustainable growth and business performance. The conventional supply chains are lack resilience and sustainability orientation. The inclusion of DC in SMEs' supply chains becomes inevitable considering the industrial competition in the VUCA world (Troise et al., 2022; Persis et al., 2021). The DC bring organisational agility and enhance the SMEs' financial and product and process innovative performance (Troise et al., 2022). The DC can be viewed as the competency of the SME to reconfigure resources in face of approaching opportunities and threats, thus adapting swiftly to the risks and vulnerabilities, and creating competitive advantage (Teece, 2018). DC are a dominant concern for researchers. Although research shows dynamic capacity alignment for SMEs. Thus, a holistic practice-driven system can be developed in SMEs specific business strategies (Corrales-Estrada et al., 2021). Supply chain DC affect the business transformation processes across multiple industries (Canhoto et al., 2021; Qvarfordt, and Aadan, 2021). The themes of Sustainable dynamic disruption capabilities were gathered from extensive literature review and the key constructs of DC in line with our objective are summarised as below:

3.1.1   The sustainable capability of knowledge absorption

The challenge to mitigate the supply chain vulnerabilities requires the development of the capability to dynamically solve the problems by recombining the existing knowledge and acquiring and utilising new knowledge (Cunha Filho et al., 2021; Robertson et al., 2021). Acquiring, retaining, interpreting, and integrating knowledge by the supply chain managers serves as the source of adoption and renewal to the changing market dynamics and becomes a competitive advantage (Baz et al., 2021; Tseng and Lee, 2014). Knowledge absorption plays a substantial role in understanding the nature and character of crisis and helps small firms to respond quickly to future disasters in a more flexible and adaptive form. Thus, knowledge absorption can comply with the crisis management and DC of SMEs (Haneberg, 2021).

3.1.2   The sustainable capability of demand oriented perception

The firm's capability to perceive the market demand helps the firm in acquiring knowledge and skills to navigate through the market vulnerabilities and in the process gain a competitive advantage. It is the competency of the firm to react to the market dynamic shifts with a focus on sustainable growth (Bharadwaj and Dong, 2014). Amidst COVID-19 most small firms are inclined towards understanding their sustainable

capability and formulating sustainable policy and assessing their impact during normal and time disruptions (Juergensen et al., 2020; Joshi and Sharma, 2021; Lu, et al., 2021)

3.1.3 The sustainable capability of Innovation

When confronted with unexpected and powerful events the market dynamism calls for companies to continuously replace, rebuild new, and transform their internal abilities, technologies, systems, and processes. The innovation capability as a dynamic capability helps a company to take transformative actions and prepares firms to adjust to the changing conditions (Teece, 2017) quickly and flexibly. The innovative capabilities for a sustainable supply chain can be enhanced through innovative ways of financing, digital and technology adoption, and enhanced customer experience (Joshi et al., 2021). Government support also plays a significant role in developing a dynamic strategy for adopting a new form of innovation and transforming that into sustainable capabilities (Pu et al., 2021).

3.1.4 The sustainable capability of renovation

SME firms are constantly involved in monitoring the changes and developing sustainability and resilience to enhance business continuity (Corrales-Estrada et al., 2021). The change in the ecosystem insists form to develop the internal ability to respond to such risk and restore from the disruptive jolts (Nasir et al., 2021). This dynamic capability nurtures the capability of the firm to efficiently absorb and mitigate the negative impacts of potential vulnerabilities threatening to jeopardise the continuity or longevity of the firm (Brusset and Teller, 2017; Teece, 2017).

3.1.5 The sustainable capability of social network enhancement

The internal and external social network of a firm is wrought with potentially hazardous challenges with the ability to disrupt the entire business functioning. Supply Chain firms try to inculcate and promote healthy relationships with all the active and inactive members of the supply chain who may influence the firm's business prospects (Hong et al., 2018; Joshi, 2018). According to Effendi et al. (2020) and Patma et al. (2021), the decision of adoption of social media by SMEs is significantly affected by various dimensions viz., technology, organisational, environmental. And social media awareness. The study shows that during the critical time of the emergency role of government plays a critical role in the adoption of social media technology.

3.1.6 Firm's sustainable performance

Though the literature is abundant and replete with studies of DC and sustainable performance of SMEs (Hernández-Linares et al., 2021; Joshi et al., 2020d), however as highlighted by Liboni et al. (2017), the true measure of sustainability in turbulent times is reflected in the Triple bottom-line measure of performance, which is a relatively less studied area (Sharma et al., 2021c). Hence, this study takes into account all three perspectives of sustainable performance.

3.2   Theoretical framework

A framework has been developed to study the interrelationships of the three major determinants SSCMP, DC's, and organisation performance (Hong et al., 2017). The basic purpose of the proposed research model is to analyse how the implementation of SSCMP and DC's influence the performance of the firm (Bag et al., 2021a; Conz and Magnani, 2020). The framework further analyses if the involvement of the company in SSCMP implementation also results in the development of DC of the company and supports previous research (Bailey, and Breslin, 2021).

Figure 2   Theoretical framework (see online version for colours)
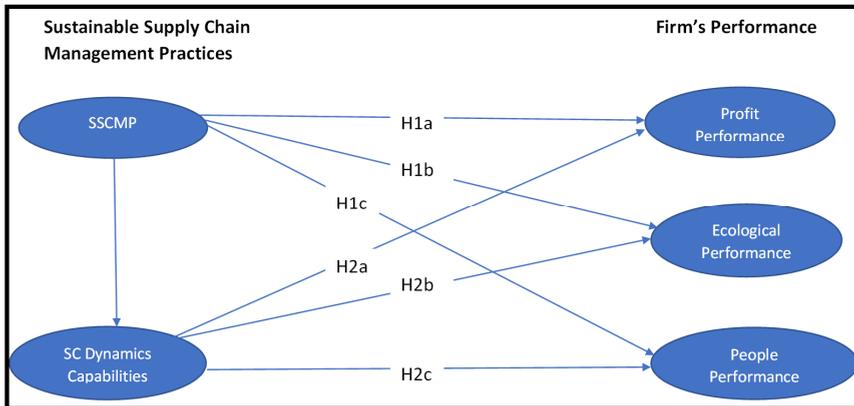
3.3   Hypotheses

Based on the framework the following hypothesis has been postulated to test the proposed inter-relationships of the three determinants.

SSCMP and firm's performance:

H1   Firms overall performance is positively influenced by SSCMP.

    H1a   Firms Profit performance is positively influenced by SSCMP.

    H1b   Firms ecological performance is positively influenced by SSCMP.

    H1c   Firms people performance is positively influenced by SSCMP.

S-C DC's and firms' performance:

H2   Firms overall performance is positively influenced by S-C DC.

    H2a   Firms profit performance is positively influenced by S-C DC.

    H2b   Firms ecological performance is positively influenced by S-C DC.

    H2c   Firms people performance is positively influenced by S-C DC.

SSCMP and SC dynamic capability:

H3   SSCMP positively influence supply-chain dynamic capability.

4 Research methodology

4.1 Survey instrument

To analyse the proposed research model the study deploys a survey of the selected companies through a questionnaire. The survey instrument has been designed in a fashion to obtain relevant information from the respondents regarding the understanding and level of implementation of SSCMP and DC's in their respective companies. The questionnaire has taken construct inputs from the extant literature and a similar study by Hong et al. (2018). The first segment of the questionnaire is devoted to collecting data of the individual respondent. The next two sections focus on SSCMP and DC's. The last fourth section seeks responses on the ecological, social, and financial performance of the company. The responses are collected using five points Likert scale. The survey instrument was validated for content by seeking expert opinions and making necessary changes as per their recommendations.

4.2 Sample selection and data collection

The research deploys a purposive sampling method and collects data from the selected consumer goods companies. The senior logistic officials from the company with vast knowledge and experience in the field were purposely selected to obtain authentic data for analysis. The sector was selected considering the existence of matured supply chains with experienced senior supply chain professionals. The data was collected using both online and offline methods. Total 158 responses were obtained, after elimination of incomplete responses, finally, a total of 153 filled-in responses were recorded.

4.3 Research method

As the study involved validation of multi-relation structural model hence structural equation modelling was preferred over traditional statistical techniques (Kumar, 2018). Smart PLS version 3.0 was used to analyse the structural relationship in SEM. A step-by-step analysis was conducted by first checking the validity and robustness of the planned measurement model. Secondly, the goodness of model fit was established, and lastly, the hypothesis of the proposed structural model was tested. In recent past research, Smart PLS has been used for data analysis for a variety of research problems that are applied to various industries. Hazen et al. (2015) explained various guidelines on structured equation models in the research domain of operations and supply chain management. A few studies are focused on the use of applications of SEM in SMEs of developing countries. Shahi et al. (2021) discussed various dimensions of integrated supply chain processes and explained the adoption of SSCMP in textile operations and its impact on the firm's performance. According to Foo et al. (2018), the implementation of sustainable practices can empower manufacturing SMEs. The results show that the inter-relationship among suppliers, their selection, and collective performance for sustainable supply chains in SMEs is still lacking empirical shreds of evidence.

Table 2   Demographic detailing of the respondents

Details	N = 153
Gender	
Male	82
Female	71
Age	
25–35 Years	28
36–45 Years	56
46–55 Years	43
55 Years and above	26
Educational qualification	
Graduation	71
Post-graduation	80
PhD	2
Industrial experience	
0–5 years	8
5–10 years	38
11–15 years	29
16–20 Years	32
20 Years and above	46
Industrial domain	
Production planning	76
Inventory and warehousing	52
Sales and distribution	18
Customer care and industrial relationship	7

5   Data analysis and interpretation

5.1   Demographic profile

Firstly, data were analysed to classify and understand the demographic profile of the respondents. The distribution of data in terms of annual turnover, employee strength, age of the company, and the organisational level of the respondents was analysed, and the classification is as shown in Table 3.

5.2   Content and convergent validity

Content validation of the instrument implies checking if all items relevant to measure the construct have been appropriately included (Hong et al 2018). This was done twofold, firstly the available literature was thoroughly spurred, prodded, and deliberated to include all relevant factors. Secondly, the designed instrument was then vetted by the experts to

establish the clarity, understanding, and relevance of the items. Similarly, the convergent validity was also established by two methods:

1 Factor loadings – the threshold limit is 0.5. As shown in Table 4, the calculated factor values are within the threshold limit. Only one-factor knowledge item no. 2 had loading <0.5 however as the value of 0.478 is close to the threshold limit hence it is accepted.

2 Average variance extracted (AVE) – the threshold limit to establish the average variance is 0.5 and as all factors show value above this limit, hence the data is satisfactorily validated.

Table 3 Categorisation of respondents

Features	Categories	Frequency	Percentage
SME sector/type	FMCG including electronic goods and pharmaceutical SMEs	153	100.00
Annual turnover (size)	< 100 Cr	8	5.23
	100 Cr to < 500 Cr 19 12.42	19	12.42
	500 Cr to < 1,000 Cr	38	24.84
	1,000 Cr to < 5,000 Cr	51	33.33
	> 5,000 Cr	37	24.18
Workforce strength	< 50	5	3.27
	51–100	18	11.76
	101–2,000	36	23.53
	2,001–5,000	73	47.71
SME age	Less than 3 years	3	1.96
	3–10 years	31	20.26
	10–20 years	47	30.72
	21–30 years	72	47.06
Organisation level	Executives/ officers	48	31.37
	Senior/middle-level managers	86	56.21
	Top-level management	14	9.15
	Business consultant/SME experts	5	3.27

5.3 Reliability

The reliability of the instrument was established by Cronbach's alpha coefficient and composite reliability estimates. The threshold value is 0.7 and as shown in Table 4 the calculated values are more than the threshold limit hence signifying sound data reliability.

Table 4   Reliability test

Variables	Dimensions	Factor loadings	Cronbach's alpha	rho_A	Composite reliability	Average variance extracted (AVE)
SSCM practices	Coord_trust_1	0.711	0.840	0.843	0.847	0.580
	Coord_trust_2	0.725				
	Coord_trust_3	0.758				
	Learning_1	0.748				
	Learning_2	0.791				
	Learning_3	0.705				
	Orientation1	0.724				
	Orientation2	0.743				
	Orientation3	0.8				
	SCRM1	0.654				
	SCRM2	0.742				
	SCRM3	0.792				
	SCRM4	0.697				
	Continuity1	0.705				
	Continuity2	0.771				
	Continuity3	0.727				
SC dynamic capability	Knowledge1	0.696	0.757	0.754	0.758	0.576
	Knowledge2	0.478				
	Knowledge3	0.783				
	Knowledge4	0.782				
	Marketorient1	0.793				
	Marketorient2	0.804				
	Marketorient3	0.789				
	Marketorient4	0.761				
	Innovation1	0.787				
	Innovation2	0.769				
	Innovation3	0.798				
	Innovation4	0.697				
	Reconstruct1	0.759				
	Reconstruct2	0.783				
Economic performance	OpPerform2	0.794	0.781	0.784	0.752	0.589
	OpPerform3	0.756				
	OpPerform4	0.699				
	MktPerform1	0.736				
	MktPerform2	0.805				
	MktPerform3	0.845				
	FinPerform1	0.803				
	FinPerform2	0.889				
	FinPerform3	0.871				
	FinPerform4	0.749				
	FinPerform5	0.753				

Table 4 Reliability test (continued)

Variables	Dimensions	Factor loadings	Cronbach's alpha	rho_A	Composite reliability	Average variance extracted (AVE)
Environmental performance	Pollution1	0.826	0.821	0.819	0.824	0.683
	Pollution2	0.874				
	Pollution3	0.839				
	Resource1	0.701				
	Resource2	0.810				
	Resource3	0.795				
Social performance	EmpPersp1	0.856	0.790	0.781	0.786	0.677
	EmpPersp2	0.884				
	EmpPersp3	0.812				
	EntPersp1	0.834				
	EntPersp2	0.861				
	EntPersp3	0.794				
	EntPersp4	0.827				

5.4 Discriminant validity

Discriminant validity measures the degree of distinctness of each construct. As measured by the correlation method the values should be less than the threshold limit of 0.9. The values as shown in Table 5 correspond to our acceptable threshold values hence establishing the discriminant validity.

Table 5 Discriminant validity

	DC	ProfitPerf	EcolPerf	S-SCM	PeoplePerf
DC					
ProfitPerf	0.843				
EcolPerf	0.832	0.867			
SSCMP	0.796	0.828	0.842		
PeoplePerf	0.824	0.845	0.836	0.871	

5.5 Fitness of the model

The proposed model was then tested for its goodness of fit and the following values were obtained.

Table 6 Fitness of model

	Saturated model	Estimated model
SRMR	0.06	0.067
d-U_LS	6.712	8.624
d-G	9.895	10.125
χ^2	5,873.42	6,230.65
NFI	0.67	0.682

As in Table 6, the calculated values of SRMR are less than the threshold limit of 0.08, hence the model can be said to be consistent with data and fits well to further analyse the structural relationship.

5.6   Hypothesis testing

To further assess the structural relationship, the hypothesis proposed in the study is subjected to a bootstrap test. The bootstrapping gives us the significant path coefficients i.e., p values which are commonly referred parameters for acceptance or rejection of the hypothesis. The parameter value is .05.

The result analysis of hypothesis testing is tabulated in Table 7.

Table 7   Path coefficients

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
SSCMP → DC	0.895	0.895	0.032	41.562	0
SSCMP → People Perf	0.664	0.681	0.149	4.485	0
SSCMP → EcolPerf	0.472	0.469	0.152	2.894	0.004
SSCMP → ProfitPerf	0.388	0.378	0.134	3.021	0.004
DC → ProfitPerf	0.518	0.541	0.134	4.010	0
DC → EcolPerf	0.476	0.495	0.148	3.40	0.002
DC → PeoplePerf	0.249	0.241	0.149	1.569	0.087

The analysis as shown in Table 6 depicts that H1a, H1b, H1c have significant p-value (less than 0.5) hence the three hypotheses are accepted which says that SSCMP has a positive influence on all three performance measures of the firm i.e., Ecological, people and profit performance. For hypotheses H2a and H2b, the p-value < 0.5 hence the two hypotheses are accepted. For H2c it is more than 0.5 i.e., insignificant, hence H2c stands rejected. The positive association of DC's with profit and ecological performance is indicated through the above assessment but the same association is not reflected with social performance.

6   Discussion and findings

The theoretical foundation of literature on the subject suggests that the companies when faced with potential disruptions, need to orient, design, and implement SSCMP and evolve and develop DC's to navigate through the catastrophic effects of the disruptions and also to gain competitive advantage in the process for long term survival. The study further explores how the implementation of SSCMP and DC's influences the TBL parameters of the social, ecological, and monetary performance of a company. Based on previous research outcomes this study also postulated that SSCMP has a positive effect on firms' people, profit, and ecological dimensions. The empirical outcomes of the study were in agreement with this postulation. It is observed that increased awareness of environment protection, government stringent policies, and active NGO groups have enforced the firms to take environment-friendly measures. This has brought in a positive

impact on SSCMP and the firms have now initiated coordination with their supply chain partners to have a more green -supply chain with control on pollution emissions and energy consumptions. Similarly, government policies and in a race to improve the public image the companies are now actively participating in CSR activities. The companies now strive to implement SSCMP practices that are employee friendly and also make efforts to contribute significantly to society's well-being thus positively affecting people's performance. All these coordinated efforts of the company towards sustainability support the profit objective of the firm. Implementation of Six Sigma, JIT, lean management, TQM, WMS, etc. is all increasing the delivery quality with a reduced period, thus enhancing the cost reduction and profit maximisation of the establishment (Sharma and Joshi, 2020a). The research also establishes that DC amplify the ecological and profit performance of the firm but are not positively associated with the social performance. The capability to recombine new and existing knowledge, development of a capability to renovate the existing internal competencies and innovate new products, process, and systems in the face of market dynamism, and ability to restructure partner relationships when faced with hazardous disruptions has all added up to build a sustainable culture in the organisation which is reflected in positive ecological and profit performance. However, it is observed that as social capabilities take time to build up their effects hence the effect of DC's is not overtly evident in the social dimension.

This result is like the study of Klassen et al. (2012). Another important assumption of the study was to find if the SSCMP influences the development of DC. Again, the empirical analyses proved that SSCMP does influence the development of DC's in the firm. The sustainable policies of coordination amongst supply chain associates, risk management, continuous learning, striving to create agility and continuity in face of the potential risks, all contribute towards the orientation of the managers to rebuild and readopt their capabilities to enhance their power of managing, recovering and restoring themselves when faced with supply chain disruptions.

7   Conclusions

The validity of the five constructs of SSCMP, SC DC, and another three constructs of SSCM performance was assessed through content validity, convergent validity, and discriminant validity. The study outcomes gave a satisfactory result; hence the constructs had good validity and can be used further for measurement of SSCMP, DC's, and enterprise sustainable performance. The study develops a parsimonious scale to measure and evaluate SSCMP and DC's for a firm's sustainable performance which is a significant theoretical contribution in the field which is yet to develop a consensus on the most appropriate SSCMP and capabilities. Apart from theoretical support, this will also assist the practicing managers in quantifying the practices of SSCMP and DC's. It will at the same time guide them on methods to assess their socio-economic and ecological performance to ensure true sustainability. Technology advancement makes information sharing very fast and wide. This has heightened the awareness amongst the customers, activists, NGO's and government. All these factors are compelling firms to consider the responsibility towards society and the natural ecosystem. The scale so developed on SSCMP and DCs' will help managers prepare for these added concerns and assist to expand the focus beyond economic pursuits to also include social and environmental justice. The study attempts to develop a parsimonious scale for the measurement of

SSCMP and DC's. Though the study is based on the extant review of the literature and expert opinions however there is a possibility that not all factors may have been included, hence it can act as triggering groundwork for upcoming research. The small sample size and focus on only a single industry may have biased results. Future studies with appropriately larger samples, different industries, and different countries can be considered.

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