Prolonging retailer-supplier relationship: a study of retail firms during COVID-19 pandemic

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Abstract: The world is beholding new drifts in retail buying, health services, social factors during the current pandemic. Retailers and suppliers are challenged to take the risk and prepare themselves to implement strategic actions according to the dynamic environment. This study has made an effort to identify the key determinants of the retailer-supplier relationship to be focused on surviving amidst COVID-19 pandemic. This study aims to identify the key determinants of retailer-supplier relationship and assessing retail firms' supply chains appropriate as per key determinant to be intensive in a pandemic situation. The work reveals collaboration efficiency and co-creation are the prominent determinants for dealing the retailer-supplier association. The study shows that order fulfilment is the most suitable RSCs for creating co-creation and capabilities in managing humanitarian logistics to survive in the COVID-19 pandemics.

Keywords: retail-supply relationship; order fulfilment; co-creation; demand driven supply chains; COVID-19.

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1   Introduction

COVID-19 has carried intense risk and subsequent struggle for retailers and suppliers to survive in this situation and thus they are working collectively to procure and manage their supply chains for delivering essentials to the customers (Roggeveen and Sethuraman, 2020). During this pandemic, retailers can be able to manage inventory of all demanded essentials goods during the lockdown, only by the extended support from the local partners and suppliers. Retail firms are the business entities that are precisely involved in reselling and distributing daily needs products to various segments of end consumers at various prices and categories, based on their purchase decisions (Joshi et al., 2021; Guo et al., 2021). Retailers engaged in various inventory and pricing decisions aiming the effective and flawless material flow in the supply chains (Shahed et al., 2021). Retail firms utilise digital platforms, multichannel and omnichannel, and cross-channel strategies to ensure the information flow and fund flow and to remain the retail supply chains more agile and responsive (Badenhop and Frasquet, 2021; Joshi and Sharma, 2021a). Approximately 1.5 million modern retail stores with a business worth of 4700 billion are employing 60 lakh people currently in India. During March and early April, the business has further reduced to 15%. Stores selling essential goods that are allowed to open during lockdown have also witnessed low revenues as they are only allowed to sell essential services (Joshi et al., 2017). The pandemic has not only brought huge disruption in global retailing but is also understood as the opportunity to study the outrageous gaps and susceptibilities during disaster situations.

Retail supply chains are confronted to adjust with the risk and to organise themselves to fit in for the post-pandemic situations. Thus, to understand response and readiness towards the highly vulnerable ecosystem for retail supply chains and adoption towards more sustainable businesses. Besides, the study is an attempt to align the protracting the RSCs from both an operational and strategic perspective in the new world order.

1.1 Problem statement

The COVID-19 has forced retailers to act proactively to survive in this uncertain period. To sustain and survive they need to adopt novel approaches that may be appropriate in the changing socio-economic environment. The retailers are assessing the environment, anticipating the changes in demand arise due to pandemic while hiring the local suppliers. The retailer supply chain (RSC is based on many determinants such as network structure, added value, information exchange, trust, data security, collaboration, and performance, etc. (Davis-Sramek et al., 2020; García-Arca et al., 2020; Sharma et al., 2021a, 2021b, 2021c, 2021d, 2021e, 2021f).

The retailers are adapting to change to fight with COVID-19 and thus there is a need to identify the critical determinants affecting their relationship and implementing suitable RSCs to overcome this situation.

The purpose of the research article is to conceptualise the appropriate RSCs during COVID-19. By deploying MCDM techniques, the following set of research objectives need to be achieved.

R1 How the RSC is changing amidst pandemics? Which determinants are dominantly shaping this structure?

R2 What are the appropriate RSCs to fight this pandemic situation?

Collectively, it aims to identify and analyse the modified R-S relationship developed amidst pandemic. With this aim initially a systematic literature review (SLR) is conducted. This study has employed an integrated SWARA-BWM. SWARA method engaged in measuring the weights of determinants of retailer-supplier relationship and best worst method (BWM) is used to assess the various RSCs adopted during COVID-19.

The major outcomes of this study are as follows:

• The key contribution of the work is to establish key determinants that define RSC during pandemic situations.

• Further, the RSCs to provide extended service-portfolio during a pandemic are assessed using Best-worst method. Thus, the finding shall be helpful to the firms to manage their RSC during uncertain situations.

The research article is divided broadly into six sections. Section 2 explains the secondary literature on key enablers of retailer-supplier relationships and RSCs. The next section explains the methods used for research and their significance. Section 5 including key outcomes, arguments, and practical suggestions of the study. Whereas, Section 6 highlights the summary, and research directions for future.

2 Literature review

The section explains past research on various perspectives retailer-supplier relations and developed RSCs.

2.1 Determinants of retailer-supplier relationship

A retailer-supplier relationship is a continuum that balances suppliers and inventory (Joshi and Sharma, 2021b; Singh et al., 2020). This partnership is the result of the mutual

understanding to create competitive advantage through data sharing, and mutual benefits (Tripathi and Joshi, 2019). RSC notes a typical structure of suppliers and retailers that exhibits coordination and risk-sharing among themselves (Joshi and Joshi, 2016; Eriksson et al., 2021).

The coordination leads to trust among parties and increases the dynamic capabilities (Ryu et al., 2021). Supply chain contract among retailers and suppliers helps them to demonstrate long-term association among each other (Bóna and Sárdi, 2019).

Information exchange among parties acts as a catalyst for collaborative inter-organisational relationships (Prakash et al., 2020).

The information-sharing of retailer-supplier develops competitiveness of supply-chains. The retailers engaged in a variety of activities viz. data inventory management, demand forecast, and order placement and fulfilment with suppliers and customers.

During the COVID-19 situation, the real-time information exchange leverage the benefits of RSCs (Dvorak et al., 2021). Although, the benefits are not equally shared among the partners. Cachon (1999) emphasised that for uncertain situations, partners must share benefits to develop coordination among channels. Various recent studies also highlight the importance of competing suppliers for stochastic demand (Wang et al., 2021).

Based on information sharing as a strong parameter, past studies exhibit that the structure of the firms also influence by the level and degree of collaboration it has with its suppliers (Prakash et al., 2020; Chou et al., 2014; Prasad et al., 2015).

Figure 1   PRISMA diagram – study selection and characteristics
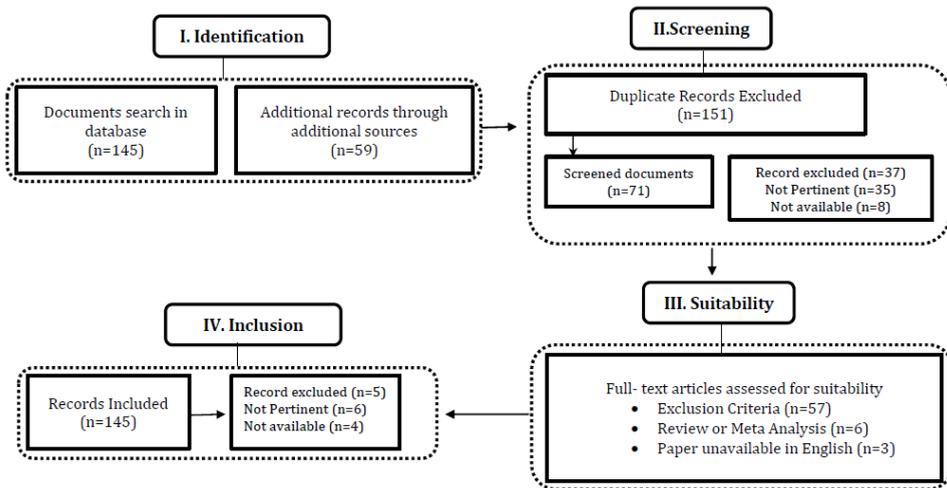
Centralisation is essential for integration at the organisation level and decentralisation is required for flexibility. The pandemic insists retailers come into collaborating with their supply chain partners to combat the situation. The SC collaboration leads to reduced risk of the bullwhip effect and enhances the efficiency of the overall network and helps the retail firm to reduce overall cost and improve cash inflows (Aggarwal and Srivastava, 2016). During emergencies, the supply chain becomes complex and requires being more responsive (Sharma et al., 2021a, 2021b, 2021c, 2021d, 2021e, 2021f; Rana and Joshi,

2020; Sharma and Joshi, 2020b; Sharma et al., 2020a; Akhtar and Khan, 2015). Thus, the identification of physical resources becomes essential for the retailer-supplier relationship during emergencies. Past research explained the role of enablers that strengthen the sustainability of RSC (Joshi et al., 2020a, 2020b). Based on the previous researches, the authors adopted a literature survey in the following steps:

1   setting the research aim

2   selecting the scholarly database

3   identification of the keywords

4   analysis of the most appropriate documents

5   extraction.

The research questions are designed to focus on retailer-supplier relationships and the RSC effectiveness during emergencies. The term 'retailer-supplier relationship' is searched in both WoS and Scopus scholarly databases inclusive of research articles only. The search excludes conference proceedings, book chapters. The timeline for the search was 2015–2021 (till 15 May).

The data has been collected during May 2021. Initially, 151 documents were searched from the Scopus database. After the first round of elimination, 71 research papers were left. After further readings, 42 research papers are selected for final analysis. From the selected papers, determinants of retailer-supplier relationships are identified. Figure 1 depicts the PRISMA diagram that illustrates the process of study selection and its characteristics.

Figure 2   Delphi process flow chart
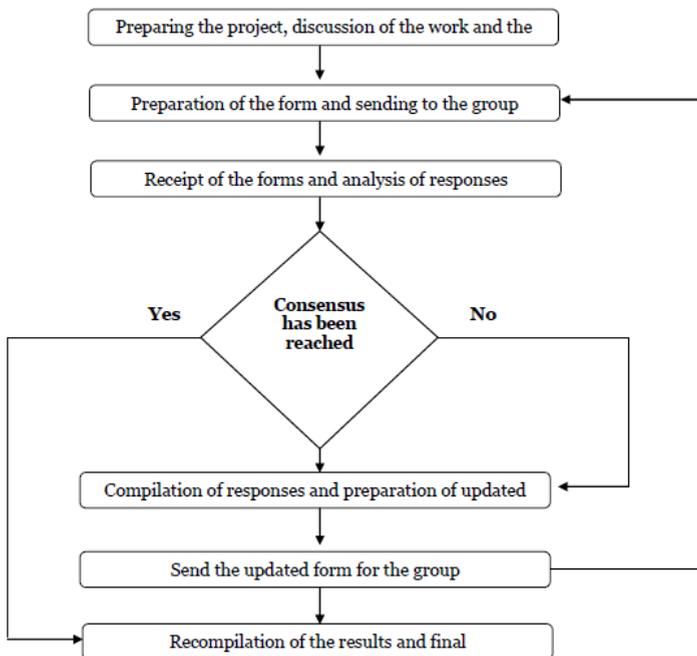
Source: Adopted from: Galo et al. (2014) and Panahi et al. (2017)

Table 1   Determinants affecting the retailer-supplier relationship

Criteria	Determinants	Implied meaning	References
C1: Partnership structure (PS)	Governance structures and flexibility (PS1)	Inter-firm governance and retail-supplier networks exhibit flexible structures to support incentive structure, traceability, and transparency in the information exchange.	Chenarides et al. (2021), Thilmany et al. (2021)
	Visibility (PS2)	Retailer and product visibility increase supply chain resilience.	Baah et al. (2021), Mubarik et al. (2021), Sharma and Joshi (2021)
	Internal collaboration dynamics (principal engagement. Shared motivation, the capacity of Joint action) (PS3)	Impliedly leads to flawless information exchange, leads to process integration and supply chain flexibility.	Sharma et al. (2021), Vandchali et al. (2021), Joshi (2015a, 2015b), Joshi (2013), Prakash et al. (2020)
	Resource sharing (PS4)	Information sources gathering and dissemination across the supply chain.	Sharma et al. (2021), Song and Song (2021), Vadakkepatt et al. (2021)
C2: Collaboration efficiency	Collaborative planning among partners (CPFR) (CE1)	Collaboration among suppliers and retailers for replenishment planning and material fulfillment	Daghar et al. (2020), Friday et al. (2021), Sharma et al. (2021)
	Co-creation among partners (CE2)	Value creation and recreation among supply chain partners.	Mollenkopf et al. (2020), Sales-Vivó et al. (2021)
	Collaboration among supply chain actors (CE3)	The collaboration and coordination among actors will bring benefits for the firms	Fei et al. (2020), González-Torres et al. (2021)
	Anticipated benefits and risk management (CE4)	Results into mutual benefits from improved contextualisation. The retailer and suppliers should be aware of the risk so that the firm must be concerned about any internal, external, and environmental risks.	Pantano et al. (2020), Dvorak et al. (2021)
	Ability to improve efficiency (CE5)	Carrier selection is one of the main concerns during disaster operations. The integration of carriers and suppliers may bring efficiency for the firms.	Yang et al. (2020), Song et al. (2017), Vadakkepatt et al. (2021)
	Dynamic capabilities and competitive advantage (CE6)	Dynamic capabilities among partners lead to sustainable competitive advantage	Thilmany et al. (2021)
	Capabilities in managing humanitarian logistics (CE7)	The RSC management success in humanitarian logistics is entirely depending upon the effectiveness of responses and their patterns.	Mollenkopf et al. (2021), Schleper et al.2(021), Shahed et al. (2021)

Table 1 Determinants affecting the retailer-supplier relationship (continued)

Criteria	Determinants	Implied meaning	References
C3: IT communication	Data integration (ICT1)	Increases the confidentiality among the stakeholder and integrate the flow of information in both upstream and downstream activities.	Sharma et al. (2020bs), Grewal et al. (2021)
	Big data analytics (ICT2)	Decision-making for supplier selection is becoming an interdisciplinary perspective and strengthens the cross-sector partnership among RSC entities.	Brandtner et al. (2021), Grewal et al. (2021)
	Technology (ICT3)	Specific tools have been created to help companies to predict and overcome disruptions.	Joshi, and Sharma (2021b), Pantano et al. (2021), Sharma et al. (2020a, 2020b, 2020c) McGrath et al. (2021), Kamble et al. (2019)
C4: Communication quality	Communication among internal business functions (CQ1)	The relationship develops communication among supply chain partners	Kraus et al. (2020)
	Negotiation among parties (CQ2)	Information exchange among partners.	González-Torres et al. (2021)
	Tools for communications (CQ3)	The latest tools are helpful for information processing and sharing.	Gupta et al. (2021), Shankar et al. (2021)
C5: Humanitarian operations	Emergent stock (HO1)	Emergent stock is held by companies to avoid 'stock out' situation	Verma and Gustafsson (2020), Naeem (2020), Sales-Vivó et al. (2021)
	Product flexibility (HO2)	To reduce the cost, 'shelf to order' is performed by retailers	Daghar et al. (2020), Zhao and Kim (2021)
	Network resources (HO3)	External sources in the retailer-supplier chain providing strategic advantages.	Sharma et al. (2020b, 2020c), Mollenkopf et al. (2020)
	Transportation modes (HO4)	Stock availability as per demand and ensuring it with robust transportation mode.	Hendrickson and Rilett (2020), Jiao and Azimian (2021)

The Delphi technique is used to group these determinants systematically. Figure 2 explains the process of using the Delphi technique, the experts evaluated the enablers and evaluate their importance on the questionnaire- response sheet.

The experts merged some enablers and grouped 21 variables under five main criteria – criteria 1 (C1): partnership structure (PS), criteria 2 (C2): collaboration efficiency (CE), criteria 3 (C3): information, communication and, criteria 4 (CQ): communication quality, criteria 5 (C5): Humanitarian operations. Table 1 depicts the arrangement of criteria and sub-criteria.

2.2   Retail supply chains

In pandemic situation, the majority of retailers are transforming their business model to demand-specific (Choi and Sethi, 2021). For survival, retailers are engaged in selling 'essential items' and adopted a pull-based strategy and hence the RSCs are switching to new forms of innovation (Sharma et al., 2021a). During the COVID-19 situation, logistics partners are being outsourced for local supply and customer demand fulfilment. In India, organised retail chains and many others are utilising a hybrid business model for both B2B and B2C. Moreover, the local retail chains (Kirana Stores) are also rebuilding their presence to the masses, through both forms. The focus of the RSCs is to create 'added value' such as optimisation of pick and drop feature, Omni-channel support, demand management, diversified supply chains, order fulfilment, financial stability, adopting digital apps, proper supply-chain management, and resource planning (Brandtner et al., 2021; Chopra et al., 2021). The detailed areas of services offered by the retail chains are exhibited in Table 2.

Table 2   Retail supply chains

Retail-supply chain key areas	Definition	References
Demand-driven supply chain (DDSC)	During pandemic, due to stochasticity for the 'essential items', suppliers are facing challenges in planning and replenishing the inventory to prevent stock-out situations.	Sharma et al. (2021), Tiedemann (2020), Wang et al. (2021)
Omni-channel supply chains (OCSC)	A response RSN ensure a unified experience among all channel partners and suppliers by amplifying omnichannel strategies	Davis-Sramek et al. (2020), Sharma and Joshi (2019a), Pereira and Frazzon (2021), Raza and Govindaluri (2021)
Diversified supply chains (DSC)	With the extension of service, retailers have enhanced their portfolio from core activities to extended activities.	Althaf and Babbitt (2021), Todo and Inoue (2021)
Order fulfilment supply chains, optimising delivery and pickup (OFSC)	Local collaborations lead to forwarding alignment for material and fund flow and timely and efficient delivery of products and services.	Sharma and Joshi (2019b, 2019c), Sharma et al. (2020a, 2020b, 2020c, 2020d), Hamdan and Diabat (2020)
Financial stability supply chains (FSSC)	With a dual business model, retailers ensured real-time online transactions.	Battiston et al. (2021), Hamledari and Fischer (2021)

Table 2 Retail supply chains (continued)

Retail-supply chain key areas	Definition	References
Adapting digital technology supply chains (ADSC)	Digital technologies lead to more focused services to the customers	Sharma and Joshi (2020a, 2020b), Joshi and Sharma (2021a, 2021b), Sharma et al. (2021e, 2021f), Joshi (2016, 2013), Yang et al. (2021)
Crowd and resource management supply chains (CRMSC)	Retailers are using mobile payments system and avoid long queues. The retailers are using staff appropriately	Jifroudi et al. (2020), Queiroz et al. (2020), Pavlov et al. (2019), Gong et al. (2018), Sharma et al. (2021d)
Customer relations supply chains (CRSC)	Developing and maintaining strategies for long-term relations with the customer, retailers, and suppliers.	Joshi and Sharma (2020b), McGrath et al. (2021), Fiala (2005), Sharma et al. (2021e)
Competitive pricing supply chains (CPSC)	Dynamic pricing is offered to the customer due to online services that lead to making the market more competitive and economic to the customers	Jie et al. (2013), Joshi (2018), Tao et al. (2021), Alhawari et al. (2020a), Sharma et al. (2021f)

The RSCs are constantly building new ways and means for effective communication to build customer relations and order fulfilment, etc. but the changing environment consisting of a variety of perspectives that help retailing firms to make operational decisions. Table 2 depicts various types of retail chains available during the COVID-19 situation. Although their suitability still needs to be understood.

2.3 *Research gaps*

In earlier research, various issues related to the RSC ecosystem including the role of information across partners, partnership structure, and its significance for competitive advantage. The partnership leads to high efficiency, risk management, and coordination across RSC (Sharma et al., 2019). Recently, many researchers are assessed how RSC are leveraging from a multi-channel and omnichannel perspective (Sharma et al., 2020a) and ensuring order fulfilment (Sharma et al., 2021). The usage of digital technologies by RSC is also well studied by few researchers in terms of its appropriateness to the varying business ecosystem (Ivanov et al., 2019; Sharma et al., 2021). The literature discussed various factors that influence RSC although there is a need to develop an integration among factors. Also, the past contributors evaluated the performance of RSC but there is a dearth of research on RSC's role amidst pandemic (Joshi et al., 2020a, 2020b; Joshi and Sharma, 2021a). Thus, this study is an attempt to overcome the lacuna and to analyses enablers of RSCs to provide an approach to fight the pandemic.

3   Research methodology

An integrated approach is inclusive of two methods SWARA and BWM. The first method is applied to evaluate the weight of the enablers of retailer-supplier selection whereas later on BWM is employed to select the most effective RSC based on key enablers. Detailed discussion on these MCDM methods are as follows: SWARA and BWM are modern and specialised methods that are aimed to weighing criteria of different approaches (Saryatmo and Sukhotu, 2021; Sharma and Joshi, 2021; Prasad et al., 2015).

3.1   SWARA method

Conventionally, various MCDM techniques including TOPSIS, DEMATEL, AHP methods are being used in past research for evaluating the efficiency and ranking the alternatives for managerial decisions based on specific parameters (Shanker et al., 2021; Rajora et al., 2018; Sharma et al., 2021c). In recent studies, SWARA is being used to evaluate the critical factors in context to the pandemic situation (Sharma and Joshi, 2021). From a decision manager's perspective, the methods carry less number of comparisons and it is simplified and easy to use for them. The respondents are directed to assess the prominence of each weight and to do the ranking, by their priorities as per their domain experience and skills. Nine point scale is being used for recording the response. '1' denotes as highest priority and '9' denotes the least priority. In the recent past, various applications of the SWARA method is being discussed in location selection (Yücenur and Ipekçi, 2021), sustainability (Trivedi et al., 2021; Zavadskas et al., 2021), urban waste management (Sharma et al., 2020a, 2020b, 2020c, 2020d). The steps for the calculation are summarised in the following stages:

Step 1   Parameter selection based on expert opinion.

Step 2   Determining the weightage for criteria.

Step 3 k_j (computation of coefficient)

$$k_j = \begin{cases} 1 & j = 1 \\ s_j + 1 & j > 1 \end{cases} \tag{1}$$

Step 4   Calculations of weight w_j

$$w_j = \begin{cases} 1 & j = 1 \\ \dfrac{x_j - 1}{k_j} & j > 1 \end{cases} \tag{2}$$

Step 5   Calculations.

3.2 Best worst method

BWM aims to provide more accurate results for managerial decisions in a business firm (Rezaei et al., 2016). The B (best) and W (worse) cases can be evaluated using this approach. The method contains the following steps:

Step 1   Identification of decision criteria.

Step 2   To evaluate the B and W case, based on experts' responses.

Step 3   Using 9 point scale, analyse the preference for best decision (B), to generate the best to other values suggested by the experts.

Step 4   All attributes are rated further with the worst value, as suggested by experts.

Step 5   Optimisation of weights $(w_1^*, w_2^*, w_3^*, ..., w_n^*)$, calculated further.

The minimax model can be expressed as:

$$\text{Min max}\left\{\left|w_B - a_{B_j}w_j\right|, \left|w_j - a_{jw}w_w\right|\right\}$$
$$\text{s.t.} \sum_j w_j = 1 \tag{3}$$
$$w_j \geq 0, \text{ for all } j$$

Model (3) when transformed into a linear model gives better results, the model is shown below: min ξ^L s.t.

$$\left|w_B - a_{B_j}w_j \leq \xi^L, \text{ for all } j\right|$$
$$\left|w_j - a_{jw}w_w \leq \xi^L, \text{ for all } j\right|$$
$$\sum_j w_j = 1 \tag{4}$$
$$w_j \geq 0, \text{ for all } j$$

Model (4) can be solved to obtain optimal weights $(w_1^*, w_2^*, w_3^*, ..., w_n^*)$ and optimal value ξ^L.

Consistency (ξ^L) of attribute comparisons close to 0 is desired (Rezaei et al., 2016).

3.3 Data collection

Broadly, Retail firms are aiming to value creation across the supply chains and can be characterised into a variety of forms based on their types (organised and unorganised) and nature of business size ranging from provisional stores, discount stores, supermarkets, super specialty stores, dealing into any and every form of consumer requirements (Goic et al., 2021; Hernandez and Haddud, 2018; Joshi and Sharma, 2018). To avoid any ambiguity, the data has been collected from the organised retail firms supplying essentials to the consumers during restricted hours in the pandemic. Because of industrial shutdown raised due to pandemic which results in geographical constraints for data collection during the research period, the authors decided to take the sample from the geographic region. Thus, the experts include owners, managers, and employees of retail firms established in Dehradun, Uttarakhand, and are actively contributing during

COVID-19 to provide services in the restricted hours, allowed by the government of Uttarakhand. The data collection was done within three weeks after communicating all the selected and validated variables to the experts in May 2021. A total of 22 experts in two groups are selected for responding to the survey. The data collection is contacted through telephone, and e-mail for discussion and. The detail of the determinants is exhibited in Table 1 and the profiling of experts is mentioned in Table 3.

4   Research framework

The framework is developed in two stages to achieve the research aim. During the first phase, the determinants affecting the retailers during the pandemic situation are determined and are analysed through SWARA to calculate weights. During the second phase, retail chains are assessed as per the need during the COVID-19 situation, using the Best-worst method. Figure 3 demonstrates the research framework.

Table 3   Demographic details of experts

Description	Number (22)
Gender	
Male	18
Female	4
Age	
20–30 years	5
31–40 years	7
41–50 years	7
51 years and above	3
Education	
Graduation	10
Post-graduation	9
Doctoral/post-doctoral	3
Domain exp.	
0 to 3 years	6
5–10 years	9
10–15 years	7
Functional area	
Production and operations management	8
Warehouse/inventory	8
Sales and distribution	6
Retailer	8
Customer relationship executive/officer	6
Suppliers and distributors	8

Figure 3 Proposed research framework
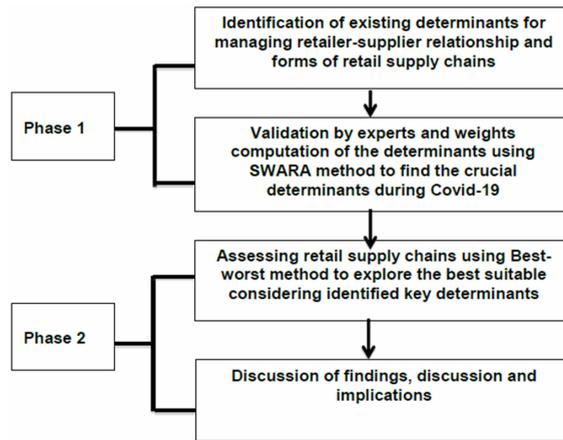
4.1 Applications

The study aims to evaluate the organised retail firms and their extended services during pandemic. The two groups stood formed created on common parameters (years of experience, qualification, and domain knowledge). The two groups of decision-makers (E1 and E2) include 11 experts in each, of whom four are managers, two owners, one employee (handling SKUs), and two owners of retail stores are formed. The managers are working executives belong to various functional areas including material management, cash management, sales and distribution, and procurement. They are involved in operations decisions related to order fulfilment. The suppliers have impanelled business partners associated with the retail firm for at least 3–4 years. Their experience ranging from 3 to 15 years. Both groups have managed their RSCs in their respective regions successfully for the last two months. These experts are aware of retailer and supplier relationships and RSCs and also the customer expectations. The additional sheet of determinants and RSCs are shared with each expert and the designed methodology.

4.1.1 Phase I: weights calculations

Based on the literature, 21 determinants that validated by experts. The experts decide the average value for both levels. The judgment for the two groups E1 and E2 are merged by the SWARA. In Table 4, the weights are explained and in Table 5 global weights are imparted in Table 5.

Table 4 Priorities (main criteria)

Category	E1	E2	Geometric mean	Rank
C1 (PS)	0.2562	0.2552	0.2557	2
C2 (CE)	0.4996	0.4976	0.4986	1
C3 (ICT)	0.0384	0.0403	0.0393	5
C4 (CQ)	0.1348	0.1343	0.1346	3
C5 (HO)	0.0710	0.0726	0.0718	4

Table 5   Sub-criteria and weights

Criteria	Sub-criteria	E1	E2	Geometric mean
C1 (PS)	PS1	0.0683	0.0679	0.0681
	PS2	0.0364	0.0357	0.0361
	PS3	0.1315	0.1323	0.1319
	PS4	0.0200	0.0193	0.0196
C2 (CE)	CE1	0.0350	0.0362	0.0356
	CE2	0.2398	0.2350	0.2374
	CE3	0.1230	0.1237	0.1233
	CE4	0.0647	0.0651	0.0649
	CE5	0.0194	0.0201	0.0198
	CE6	0.0065	0.0064	0.0065
	CE7	0.0111	0.0112	0.0111
C3 (ICT)	IC1	0.0062	0.0064	0.0063
	IC2	0.0211	0.0224	0.0218
	IC3	0.0111	0.0115	0.0113
C4 (CQ)	CQ1	0.0204	0.0216	0.0210
	CQ2	0.0756	0.0738	0.0747
	CQ3	0.0388	0.0389	0.0388
C5 (HO)	HO1	0.0190	0.0193	0.0191
	HO2	0.0360	0.0376	0.0368
	HO3	0.0103	0.0101	0.0102
	HO4	0.0057	0.0056	0.0057

Table 6 explains weights related to criteria and sub-criteria.

Table 6   Ranking

Criteria	Sub-criteria	Sub-criteria	Geometric mean	Ranking
C2 (CE)	0.4986	CE1	0.03557	10
		CE2	0.23740	1
		CE3	0.12334	2
		CE4	0.06491	6
		CE5	0.01976	13
		CE6	0.00646	19
		CE7	0.01113	17
C1 (PS)	0.2557	PS1	0.06808	5
		PS2	0.03607	9
		PS3	0.13190	3
		PS4	0.01963	14

Table 6 Ranking (continued)

Criteria	Sub-criteria	Sub-criteria	Geometric mean	Ranking
C4 (CQ)	0.1346	CQ1	0.02099	12
		CQ2	0.07472	4
		CQ3	0.03882	7
C5 (HO)	0.07178	HO1	0.01912	15
		HO2	0.03680	8
		HO3	0.01020	18
		HO4	0.00566	21
C3 (ICT)	0.03933	IC1	0.00628	20
		IC2	0.02175	11
		IC3	0.01130	16

4.1.2 Phase 2: ranking of retail supply chains using BWM

The RSCs are ranked using the Best-worst method. Each RSC is compared with the other considering the pandemic situation and obtained a value. The group of experts identified the most important (best) and least important (worst) RSC during this pandemic. The steps are followed as discussed in Section 3.2 using equations (4) and (5), the best and least criteria are computed. The experts' responses of ranking best and worst criteria are illustrated in Table 7. All the experts of both the groups to rank RSCs based on nine points measurement scale. Table 8 demonstrates weights as suggested by the BWM optimisation model (Rezaei, 2020).

Table 7 Best and worst criteria

Criteria	Identified as best by experts	Identified as worst by experts
DDSC	E18, E21	E10, E6
OCSC	E2, E9	E15, E12
DSC	E4, E6	E9, E13
OFSC	E1, E19, E15, E20	E7, E9
FSSC	E7, E10, E11	E19, E16, E20
DSC	E3, E14	E4, E17, E21
CRMSC	E5, E16	E3, E8, E14
CRSC	E8, E12	E5, E11, E2
CPSC	E17	E18, E22

The weights of RSCs from both the expert group (E1) and expert group (2) are determined using a BWM optimisation solver. Geometric means are used to evaluate final weights for both groups E1 and E2. The result of the BWM optimisation is shown in Table 8.

Table 8   Total relative significant values and priorities of retail supply chains

Retail supply chains	E1	E2	Geometric mean	Ranking
DDSC	0.137909364	0.112798252	0.124723435	2
OCSC	0.076552081	0.082829477	0.079628945	6
DSC	0.111805021	0.094580717	0.10283287	4
OFSC	0.146543607	0.116648369	0.130744303	1
FSSC	0.118687713	0.105234811	0.111759022	3
ADSC	0.093902555	0.066333339	0.078923191	7
CRMSC	0.091439563	0.075411193	0.083039548	5
CRSC	0.052431667	0.11661412	0.078193815	8
CPSC	0.053456965	0.102167285	0.073902321	9

5   Discussion

In the study, the enablers of the RSC are ranked that built on prominence values using SWARA and ranked for relevant retail chains using BWM appropriate as per the crucial determinants existing in the pandemics. These research findings will help the retail industry professionals and stakeholders of the RSC ecosystem during pandemic times. In Table 4, the enablers are based on their weights, which express their CE has the higher weight (0.4986) vis-a-vis other enablers. The CE, the main category (C2) is followed by partnership structure weightage (0.2557), communication quality (0.1346), humanitarian operation (0.0717), and information, communication, and technology (0.0393). Therefore, the comprehensive system to establish demand-supply collaboration among supply chain partners (Natvig and Wienhofen, 2016). The main criteria CE (C2) includes seven sub-criteria- collaborative planning, forecasting and replenishment (CE1), co-creation (CE2), capabilities in managing humanitarian logistics (CE3), collaboration and coordination among actors (CE4), operational and dynamic capabilities (CE5), ability to improve efficiency (CE6), and anticipated benefits (CE7). Retail organisations keep on innovating their plans to handle the way customers behave and shop and thus, value creation is needed to influence customers' intentions (Balaji and Roy, 2017). Table 6 reveals that co-creation (CE2), has the maximum weight (0.2374) followed by capabilities in managing humanitarian logistics (CE3) with a weightage of (0.1233) indicating that the co-creation process is the most important requirement in managing the retailer-supplier relationship. With the change in priorities, the right balance between customer choices and retailer fulfilment becomes significantly important, and therefore, the collaboration and co-creation leads to sustainable RSCs. The second most important criterion (C1) is a partnership structure (PS) including four sub-criteria. This determinant has obtained weight of 0.2557 and the sub-criteria – internal collaboration dynamics (PS3) is the third most dominant determinant helping retailers to survive during the critical situations. The collaborations among the partners develop jointly decision-making actions that fulfil the requirements of the stakeholders and bring more productivity. The stakeholder's needs and satisfaction are needed to manage during the pandemics and thus the identified dominants shown in Table 6 will shape the focus of retail supply chains leading towards the fulfilment of consumers' excessive and unpredictable demand during

Covid-19. The third dominant criterion is communication quality (C4) and obtained a weightage of 0.1346. This criterion has three sub-criteria – tools for communication (CQ1), negotiation among parties (CQ2), communication among internal business functions (CQ3). Table 6 illustrates that negotiation among parties (CQ2) has been ranked in fourth place with a weightage of 0.07472. This sub-criterion weightage indicates that the communication between retailers and suppliers during this pandemic is dependent on the negotiation process. The criteria at the fourth and the last place are humanitarian operations (C5), and Information, communication and technology (C3) with respective weights 0.07178 and 0.03933. The results of the Best-worst method optimisation are shown in Table 8. The results exhibit that Order fulfilment supply chains (0.130) have achieved the higher rank to deal with the COVID-19 situation, next enabler demand-driven supply chain (0.124), and Financial stability supply chain (0.111). As the pandemic is continuing to spread and adversely affecting the local people, retailers, and their suppliers through mutual collaboration and coordination are trying to provide the 'essential services' to the masses. To obtain this, RSCs are engaging suppliers to ensure to delivery of material at the doorstep. The restricted time, lockdown, and curfews are other pressures that are the key reasons for the adoption of RSC so that the order fulfilment can takes place without delay or losses.

5.1 Implications of the research

The impact on the retailer supplier relationship is two-fold. First, the sustainable RSC should measure the short term, mid-term and long range demand, and inventory to compensate for the inventory losses due to factory shutdowns and economic downfall. Secondly, retailer supply chains are maintaining onsite lower inventory of essential items. As the order fulfilment is being done to the doorstep of the customer. Thus the global pandemic is changing purchasing behaviour radically. The new transformation from tradition to online ordering leads to bringing new changes and the creation of neo-retail-supply chain ecosystems. During the second wave of COVID-19 countries like India are restricting shopping hours that shift the buying intentions and behaviour of the customer. Thus, the emerging need for RSC is to get prepared for the 'new normal. A supply chain focusing on order fulfilment, demand, and financial stability during routine and uncertain situations to overcome stockout situations.

The study has given practical directions to the retail firms to formulate survival plans in the light of changing behaviour and preferences of the customers amidst COVID-19 situations. The consumer inclination towards online platforms, order fulfilment as per their convenience, regular sanitisation of retail firms. Today, retailers and suppliers are sensitising and skilling their employees about contactless delivery and other modes of communication for effective communication to address the ongoing pandemic situation. The situation that arises due to pandemic is making retailer-supply chains more adaptive and appropriate to deal with any crisis. The future requirements shall be an extensive retailer and supplier collaboration to predict demand, order fulfilment, and financial stability.

The study can be fruitful for the retail firms to develop new strategic plans based on changing priorities and behavioural designs as it will be effective in amidst pandemic situations. The consumer inclination towards online platforms, order fulfilment as per their convenience, regular sanitisation of retail firms, new normal measures for retail

firms. Today, retailers and suppliers are sensitising and skilling their employees about contactless delivery and another mode of communication for effective communication to deal with the ongoing pandemic situation. The act as a catalyst to grow retailer-supply chains adaptive and appropriate to deal similar situations in future. The future requirements shall be an extensive retailer and supplier collaboration to predict demand, order fulfilment, and financial stability.

6   Conclusions

This research paper is an effort that aims to know the changing retailer-supplier relationship during COVID-19 using SWARA to explore the prominent determinants affecting retailer supply chains. BWM is deployed to assess the RSCs suitability as per the pandemic situation and considering the dominant enablers such as CE, Partnership structure, and communication quality. The research exhibits that retailers and suppliers shall deploy new ways and means aiming to survivability amidst COVID-19.

There is no single model to be adopted by the retailer and the suppliers in this pandemic although the retailers are focusing more on order fulfilment and financial sustainability. Due to the lockdown situation, the majority of customers are using online ordering and prefer to have a contactless delivery option, that stresses process innovation and making their supply chains more responsive. The research is an attempt to explore the opportunity among retailers and suppliers to know the changing dynamics and behavioural intentions among customers. The study is an attempt to develop a sustainable system to collaborate and integrate RSC during the pandemic situation.

The research has certain limitations. Firstly, the enablers of retailer-supplier decision experts and research may further be validated through case studies and empirical studies. More stakeholders can be added in future studies to ensure credible and scalable outcomes. Secondly, the global effect of a pandemic can be further examined in other countries as well. The studies for the future can specified how collectively retailers and suppliers are collectively responding to the pandemic, locally and globally. Thirdly, the study is based on the retail industry, although the extended research can be done into other industries or cross-industrial. Thus, future work can deploy data from other industries.

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