Humanities & Social Sciences Communications

ARTICLE

https://doi.org/10.1057/s41599-024-02771-6 OPEN

A contingent value of bricolage strategy on SMEs' organizational resilience: lessons from the COVID-19 pandemic

Ji-Hoon Park [1] & Ribin Seo [2]✉

During the economic disruption caused by the COVID-19 pandemic, small and medium-sized enterprises (SMEs) have adopted various crisis management techniques, including bricolage-coping strategies, to strengthen their organizational resilience. However, the specific impact of bricolage on SMEs' resilience and the factors influencing this relationship are not fully understood. Our study explores a theoretical framework that suggests the effectiveness of the bricolage–resilience relationship is contingent on government support and business process innovation during crises. An analysis of responses from the Korean Innovation Survey 2021 shows that SMEs utilizing bricolage strategies exhibit greater resilience than those relying solely on conventional crisis responses. Interestingly, the resilience implication of bricolage diminishes when firms receive government financial aid or engage in business process innovations. This suggests that government financial support might reduce the necessity for self-reliant resilience strategies in firms practicing bricolage, while business process innovation may create challenges in productive resource orchestration between firm survival and growth.

[1] School of Business, Hanyang University, Seoul, Republic of Korea. [2] Department of Industrial and Management Engineering, Pohang University of Science and Technology, Pohang, Republic of Korea. ✉email: ribinseo@postech.ac.kr

Introduction

The COVID-19 pandemic triggered a significant economic disturbance, leading to global financial instability. This rare and unpredictable event profoundly affected numerous industries, particularly impacting small and medium-sized enterprises (SMEs). These businesses encountered supply chain disruptions, demand reductions, and increased transaction costs (Clauss et al., 2021; Kuckertz et al., 2020; Levy, 2021). SMEs, inherently vulnerable, struggled to generate increased innovation returns during such crises (Soluk et al., 2021). Measures implemented to mitigate viral transmission served to further sever SMEs from their established market bases, intensifying their challenges (Shepherd, 2020). These combined difficulties resulted in significant revenue losses and a heightened risk of business failure. In response, SMEs need to adopt comprehensive crisis management strategies (Williams et al., 2017). It is crucial for firms to assess their capacity to restore, maintain, and renew their ongoing business operations by utilizing available resources to counter the effects of disruptive external events, termed *organizational resilience* (OR) (Bhamra et al., 2011; Giustiniano et al., 2018; Tengblad and Oudhuis, 2018). The literature on crisis management emphasizes various strategies to support OR, including entrepreneurial initiatives (Bishop, 2019; Doern et al., 2019), strategic decision-making processes (Probert and Turnbull, 2011), contingency planning (Zsidisin et al., 2005), effective communication protocols (Coombs, 2015), and building collaborative partnerships (Patrucco et al., 2021; Radziwon et al., 2021).

While previous research provides invaluable insights, analyzing individual actions in isolation may not fully capture the complex and multifaceted crisis-response strategies crucial for SMEs in managing crises (Crupi et al., 2021). Given the inherent challenges the firms face, including limited resources, unstructured management, and lack of multidisciplinary skills (Seo, 2019), there is significant potential for adopting versatile recovery approaches under these constraints (Williams et al., 2017). For SMEs with little experience in crisis management, a flexible, spontaneous, and adaptive approach to liquidity management may prove more effective than rigid methods during crises (Brown and Rocha, 2020). Such a strategy involves dynamically reallocating internal resources, acquiring external resources, and adjusting operational routines that are effective in ordinary business conditions (Kuckertz et al., 2020). Developing a comprehensive theoretical framework that captures the convertible and manifold nature of SMEs' crisis-response strategies could enhance their resilience to crisis-induced challenges (Glynn, 2021). This holistic view could provide a more thorough understanding of how SMEs can effectively navigate crises, promoting a robust and sustainable OR.

We suggest that the *bricolage strategy* offers a valid theoretical framework for the firms' idiosyncratic approach to productive organizational crisis management. Bricolage, at its core, represents a firm's ability to creatively use diverse resource combinations to tackle new challenges and capitalize on arising opportunities under constrained circumstances (Baker and Nelson, 2005). SMEs employing bricolage approaches as crisis-response strategies tend to skillfully capitalize on the alignment between internal and external resources (Doern et al., 2019) which, in turn, can lead to increased resilience in their innovation processes to overcome challenges brought on by exogenous crises (Giustiniano et al., 2018). In their study on the COVID-19 pandemic, Kuckertz et al. (2020) observed that entrepreneurs adapted to new opportunities and operational paths by adopting a bricolage approach, effectively navigating unknown management challenges. Boin (2009) argued that the effectiveness of an organization's crisis-response strategy, closely tied to its resilience, depends on its capacity for improvisation, coordination, flexibility, and endurance, enabling rapid recovery and timely adaptation. These perspectives imply that utilizing a bricolage strategy could create an environment that allows SMEs to enhance their OR, strengthening their ability to withstand the effects of external shocks.

Nevertheless, the extent to which SMEs' bricolage strategy enhances their resilience remains insufficiently underexplored in existing research, presenting a compelling field for further investigation. The knowledge gap is not about whether firms benefit from employing a bricolage strategy for resilience, but rather about the specific conditions under which its benefits are materialized (Duymedjian and Rüling, 2010). We posit that the resilience implication of bricolage strategy is dependent on the internal and external countermeasures adopted by bricoleur SMEs to rejuvenate their operations against crises. These measures could include utilizing government support externally (Juergensen et al., 2020) or initiating business process innovations internally (Aliasghar et al., 2020). Shedding light on the specific circumstances that may influence firms' crisis management efforts will contribute to refining existing theoretical lenses for the phenomenon understanding and guiding managerial practices for improved resilience outcomes (Yu and Wang, 2021). By examining these subtleties, we aim to provide more applicable insights for organizations facing the complexities of crises.

Our objective is to investigate the specific conditions under which SMEs benefit from adopting a bricolage strategy for OR during crises. The central research question is: What factors influence the effectiveness of a bricolage strategy for SMEs' OR in crises? We introduce the concept of a bricolage–resilience mechanism, which affects firms' strategic direction and is influenced by deliberate choices to acquire external resources and reconfigure internal ones, notably through governmental support and business process innovation. Utilizing data from 3179 responses in the Korean Innovation Survey (KIS) 2021, we provide empirical evidence that clarifies the conditional circumstances that enable the bricolage approach to enhance resilience against external shocks. This research enriches the growing field of crisis management studies. Additionally, our study sheds light on the bricolage–resilience relationship, moderated by institutional interventions (i.e., government financial and operational support) and independent proactive measures (i.e., business process innovation) (Linnenluecke, 2017). These findings contribute to a deeper understanding of the complexities of SME crisis management, offering significant theoretical insights and practical recommendations in an era marked by continuous and increasing global challenges.

Theory and hypotheses

Organizational resilience in crisis management. Crisis management fundamentally involves a systematic approach to recognizing and confronting crises to minimize potential harm, (Ardito et al., 2021). Coombs (2015) further developed this notion by categorizing the management of crises into three distinct phases: preparation and prevention before the crisis, response during, and learning and revision after the crisis. In the face of disruptive crises, organizations are compelled to deploy dynamic and resilient strategies (Glynn, 2021; Patrucco et al., 2021). Such circumstances necessitate that firms adapt their operational processes and managerial practices, thereby testing their adaptive capacity to handle disruptions and maintain operational functionality (Tengblad and Oudhuis, 2018). This organizational capacity is referred to as OR, a concept further defined by Williams et al. (2017) as a firm's ability to interact with

the environment in a way that positively adjusts and maintains its functioning before, during, and after adversities.

Resilience in this context signifies a firm's capability to absorb exogenous shocks and adapt to disruptive events that threaten its existence, all while preserving its core functionality (Su and Junge, 2023). This concept has been employed in crisis management research to explain how organizations effectively respond to and manage the adversities induced by crises to recover functionally (Giustiniano et al., 2018). Hamel and Välikangas (2003) depict resilience as an ongoing process within organizations to anticipate, mitigate, and recuperate from disruptions that have potentially unpredictable and detrimental impacts. Boin (2009) emphasizes the endeavor of resilient organizations to augment their absorptive and adaptive capacity in preparation for and management of emerging, uncertain threats. Adding to this discourse, Iftikhar et al. (2021) introduce a distinction within resilience-as-capability, identifying two forms: (a) proactive resilience, which is the foresight and monitoring ability of an organization to anticipate and manage potential events and evolving conditions before they compromise functionality, and (b) reactive resilience, defined as the agility of an organization in responding to disruptive events to restore operations, maintain core functions, or transition to a new, desirable state. The latter form aligns more closely with the OR concept and is particularly relevant to this study.

Delving into the theoretical aspects of OR, a significant body of research has identified common traits among resilient organizations (Giustiniano et al., 2018; Glynn, 2021; McManus et al., 2008; Tengblad and Oudhuis, 2018). Despite the diversity in conceptualizations, there is an emphasis on the adaptive capacity of organizations during disruptive crises (Friedman et al., 2016; Soluk et al., 2021), highlighting the ability of self-adaptation to mitigate uncertain damages, anticipate future losses, and foster prompt responses to threats (Aggarwal et al., 2017). This focus on adaptation is crucial for long-term success. Moreover, flexibility in exploiting and exploring resources is underscored, legitimizing business continuity in turbulent markets (McManus et al., 2008) and advocating for agile managerial practices to navigate uncertainties (Iftikhar et al., 2021). The role of resources in crisis management is also explored, proposing that resilient firms strategically reserve economic and non-economic resources to navigate unpredictable consequences (Ardito et al., 2021), thereby enhancing overall resilience.

Acknowledging the various facets of OR, the literature collectively indicates the significance of a firm's ability to adapt its resources to new contexts and recombine them innovatively during crises, a key aspect for survival and continuity (Kuckertz et al., 2020). Resilience serves as a prerequisite for firms to not only survive but also capitalize on new opportunities and revive their business through crisis-driven innovation activities (Giustiniano et al., 2018). Clauss et al. (2021) argue that firms resilient in crises are those that continue to pursue innovation to create and capture value. This aligns with observations that strategic adaptations and innovative approaches in response to crises can provide survival benefits for firms (Wenzel et al., 2021). As the COVID-19 crisis has demonstrated, firms should evaluate the impact of crises on innovation and consider additional innovations to exploit new opportunities for value creation (Sharma et al., 2022). In essence, the literature accentuates the role of adaptation in ensuring OR during crises, positing that firms effectively leveraging their resources, maintaining flexibility, and adapting strategies to emerging challenges are better positioned to navigate uncertainties and sustain long-term success.

Focusing on firms' OR in terms of their innovation activities, we recognize that innovation is integral to increasing firm productivity and growth (Audretsch et al., 2014). Continuous innovation is essential for long-term success, as discontinuation or reduction in innovation investments during external crises can significantly impair firm performance. This is particularly true given that a substantial portion of investment in innovation is often tied to skilled knowledge workers (Wright et al., 2018). Dismissing these workers or abandoning innovation projects not only results in the loss of valuable knowledge assets but also incurs significant costs. Therefore, emphasizing firms' OR in innovation activities is vital to understanding the organizational implications of firms' strategies during crises. This study aims to shed light on these dynamics, highlighting the importance of maintaining innovation trajectories to ensure resilience and sustain growth amidst challenges.

Bricolage strategy of SMEs. During the unprecedented COVID-19 pandemic, characterized by concurrent supply and demand shocks, SMEs faced considerable challenges. The stringent infection-control measures imposed significant operational constraints on businesses, with many struggling to maintain their conventional operations. SMEs, in particular, were acutely impacted due to their inherent vulnerabilities like resource scarcity and a general lack of preparedness (Bhamra et al., 2011). This vulnerability was compounded by their limited strategic options in counteracting the adverse effects of the crisis, such as liquidity issues, existential threats, curtailment of innovation activities, and growth obstacles under the heightened pressures of an external shock (Brown and Rocha, 2020; Clauss et al., 2021). The reliance of SMEs on specific business models further exacerbates their risks, as it narrows their risk management capacities and constricts their access to private financing (Sharma et al., 2022).

However, these challenges that make SMEs vulnerable also catalyze their entrepreneurial drive to develop multiple, flexible, and adaptable crisis-response strategies, leveraging their entrepreneurial nature for business continuity (Beliaeva et al., 2020). This agility and resourcefulness are crucial for SMEs to navigate through crisis-induced challenges, steering toward recovery (Santos et al., 2020). In this context, research on crisis management has pinpointed several critical factors and strategies that bolster SMEs' resilience during crises. Puumalainen et al. (2023) argued that strategic orientation, particularly in the form of resource reconfiguration to seize entrepreneurial opportunities and adapt to fluctuating market demands, is vital for SMEs' crisis performance. Kuckertz et al. (2020) reveal that strategic crisis responses entail a blend of diverse, experimental measures, underpinned by relational and financial capabilities. These measures can range from leveraging the goodwill of partners and mutual support, tapping into social capital in communities, marshaling capital through internal channels, to seeking government assistance. Williams et al. (2017) advocate for the adoption of spontaneous approaches in SMEs to efficiently utilize and combine available resources within and outside the organization as a viable recovery strategy. Such strategies enable SMEs to respond with agility and flexibility, effectively confronting the challenges posed by the crisis. By adopting these methodologies, SMEs can significantly boost their resilience, thereby enhancing their prospects of successfully navigating through the tumultuous period of crises.

The extensive body of literature on crisis-response strategies for SMEs has predominantly centered on well-defined frameworks and methodologies. Yet, there is an emerging interest in exploring the efficacy of employing a bricolage strategy to enhance crisis performance among these firms. The concept of bricolage is central to understanding how firms improvise under pressure by creatively leveraging available resources to navigate new opportunities and threats, especially in demanding situations

(Baker and Nelson, 2005). Bricolage is a spontaneous approach that involves utilizing and recombining available resources to address specific needs and challenges (Halme et al., 2012; Witell et al., 2017). Originating from Lévi-Strauss's anthropological work in 1962, the concept of bricolage underscores a unique interaction with the environment where individuals create new forms and order using readily available tools and materials. Baker and Nelson (2005) expanded on this by identifying three defining characteristics of bricolage: improvisation, using the resources at hand, and the creative recombination of resources.

In their groundbreaking work, Senyard et al. (2014) pioneered the concept of bricolage operationalization through the development of the bricolage scale, which is specifically designed to evaluate a firm's capacity to strategically and creatively utilize existing resources in resource-scarce environments. This scale has gained considerable traction in a variety of studies (e.g., An et al., 2018; Stenholm and Renko, 2016; Yu and Wang, 2021), underscoring its significant applicability and usefulness across diverse contexts. The foundational concept of this scale is rooted in Baker and Nelson's (2005) interpretation of bricolage, which they define as the improvisational actions of entrepreneurs faced with resource limitations. Bricolage is characterized by entrepreneurs addressing new challenges without the benefit of additional resources, thereby emphasizing the ingenious resource orchestration and utilization required in such situations. However, Davidsson et al. (2017) have pointed out a need for further refinement in measuring bricolage, suggesting the development of more nuanced, context-specific scales. Our study addresses this gap by focusing on measuring firms' bricolage strategies during the unique and challenging circumstances of the COVID-19 pandemic. This approach not only tailors the scale to this specific context but also ensures alignment with the established concept of bricolage.

To apply this operationalization effectively in practice, it is essential to acknowledge that while entrepreneurs operate in resource-constrained environments, they still have access to some resources that can be leveraged in creative ways. The COVID-19 pandemic represents a quintessential context for examining SMEs' bricolage strategies, as it has imposed severe resource constraints, propelling firms into uncharted operational territories. This crisis is especially relevant for the service SMEs included in our study. Prentice et al. (2021) highlight that service firms have been disproportionately impacted by the pandemic, particularly in terms of resource availability for their operations, more so than other types of firms. This situation makes them ideal subjects for investigating bricolage strategies tailored to respond to the unique challenges posed by the pandemic.

Bricolage strategy for SMEs' organizational resilience. For the bricolage strategy to be effectively applied, it presupposes that firms face resource constraints due to penurious environments, yet retain access to some resources that they can creatively utilize. The COVID-19 pandemic presented an ideal context to examine firms' bricolage strategies. This unprecedented crisis created extraordinary penurious environmental conditions, necessitating unique adaptive strategies by firms. Particularly noteworthy is the case of service firms included in this study. These firms are relevant for assessing bricolage strategies in response to the pandemic. Service firms have been disproportionately affected by the pandemic, especially in terms of resource availability for business operations, as compared to other types of firms, as outlined by Prentice et al. (2021).

Improvisation in bricolage is not about the absence of constraints but about an attitude of making do and rejecting the restrictions imposed by specific conditions related to resources (Senyard et al., 2014). Companies that adopt bricolage are determined to adapt and find ways to accomplish tasks without the ideal tools, resources, or skills at their disposal. The focus on utilizing resources at hand involves a critical examination of underutilized internal resources and the acquisition of low-cost or free external resources, which may be perceived as worthless by others but are deemed valuable by those employing bricolage (An et al., 2018). Lastly, the creative recombination of resources involves repurposing them for different, often innovative uses. This facet of bricolage suggests that it can serve as an alternative strategy for firms, particularly SMEs dealing with resource constraints due to its improvisational and innovative nature (Stenholm and Renko, 2016).

In the context of SMEs facing exogenous shocks like the COVID-19 pandemic, adopting a bricolage approach could lead to more flexible and diverse experiments with alternative solutions to address resource scarcity issues and achieve a resilient recovery. Bricolage inherently focuses on maximizing the use of available resources when confronted with challenges (Crupi et al., 2021; Duymedjian and Rüling, 2010). Employing this strategy results in a range of intertwined behaviors that aim to discover new sources of capital and manage crisis-induced adversities associated with resource constraints (Santos et al., 2020). The resource constraints that are often exacerbated during crises provide a fertile ground for employing a bricolage strategy, becoming a crucial factor in discovering challenges and opportunities through which a firm can reconfigure its resource base for innovations (Baker and Nelson, 2005; Halme et al., 2012). Despite the perceived risks, those engaging in bricolage are receptive to experimenting with new options to exploit untapped functions of resources (Santos et al., 2020).

Witell et al. (2017) have elucidated four functions of bricolage that can be particularly beneficial for SMEs: addressing resource scarcity proactively, efficiently utilizing what is on hand, improvising when recombining resources, and fostering relationships with external partners. These functions highlight the potential of undefined yet promising methods for recombining available resources, empowering SMEs to enhance their adaptive capacity to prepare for and manage emerging contingencies with uncertain threats in their innovation activities. Thus, developing crisis-response initiatives based on a bricolage-coping strategy presents a promising approach to fulfilling SMEs' resilience requirements for continued innovations in the face of adversity. Given this theoretical foundation and the highlighted potential of a bricolage strategy in crisis management, the following hypothesis is proposed:

> H1: Employing a bricolage strategy is positively related to crisis-responding SMEs' organizational resilience in innovation activities.

Government support's contingent role. Organizational crisis management involves a strategic interplay between individual firm initiatives and supportive policy measures from policymakers. In the face of the COVID-19 crisis, SMEs have encountered severe challenges due to rapid declines in both demand and supply, highlighting their reliance on external support for resilience (Juergensen et al., 2020). Government initiatives play a crucial role in this regard, offering policy schemes to enhance business resilience, particularly for SMEs, and supporting their crisis-response actions (Williams et al., 2017). Given the extensive damage caused by governments' countermeasures, it is unrealistic to expect firms, even resilient ones, to recover solely through individual efforts (Bishop, 2019).

Government-led policy initiatives during crises are essential for safeguarding economies and mitigating the impact on businesses,

especially SMEs (Juergensen et al., 2020). These initiatives have primarily focused on ensuring firms' access to sufficient resources for damage recovery and sustained operation, which is vital for their economic contributions. Kuckertz et al. (2020) observed prompt and decisive government responses to support SMEs in crisis, including immediate institutional measures to address survival threats like decreasing revenues and increasing costs. Protective measures for SMEs have included financial support to enhance capital resources (e.g., loan interest rate reductions, improved loan accessibility, wage subsidies, direct payments) and operational support to revive business operations (e.g., tax relief, delayed loan payments, reduced operating costs, short-hour work arrangements, customs and export fee assistance). An OECD (2020) survey provided a cross-country analysis of SME policy responses, revealing a combination of financial and operational support by most governments, including grants, subsidies, wage-support schemes, and deferrals of social security payments.

As SMEs face illiquidity challenges, they actively seek and utilize government crisis-response support to access external resources (Brown and Rocha, 2020; Juergensen et al., 2020). Research examining the resilience implications of policy schemes for SMEs during the COVID-19 crisis found that external support significantly contributed to innovation activities for business survival, but not necessarily for firm performance (Adam and Alarifi, 2021). Chen et al. (2022) distinguished between the roles of payment relief and financial support, finding that liquidity constraints were alleviated more effectively by payment relief than by financial support, underscoring the importance of operational support.

Linnenluecke (2017) highlighted the need to explore the impact of institutional measures on resilience, asking which policy tools or institutional supports foster resilience in crises. In response, this study examines the relationship between firms employing a bricolage strategy and their confidence in recovering from disruptive events with the aid of government support in the resilience process. Government support can enhance SMEs' internal resource bases, thereby reinforcing the resilience implications of their strategic decisions and behaviors, which are geared toward flexible adaptation to the crisis. By adopting a bricolage-coping strategy, firms can effectively exploit and recombine available resources (Baker and Nelson, 2005). The institutional environment, including government support, is crucial in determining the potential effectiveness of firms' improvisational approaches to resource exploitation and recombination for resilient recovery (Kuckertz et al., 2020). Given the different purposes of government financial and operational support (Chen et al., 2022), we propose the following hypothesis:

> H2: The bricolage–resilience relationship in crisis-responding SMEs is positively contingent on the level of government financial and operational support received.

Business process innovation's contingent role. The COVID-19 crisis has significantly impacted the business landscape, compelling firms to reassess and adapt their strategies to address the challenges posed by such an unprecedented event. In this context, Wenzel et al. (2021) delineate four strategic postures that firms can adopt in response to disruptive events: retrenching, persevering, exiting, and innovating. Among these, innovating stands out as a forward-looking approach, striving to capitalize on new opportunities that arise from crises. This innovative posture necessitates creativity, strategic insight, and technical expertise to develop and execute new business models that align with the evolving market conditions. Innovation emerges as a key strategy in overcoming the challenges induced by crises by integrating internal and external resources to reform unsustainable operational mechanisms (Clauss et al., 2021). Firms that are proactive in recognizing potential adversities and opportunities during a crisis are more inclined to pursue business innovations, adapting effectively to changing market demands (Sharma et al., 2022).

Business process innovation is a critical aspect of this strategy. It involves identifying inefficiencies in existing business models and redesigning operational mechanisms to enhance efficiency and effectiveness (Frishammar et al., 2012). As defined by OECD/Eurostat (2018), this type of innovation represents a significant change in a firm's business process for one or more functions. Scholars concur that a business process encompasses interrelated elements essential for value creation and capture, which mutually reinforce each other (Clauss et al., 2021; Shepherd, 2020). Engaging in business process innovation allows firms to reconfigure the scope and scale of their organizational systems to meet changing market demands, paving the way for novel activities beyond existing ones. Hence, firms that adopt business process innovation are well-positioned to respond effectively to the challenges brought about by crises, pivoting their strategies towards emerging opportunities and evolving market needs.

However, for SMEs grappling with crisis-induced challenges, realizing the potential benefits of business process innovation may pose difficulties. This challenge arises from the necessity of significant resource investments and the complexities involved in navigating such innovations (Beliaeve et al., 2020). The availability of resources, which underpins the relationship between bricolage and resilience, can be constrained by efforts to innovate existing business processes that become unviable during a crisis. SMEs responding to crises should thus consider developing new business process innovations, as the adversities of the crisis have severely affected their current processes (Kuckertz et al., 2020). While operational diversification through innovative initiatives enables better adaptation to changing market needs during turbulent times (Frishammar et al., 2012), these endeavors typically require resources beyond the capacity of resource-constrained SMEs (Beliaeva et al., 2020). The inherent disadvantages of SMEs, leading to inadequate resource allocation for innovation, might impede the potential increased returns from bricolage, consequently affecting their OR.

Implementing business process innovation during an economic crisis demands significant alterations to a firm's existing operations to exploit new market opportunities. Concurrently, it is vital to consider the resources consumed in transforming existing business processes (Puumalainen et al., 2023; Sharma et al., 2022). SMEs, typically less adaptable than larger firms, may face inflexibility in their resilience-by-bricolage initiatives due to their limited competencies. Seo (2019) argues that SMEs generally lack the essential resources needed for successful business process innovation, thus constraining their innovation capacity. The strong focus on resource commitment for innovations may hinder the adaptive capacity of bricoleur firms in managing disturbances and maintaining functionality (Beliaeve et al., 2020; Friedman et al., 2016). It is suggested that for bricoleur SMEs, an excessive emphasis on innovations to exploit new opportunities can lead to a short-term insufficiency in resource availability, ultimately impeding their ability to achieve resilient adaptation in the aftermath of the crisis. Building upon these, the following hypothesis is presented:

> H3: The bricolage–resilience relationship in crisis-responding SMEs is negatively contingent on the level of their business process innovation.

Methods

Data and sample. The focus of this study is to examine how firms' resilience manifests in their innovation activities, especially

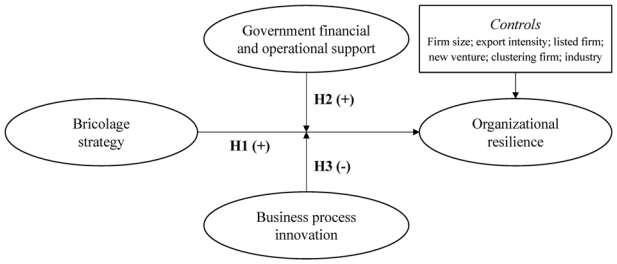

Fig. 1 Research framework. This figure illustrates the research model used in this study, along with the proposed hypotheses.

in the face of the unprecedented challenge presented by the COVID-19 pandemic. To examine the theoretical framework outlined in Fig. 1, we utilized the KIS 2021 data. This national statistical survey, conducted by the Science and Technology Policy Institute (STEPI) and authorized by Statistics Korea, gathered information on the innovation activities of South Korean service firms in 2020. CEOs or top managers, who are in charge of strategic planning, served as informants. The survey's design was aligned with the Oslo Manual 2018 (OECD/Eurostat, 2018), ensuring compatibility with the Community Innovation Survey questionnaire, a tool frequently used in strategic management, entrepreneurship, and innovation research. The initial KIS dataset encompassed data from 4000 firms across 33 service industries, selected from a larger pool of 60,111 firms listed in the Statistical Business Register of Statistics Korea.

In selecting firms for the sample, STEPI adhered to specific criteria. These included establishment before 2018, a workforce of over 10 full-time employees, and a minimum operational period of three years by 2020. The selection process employed a stratified and systematic sampling method. Out of the total sample, 3273 SMEs were selected, excluding those from industries with no variation in the dependent variable (i.e., consistently zero OR values). This exclusion was imperative to maintain the integrity of the logistic regression models, which rely on variability in the dependent variable to accurately estimate relationships between variables. Firms with no variation in the dependent variable would not provide meaningful data for analyzing factors influencing OR and could potentially confound the effects of industry-specific characteristics on it, thus affecting the precision and interpretability of the regression results. Industry dummies were included as controls in the models to further ensure the robustness of the study's findings. Further refinement was done by removing firms categorized under "unclassified industry" to prevent collinearity issues with other industry classifications. The final sample comprised 3,179 SMEs, all with complete responses to the research constructs. The general profile of the sample is detailed in Table 1.

Table 1 Samples' profile.

Items	Frequency	Percentage
Full-time employees (2020)		
<10	229	7.20
11–50	1460	45.93
51–100	554	17.43
101–200	443	13.94
201–300	276	8.68
300+	217	6.83
Average no. of employees	115	
Industry classification		
Wholesale and retail trade	540	16.99
Transportation and storage	396	12.46
Accommodation/food service activities	153	4.81
Information and communication	363	11.42
Financial and insurance activities	104	3.27
Real estate activities	168	5.28
Scientific and technical activities	418	13.15
Facilities management	638	20.07
Education	47	1.48
Human health and social work activities	284	8.93
Arts and sports	27	0.85
Repair and other services	41	1.29
	($n = 3179$)	

Measures and tool

Organizational resilience. Critical organizational actions essential for a resilient response during adversity include sensemaking, absorption, adaptation, and coordination (Su and Junge, 2023). Within these, our study specifically zeroes in on absorption and adaptation to operationalize firms' OR in the context of innovation activities. Absorption refers to the organization's ability to maintain normal functions and persist without significant changes, and adaptation indicates the capacity for flexible changes to better align with adverse conditions (Su and Junge, 2023). While absorption focuses on continuing an organization's pre-established strategic direction, adaptation emphasizes creating new solutions to mitigate the negative impacts of adverse events through the strategic deployment of firm resources.

Aligning with this conceptual framework of OR, our study estimates SMEs' OR by employing a questionnaire item that probes the impact of the COVID-19 pandemic on their firms' innovation activities. This questionnaire comprises four items (1 = yes, 0 = no), inquiring whether a firm's planned innovation activities were (1) dropped, (2) deferred, (3) implemented as planned (reflecting the absorption aspect of resilience), or (4) newly added during the pandemic (reflecting the adaptation aspect of resilience). A firm maintaining or adding innovation activities during a crisis demonstrates its resilience by either persisting with its strategic direction (absorption) or adapting to create new solutions (adaptation). We assign a value of one to the variable if a firm's innovation activities were either maintained or expanded, indicating resilience. Conversely, a value of zero is assigned if innovation activities were dropped or deferred, suggesting a lack of resilience. This operationalization aligns with previous studies that recognize OR as the endeavor of resilient organizations to improve their absorptive and adaptive capacity during adversities (Boin, 2009; Tengblad and Oudhuis, 2018).

Bricolage strategy. Bricolage, as a theoretical construct, is traditionally anchored in the flexibility and ingenuity in utilizing available resources (Baker and Nelson, 2005). Our choice of operationalization was guided by this principle, reflecting the unique, spontaneous strategies employed by SMEs during the unprecedented challenges of the COVID-19 pandemic. The measures of bricolage strategy in this study reflect a facet of bricolage—be it resource recombination, unconventional problem-solving, or improvisational and adaptive approaches (Senyard et al., 2014; Halme et al., 2012). The pandemic's constraints necessitated multiple improvisational approaches, aligning with the essence of bricolage as firms navigated resource scarcities and operational disruptions (Crupi et al., 2021). We argue that these actions, though diverse, collectively embody the essence of bricolage, resonating with its foundational premise in literature (Duymedjian and Rüling, 2010). Thus, the surveyed responses are not mere accumulations of actions but rather reflect the

multifaceted, context-specific manifestations of bricolage under crisis conditions.

Therefore, our approach involved the use of survey items that asked respondents to identify the specific managerial actions their firms took using the resources at hand to confront the adversities brought about by COVID-19. These survey items encompassed a wide range of potential responses, including (1) temporary business shutdown, (2) export suspension, (3) implementation of remote work, (4) suspension of production or services, (5) introduction of new products or services, (6) changes in production methods (such as assembly line redesign, installation of remote control systems, and smart factory upgrades), (7) modifications in inter-firm communication and management policies (like establishing intra-virtual networks, promoting remote meetings, and introducing shift work), (8) alterations in external transactions (such as operating external virtual networks, promoting remote meetings, operating electronic transaction platforms, and conducting non-face-to-face marketing and monitoring), (9) scheduled contract cancellations, (10) recruitment cancellations, (11) layoffs, and (12) other actions. To quantify a firm's engagement in bricolage, we calculated the total number of managerial actions undertaken by summing all the selected items, thereby providing a numerical representation of the firm's bricolage strategy during the pandemic.

Government support. In response to the challenges posed by the COVID-19 crisis, the Korean government has rolled out a variety of public assistance measures aimed at supporting SMEs. To understand the impact of these measures on firms' innovation activities, respondents in our survey were asked to evaluate the extent to which each type of government support affected their firms using a five-point Likert scale (1 = extremely low influence, 5 = extremely high influence). Building on the framework established by Kuckertz et al. (2020), we categorized government support into two main types: financial and operational.

First, government financial support is subdivided into two types: (1) direct monetary support, which includes emergency job-security subsidies, subsidies for paid vacations and remote work practices, and subsidies for industries particularly hard-hit by COVID-19; and (2) finance support, encompassing public investment, loans, special government guarantees, and accounts-receivable insurance. These financial measures are designed to directly infuse capital into businesses and provide economic relief and stability. Second, government operational support includes six types of assistance: (1) tax support, which covers tax exemptions, due date extensions, customs refunds, and customs assistance; (2) infrastructure support for establishing contact-free work environments; (3) human resources support, which entails recruitment for research departments and facilitating employee training and development; (4) regulatory easing, such as easing regulations on the 52-h workweek and environmental protections; (5) market-related support, including marketing channel development; and (6) export support, which assists firms in entering foreign markets.

To evaluate the overall impact of these government assistance programs, we calculated the average values of the utility degrees to which firms received each type of government financial or operational support. This approach allowed us to gauge the perceived effectiveness and influence of different types of support on firms' innovation activities, providing insights into the areas where government assistance has been most impactful and where further support may be needed.

Business process innovation. The Oslo Manual offers a comprehensive definition of business process innovation, describing it as a significant change from a firm's previous business processes, encompassing new or improved practices in one or more business functions and implemented by the firm (OECD/Eurostat, 2018). Following this, the KIS operationalizes the measurement of business process innovations across various functions: (a) production, distribution, logistics, marketing, and sales of products; (b) general administration and management; and (c) new service-process development.

The survey asked respondents to report on their firms' engagement in business process innovation over the past year, focusing on six distinct types: (1) product manufacturing, which includes activities such as engineering, technology testing, analysis, and certification; (2) distribution and logistics, encompassing delivery service, warehousing, and order processing; (3) marketing and sales, which covers advertising, promotion, exhibitions, market research, price setting, and customer service; (4) information and communication systems, including hardware, software, data processing, databases, maintenance, web hosting, and other computer-related activities; (5) general administration and management, involving roles and responsibilities, decision-making processes, governance, accounting, bookkeeping, auditing, finance, insurance, human resource management, procurement, and supply-chain management; and (6) product- or service-development processes, which relate to the scope of in-house development, application of developed technologies, and outsourcing.

To assess the extent of business process innovation in SMEs, we calculated the number of different types of innovations each firm had initiated. This approach provides a quantitative measure of the firm's engagement in business process innovation, offering insights into the areas where firms are focusing their innovative efforts and how they are adapting their processes in response to changing market conditions and technological advancements.

Controls. To ensure accurate model specification and account for covariates that may influence the dependent variable, we included six control variables based on prior research (Bhamra et al., 2011; Iftikhar et al., 2021; Linnenluecke, 2017). We controlled for *firm size*, as measured by the number of employees in 2020, recognizing that larger firms might have more resources for business recovery. *Export intensity*, defined as the ratio of annual exports to annual sales in 2020, and the status of being a *listed firm* and/or a *clustering firm* as of 2020 were included to capture the firm's access to external resources and capital, which are crucial for addressing crisis-induced adversities (Beliaeva et al., 2020; Brown and Rocha, 2020). We also considered the *industry* of the firms' primary businesses using the two-digit Korean Standard Industry Classification to reflect the unique conditions and environments of different industries that underlie business strategies. Additionally, the status of firms being certified as *new ventures* by the government was included due to their inherent vulnerability to exogenous shocks and the liability of newness, which could affect their ability to sustain operations during crises (Seo, 2019). The relationships and interactions of these variables with OR are detailed in the descriptive statistics and correlations presented in Table 2 of the study.

Analytical tools. Given the dichotomous nature of the dependent variable, we employed logistic regression to test the hypotheses. This type of regression uses a logistic transformation of the probability of the event of interest to estimate the parameters of the models through maximum likelihood. We present odds ratios as an estimate of the relationships among variables instead of regression coefficients. The odds ratio (odd) can be obtained by an exponential transformation of the regression coefficients.

Results

To assess the impact of independent variables and moderators on dependent variables, we tested the hypotheses and included

Table 2 Descriptive statistics and correlations.

Construct	Mean	SD	Min.	Max.	1	2	3	4	5	6	7	8	9	10
1. Organizational resilience	0.211	0.408	0	1	1.000									
2. Bricolage strategy	0.304	0.504	0	4	0.158*	1.000								
3. Government financial support	0.283	0.665	0	4.000	0.128*	0.356*	1.000							
4. Government operational support	0.040	0.211	0	3.667	0.116*	0.149*	0.281*	1.000						
5. Business process innovation	0.288	0.692	0	5	0.741*	0.102*	0.110*	0.105*	1.000					
6. Firm size	114.689	197.149	10	2400	0.083*	0.055*	0.048*	0.016	0.076*	1.000				
7. Export intensity	0.011	0.085	0	1.000	0.022	0.051*	−0.012	0.016	0.019	−0.029	1.000			
8. New venture	0.030	0.170	0	1	0.158*	0.096*	−0.009	0.027	0.122*	−0.009	0.018	1.000		
9. Listed firm	0.018	0.134	0	1	0.079*	0.076*	−0.010	0.004	0.103*	0.043*	0.048*	0.100*	1.000	
10. Clustering firm	0.004	0.066	0	1	0.036*	0.045*	0.004	0.051*	0.034	−0.001	0.006	0.128*	0.062*	1.000

*$p < 0.05$ ($n = 3179$).

control variables in the regression models. Table 3 presents the results of the analyses, where Model 1 includes the control variables and Models 2–6 include the independent variables and moderators for the hypothesis tests.

We checked for multicollinearity among the independent variables by calculating variance inflation factors (VIFs) before mean-centering the variables. We did not observe any VIF levels above the critical threshold of 10; however, multicollinearity may arise from introducing interaction terms. Thus, we mean-centered each variable included in the interaction terms to test for multicollinearity using VIF (Aiken and West, 1991), and we found no indications of multicollinearity.

Model 1's results indicate that firm size (odd = 1.001, $p < 0.01$), new venture (odd = 2.501, $p < 0.01$), and listed firm (odd = 1.717, $p < 0.1$) have positive effects on a firm's OR. The significant and positive effect of new ventures is particularly noteworthy, suggesting that new ventures are more resilient in implementing crisis-response countermeasures by manifesting entrepreneurial postures. Model 2 tested H1, which postulates a positive bricolage–resilience relationship in crisis-responding SMEs. The analysis yielded a significant and positive linkage between adopting a bricolage-coping strategy and a firm's resilience to exogenous shocks (odd = 1.761, $p < 0.01$), supporting H1.

We then tested H2, which proposes a positive moderating role of government support in the bricolage–resilience relationship, through Model 3 for government financial support and Model 4 for government operational support. Interestingly, Model 3 shows that government financial support positively affects the SMEs' OR in isolation (odd = 1.797, $p < 0.01$), and it produces diminished returns from employing a bricolage strategy for resilience (odd = 0.592, $p < 0.01$). As Fig. 2 shows, when *government financial support* is small (mean–1 SD), as *bricolage strategy* increases OR probability increases from 19.2% to 51.2%; however, when *government financial support* is large (mean + 1 SD), as *bricolage strategy* increases OR probability only increases from 21.6% to 29.6%. This suggests that government financial support substitutes for firms' improvisational approaches to exploit and combine available resources in dealing with crisis-induced adversities. Model 4 suggests that government operational support enhances the firms' OR (odd = 3.130, $p < 0.01$), while its interaction with bricolage has no impact on the dependent variable (odd = 0.666, n.s.). This analysis provided no evidence to support H2.

In Model 5, we introduced the interaction terms between a bricolage strategy and business process innovation by crisis-responding SMEs to test H3, which proposes a moderating role of business process innovation in the bricolage–resilience relationship. The results showed that bricoleur firms conducting business process innovation experienced diminished resilience performance (odd = 0.545, $p < 0.1$), while innovative initiatives for business processes in isolation substantially enhanced the firms' OR (odd = 124.640, $p < 0.01$). As Fig. 3 shows, when *business process innovation* is small (mean–1 SD), as *bricolage strategy* increases OR probability increases from 0.7% to 15%; however, when *business process innovation* is large (mean + 1 SD), as *bricolage strategy* increases OR probability decreases from 85% to 82.7%. This suggests that the simultaneous use of bricolage approaches to combine available resources in multilateral ways and innovations in business processes to capitalize on new opportunities that emerged during the crisis can decrease SMEs' resource availability, thus supporting H3.

Discussion

Theoretical contributions. This study extends the crisis management literature by exploring the extent to which SMEs facing

Table 3 Hypothesis test results.

Dependent variable: *organizational resilience*	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Bricolage strategy		1.761** (0.160)	1.652** (0.172)	1.707** (0.161)	1.604** (0.238)	1.647** (0.277)
Government financial support			1.797** (0.132)			1.280† (0.186)
Bricolage strategy × Government financial support			0.592** (0.067)			0.684† (0.145)
Government operational support				3.130** (0.730)		1.413 (0.528)
Bricolage strategy × Government operational support				0.666 (0.199)		0.820 (0.468)
Business process innovation					124.640** (25.303)	119.441** (24.320)
Bricolage strategy × Business process innovation					0.545† (0.179)	0.564† (0.187)
Firm size	1.001** (<0.001)	1.001** (<0.001)	1.001** (<0.001)	1.001** (<0.001)	1.001** (<0.001)	1.001** (<0.001)
Export intensity	1.398 (0.728)	1.192 (0.637)	1.162 (0.632)	1.198 (0.643)	2.526 (2.102)	2.453 (2.053)
New venture	2.501** (0.601)	2.387** (0.578)	2.372** (0.581)	2.412** (0.586)	1.719 (0.661)	1.625 (0.628)
Listed firm	1.717† (0.538)	1.567 (0.500)	1.553 (0.500)	1.627 (0.521)	0.890 (0.478)	0.903 (0.486)
Clustering firm	1.063 (0.679)	0.918 (0.585)	0.843 (0.543)	0.742 (0.489)	0.193 (0.231)	0.181 (0.217)
Industry	*Included*	*Included*	*Included*	*Included*	*Included*	*Included*
Constant	0.149** (0.022)	0.120** (0.018)	0.153** (0.023)	0.133** (0.020)	0.053** (0.016)	0.052** (0.016)
Chi-squared	382.860**	420.560**	487.020**	448.090**	2114.960**	2122.010**
Log-likelihood	−1445.627	−1426.776	−1393.546	−1413.009	−579.575	−576.050
n	3179	3179	3179	3179	3179	3179

We reported the odds ratios for the independent and control variables.
†$p < 0.1$; *$p < 0.05$; **$p < 0.01$; Standard errors in parentheses.

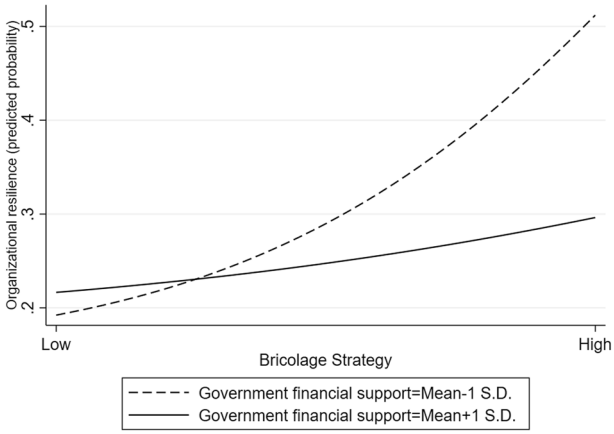

Fig. 2 Interaction effect of government financial support. This figure illustrates the interaction effect of bricolage strategy and government financial support.

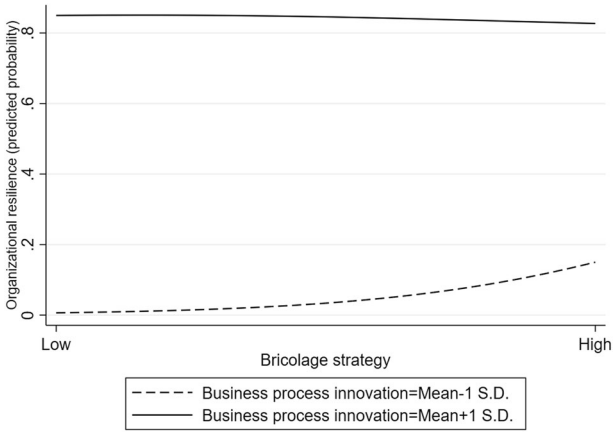

Fig. 3 Interaction effect of business process innovation. This figure illustrates the interaction effect of bricolage strategy and business process innovation.

various disturbances can benefit from adopting a bricolage strategy to improve OR. Evidence suggests that the bricolage-coping strategy enables firms to enhance their resilience. Results indicate that bricoleur firms initiate experimental recombination of available resources for new purposes to adapt to crisis-induced disruptions. For firms vulnerable to crises, resilience is crucial for adapting to changing conditions and effectively recovering while addressing challenges that disrupt business routines (Yu and Wang, 2021). However, as Bhamra et al. (2011) noted, there has been limited evidence on how business entities, particularly SMEs, can achieve varying degrees of resilience. We conclude that bricolage impacts OR levels since the improvisational behaviors corresponding to evolving crises encourage SMEs to integrate unsystematic yet complementary resource exploitation, effectively addressing environmental complexity. This aligns with Boin's (2009) argument that resilience is linked to an organization's crisis-response strategy, based on its capacity for improvisation, coordination, flexibility, and endurance toward rapid recovery. This study contributes to the literature by responding to prior calls to identify predictive factors that promote resilient characteristics within organizations (Linnenluecke, 2017).

We now turn to a rarely explored question: What factors contribute to differences in the potential implications of bricolage for SMEs OR in crises? One challenge in extending OR degrees under economic conditions is the presence of various factors influencing resilience beyond the organizational level of analysis. Consequently, we investigated the potential impact of government support on SMEs' deliberate bricolage to enhance resilience.

We hypothesized that leveraging government financial and operational support would amplify the resilience implications of the bricolage employed by firms for business recovery. However, our findings reveal that while both financial and operational countermeasures improve SMEs' operational resilience as intended, these support types have distinct impacts on resilience when interacting with a bricolage-coping strategy. Specifically, government financial support hinders bricoleur firms from attaining high resilience, while government operational support does not affect the resilience outcomes of their bricolage approaches.

We suggest that government financial support may substitute for bricoleur firms' resource commitments when addressing crisis challenges for recovery. This aligns with Chen et al.'s (2022) assertion that financial support did not alleviate SMEs' liquidity constraints during crises, as it could replace bricoleurs' self-sustaining efforts to repurpose available resources. We recommend that SMEs leverage government financial and operational support to enhance their adaptive capacity and maintain business functionality during crises while remaining cautious about using financial support due to its potentially adverse impact on the resilience implications of bricolage. Although financial subsidies often entail various requirements, resources used to comply with these regulations and navigate bureaucratic obstacles might be better spent implementing bricolage strategies for survival (Halme et al., 2012; Kuckertz et al., 2020). Puumalainen et al. (2023) also expressed concern that overreliance on government financial support could foster dependence on external aid, impeding SMEs' proactive development of self-sufficient resilience. Our evidence contributes to expanding the existing literature by examining the influence of institutional measures on SMEs' crisis-response strategies, which can determine their resilience (Glynn, 2021).

We also examined the moderating role of business process innovation in the relationship between SMEs' bricolage and resilience. Our findings indicate that the concurrent application of bricolage-coping strategies and business process innovation may exacerbate misallocation of resources for firms, misleading them to invest in projects that do not contribute to their long-term resilience although business process innovation is a strong predictor of OR in isolation. During an economic crisis, SMEs must prioritize survival over innovation, focusing on maintaining cash flow, retaining customers, and reducing costs. Implementing business process innovation is a time-consuming activity that could divert firms' attention from crucial tasks needed to address crisis-induced challenges through improvisational methods. Business process innovation may be essential to adapt to changing market values during a crisis (Felin et al., 2020) and exploit emerging opportunities for business continuity (Kuckertz et al., 2020). However, it can impose significant resource burdens on SMEs, which typically face resource limitations (Beliaeva et al., 2020).

Firms lacking the in-house expertise required to successfully implement innovative initiatives may find recruiting new talent or training employees difficult and costly during a crisis, further heightening the inherent risks of failure associated with innovation. Our findings support Seo's (2019) argument that not all innovative initiatives, which resource-constrained firms may struggle to afford, yield entirely positive outcomes. Bricolage allows firms to creatively use and combine their existing resources in new ways to meet changing market needs, without requiring significant investment in new resources (Baker and Nelson, 2005). Additionally, bricoleur firms adapt quickly to changing circumstances and develop new capabilities as needed (Duymedjian and Rüling, 2010). Therefore, SMEs benefit from adopting a bricolage strategy in the short term while working toward building the necessary resources to invest in more substantial innovation initiatives in the long term.

The distinction between OR and business process innovation is fundamental in understanding their interplay. OR in this study is defined as a firm's capability to adapt and respond to external disruptions, exemplified by challenges presented during the COVID-19 pandemic. This form of resilience highlights an organization's external agility and flexibility. Conversely, business process innovation focuses on significant internal changes within a firm's operations across various business functions, marking a proactive internal strategy. Despite both being related to innovation, they operate on different spectrums: OR is externally reactive, addressing external shocks (Iftikhar et al., 2021), while business process innovation is an internally proactive transformation (Aliasghar et al., 2020). This approach to the intricate relationship between external adaptive capacity and internal process innovation is critical for a comprehensive analysis of resource orchestration for innovation in the context of contemporary crisis management.

Our findings significantly enrich the current knowledge of SMEs in service sectors during the COVID-19 crisis by providing more generalizable insights into resilience enhancement through bricolage-coping strategy. Prior studies have examined how service-oriented firms can bolster their business continuity in the face of survival threats posed by the COVID-19 crisis (Huang and Jahromi, 2021). Although this body of work has offered valuable perspectives on specific industries such as restaurants (Karniouchina et al., 2022), specialized services (Walsman, 2022), and hospitality (Cambra-Fierro et al., 2022), the potential causality among crisis-response strategies, institutional interventions, and operational resilience has been relatively unexplored (Levy, 2021; Linnenluecke, 2017; Shepherd, 2020). This study bridges this gap in the literature by offering more extensive implications for a range of service sectors through a holistic approach that integrates the multiplicative resilience implications of both managerial and policy responses, thereby enhancing the comprehension of effective crisis management.

Overall, the literature posits that crisis management is a systematic approach encompassing crisis prevention and preparation, response during crises, and learning and revision post-crisis. Resilience, a central concept in crisis management, refers to a firm's ability to absorb and adapt to disruptive events while maintaining functionality. Resilient organizations often exhibit shared traits, such as adaptive capacity, organizational flexibility, and improvisation. We conclude that employing bricolage has emerged as a critical strategic stance, enabling SMEs to revive their businesses through crisis-driven recovery efforts. Amidst unpredictable economic crises, firms should consider the potential impacts of interactions between institutional or intraorganizational countermeasures *and* their bricolage strategy on OR.

Practical implications. This study offers practical implications for managers and policymakers in devising and implementing appropriate crisis management strategies. SMEs can exhibit varying resilience degrees by proactively adapting to economic turbulence challenges, mitigating the worst effects of restrictive market conditions. However, their resilience depends on their ability to enhance resource availability. This research reveals that adopting improvisational approaches to recover from crisis-related damage increases firms' adaptive capacity to develop and apply new resources in response to their turbulent environments. SMEs should be receptive to diverse modes of behavior to expand resource availability and explore novel resource transformation functions when tackling crisis challenges.

Managers can leverage government financial and operational support to enhance resilience and maintain business functionality during a crisis. We posit that government support plays a constructive role in helping SMEs maintain organizational adaptability in crises. However, firms employing a bricolage strategy should exercise caution when utilizing financial support, as it can have substantial effects on their self-sustaining efforts to expand resource availability for resilience. Meeting stringent criteria for extra resources through government financial support may deplete resources acquired via bricolage-coping strategies (Kuckertz et al., 2020), diluting firms' initiatives to materialize potential resource value. From an institutional standpoint, operational support programs aimed at enhancing firms' resource orchestration would be more sustainable policy interventions for activating resilience.

Although business process innovation may offer growth opportunities and competitive advantages, the risks associated with pursuing such initiatives during a crisis may outweigh the potential benefits for SMEs. They must carefully evaluate potential innovation risks and returns before undertaking innovation projects during challenging times. Economic crises often result in market volatility and fluctuating customer demand. Allocating funds for innovation projects may divert resources from critical operational needs, increasing insolvency risk. Given that innovation can impose unaffordable resource burdens on organizations, they must exercise caution when devoting excessive attention to innovations (Seo, 2019). Predicting innovation success in such uncertain environments can be difficult for SMEs, heightening failure risk. Managers in SMEs must ensure sufficient resources are available for bricolage-coping responses, maintaining a clear focus on business revival (Bhamra et al., 2011).

Limitations and future research. This study has limitations that present opportunities for future research. Firstly, our assumption of linear relationships among phenomena for model conciseness may not fully capture each construct's unique impact on optimal conditions for resilience enhancement. For example, overreliance on bricolage can result in liability, leading to resource dispersal and difficulty in maintaining a coherent recovery strategy (Baker and Nelson, 2005). Excessive bricolage can also challenge organizations seeking to scale, as ad-hoc solutions may not be sustainable or replicable for long-term growth (Senyard et al., 2014). This limitation hampers their ability to adapt to future crises, innovate, and evolve in a rapidly changing business landscape. Thereby, the resilience implications of an excessive bricolage-coping strategy may plateau or become negative beyond a certain threshold.

Our analysis cannot eliminate endogeneity issues arising from an implicit recursive model in the theoretical framework. The COVID-19 pandemic, as a specific economic crisis causing complex impacts, makes implementing universal policy measures and firm responses challenging. Establishing causality in research based on cross-sectional data is difficult, hindering causal inferences between strategic choices and actions. This justifies using qualitative research methods to better understand respondents' perceptions and responses to exogenous shocks. Future research should employ alternative empirical methods, such as experiments, to investigate the decision-making and behavioral processes underlying SMEs' crisis-response strategies.

Future research could examine organizations' systems that enable different resilience configurations. Resilience encompasses not only addressing adversities but also adjusting organizational functioning under various conditions. Understanding resilience configuration within systems remains crucial. In large-scale, unforeseen events like COVID-19, agile responses may be more effective than rigid ones. Burnard et al. (2018) suggest that OR configuration relies on organizations' systems to adapt by flexibly allocating resources and preparing through systematic risk management. Incorporating reactive or proactive preparation components in addition to adaptation aspects could yield more accurate predictions and explanations of crisis-response strategies (Burnard et al., 2018).

Adopting a process-based view of OR, as suggested by Conz and Magnani (2020), indeed opens up opportunities for studies to develop a more comprehensive OR measurement. This perspective emphasizes examining OR as a dynamic process that unfolds over three critical phases: pre-adversity, adversity, and post-adversity. Each phase involves distinct actions and strategies that contribute to an organization's overall resilience. This approach would not only help in understanding how organizations navigate through each phase of a crisis but also offer insights into the effectiveness of different strategies and actions at each stage.

Conclusion

Despite burgeoning interest in the realm of SME crisis management research, scholarly inquiry remains limited in its examination of the potential implications of a bricolage-coping strategy for tackling resource constraints, a salient SME shortcoming. This knowledge void prompted us to postulate that bricolage could fortify SMEs' resilience in the face of crises, contingent upon the external and internal counteractive measures undertaken by bricoleur firms.

We draw on the conceptual frameworks of bricolage strategy and OR, and we evaluate the moderating roles of governmental financial and operational support, as well as business process innovation, as countermeasures within the context of the COVID-19 crisis in the bricolage-resilience mechanism. Our analysis contributes to the academic discourse by proffering empirical evidence elucidating the potential implications of a bricolage approach for resilience, as well as its conditional factors, within SMEs amidst capricious economic crises. This deeper understanding of the nexus between bricolage and resilience under specific conditions paves the way for more effective crisis management strategies for SMEs navigating turbulent and uncertain landscapes.

This study on Korean SMEs' resilience during the COVID-19 crisis, with a focus on the bricolage strategy, provides insights potentially relevant on a global scale. The pandemic, a worldwide shock, has affected SMEs in various countries, each facing comparable challenges and degrees of impact. Kuckertz et al. (2020) discuss the similarity among global policy measures adopted to support SMEs, highlighting the universal need for efficient crisis management. The bricolage approach, characterized by adaptability and spontaneity, as seen in Korean SMEs, are corresponding to equivalents in other countries experiencing similar crises (Singh et al., 2022). Through a bibliometric analysis of prior studies, Singh et al. (2022) found that this strategy, which promotes creativity and flexible resource use, aligns with the global entrepreneurial response to crises, marked by rapid pivots and innovations.

However, seeking global implications of our findings requires caution. Differences in institutional agendas, government support, and industrial conditions across countries can affect the resilience efficacy of bricolage strategies. The scope of government support, as Kuckertz et al. (2020) note, differs internationally, influencing the bricolage strategy's effectiveness. The specific economic and regulatory contexts in different nations may also present unique challenges and opportunities for SMEs, shaping their strategic orientations to crisis management (Adam

and Alarifi, 2021). While the contingent mechanisms underlying the bricolage–resilience relationship observed in the Korean context provide a useful framework, their application elsewhere necessitates careful adaptation to local conditions and peculiarities.

Data availability

This study used the Korean Innovation Survey (KIS) data provided by the Science and Technology Policy Institute (STEPI). The authors are not authorized to disclose the national statistical data. The data is available from the institute upon its permission for researchers' requests: https://www.stepi.re.kr/kis/service/sub02_data_application.do.

Received: 6 September 2023; Accepted: 31 January 2024;
Published online: 13 February 2024

References

Adam N, Alarifi G (2021) Innovation practices for survival of small and medium enterprises (SMEs) in the COVID-19 times: the role of external support. J Innov Entrep 10(1):1–22. https://doi.org/10.1186/s13731-021-00156-6

Aggarwal V, Posen H, Workiewicz M (2017) Adaptive capacity to technological change: a micro-foundational approach. Strateg Manag J 38(6):1212–1231. https://doi.org/10.1002/smj.2584

Aiken L, West S (1991) Multiple regression: testing and Interpreting Interactions. Sage, New York

Aliasghar O, Sadeghi A, Rose E (2020) Process innovation in small- and medium-sized enterprises: the critical roles of external knowledge sourcing and absorptive capacity. J Small Bus Manag 61(4):1583–1610. https://doi.org/10.1080/00472778.2020.1844491

An W, Zhao X, Cao Z et al. (2018) How bricolage drives corporate entrepreneurship: The roles of opportunity identification and learning orientation. J Prod Innov Manag 35(1):49–65. https://doi.org/10.1111/jpim.12377

Ardito L, Coccia M, Messeni A (2021) Technological exaptation and crisis management: evidence from COVID-19 outbreaks. R D Manag 51(4):381–392. https://doi.org/10.1111/radm.12455

Audretsch DB, Coad A, Segarra A (2014) Firm growth and innovation. Small Bus Econ 43:743–749. https://doi.org/10.1007/s11187-014-9560-x

Baker T, Nelson R (2005) Creating something from nothing: resource construction through entrepreneurial bricolage. Adm Sci Q 50(3):329–399. https://doi.org/10.2189/asqu.2005.50.3.329

Beliaeva T, Shirokova G, Wales W et al. (2020) Benefiting from economic crisis? Strategic orientation effects, trade-offs, and configurations with resource availability on SME performance. Int Entrep Manag J 16:165–194. https://doi.org/10.1007/s11365-018-0499-2

Bhamra R, Dani S, Burnard K (2011) Resilience: the concept, a literature review, and future directions. Int J Prod Res 49(18):5375–5393. https://doi.org/10.1080/00207543.2011.563826

Bishop P (2019) Knowledge diversity and entrepreneurship following an economic crisis: an empirical study of regional resilience in Great Britain. Entrep Reg Dev 31(5-6):496–515. https://doi.org/10.1080/08985626.2018.1541595

Boin A (2009) The new world of crises and crisis management: implications for policymaking and research. Rev Policy Res 26(4):367–377. https://doi.org/10.1111/j.1541-1338.2009.00389.x

Brown R, Rocha A (2020) Entrepreneurial uncertainty during the COVID-19 crisis: mapping the temporal dynamics of entrepreneurial finance. J Bus Ventur Insights 14:e00174. https://doi.org/10.1016/j.jbvi.2020.e00174

Burnard K, Bhamra R, Tsinopoulos C (2018) Building organizational resilience: four configurations. IEEE Trans Eng Manag 65(3):351–362. https://doi.org/10.1109/TEM.2018.2796181

Cambra-Fierro J, Gao L, Melero-Polo I et al. (2022) Theories, constructs, and methodologies to study COVID-19 in the service industries. Serv Ind J 42(7–8):551–582. https://doi.org/10.1080/02642069.2022.2060209

Chen J, Cheng Z, Gong RK et al. (2022) Riding out the COVID-19 storm: how government policies affect SMEs in China. China Econ Rev 75:101831. https://doi.org/10.1016/j.chieco.2022.101831

Clauss T, Breier M, Kraus S et al. (2021) Temporary business model innovation–SMEs' innovation response to the COVID-19 crisis. R D Man 52(2):294–312. https://doi.org/10.1111/radm.12498

Conz E, Magnani G (2020) A dynamic perspective on the resilience of firms: a systematic literature review and a framework for future research. Eur Manag J 38(3):400–412. https://doi.org/10.1016/j.emj.2019.12.004

Coombs W (2015) Ongoing crisis communication. Sage, Los Angeles

Crupi A, Liu S, Liu W (2021) The top-down pattern of social innovation and social entrepreneurship bricolage and agility in response to COVID-19: cases from China. R D Man 52(2):313–330. https://doi.org/10.1111/radm.12499

Davidsson P, Baker T, Senyard JM (2017) A measure of entrepreneurial bricolage behavior. Int J Entrep Behav 23(1):114–135. https://doi.org/10.1108/IJEBR-11-2015-0256

Doern R, Williams N, Vorley T (2019) Special issue on entrepreneurship and crises: business as usual? An introduction and review of the literature. Entrep Reg Dev 31(5-6):400–412. https://doi.org/10.1080/08985626.2018.1541590

Duymedjian R, Rüling C (2010) Towards a foundation of bricolage in organization and management theory. Organ Stud 31(2):133–151. https://doi.org/10.1177/0170840609347051

Felin T, Gambardella A, Stern S et al. (2020) Lean startup and the business model: experimentation revisited. Long Range Plan 53(4):101889. https://doi.org/10.1016/j.lrp.2019.06.002

Friedman Y, Carmeli A, Tishler A (2016) How CEOs and TMTs build adaptive capacity in small entrepreneurial firms. J Manag Stud 53(6):996–1018. https://doi.org/10.1111/joms.12184

Frishammar J, Kurkkio M, Abrahamsson L et al. (2012) Antecedents and consequences of firms' process innovation capability: a literature review and a conceptual framework. IEEE Trans Eng Manag 59(4):519–529. https://doi.org/10.1109/TEM.2012.2187660

Giustiniano L, Clegg S, Cunha M, et al., (eds) (2018) Elgar introduction to theories of organizational resilience. Edward Elgar Publishing, Cheltenham

Glynn MA (2021) 15 days to slow the spread': covid-19 and collective resilience. J Manag Stud 58(1):265–269. https://doi.org/10.1111/joms.12644

Halme M, Lindeman S, Linna P (2012) Innovation for inclusive business: intrapreneurial bricolage in multinational corporations. J Manag Stud 49(4):743–784. https://doi.org/10.1111/j.1467-6486.2012.01045.x

Hamel G, Välikangas L (2003) The quest for resilience. Harv Bus Rev 81(9):52–63. https://hbr.org/2003/09/the-quest-for-resilience

Huang A, Jahromi MF (2021) Resilience building in service firms during and post COVID-19. Serv Ind J 41(1–2):138–167. https://doi.org/10.1080/02642069.2020.1862092

Iftikhar A, Purvis L, Giannoccaro I (2021) A meta-analytical review of antecedents and outcomes of firm resilience. J Bus Res 135:408–425. https://doi.org/10.1016/j.jbusres.2021.06.048

Juergensen J, Guimón J, Narula R (2020) European SMEs amidst the COVID-19 crisis: assessing impact and policy responses. J Ind Bus Econ 47(3):499–510. https://doi.org/10.1007/s40812-020-00169-4

Karniouchina K, Sarangee K, Theokary C et al. (2022) The impact of the COVID-19 pandemic on restaurant resilience: lessons, generalizations, and ideas for future research. Serv Sci 14(2):121–138. https://doi.org/10.1287/serv.2021.0293

Kuckertz A, Brändle L, Gaudig A et al. (2020) Startups in times of crisis: a rapid response to the COVID-19 pandemic. J Bus Ventur Insights 13:e00169. https://doi.org/10.1016/j.jbvi.2020.e00169

Lévi-Strauss C (1962) The savage mind. Oxford University Press, Oxford

Levy DL (2021) COVID-19 and global governance. J Manag Stud 58(2):562–566. https://doi.org/10.1111/joms.12654

Linnenluecke M (2017) Resilience in business and management research: a review of influential publications and a research agenda. Int J Manag Rev 19(1):4–30. https://doi.org/10.1111/ijmr.12076

McManus S, Seville E, Vargo J, Brunsdon D (2008) Facilitated process for improving organizational resilience. Nat Hazards Rev 9(2):81–90. https://doi.org/10.1061/(ASCE)1527-6988(2008)9:2(81)

OECD (2020) Coronavirus (COVID-19): SME policy responses. OECD Publishing, Paris

OECD/Eurostat (2018) Oslo Manual 2018: guidelines for collecting, reporting and using data on innovation, 4th edn. OECD Publishing, Paris

Patrucco A, Trabucchi D, Frattini F, Lynch J (2021) The impact of COVID-19 on innovation policies promoting open innovation. R D Man 52(2):273–293. https://doi.org/10.1111/radm.12495

Prentice C, Altinay L, Woodside AG (2021) Transformative service research and COVID-19. Serv Ind J 41(1–2):1–8. https://doi.org/10.1080/02642069.2021.1883262

Probert J, Turnbull K (2011) Leadership development: crisis, opportunities, and the leadership concept. Leadership 7(2):137–150. https://doi.org/10.1177/17427150103948

Puumalainen K, Sjögrén H, Soininen J et al. (2023) Crisis response strategies and entrepreneurial orientation of SMEs: a configurational analysis on performance impacts. Int Entrep Manag J 19:1527–1559. https://doi.org/10.1007/s11365-023-00847-4

Radziwon A, Bogers M, Chesbrough H et al. (2021) Ecosystem effectuation: creating new value through open innovation during a pandemic. R D Man 52(2):376–390. https://doi.org/10.1111/radm.12512

Santos L, Borini F, Oliveira M et al. (2020) Bricolage as capability for frugal innovation in emerging markets in times of crisis. Eur J Innov Manag 25(2):413–432. https://doi.org/10.1108/EJIM-06-2020-0225

Senyard J, Baker T, Steffens P et al. (2014) Bricolage as a path to innovativeness for resource-constrained new firms. J Prod Innov Manag 31(2):211–230. https://doi.org/10.1111/jpim.12091
Seo R (2019) Entrepreneurial orientation and innovation performance: insights from Korean ventures. Eur J Innov Manag 23(4):675–695. https://doi.org/10.1108/EJIM-01-2019-0023
Sharma G, Kraus S, Liguori E et al. (2022) Entrepreneurial challenges of COVID-19: re-thinking entrepreneurship after the crisis. J Small Bus Manag. https://doi.org/10.1080/00472778.2022.2089676
Shepherd DA (2020) COVID 19 and entrepreneurship: time to pivot? J Manag Stud 57(8):1750–1753. https://doi.org/10.1111/joms.12633
Singh M, Dhir S, Mishra H (2022) Synthesizing research in entrepreneurial bootstrapping and bricolage: a bibliometric mapping and TCCM analysis. Manag Rev Q. https://doi.org/10.1007/s11301-022-00308-2
Soluk J, Kammerlander N, De Massis A (2021) Exogenous shocks and the adaptive capacity of family firms: exploring behavioral changes and digital technologies in the COVID-19 pandemic. R D Man 51(4):364–380. https://doi.org/10.1111/radm.12471
Stenholm P, Renko M (2016) Passionate bricoleurs and new venture survival. J Bus Ventur 31(5):595–611. https://doi.org/10.1016/j.jbusvent.2016.05.004
Su W, Junge S (2023) Unlocking the recipe for organizational resilience: a review and future research directions. Eur Manag J 41(6):1086–1105. https://doi.org/10.1016/j.emj.2023.03.002
Tengblad S, Oudhuis M (2018) Conclusions: the resilience framework summarized. In: Tengblad S, Oudhuis M (eds) The resilience framework: work, organization, and employment. Springer, Singapore, p 233–248
Walsman MC (2022) Operational adaptation and innovation during COVID-19: lessons learned from consulting and a road map for the future. Serv Sci 14(2):195–212. https://doi.org/10.1287/serv.2022.0301
Wenzel M, Stanske S, Lieberman MB (2021) Strategic responses to crisis. Strateg Manag J 42(2):16–27. https://doi.org/10.1002/smj.3161
Williams T, Gruber D, Sutcliffe K et al. (2017) Organizational response to adversity: fusing crisis management and resilience research streams. Acad Manag Ann 11(2):733–769. https://doi.org/10.5465/annals.2015.0134
Witell L, Gebauer H, Jaakkola E et al. (2017) A bricolage perspective on service innovation. J Bus Res 79:290–298. https://doi.org/10.1016/j.jbusres.2017.03.021
Wright M, Tartari V, Huang KG et al. (2018) Knowledge worker mobility in context: pushing the boundaries of theory and methods. J Manag Stud 55(1):1–26. https://doi.org/10.1111/joms.12316
Yu X, Wang X (2021) The effects of entrepreneurial bricolage and alternative resources on new venture capabilities: evidence from China. J Bus Res 137:527–537. https://doi.org/10.1016/j.jbusres.2021.08.063
Zsidisin G, Melnyk S, Ragatz G (2005) An institutional theory perspective of business continuity planning for purchasing and supply management. Int J Prod Res 43(16):3401–3420. https://doi.org/10.1080/00207540500095613

Acknowledgements

This work was supported by the research fund of Hanyang University (HY-202200000003489).

Author contributions

Ji-Hoon Park contributed to conceptualization, methodology, data curation, formal analysis, funding acquisition, writing—original drafting. Ribin Seo contributed to conceptualization, project administration, validation, writing—original drafting, reviewing, and editing.

Competing interests

The authors declare no competing interests.

Ethical approval

This study did not involve any kind of clinical or medical experimentation or any identifiable human material and data. This was a non-interventional study that collected data through an online survey and ensured the anonymity of the respondents. The survey was designed to elicit the opinions and views of the respondents on their adaptability at work. The respondents were not asked to provide their names, identification, address, or any other identifying elements.

Informed consent

This article does not contain any studies with human participants performed by the authors.

Additional information

Correspondence and requests for materials should be addressed to Ribin Seo.

Reprints and permission information is available at http://www.nature.com/reprints

Publisher's note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.