Developing OA in SMEs: Examining Complexities Interlinkage of Social Capital, CKC, and Innovation

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Abstract

Although SC and CKC were considered essential drivers in maintaining competitive advantage, empirical evidence on how CKC impacted to CKC on OA remained limited. Therefore, the present study examined the nexus between SC and CKC in building innovation and agility and testing strategic flexibility as a MV. It employed a quantitative approach by distributing questionnaires to 414 managers of SMEs analyzed by SmartPLS-SEM. The discoveries showed that SC significantly affected CKC, innovation, and OA. Meanwhile, CKC was not significantly impacted OA. Furthermore, strategic flexibility was not a MV of the relationship between innovation and OA. Based on these findings, this study produced recommendations for managers to strengthen OA.

Keywords; SC, CKC, innovation, strategic flexibility, OA.

Introduction

Encountering market turbulence, competitor challenges, and even devastating effects of the pandemic, an organization requires the capability and agility to respond to changes, performs certain adjustments (Baškarada and Koronios, 2018), and strengthen its innovations ability (Audretsch and Belitski, 2022; Miroshnychenko *et al*., 2021; Yildiz and Aykanat, 2021) to maintain performance, and sustainable competitiveness (Chung *et al*., 2019a; Liu and Yang, 2020). Moreover, in the current Covid-19 pandemic situation, everything has become unpredictable, causing turbulence in multiple sectors. Thus, the conventional competitive strategy was no longer effective (Al-Omoush *et al*., 2020a). The pandemic prompted the organization to continuously innovate by maintaining good relationships with the customers (Dabić *et al*., 2021), optimizing available resources (Liu and Yang, 2020), and focusing on their product development (Cai *et al*., 2019). The managers strived to identify opportunities through innovation. However, many failed to utilize precious resources to achieve strategic competitiveness (Audretsch and Belitski, 2022). Therefore, the business organization need resistance ability by enforcing a variety of scenarios under uncertain contexts (Chan and Muthuveloo, 2020)(Baškarada and Koronios, 2018; Koçyiğit and Akkaya, 2020; Teece *et al*., n.d.). However, innovation was considered vital during a crisis, and how the company had laid the foundation for a resilient organization through increasing the role of innovation needed further empirical evidence (Al-Omoush *et al*., 2020b) (Teixeira and Werther, 2013). Nevertheless, it was urgently needed given the intense disturbance that required anticipation and exploitation of innovation ability towards sustained competitive advantages (Belhadi *et al*., 2021).

The present study attempted to close research gaps as follows. First, the role of SC and CKC thrturbulence caused by the pandemic remained unexplored (Al-Omoush *et al*., 2020b). Although SC and CKC have contributed to sustaining competitive advantages, the empirical evidence between this construct and innovation remained limited (Ganguly *et al*., 2019; Singh *et al*., 2021). Second, the previous research disregard the effect of CKC on OA (Al-Omoush *et al*., 2020b). After all, by building adequate collaborative knowledge, an organization will have the critical notion of developing DC (Harsch and Festing, 2020), creating a culturally resilient culture (Felipe *et al*., 2017), thus enduring each potential crisis scenario. Third, while strategic value from CKC practice was evident, most companies could not understand how this practice

can be adapted to enhance their innovation abilities in the face of crisis, especially in SMEs. Moreover, SMEs have limited resources (Özbuğday *et al*., 2020).

The existing literature described OA as a complex construct. It can be impacted by many drivers such as organizational culture value (Felipe *et al*., 2017), organizational flexibility (Koçyiğit and Akkaya, 2020), KC (Chung *et al*., 2019a), and innovation (Al-Omoush *et al*., 2020b; Cai *et al*., 2019; Ravichandran, 2018). However, there was still a scarcity of insight into mechanism underpinning innovation that strengthens agility. Thus, the role of moderation should be considered. Furthermore, it was hoped to enrich the understanding of innovation's role in building agility. Hence, this study aimed to explore the predictor of OA using a relevant variable called strategic flexibility that was not been extensively studied yet. Therefore, strategic flexibility has become the key element to making changes in organizational strategic planning so that the impact on innovation and OA will be even more substantial in the future.

Motivated by the research gaps, the present study aimed to examining the nexus between SC and CKC towards innovation and OA by proposing a structural equation model for SMEs in Indonesia based on three primary reasons. First, SMEs were grown exponentially with a total of 64,5 million units that potentially became the backbone of the economy (Surya *et al*., 2021). Therefore, it indicated the magnitude of the potential of SC that needed to be empowered as the strength to build resilience in facing the turbulences. Second, Indonesian SMEs had a weak internal driver in a business dynamic; hence it required knowledge collaboration to improve innovation (Arsawan, Koval, *et al*., 2022) for the employees from the grassroots level up to the organization (Arsawan, Kariati, *et al*., 2022; Parwita *et al*., 2021). Third, SMEs need to prepare strategic flexibility when facing turbulence caused by market shifts or the pandemic (Khan, Majid, Yasir, *et al*., 2020; Miroshnychenko *et al*., 2021) so that they can survive in difficult situations (Felipe *et al*., 2017). The second section of the article discusses the literature and hypotheses development followed by method and result to propose a scenario and discussion about agility.

Literature Review

OA and DC in SMEs

OA was the brainchild of Sherehiy et al., (2007) that was rooted in two primary concepts called adaptation (reactive) and organizational flexibility (proactive). OA reveals the ability to recognize environmental transition and counter it quickly by reshaping the resource set, business processes, and strategies (Wageeh, 2016; Žitkienė and Deksnys, 2018). In the SME sector, adapting to change was essential to reduce resource issues for future development (Liu and Yang, 2020). Consequently, ensuing the inclusive approach bring out by previous researchers (Ahmadi and Ershadi, 2021; Al-Omoush *et al*., 2020b; Zhou *et al*., 2018), this study conceptualized OA as responsive capabilities aiming for a more efficient approach in a complex environment (Panda and Rath, 2016). This approach involved rapid responses to changing situations (Walter, 2021) and the ability to predict and take the opportunity, primarily by innovation and learning (Teece *et al*., n.d.; Zhou *et al*., 2018).

Furthermore, the dynamic theory was employed to frame this study considering the recent turbulence of the business landscape. This theory was the expansion of the RBV (Barney, 1991), which stated that the reason for the difference among organizations was their competitive advantage attributed to unique, valuable, non-replicable, non-reproducible, and non-replaceable (Barney and Barney, 2001). DC theory center on the organizations's ability to respond to a constantly changing business environment. In other words, organizations must be sensitive in sensing, seizing, and shaping internal and external opportunities and threats for the

purpose of the right strategic decisions and reconfigure and reuse all potential and resources (Ferreira *et al*., 2020; Harsch and Festing, 2020; Weaven *et al*., 2021). As a fact, over the past decade, dynamic managerial competencies and capabilities have resulted from the increasing quality of knowledge (Ganguly *et al*., 2019; Sabetzadeh and Tsui, 2015) that formed from a collaborative process that was implemented as an essential feature of the organization (Al-Shami and Rashid, 2022; Harsch and Festing, 2020; Weaven *et al*., 2021). Furthermore, DC were hard for competitors to imitate based on particular characteristics, cultural values (Teece *et al*., 1997), and complex imitability (Teece *et al*., 2009). Therefore, strong DC served as a solid foundation for OA.

SC and CKC

Previous research revealed the function of SC in supporting knowledge management to achieve sustainable performance (Tu, 2020). The literature also explored how KC considered as a dynamic process that happens during SI between organizations and their partners (Al-Omoush *et al*., 2020b; Chung *et al*., 2019a). The social network in the organization served as a channel for transmitting and integrating knowledge, thus could optimize the role of sharing and creating dynamic ideas and new values (Ode and Ayavoo, 2020). CKC was seen as a collaborative mechanism (Calantone *et al*., 2002) to create and develop knowledge between partners to improve insight into changes (Zhao *et al*., 2020a). Collaboration described a knowledge transfer mechanism that was harmonized and unified through dynamic SI (Faccin and Balestrin, 2018) and thus could produce collaborative knowledge (Nonaka and von Krogh, 2009) both directly and indirectly between partners (Tu, 2020). SC allowed the organization to survive a crisis by pooling expertise and resources (Zhao *et al*., 2020b). Furthermore, (Faccin and Balestrin, 2018) revealed that CKC was reflected in the knowledge of organizations that develop sustainably, resulting in adjusment to environmental changes and rapidly changing market needs. Meanwhile, SC formed a synergistic and coordinated network that allowed the company to adopt the necessary changes swiftly by means of knowledge (Khan, Majid and Yasir, 2020a). Finally, SC produces relational and cognitive skills, increasing OA to respond to environmental changes briskly, flexibly, and structured (Ooi *et al*., 2017) to manage challenges, seize new opportunities, create value and ensure long-term viability(Liu *et al*., 2016). Based on this, the hypothesis is formulated as follows:

H1 SC significant to CKC

H2 SC significant to OA

SC and firm innovation

SC describes the interaction process between organizations and stakeholders that can affect the exchange of knowledge, ideas and resources among organizations (Ganguly *et al*., 2019). The literature showed that building strong bonds with business affiliations through SI dynamically affected favorable outcome in acquiring resources and capacity for innovation (Chen, Jiao, *et al*., 2016). Experts already highlighted that the social approaches supply a fundamental basis for describing the impact of external and internal relationships on innovation (Steinmo and Rasmussen, 2018; Tu, 2020; Yildiz and Aykanat, 2021). Moreover, SC has been considered a vital contributor to the success of innovation (Thompson, 2018; Yeşil and Doğan, 2019) because it involves collaboration-oriented leadership behavior in the achievement of innovation (Chen, Zheng, *et al*., 2016). Furthermore, substantial SC promotes efficiency and ensures the quality of knowledge flow, thereby encouraging innovation activities without agonizing about risks and barriers (Ganguly *et al*., 2019). Thus, interaction among organizations helped reduce knowledge limitations and updated the knowledge base, providing

a high-quality source of motivation for innovation. Based on the discussion above, the hypothesis is formulated as follows:
H3 *SC significant to firm innovation*

CKC and OA

In building OA, the role of CKC has not been studied extensively (Al-Omoush *et al*., 2020b). At the same time, OA was seen as the ability to govern and apply knowledge beneficially (Bouton *et al*., 2021; Tu, 2020) in responding and adapting organizations to market turbulence and competition dynamics (Chen, Jiao, *et al*., 2016; Dung *et al*., 2020). In order to achieve existence, agility requires applying knowledge, idea quality and collaboration to explore new opportunities in a volatile market (Chen, Jiao, *et al*., 2016). Tu, (2020) claimed that the creation and dissemination of knowledge reflect the value chain of knowledge capital in building agility (Chang *et al*., 2021). Furthermore, OA requires more dynamic learning and KC strategies than competitors (Wang and Hu, 2017) to transform this new ideas into responsive activities (Chung *et al*., 2019b; Koçyiğit and Akkaya, 2020; Liu and Yang, 2020). Hence, the proposed hypothesis was as follows:
H4 CKC significant to OA

Innovation and OA

Innovative and less innovative organizations differed in terms of adaptation, risk management, and perspectives on uncertainty (Ravichandran, 2018). Innovative companies focus on learning and experimentation, overcoming uncertainty, and encouraging risk-taking (Hock-Doepgen *et al*., 2021). In contrast, less innovative organizations are afraid of taking risks and uncertainty and tend to be weak in preparing business strategies (Teece *et al*., 2016). It indicated that innovative companies had an organizational climate open to new ideas that affected their ability to identify new market opportunities and products than competitors (Cai *et al*., 2019; Chen and Liu, 2020; Falahat *et al*., 2020). Thus, organizations built new business models to pool existing resources into more dynamic mobile capital (Hock-Doepgen *et al*., 2021). Thus, the changes brought about by innovation make organizations more agile (Cepeda and Arias-Pérez, 2019a; Ravichandran, 2018; Teece *et al*., 2016; Yildiz and Aykanat, 2021). Thus, we positioned:
H5 Innovation significant to OA

The mediating role of CKC

SC has pivotal role in transferring and integrating knowledge was vital in forming collaborative knowledge (Ode and Ayavoo, 2020) and therefore increased adaptation to rapid change (Zhao *et al*., 2020a). This mechanism was the implementation of the interaction of all social resources (Faccin and Balestrin, 2018), which produced collaborative knowledge both directly and indirectly (Tu, 2020). In a crisis, whether due to market turbulence or other disturbances, SC contributes to the organization's survival (Zhao *et al*., 2020b) and optimizes the diffusion of skills and resources (Yi *et al*., 2021). Moreover, CKC becomes the foundation for organizations to adapt to environmental changes and dynamic markets (Faccin and Balestrin, 2018). In order to build agility, organizations need to form a coordinated network to collect ideas and turn them into knowledge (Khan, Majid, Yasir, *et al*., 2020). It produced relational skills that ultimately improved OA, especially in responding to changes flexibly (Ooi *et al*., 2017). It ultimately enabled organizations to manage challenges and opportunities, also value and sustainability (Dung *et al*., 2020; Kamboj and Rahman, 2017; Liu *et al*., 2016). Predicated on the discussion above, the hypothesis was proposed as follows:
H6 CKC mediates SC and OA.

Mediating the role of firm innovation

The existence of SC was as a liaison between organizations and stakeholders through the exchange of ideas, knowledge and resources (Ganguly *et al.*, 2019). Therefore, it was necessary to develop strong ties with partners to generate resources and capabilities for innovation (Chen, Jiao, *et al.*, 2016). Expert's findings revealed that SC provided the foundation of the relationship between partners (Steinmo and Rasmussen, 2018; Tu, 2020; Yildiz and Aykanat, 2021) and was an essential driver of successful innovation (Thompson, 2018; Yeşil and Doğan, 2019). Furthermore, innovative organizations focused on learning and risk-taking (Hoc Doepgen *et al.*, 2021), indicating an organizational climate that was open to new ideas (Cai *et al.*, 2019; Chen and Liu, 2020; Falahat *et al.*, 2020), and ultimately made the organization more agile (Cepeda and Arias-Pérez, 2019a; Ravichandran, 2018; Teece *et al.*, 2016; Yildiz and Aykanat, 2021). Thus, innovation provided the power to face the risk of uncertainty (Teece *et al.*, 2016) to have sainable performance and competitive advantage (Arsawan, Koval, *et al.*, 2022). Formulated on the discussion, the hypothesis was as follows:
H7 Innovation mediates SC and OA.

The moderating role of strategic flexibility

According to DC (Teece *et al.*, 1997), organizations must be sensiti to opportunities and threats to develop and configure plans and strategic decisions (Ferreira *et al.*, 2020; Harsch and Festing, 2020; Weaven *et al.*, 2021). Therefore, the organization must have a strategy that can adapt the organizational conditions to the changes that occur (Baškarada and Koronios, 2018). Strategic flexibility was the ability to quickly combine and reconfigure the company's stock of resources (Teece *et al.*, 2009) and carry out the actions taken by the compan n real-time (Brozovic, 2018; Teece *et al.*, 2016). In compliance with (Gorondutse *et al.*, 2020; Miroshnychenko *et al.*, 2021; Yang *et al.*, 2015a), strategic flexibility was achieved through optimizing resource flexibility. If the resource was scarce, the organization must find other resources; meanwhile, if the resource was sufficient, it allowed the company to use resources more efficiently for new purposes (Cai *et al.*, 2019; Liu and Yang, 2020). In addition, high strategic flexibility allowed companies to build, transfer, and integrate ideas quickly and prepare new patterns according to the current situation (Xiu *et al.*, 2017). As a result, a company with strategic flexibility can reduce response time to dynamic changes (Cingöz and Akdoğan, 2013) by creating, expanding, or modifying knowledge bases (Thomas, 2014) that enable the company to process its knowledge resources effectively, thereby increasing the value of knowledge for OA (Gorondutse *et al.*, 2020; Yang *et al.*, 2015b). Hence, we recommend that:
H8 Strategic flexibility positively moderates innovation and OA so innovation is linked with better OA in companies with high levels of strategic flexibility.

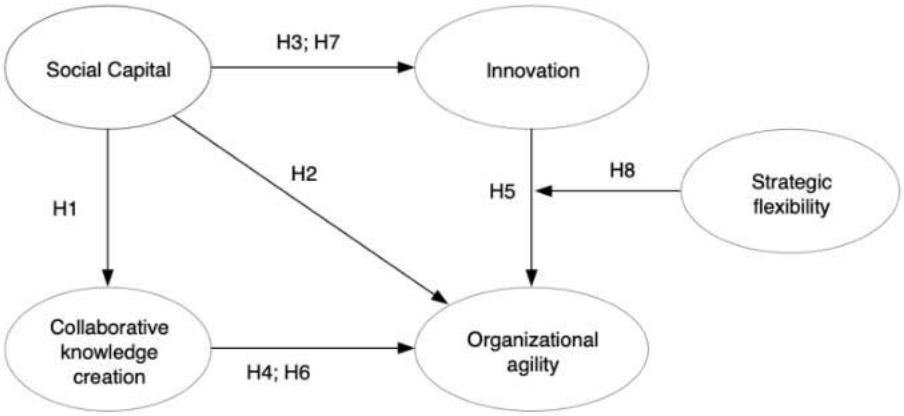

Figure 1. Conceptual framework

Methodology

Data and sampling method

This study involved SMEs, which were the backbone of the Indonesian economy. In order to obtain the initial sample, we used the local government database of the Bali province to identify SMEs for research purposes. The population of this study was 450 woodcraft SMEs in Bali Province, Indonesia. Accordingly, the sample was determined by a simple random sampling method called the lottery method, meaning that each member of the population received the same opportunity as the sample once. The formula determined the total number of sample frames (Krejcie and Morgan, 1970); hence 207 SMEs were asked to complete the research questionnaire. Research respondents were managers and assistant managers as the ideal targets as they have a strategic view of organizational characteristics related to organizational practices. The data was collected for 6 months from February to July 2022 via email, Google Forms, and the direct visit by first sending a prior email notification regarding this study. We obtained a total of 414 responses which can be analyzed to achieve the objectives of this study.

Measurements

Since previous studies had evaluated the construct variables used for this study, the construct measurement was adopted from the existing literature. SC was measured by 5 indicators adopted from (Al-Omoush *et al*., 2020b; Hayton, 2005; Liu *et al*., 2016). CKC was measured by 8 indicators adopted from (Al-Omoush *et al*., 2020b; Chen, Jiao, *et al*., 2016; Faccin and Balestrin, 2018; Nonaka and Takeuchi, 1995). Firm innovation had 10 indicators adopted from studies by (Calantone *et al*., 2002; Ngo and O'Cass, 2009; Ode and Ayavoo, 2020). OA was measured by 5 indicators adopted from (Al-Omoush *et al*., 2020b; Nafei, 2016; Preston *et al*., 2008). Lastly, strategic flexibility with 6 indicators adopted from (Brozovic, 2018; Miroshnychenko *et al*., 2021).

To evaluate the constructs, we employed A 7-point Likert scale ranging from "1: strongly disagree to 7: strongly agree". For ensuring clarity of instructions and statements, the questionnaire written in the Indonesian language was piloted on 10 SME managers who were experienced in corporate strategic planning. This process caused minor changes to the wording of instructions and questions of the questionnaire.

Table 1. Constructs measurement

Variable	Sources
SC	(Al-Omoush *et al*., 2020b; Hayton, 2005; Liu *et al*., 2016)
CKC	(Al-Omoush *et al*., 2020b; Chen, Jiao, *et al*., 2016; Faccin and Balestrin, 2018; Nonaka and Takeuchi, 1995)
Firm innovation	(Calantone *et al*., 2002; Ngo and O'Cass, 2009; Ode and Ayavoo, 2020)
OA	(Al-Omoush *et al*., 2020b; Nafei, 2016; Preston *et al*., 2008)
Strategic flexibility	(Brozovic, 2018; Miroshnychenko *et al*., 2021)

This present study employed partial least square based on variance (PLS-SEM) to estimate the proposed OA model and assess the relationship between variables, either directly or indirectly. For this purpose, this study employed the SmartPLS 3.2.8 software. In order to evaluate the validity and reliability of the construct variables, as recommended by (Hair *et al*., 2016), this study evaluated the measurement model. Furthermore, to test the hypothesis about the relationship between variables, this study assessed the structural model. Since the research objective was to validate the theory of DC in building OA models, using SEM-PLS was acceptable (Hair Jr *et al*., 2017).

Result

Respondent Profile

Table 2. showed the demographic outline of the sample. It showed that the respondents mostly had a higher educational background. It was one of the critical pillars of how managers earned quality knowledge (Ganguly *et al*., 2019; Zhang *et al*., 2019) to develop plans and strategies for dealing with various turbulences (Thomas, 2014).

Table 2. Demographical facts

Description		Frequency	Percentage (%)
Age	<25	35	8,5
	25-30	142	34,3
	31-35	135	32,6
	36-40	79	19,1
	41-45	23	5,5
Gender	Male	239	57,7
	Female	175	42,3
Education	Bachelor	277	66,9
	Master	126	30,4
	Doctor	11	2,7
Experiences	<5	2	0,5
	6-10	181	43,7
	11-15	129	31,2
	16-20	102	24,6

The assessment of the measurement model

Table 3. showed that all indicators had a loading factor value higher than 0,6. Furthermore, the CR value was more than 0,7, while the AVE value was more than the recommended level of 0,5. Furthermore, data analysis determined that the square root value of AVE was more than the construct correlation value, indicating that the discriminant validity requirement was met. These indicators showed that the validity and construct reliability requirements were met (Hair Jr *et al*., 2017). Furthermore, the value of VIF was between 1.437- 4.468 (smaller than the

recommended level of 5), indicating did not exhibit any issues connected to the variance of the general method (Hair *et al*., 2016).

Table 3. Measurement MIs

Indicators	Loading**	CR	AVE
SC		0.928	0.725
1. Social networks enhance the opportunities, ideas and insights	0.940		
2. Bond connections and collective with partners	0.904		
3. Partners actively involved in decision making	0.935		
4. Social networks' feedback and recommendations.	0.752		
5. Social networks influence processes, products, and services	0.696		
CKC		0.911	0.564
1. Getting novel ideas and technologies	0.691		
2. Collaborating with partners to gain new knowledge	0.639		
3. Launching and exchanging creative ideas	0.626		
4. Sharing repositories of knowledge and best practices	0.862		
5. Reconfiguring new knowledge.	0.783		
6. Sharing new values and thoughts	0.757		
7. Collaborative learning experiments	0.788		
8. Strengthening knowledge and experience transfer	0.831		
Firm innovation		0.932	0.582
1. Developing new products using available of resources	0.830		
2. The company pursues up to date strategy to do things	0.775		
3. Respond to activities that involves technology	0.775		
4. Availability of knowledge to develop new products	0.718		
5. Company continually explores new ideas	0.634		
6. Competency to process technologies	0.692		
7. The company's creativity in its methods of operation	0.817		
8. Adopting the products and processing technologies to accomplish future needs	0.834		
9. Company often sells its new products and services	0.836		
10. The perception about innovation as something risky and resisted	0.687		
OA		0.921	0.701
1. The opportunities produced by the crisis is pursued	0.732		
2. Recognising dynamic environmental transition	0.835		
3. Improvement in terms of the agility of decision making	0.849		
4. Adaption for resources to accomodate the changing environment	0.911		
5. New strategies was taken into consideration.	0.849		
Strategic flexibility		0.919	0.657
1. If there is change of circumstances, our organization can adjust its current plans effortlessly	0.888		
2. If there is change of circumstances, our organization is well-prepared to act accordingly	0.888		

3. If there is change of circumstances, organization can adjust the strategy changes	0.898		
4. If there is change of circumstances, organization has the required competency to modify daily routines and practices	0.723		
5. If there is change of circumstances, our organization can generate a new project proactively	0.737		
6. If there is change of circumstances, our organization can prioritize projects with the highest likelihood to succeed	0.702		

Structural Model Testing

This study applied the bootstrap method with 5000 samples to evaluate the significance of the indicators and path coefficients (Chin, 2010). The results showed that the goodness-of-fit (GoF) model had a value of 0,675, which indicated that the fitness model was significant. In conclusion, these findings indicated that the proposed OA model could be applied to the woodcraft SME sector. In addition, testing on the standard residual root mean square (SRMR) dan normed fit index (NFI) showed that the SRMR value was 0,086, while the NFI was 0,687, indicating that the model was fit (Tenenhaus *et al*., 2005). Furthermore, the examination of R^2 revealed that SC, CKC, and innovation described a 0,295 (29,5%) variance in OA. Finally, all Q^2 had positive values, which indicated that all variables had good relevance predictions (Chin, 2010).

Hypotheses Testing

The analysis results showed that 4 of the 5 hypotheses of the direct relationship were confirmed (Table 4.). The relationship between SC dan CKC was significant (β = 0.442, STDEV 0.054, T Statistik 8.323>1.96); hence hypothesis 1 was accepted. The relationship between SC and OA was significant (β = 0.198, STDEV 0.058, T Statistic 3.413>1,96); hence hypothesis 2 was accepted. The relationship between SC and innovation was significant (β = 0.534, STDEV 0.047, T Statistic 11.287>1,96); hence hypothesis 3 was accepted. The relationship between CKC and OA was not significant (β = 0.062, STDEV 0,053, T Statistic 1.177<1,96); hence hypothesis 4 was rejected. Lastly, the direct relationship between innovation and OA was significant (β = 0.375, STDEV 0,054, T Statistic 7.012>1,96); hence hypothesis 5 was accepted.

Table 4. Path Coefficients

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Decision
SC -> Collaborative K C	0,442	0,446	0,054	8,232	0,000	Sig
SC -> Org Agility	0,198	0,194	0,058	3,413	0,001	Sig
SC -> Firm Innovation	0,534	0,535	0,047	11,287	0,000	Sig
Collaborative K C -> Org Agility	0,062	0,059	0,053	1,177	0,240	Non-sig
Firm Innovation -> Org Agility	0,375	0,376	0,054	7,012	0,000	sig

Mediation Testing

Following the identification of the direct relationship between variables, the next stage was to test the positions of mediating variable. In this study, we tested two mediation pathways.

According to (Hair Jr *et al*., 2017), the method used was to measure the VAF value < 0,20, meaning that mediation was not found, while 0,20-0,80 indicates partial and VAF value > 0,80, meaning that there was full mediation. In order to test the mediating effect of the model, non-parametric bootstrap was used (Hair *et al*., 2016). Finally, the variance accounted for (VAF) was calculated to obtain the indirect link and total sizes. When the VAF was greater than 80%, it indicated full mediation; between 20 to 80% were partial; below 20% indicated no mediating effect (Hair *et al*., 2016). Furthermore, the results were presented in Table 5.

Table 5. Mediation Analysis

Link*	Mediator*	Independent Variable-Mediator	Mediator-Dependent Variable	Direct	Indirect	Total effect	VAF (%)	Decision
SC-OA	CKC	0.442	0.062	0.198	0.274	0.472	0.581	Partial mediation
SC-OA	INNOV	0.534	0.375	0.198	0.200	0.398	0.503	Partial mediation

The role of mediation in the causal relationship between SC, CKC, and OA, along with SC, innovation, and OA, was examined using the VAF test. Because this study examined two mediation pathways, we assumed that CKC partially mediates the relationship between SC and OA, where the VAF value was 58,1%, indicating that hypothesis 6 was accepted. Furthermore, innovation partially mediated the relationship between SC and OA with a VAF value of 50,3%, indicating that hypothesis 7 was accepted.

Finally, we analyzed the MV in this research model. Multigroup analysis using PLS examined the moderating role of strategic flexibility (Henseler and Fassott, 2010). However, the analysis showed that strategic flexibility did not mediate the relationship between innovation and OA ($\beta = 0,084$, STDEV 0,044, T Statistic 1.912<1,96, PV 0,056); hence hypothesis 8 was rejected. The analysis results were presented in Table 6. and Figure 2.

Table 6. Moderating testing

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Decision
Firm_in*Stra_Flex -> Org Agility	0,084	0,086	0,044	1,912	0,056	Non-sig

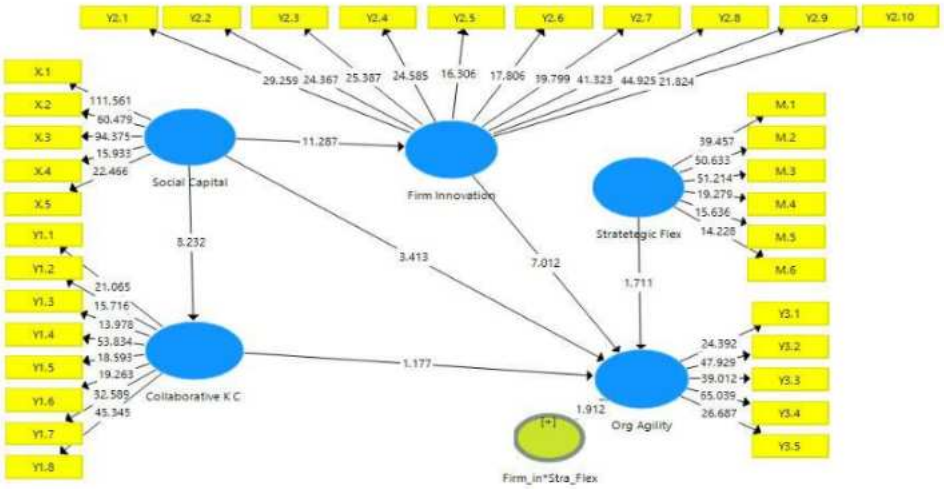

Figure 2. Output Analysis

Discussion and theoretical implication

This study examined the factors that affect OA and strategic flexibility in anticipating the turbulence and challenges of globalization. Using PLS-SEM analysis, this study revealed that OA was significantly influenced by innovation followed by SC. These results validated previous research in the context of SMEs by (Ganguly *et al*., 2019; Singh *et al*., 2021), which found the critical role of SC in building innovation. Furthermore, these results implied that SC was essential in building knowledge collaboration that led to innovation capabilities, further enhancing OA. This finding strengthened previous research on organizational efforts, especially SMEs, in improving OA (Al-Omoush *et al*., 2020b; Cepeda and Arias-Pérez, 2019b; Chung *et al*., 2019b; Ravichandran, 2018).

Contrary to what was expected, CKC did not significantly affect OA. This result contradicted the study conducted by (Al-Omoush *et al*., 2020b), which found that CKC was an essential driver in building OA because knowledge was the principal capital in building agility (Cegarra-Navarro and Martelo-Landroguez, 2020; Panda and Rath, 2021). Therefore, a possible explanation for the insignificant effect of CKC on OA could be that SMEs were still not open to building collaborative knowledge. SMEs viewed knowledge as exclusive capital and were unwilling to share it, fearing that it could increase the competitiveness of the competitors (Arain *et al*., 2019). Furthermore, strategic flexibility was not a MV of the relationship between innovation and OA. This result was contrary to a study conducted by Nassani and Aldakhil, (2021) that strategic flexibility strengthened the strategic orientation of SMEs. A possible explanation was that woodcraft SMEs already had agility because they had unique, distinctive products that competitors could not imitate. Furthermore, they could anticipate and seize opportunities when the market appetite changes (Yildiz and Aykanat, 2021). These findings also refuted the statement from Özbuğday et al., (2020) that SMEs had limited resources. Instead, SMEs could anticipate and seize opportunities and reconfigure their resource sets, business processes, strategies, and innovations (Wageeh, 2016; Žitkienė and Deksnys, 2018) Walter, 2021).

The present study contributed to enhanced the literature on OA and DC theory in four main elements. First, this study proposed and examined an integrated model of supporting SC, CKC,

and innovation in woodcraft SMEs, where the combination of these three drivers was the key to building OA. It turned out that the OA model had good compatibility and explanatory power. Thus, it confirmed that SC, CKC, and innovation were generally accepted (Al-Omoush *et al.*, 2020b), especially in the SME sector (Khan, Majid and Yasir, 2020b). More specifically, SC played a vital role in increasing CKC and innovation and encouraging SMEs to increase agility to face challenges and turbulences. The results proved that SC and CKC were the basis for forming innovations that ultimately ma[46] SMEs more agile. Furthermore, this study assessed OA by integrating SC into the OA model. The results of analysis showed that the OA integration model for SMEs was fit. In addition, the inclusion of innovation in the OA model increased its explanatory power. Conceptually, the results of this study strengthened the SC-OA model (Al-Omoush *et al.*, 2020b) in the SME sector. This finding showed that in SMEs, SC and CKC could simultaneously strengthen the influence of innovation on OA. Thus, the OA model in the context of SMEs was conceptually extended to the SC-innovation OA model. Furthermore, these findings provided further evidence for the conclusions of previous studies (Cepeda and Arias-Pérez, 2019a; Dabić *et al.*, 2021; Yildiz and Aykanat, 2021), which claimed that innovation was an essential determinant of OA.

Second, this study revealed that CKC and innovation mediated the relationship between SC and OA. Although the mediation relationships tested were significant, the relationship between SC, CKC, and OA had a greater value. These resu[44] proved that SMEs were highly focused on establishing practical collaborative knowledge (Cegarra-Navarro and Martelo-Landroguez, 2020; Haider and Kayani, 2021) to develop potential and quality knowledge (Ganguly *et al.*, 2019). Furthermore, managers' involvement was required in knowledge-sharing practices (Arsawan, Kariati, *et al.*[47]2022) to generate knowledge capability (Mao *et al.*, 2015) and knowledge application (Cegarra-Navarro and Martelo-Landroguez, 2020; Ode and Ayavoo, 2020). Therefore, SMEs must take notice of knowledge and prioritize it for organizational sustainability, productivity improvement, innovation, and competitiveness.

Third, OA was an interesting topic for researchers, policymakers, and practitioners, but the existing literature on how Indonesian SMEs can build agility, especially in a crisi[38]was not comprehensive yet. Most relevant research focused on European countries, while this study contributed to the OA literature in developing countries. The results showed that SC and innovation affected OA. Furthermore, it was the first study to link SC, CKC, and innovation as antecedents of OA when it was majorly studied in developed countries such as Germany (Harsch and Festing, 2020), Taiwan (Liu and Yang, 2020), dan Spain (Felipe *et al.*, 2017).

Fourth, this study increased insights into DC related[25] to the ability of SMEs to respond to the rapidly changing business environment. The results showed that SC was the key element of DC used for capturing new opportunities through strengthening CKC to improve managerial competence (Teece *et al.*, 2016), designing and improving business mode[43]innovation to build OA. Notably, SC triggers the emergence of CKC in SMEs, which positively affect the emergence of innovation. Furthermore, from the perspective of DC, the results showed the importance of integrating these drivers into a competitive advantage (Ferreira *et al.*, 2020) because the better performance was[35] combination and interaction between knowledge resources and their capabili[3]s (Teece *et al.*, 2009; Weaven *et al.*, 2021). Finally, this study showed the urgency of OA as a performance evaluation measure in countering to turbulence and other similar pandemics (Al-Omoush *et al.*, 2020a). This evaluation helped to gain new theoretical insights to investigate advanced knowledge about the value of CKC and innovation to anticipate risks due to turbulence.

Managerial Implications

In managerial implication, this research provided insight into three elements. First, understanding the critical role of SC and CKC in attaining innovation and its impact on OA provides managers with valuable insight into governing severe turbulence. Achieving innovation required investing in SC and CKC to answer the crisis. Managers had to realize that a abundant and measurable quality of collaborative knowledge enabled the development of innovation in both products, processes, and methods to strengthen innovation capabilities. Second, the organization had to provide a robust mechanism for building ties, social networks, and collaboration with all stakeholders (such as suppliers, business partners, government, and even competitors) who offered renewable knowledge resources to sense and seize the opportunities that enabled innovation under an unprecedented and highly volatile environment. Eventually, the research model presented a paradigm for achieving OA that guides organizations on the implementation to thriving SC, CKC, and high cruising range on the ability of innovation to overcome challenges and turbulence.

Limitations and Future Study

Although the present study provided theoretical and managerial contributions, this study had several limitations that are worth examining and urges for research in the future. First, this present study was conducted while the pandemic was still occurring in Indonesia, but the world began to accept and make peace with Covid-19. Undeniably at this point, mobility was still limited by rules such as regional lockdowns and health protocols. Under these conditions, collecting a large sample of data was difficult, especially from SMEs in Indonesia. Therefore, the discoveries of the present study cannot be generalized conclusively to different industries or countries. Consequently, the research model in the present study should be assessed in further studies, targeting a substantial amount of sample from different sectors, countries, and regions to authenticate these results. Second, the measurement of the variables in the present study was chosen at the enterprise level, while the development of capabilities and the realization of increased agility began at the level of individual business processes in different departments or units. Therefore, future research can be completed at the individual or team level within the organization.

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Developing OA in SMEs: Examining Complexities Interlinkage of Social Capital, CKC, and Innovation

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