Uncertain Supply Chain Management 10 (2022) 1065–1076

Contents lists available at GrowingScience

Uncertain Supply Chain Management

homepage: www.GrowingScience.com/uscm

The impact of participative budgeting on the supply chain resilience amid COVID-19 pandemic: Empirical evidence from Vietnam

Quang-Huy Ngo[a*]

[a]*FPT University, Vietnam*

A B S T R A C T

Disruptive impact as the Covid-19 pandemic reduces the motivation of managers working in the supply chain function. A motivation as organizational commitment is crucial for organizations to foster supply chain resilience through enhancement of internal and external supply chain integration. This study draws upon the budgeting literature to explore the role of participative budgeting on the supply chain resilience amid Covid-19 pandemic. Data were collected from 191 managers working in supply chain functions of organizations operating in industrial zones in Vietnam. The technique of partial least square structural equation modelling was used to assess data. The results suggest that Covid-19's disruptive impact increases participative budgeting, which results in organizational commitment. This commitment leads to the enhancement of internal and external supply chain integration, which in turn leads to supply chain resilience. This study is the first study to explore how and why budgeting practices lead to the enhancement of supply chain resilience amid Covid-19 pandemic.

Article history:
Received December 2, 2021
Received in revised format December 17, 2021
Accepted February 11 2022
Available online February 11 2022

Keywords:
Disruptive impact
Organizational commitment
Participative budgeting
Supply chain integration
Supply chain resilience
Vietnam

1. Introduction

The Covid-19 pandemic causes a dramatic impact on the world economy. It has a negative impact on every organization in the world and as a result, they need to find a new way to adapt with the pandemic. According to El Baz and Ruel (2021), the pandemic causes disruption in the supply chain, which is insufficient to operate normally. To gain insight to the degree to which the supply chain can recover from the Covid-19's disruptive impact (DI), supply chain resilience (SCR) should be considered (Ponomarov & Holcomb, 2009). Currently, because the pandemic is on-going, there is a growing body of the research raising a call for more insight into what mechanism, which allows supply chain managers to be able to resile the supply chain (see El Baz & Ruel, 2021; Remko, 2020). At the individual level, the Covid-19 related research shows that the pandemic has a negative impact on individual motivation (Mani & Mishra, 2020). In supply chain function, it may observe the same effect on supply chain managers. In this function, a motivational effect as organizational commitment (OC) is crucial for these managers because Alfalla-Luque, Marin-Garcia, and Medina-Lopez (2015) showed that the motivation as employee commitment has a positive effect on supply chain integration, which in turn leads to enhancement of SCR. As a result, it is required to shed light on what management practices lead to the improvement of this commitment to gain the resilience improvement through integration.

In supply chain literature, budgeting practice is argued to be crucial in coping with supply chain disruption (see Zhang, Zhao, & Pang, 2018). Therefore, in the search for the practices, budgeting literature may provide the answer. In this literature, participative budgeting (PB) is revealed to be required when the external environment is uncertain (Shields & Shields, 1998). In addition, this literature also shows that this practice allows the enhancement of commitment (Parker & Kyj, 2006). In this regard, this evidence may provide insight into how supply chain managers are able to resile the supply chain thanks to PB. Therefore, this paper formulates the research questions as follows.

* Corresponding author
E-mail address: huynq121@fe.edu.vn (Q.-H. Ngo)

doi: 10.5267/j.uscm.2022.2.005

RQ1. Whether or not DI leads to PB?
RQ2. Whether or not PB leads to OC?
RQ3. Whether or not OC leads to SCI?
RQ4. Whether or not SCI leads to SCR?

Drawing upon the budgeting literature and multi-level approaches, this study proposes that disruption impact caused by the pandemic induces the needs for PB. And when managers participate more in budgeting processes, they improve their commitment, and as such improve the ability of SCR. Data collected from 191 supply chain managers working in enterprises located in Vietnam. The technique of partial least square structural equation modeling was used. The result shows that disruption impact is positively associated with PB. Participative budget is positively associated with OC, and as a result, improves SCR. This study contributes to the literature as follows.

First, this study extends the current knowledge on how and why budgeting literature provides a mechanism for supply chain managers to deal with the disruption caused by the pandemic and gain the improvement of SCR. Particularly, budgeting practices have gained much attention from supply chain scholars. Recently, Zhang et al. (2018) used the mathematical model to argue that budgeting practices as budget allocation allows them to cope with supply chain disruption. However, this study may not capture the whole effect created by the budgeting practices due to the focus on the mathematical model. In the budgeting process, managers evolve in and have an influence on budget setting (Derfuss, 2009). Therefore, modern thinking on the budgeting practices calls for more psychological-based research in budgeting literature to gain insight into the managerial behaviors in budgeting (see Covaleski, Evans III, Luft, & Shields, 2003; Kenno, Lau, & Sainty, 2018). Following this call, this study extends the current knowledge of the crucial role of psychological mechanisms resulting from budgeting practices on the effectiveness of supply chain management.

Second, this study follows the call for more research to gain insight into what mechanism leads to the resilience amid the pandemic and how and why this mechanism has an effect (see El Baz & Ruel, 2021; Remko, 2020). This study uses the budgeting literature to show that when there is ID, PB is demanded. PB fosters OC, and as such improves supply chain integration (SCI). This integration leads to SCR. In this regard, this study contributes to the Covid-19 related research in supply chain management by highlighting the role of PB as a mechanism to improve the resilience amid the pandemic.

Third, although variables at individual levels like commitment are crucial in the supply chain management literature, the topic relating to workforce management seems to be ignored (Alfalla-Luque et al., 2015; Maloni, Campbell, Gligor, Scherrer, & Boyd, 2017). As a result, there is a limited understanding regarding what and how to trigger this commitment in supply chain literature. In addition, Vanichchinchai (2012) argued that in comparison to other parties within the supply chain, internal employees seem to receive a lack of attention. Addressing this gap, this study shows that PB triggers internal managers of supply chain functions, and in turn improves SCI. In this regard, this study contributes to the supply chain management by showing budgeting practices as PB can enhance commitment of the internal managers.

Fourth, this study also contributes to the budgeting literature in twofold. Most budgeting studies collect data by asking managers from different functions of organization (see Derfuss, 2009, 2015; Derfuss, 2016). According to the knowledge, there is no study examining managers in supply chain function, and as such questions the robustness of budgeting literature in prediction of managerial behavior. Acknowledging this limitation, this study collects data from supply chain managers to reveal the robustness by showing budgetary participation induces OC of the managers. In addition, this study also shows that DI leads to PB. In this regard, external events as pandemic also leads to PB. Thus, this study contributes to the literature by revealing a new antecedent of PB (see Mahlendorf, Schäffer, & Skiba, 2015).

This paper is structured as follows. The following section provides the theoretical background and indicates the development of the hypothesis. The next section introduces the methodology used in this paper. After that, results are revealed and then discussion is followed. The last section concludes the paper and provides the research avenue.

2. Theoretical background and hypothesis development.

2.1. Theoretical background and conceptual definitions

PB

It refers to the degree to which managers are involved in the budgeting process to determine and influence their budget targets (Ngo, Doan, & Huynh, 2017; Shields & Shields, 1998). This variable has gained much attention since the first introduction to the literature by Argyris (1952). Drawing from the nomological network of Shields and Shields (1998) and the multi-level analysis in supply chain management of Adobor (2019), this paper proposes the research framework as shown in Fig. 1.

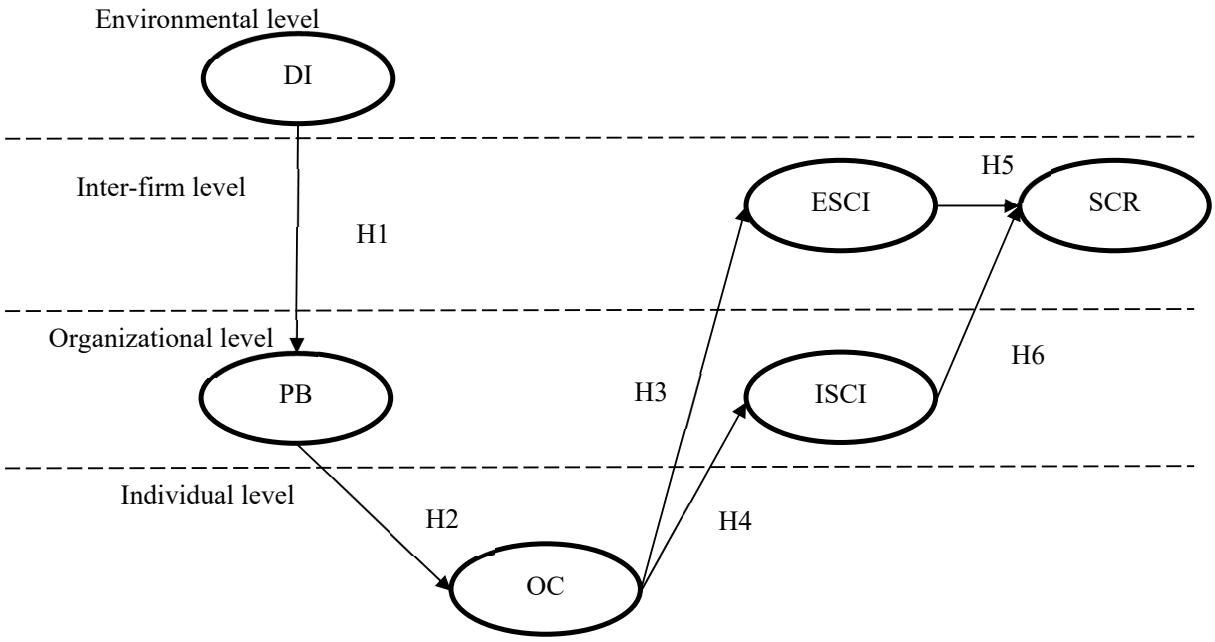

Fig. 1. Research model

OC

Allen and Meyer (1996) identified three types of commitments. which consists of affective, continuance, and normative commitment. The affective commitment refers to a degree of individuals' identification themselves with the organization. Continuance commitment is defined as that the individual's need to continue working because of the lack of work alternatives. Normative commitment refers to individuals' belief that these individuals should commit to their organizations due to a high sense of obligation. This study focuses only on affective commitment.

SCI

This concept is defined as the practices and procedures, which improves the collaboration between internal and external entities within the supply chain, and as such organizations can gain operational and strategic efficiencies internally and externally (Mellat-Parast & Spillan, 2014). There are three types of integration. First, supplier integration refers to the degree to which suppliers share information and participate in the decision-making process (Petersen, Handfield, & Ragatz, 2003). Second, customer integration describes the degree of customers' engagement in the decision relating to the products/service provided by the organizations and their coordination between the organizations and them (Droge, Vickery, & Jacobs, 2012). Third, internal integration refers to the chain of activities that require the involvement of multiple functions within an organization in order to successfully deliver products to the customers (Basnet, 2013). These two types of the integration are two dimensions of external supply chain integration (ESCI) while the last type is internal supply chain integration (ISCI) (Durach & Wiengarten, 2020)

SCR

To understand the definition of SCR, it is first necessary to shed light on organizational resilience. Organizational resilience refers to the organizational ability to resist difficult situations and as such this ability allows the organization to recover and return to normal states (Duchek, 2020). In a similar vein, SCR is defined as the extent to which the capability of the supply chain to adapt and respond to unpredictable events allows the recovery from such events fully (Ponomarov & Holcomb, 2009).

2.2. Hypothesis development

The link between DI and PB

One consequence of the pandemic is the disruption of the supply chain. More specifically, due to widening spread of the virus, one of the effective ways to deal with this is the implementation of the lock down. There are two consequences relating to the lockdown (see Mahajan & Tomar, 2021). One consequence of the lockdown limits domestic and international

transportation. Another consequence is the implementation of social distancing requiring employees to work from home. It leads to the shortage of employees required to perform the normal activities. These two issues are more robust in emerging countries than emerged countries because it is argued that the supply chain is long and fragile (Aggarwal, 2018; Reardon, Mishra, Nuthalapati, Bellemare, & Zilberman, 2020). In this regard, the Covid-19 pandemic strongly causes the supply chain disruption (El Baz & Ruel, 2021). According to Sreedevi and Saranga (2017), the disruption of the supply chain is a cause of environmental uncertainty. Environmental uncertainty happens when a manager working in an organization perceives that the outcomes of the future events on organizational operations is difficult to predict due to the lack of information used to predict the external environment (Downey, Hellriegel, & Slocum Jr, 1975; Duncan, 1972).

Budgeting literature suggests that PB can enhance the predictivity by supplying information (Ngo, 2019). Particularly, when managers perceive the external environment to be uncertain, they are more likely to participate in the budgeting process to cope with the uncertainty (Zainuddin, Yahya, Kader Ali, & Abuenniran, 2008). The literature indicates that PB enhances the communications across functions (Winata & Mia, 2005), which in turn results in a better insight into the external environment (Kren, 1992). In this regard, Shields and Shields (1998) suggested that environmental uncertainty is the antecedent of PB. DI leads to environmental uncertainty, it may posit that supply chain managers participate in the budgeting process to cope with uncertainty. The first hypothesis is as follows.

H_1: *DI positively affects PB.*

The link between PB and OC

Research has shown that participation in decision-making has a positive impact on OC (Johnson, 1992; Ohana, Meyer, & Swaton, 2013; Patchen, 1970). There are several reasons why participation enhances OC. First, participation in decision-making processes satisfies individuals' needs by enhancing a sense of self-expression, respect, independence, and equality, which in turn may increase level of commitment (see French Jr, Israel, & As, 1960). Second, participation in decision-making also fosters a high degree of communication, which serves as a means for information exchange. Such communication allows employees to receive more available information and in turn they are more likely to be satisfied with the communication, which enhances their degree of OC (Putti, Aryee, & Phua, 1990). Finally, participation in decision-making allows employees to have discussions with their supervisors. It may influence employee perceptions of interpersonal justice, which in turn increases affective and normative commitment (Schappe & Doran, 1997). Thus, Latham, Winters, and Locke (1994) suggested that participation serves as the motivational device, which results in OC. Budgeting literature also suggests that participation increases subordinates' OC. Numerous studies reveal a positive correlation between these two variables (see Nouri & Parker, 1998; Quirin, Donnelly, & O Bryan, 2000; Yahya, Ahmad, & Fatima, 2008). In line with these studies, this study expects the positive relationship between budgetary participation and OC. The second hypothesis is proposed as follows.

H_2: *PB positively affects OC.*

The link between OC and SCI

OC has an impact on SCI. It is revealed that employees have an impact on SCI (Huo, Ye, Zhao, & Shou, 2016). According to (Holmberg, 2000), the implementation of supply chain management can be considered successful when there is an integration of internal functions of the organization and the effectiveness in linking these functions with external operations of its partners. In this regard, employees from internal functions play a crucial role in examination of the SCI. When the commitment is increased, these employees are more likely to cooperate with not only the employees in the same organizations but also employees from other organizations within the supply chain in order to improve the effectiveness of the supply chain (Mello & Stank, 2005; Xiao, Zheng, Pan, & Xie, 2010). Thus, it is argued that OC is crucial to gain the success of supply chain management (Fawcett, Ogden, Magnan, & Cooper, 2006). Alfalla-Luque et al. (2015) found that employees' commitment is positively related with SCI. Durach and Wiengarten (2020) argued that SCI includes ESCI and ISCI. Therefore, the next two hypotheses are proposed as follows.

H_3: *OC positively affects ESCI.*
H_4: *OC positively affects ISCI.*

The link between SCI and SCR

Recent researchers pay more attention to the role of SCI on SCR. Particularly, SCI can be categorized as ISCI and ESCI (Wong, Wong, & Boon-Itt, 2013). ISCI improves the circulation of knowledge about the external environment between different functions in the department (Turkulainen, Roh, Whipple, & Swink, 2017). In addition, the circulation of the knowledge does not limit within the organization thanks to ESCI. It fosters the positive effects on the partners within the supply chain, which in turn allows them to acknowledge the environmental changes and quickly respond to the change of the environment (Liu, Shang, Lirn, Lai, & Lun, 2018). As a result, recent studies (see Piprani, Mohezar, & Jaafar, 2020; Siagian,

Tarigan, & Jie, 2021) successfully establish the link between SCI and SCR. Thus, this study expects the same effects of ESCI and ISCI on SCR. The fifth and sixth hypothesis is formulated as follows.

H_5: ESCI positively affects SCR.
H_6: ISCI positively affects SCR.

3. Method

3.1. Data collection

Data was collected from enterprises operating in Vietnam. A list containing information of enterprises currently operating in the industrial zone in Vietnam was used. This list was drawn from the database of the Vietnamese Ministry of Planning and Investment. Thanks to the assistance of a private agent, the collection process was executed between March and May of 2021. The agent used an online survey to collect data. Particularly, an email was sent to these enterprises to ask the managers working at supply chain function to participate in the research's survey. To improve the response rate, the respondents are promised to receive a coupon of five hundred thousand Vietnam Dong. Besides, the survey does not ask the respondents to reveal their personal information as name, gender and age. When the collection process is over, the online survey indicates that there are 193 completed questionnaires. Two were removed due to the missing value (e.g., more than 80% of them are empty value). Thus, 191 were used for the further analysis.

3.2. Measures

All measures used in this study were adapted from prior studies with minor modifications. These measures were measured each on a 5-point Likert-type scale (1 = strongly disagree, 5 = strongly agree).
DI and SCR were measured by using the instrument from El Baz and Ruel (2021). There are three items in the first instrument and four items in the second instrument.
PB was adapted from the instrument of Milani (1975). This instrument consists of 6 items. Prior studies extensively use this instrument to assess the degree to which managers participate in the budgeting process, and thus, possess high reliability.
Affective OC was assessed by using the scale of Mowday, Steers, and Porter (1979). There are nine items in this scale. This scale was also examined intensively in budgeting (see Parker & Kyj, 2006; Yahya et al., 2008) and supply chain research (see Huo et al., 2016; Salam, 2011).

Durach and Wiengarten (2020) provided instruments to measure ESCI and ISCI. ESCI is a second-order construct, which includes two dimensions such as customer and supplier integration. ISCI is a first-order construct. There are three items in each instrument (e.g., customer integration, supplier integration, internal integration).

3.3. Common method bias

Collecting data in a same survey may pose a concern of common method bias. Thus, this study uses Harman's single factor test to address this concern. A factor analysis with a setting to one factor was performed by using SPSS. The result indicates that 26.390% of total variances is explained by one factor. In this regard, the further analysis can be performed without a concern of this bias.

3.4. Analytical procedures

To examine the research model, SmartPLS 3.2.8 was used. This program allows the assessment of partial least square structural equation modelling. There are two stages in the assessment which aims to evaluate measurement and structural model.

4. Results

4.1. Measurement model

The evaluation of the measurement model requires the examination of evaluate indicator loadings, internal consistency, convergent, and discriminant validity. According to Table 1, all indicator loadings are higher than the 0.708 threshold value (Hair, Risher, Sarstedt, & Ringle, 2019) except the following indicators: OC_2, OC_3, OC_6, OC_7, PB_2. Therefore, these items were removed from further analysis. Critical ratio and Cronbach's Alpha were used to examine the reliability of internal consistency. According to Hair et al. (2019), the satisfied criteria require these values to be higher than 0.7. Average variance extracted (AVE) was used to assess convergent validity. These values higher than 0.5 suggest the sufficient requirement (Hair et al., 2019). Assessing the discriminant validity requires the examination of the Heterotrait-Monotrait (HTMT) ratio of correlations between constructs. These values need to be lower than 0.85 (Henseler, Ringle, & Sarstedt, 2015). According to Table 1 and Table 2, these criteria are well established.

Table 1
Indicators' loadings, Cronbach's alpha, Composite reliability, and AVE

First-order construct	Second-order construct	Indicators	Loadings	Cronbach's alpha	Composite reliability	AVE
CI		CI_1	0.894	0.851	0.91	0.771
		CI_2	0.869			
		CI_3	0.871			
DI		DI_1	0.848	0.82	0.892	0.734
		DI_2	0.866			
		DI_3	0.857			
	ESCI	CI	0.852	0.714	0.874	0.776
		SI	0.909			
ISCI		ISCI_1	0.846	0.791	0.877	0.705
		ISCI_2	0.830			
		ISCI_3	0.843			
OC		OC_1	0.758	0.846	0.89	0.618
		OC_2	**0.687**			
		OC_3	**0.700**			
		OC_4	0.768			
		OC_5	0.747			
		OC_6	**0.609**			
		OC_7	**0.665**			
		OC_8	0.757			
		OC_9	0.746			
PB		PB_1	0.841	0.892	0.921	0.699
		PB_2	**0.624**			
		PB_3	0.827			
		PB_4	0.845			
		PB_5	0.811			
		PB_6	0.794			
SCR		SCR_1	0.824	0.857	0.903	0.7
		SCR_2	0.865			
		SCR_3	0.836			
		SCR_4	0.820			
SI		SI_1	0.909	0.882	0.927	0.809
		SI_2	0.902			
		SI_3	0.888			

Table 2
Heterotrait-Monotrait ratio

	CI	DI	ESCI	ISCI	OC	PB	SCR	SI
CI								
DI	0.070							
ESCI	-	0.145						
ISCI	0.069	0.154	0.084					
OC	0.327	0.104	0.424	0.541				
PB	0.237	0.549	0.374	0.295	0.502			
SCR	0.395	0.080	0.550	0.546	0.080	0.114		
SI	0.640	0.160	-	0.074	0.355	0.363	0.484	

4.2. Structural model

A bootstrapping procedure of 5.000 replacements was used to assess the structural model. This study also examines the collinearity, the model's explanatory power, and predictive accuracy before interpreting the results of the hypothesized paths (Hair et al., 2019). VIFs lower than the threshold value of 3 indicates the absence of the collinearity (Hair et al., 2019). R^2 higher than 0.25 suggests the sufficient degree of the model's explanatory power (Hair et al., 2019). Q^2 value higher than zero indicates the adequate degree of the predictive accuracy (Hair et al., 2019). Table 3 shows the establishment of these criteria.

Table 3. R^2, Q^2, and VIF of latent variables

	R^2	Q^2	VIF					
			DI	ESCI	ISCI	OC	PB	SCR
DI							1.000	
ESCI	0.142	0.098						1.000
ISCI	0.203	0.134						1.000
OC	0.196	0.115		1.244	1.244			
PB	0.226	0.155		1.244	1.244	1.000		
SCR	0.386	0.263						

Table 4 shows that all hypothesized paths are significant. Particularly, DI is positively related to PB. A high degree of PB is positively associated with a high degree of OC. OC is positively linked with ESCI and ISCI. Lastly, ESCI and ISCI are positively associated with SCR.

Table 4
Relationship between latent variables

Hypothesis	Path	Beta	*t-value*	*p-values*	Confident interval		Results
					2.50%	97.50%	
H1	DI → PB	0.475	7.128	0.000	0.340	0.603	Supported
H2	PB → OC	0.443	6.447	0.000	0.309	0.581	Supported
H3	OC → ESCI	0.245	3.060	0.002	0.087	0.401	Supported
H4	OC → ISCI	0.416	5.384	0.000	0.252	0.558	Supported
H5	ESCI → SCR	0.427	7.439	0.000	0.317	0.538	Supported
H6	ISCI → SCR	0.442	8.250	0.000	0.336	0.546	Supported
-	PB → ESCI	0.198	2.385	0.017	0.034	0.359	-
-	PB → ISCI	0.069	0.913	0.361	-0.069	0.223	-
-	PB → OC → ESCI	0.109	2.790	0.005	0.037	0.190	-
-	PB → OC → ISCI	0.184	4.481	0.000	0.109	0.272	-

4.3. Additional analysis

This study also performs an additional analysis. The purpose of this analysis is to shed lights on the intervening effects of OC on the relationship between PB and ESCI, ISCI. Particularly, according to the nomological network of Shields and Shields (1998), the link between PB and its outcomes is influenced by intervening variables. To examine to intervening effects, this study relies on the procedure of Zhao, Lynch Jr, and Chen (2010). The result shows that OC fully mediates the relationship between PB and ESCI, ISCI respectively (see Table 4).

5. Discussion

First, the results indicate the positive link between DI and PB. In this regard, when the Covid-19 pandemic causes a disruption in the supply chain, managers working in this function participate in the budgeting process. One reason is that the disruption resulting from the pandemic casts uncertainty on these managers (Sreedevi & Saranga, 2017). They demand more information to make decisions effectively. PB provides a mechanism, which allows managers to receive more information to make decisions effectively in uncertain conditions (Kren, 1992). This may provide sufficient explanation for this positive relationship. This finding is consistent with Maiga (2005), who showed the positive relationship between environmental uncertainty and PB.

Second, the results also show the positive link between PB and OC. This finding can be interpreted as that when managers participate more in the budgeting process, they effectively commit to their organization. When participating in the budgeting process, managers enhance the sense of self-expression, respect, independence, and equality, which results in high OC (see French Jr et al., 1960). Besides, thanks to the participation, the budget communication is also enhanced between managers. It leads to the satisfaction of budget information, which improves OC (Putti et al., 1990). Last but not least, participation in the budgeting process triggers the perception of organizational justice, which is beneficial to OC (Schappe & Doran, 1997). In this regard, PB leads to OC. This finding is consistent with prior studies, which show the positive relationship between these two variables (see Nouri & Parker, 1998; Quirin et al., 2000; Yahya et al., 2008).

Third, the results indicate the positive link between OC and ESCI, ISCI respectively. In this regard, when managers commits to their organization, they cooperate with not only other employees working in other function of the organization but also other entities within the supply chain as organizational customers and suppliers to improve the efficiency of the supply chain (Mello & Stank, 2005; Xiao et al., 2010), which in turn leads to the improvement of ESCI and ISCI. This finding shares the similarity with Alfalla-Luque et al. (2015), who found that employees' commitment is positively related with SCI.

Fourth, the results reveal the positive link between ESCI, ISCI and SCR. In this regard, ESCI and ISCI improve SCR. ISCI improves the circulation of environmental knowledge about different functions in the organization (Turkulainen et al., 2017). This knowledge permits the adjustment of the transportation and inventory plans to improve the delivery' s dependability. Furthermore, ISCI also increases the communications and coordination between different departments within an organization, and as such they simultaneously cooperate with each other. In this regard, ISCI allows organizations to quickly adapt and respond to the changes of environment caused by unpredictable events, and in turn improve SCR.

ESCI includes the customer integration and supplier integration. Customer integration allows the information to be shared timely and accurately, which permits the organizations to preemptively adjust the logistic activities to enhance the quality of delivering services. Supplier integration fosters information sharing between suppliers and the organization, which improves the manufacturing flexibility of the organization regarding the materials requirement. In this regard, ESCI improves the organizational adaptability and responsiveness when unpredictable events cause changes of environment. It leads to improved

SCR. In the similar vein, recent studies (see Piprani et al., 2020; Siagian et al., 2021) show the positive link between SCI and SCR.

6. Conclusion, limitations, and future research

This study aims to explore how organizations can improve SCR amid the Covid-19 pandemic. Particularly, this study proposes that the DI improve PB. When PB is enhanced, OC can be found. A high degree of OC leads to a high degree of ESCI and ISCI, and in turn, results in SCR. Data were collected from 191 managers working in supply chain functions of organizations operating in industrial zones in Vietnam. The results show that all hypotheses are supported by data. Furthermore, this study provides additional analysis, which examines the intervening role of OC on the relationship between PB and ESCI, ISCI respectively.

The results are subject to some following limitations. First, this study only collects data in Vietnam. As a result, the generalization of the results to other countries should be cautious. Second, although this study adapts the instruments from prior studies, the translation to Vietnamese may cause a noise, which may affect the findings. Third, this study uses cross-sectional data. The results may be subject to predictive limitations relating to the use of these data. Although there are some concerns relating to the limitations, this study provides a fruitful avenue for future studies. First, in the budgeting literature, PB can foster not only motivational mechanisms but also cognitive mechanisms. Cognitive mechanisms refer to the information exchanged between different parties during PB. Future studies should address whether or not these mechanisms are beneficial to ESCI and ISCI. Second, Ngo (2021) shows that PB induces autonomous motivation. The motivational literature suggests that OC and motivation shares many similarities. In this regard, future studies should include this motivation in the model to examine whether autonomous motivation has intervening effects on the relationship between PB and ESCI, ISCI respectively. Third, future studies should replicate this study with samples from other countries. In this regard, it permits the generalizations to other countries. Lastly, future studies should use longitudinal data to overcome the predictive limitations.

References

Adobor, H. (2019). Supply chain resilience: a multi-level framework. *International Journal of Logistics Research and Applications, 22*(6), 533-556.

Aggarwal, S. (2018). Do rural roads create pathways out of poverty? Evidence from India. *Journal of Development Economics, 133*, 375-395.

Alfalla-Luque, R., Marin-Garcia, J. A., & Medina-Lopez, C. (2015). An analysis of the direct and mediated effects of employee commitment and supply chain integration on organisational performance. *International Journal of Production Economics, 162*, 242-257.

Allen, N. J., & Meyer, J. P. (1996). Affective, continuance, and normative commitment to the organization: An examination of construct validity. *Journal of Vocational Behavior, 49*(3), 252-276.

Argyris, C. (1952). *The impact of budgets on people*: Controllership foundation.

Basnet, C. (2013). The measurement of internal supply chain integration. *Management Research Review, 36*(2), 153-172.

Covaleski, M. A., Evans III, J. H., Luft, J. L., & Shields, M. D. (2003). Budgeting research: three theoretical perspectives and criteria for selective integration. *Journal of Management Accounting Research, 15*(1), 3-49.

Derfuss, K. (2009). The relationship of budgetary participation and reliance on accounting performance measures with individual-level consequent variables: a meta-analysis. *European Accounting Review, 18*(2), 203-239.

Derfuss, K. (2015). Relating Context Variables to Participative Budgeting and Evaluative Use of Performance Measures: A Meta-analysis. *Abacus, 51*(2), 238-278.

Derfuss, K. (2016). Reconsidering the participative budgeting–performance relation: A meta-analysis regarding the impact of level of analysis, sample selection, measurement, and industry influences. *The British Accounting Review, 48*(1), 17-37.

Downey, H. K., Hellriegel, D., & Slocum Jr, J. W. (1975). Environmental uncertainty: The construct and its application. *Administrative science quarterly, 20*(4), 613-629.

Droge, C., Vickery, S. K., & Jacobs, M. A. (2012). Does supply chain integration mediate the relationships between product/process strategy and service performance? An empirical study. *International Journal of Production Economics, 137*(2), 250-262.

Duchek, S. (2020). Organizational resilience: a capability-based conceptualization. *Business Research, 13*(1), 215-246.

Duncan, R. B. (1972). Characteristics of organizational environments and perceived environmental uncertainty. *Administrative science quarterly,* 17(3), 313-327.

Durach, C. F., & Wiengarten, F. (2020). Supply chain integration and national collectivism. *International Journal of Production Economics, 224*, 107543.

El Baz, J., & Ruel, S. (2021). Can supply chain risk management practices mitigate the disruption impacts on supply chains' resilience and robustness? Evidence from an empirical survey in a COVID-19 outbreak era. *International Journal of Production Economics, 233*, 107972.

Fawcett, S. E., Ogden, J. A., Magnan, G. M., & Cooper, M. B. (2006). Organizational commitment and governance for supply chain success. *International Journal of Physical Distribution & Logistics Management, 36*(1).

French Jr, J. R., Israel, J., & As, D. (1960). An experiment on participation in a Norwegian factory: Interpersonal dimensions of decision-making. *Human Relations, 13*(1), 3-19.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review, 31*(1), 2-24.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science, 43*(1), 115-135.

Holmberg, S. (2000). A systems perspective on supply chain measurements. *International Journal of Physical Distribution & Logistics Management, 30*(10).

Huo, B., Ye, Y., Zhao, X., & Shou, Y. (2016). The impact of human capital on supply chain integration and competitive performance. *International Journal of Production Economics, 178*, 132-143.

Johnson, W. R. (1992). The impact of quality circle participation on job satisfaction and organizational commitment. *Psychology: A Journal of Human Behavior, 29*(1), 1–11.

Kenno, S. A., Lau, M. C., & Sainty, B. J. (2018). In search of a theory of budgeting: a literature review. *Accounting Perspectives, 17*(4), 507-553.

Kren, L. (1992). Budgetary participation and managerial performance: The impact of information and environmental volatility. *Accounting Review, 67*(3), 511-526.

Latham, G. P., Winters, D. C., & Locke, E. A. (1994). Cognitive and motivational effects of participation: A mediator study. *Journal of Organizational behavior, 15*(1), 49-63.

Liu, C.-L., Shang, K.-C., Lirn, T.-C., Lai, K.-H., & Lun, Y. V. (2018). Supply chain resilience, firm performance, and management policies in the liner shipping industry. *Transportation Research Part A: Policy and Practice, 110*, 202-219.

Mahajan, K., & Tomar, S. (2021). COVID-19 and Supply Chain Disruption: Evidence from Food Markets in India. *American journal of agricultural economics, 103*(1), 35-52.

Mahlendorf, M. D., Schäffer, U., & Skiba, O. (2015). Antecedents of participative budgeting–A review of empirical evidence. *Advances in Management Accounting, 25,* 1-27.

Maiga, A. S. (2005). Antecedents and consequences of budget participation. *Advances in Management Accounting, 14*(1), 211-231.

Maloni, M. J., Campbell, S. M., Gligor, D. M., Scherrer, C. R., & Boyd, E. M. (2017). Exploring the effects of workforce level on supply chain job satisfaction and industry commitment. *The international journal of logistics management*, *28*(4), 1294-1318.

Mani, S., & Mishra, M. (2020). Non-monetary levers to enhance employee engagement in organizations–"GREAT" model of motivation during the Covid-19 crisis. *Strategic HR Review, 19*(4), 171-175.

Mellat-Parast, M., & Spillan, J. E. (2014). Logistics and supply chain process integration as a source of competitive advantage: An empirical analysis. *The international journal of logistics management, 25*(2), 289-314.

Mello, J. E., & Stank, T. P. (2005). Linking firm culture and orientation to supply chain success. *International Journal of Physical Distribution & Logistics Management, 35*(8).

Milani, K. (1975). The relationship of participation in budget-setting to industrial supervisor performance and attitudes: a field study. *The Accounting Review, 50*(2), 274-284.

Mowday, R. T., Steers, R. M., & Porter, L. W. (1979). The measurement of organizational commitment. *Journal of Vocational Behavior, 14*(2), 224-247.

Ngo, Q.-H. (2019). Budgetary Participation's Antecedent of Information Asymmetry and its Outcomes. *Asian Journal of Accounting and Governance, 12*, 119-131.

Ngo, Q.-H., Doan, T.-N.-N., & Huynh, T.-N. (2017). A Study on Managers' Creation of Budgetary Slack in Emerging Economies: The Case of Vietnam. *Asian Journal of Accounting Research, 2*(2), 15-28.

Ngo, Q. H. (2021). Budgetary Participation in Public Sectors: A Focus on Vietnam. *Transylvanian Review of Administrative Sciences, 17*(64), 108-130.

Nouri, H., & Parker, R. J. (1998). The relationship between budget participation and job performance: the roles of budget adequacy and organizational commitment. *Accounting, organizations and society, 23*(5-6), 467-483.

Ohana, M., Meyer, M., & Swaton, S. (2013). Decision-making in social enterprises: Exploring the link between employee participation and organizational commitment. *Nonprofit and Voluntary Sector Quarterly, 42*(6), 1092-1110.

Parker, R. J., & Kyj, L. (2006). Vertical information sharing in the budgeting process. *Accounting, organizations and society, 31*(1), 27-45.

Patchen, M. (1970). *Participation, achievement, and involvement on the job*. Englewood Cliffs, CA: Prentice-Hall.

Petersen, K. J., Handfield, R. B., & Ragatz, G. L. (2003). A model of supplier integration into new product development. *Journal of product innovation management, 20*(4), 284-299.

Piprani, A. Z., Mohezar, S., & Jaafar, N. I. (2020). Supply chain integration and supply chain performance: The mediating role of supply chain resilience. *International Journal of Supply Chain Management, 9*, 58-73.

Ponomarov, S. Y., & Holcomb, M. C. (2009). Understanding the concept of supply chain resilience. *The international journal of logistics management, 20*(1).

Putti, J. M., Aryee, S., & Phua, J. (1990). Communication relationship satisfaction and organizational commitment. *Group & Organization Studies, 15*(1), 44-52.

Quirin, J. J., Donnelly, D. P., & O Bryan, D. (2000). Consequences of participative budgeting: The roles of budget-based compensation, organizational commitment, and managerial performance. *Advances in Management Accounting, 9*, 127-144.

Reardon, T., Mishra, A., Nuthalapati, C. S., Bellemare, M. F., & Zilberman, D. (2020). COVID-19's disruption of India's transformed food supply chains. *Economic and Political Weekly, 55*(18), 18-22.

Remko, V. H. (2020). Research opportunities for a more resilient post-COVID-19 supply chain–closing the gap between research findings and industry practice. *International Journal of Operations & Production Management, 40*(4), 341-355.

Salam, M. A. (2011). Supply chain commitment and business process integration: The implications of Confucian dynamism. *European Journal of Marketing*, *45*(3).

Schappe, S. P., & Doran, A. C. (1997). How does fair treatment affect employee commitment to an organization? A field study of financial holding company employees. *The Mid-Atlantic Journal of Business, 33*(3), 191.

Shields, J. F., & Shields, M. D. (1998). Antecedents of participative budgeting. *Accounting, organizations and society, 23*(1), 49-76.

Siagian, H., Tarigan, Z. J. H., & Jie, F. (2021). Supply chain integration enables resilience, flexibility, and innovation to improve business performance in COVID-19 era. *Sustainability, 13*(9), 4669.

Sreedevi, R., & Saranga, H. (2017). Uncertainty and supply chain risk: The moderating role of supply chain flexibility in risk mitigation. *International Journal of Production Economics, 193*, 332-342.

Turkulainen, V., Roh, J., Whipple, J. M., & Swink, M. (2017). Managing internal supply chain integration: integration mechanisms and requirements. *Journal of Business Logistics, 38*(4), 290-309.

Vanichchinchai, A. (2012). The relationship between employee involvement, partnership management and supply performance: Findings from a developing country. *International Journal of Productivity and Performance Management, 61*(2).

Winata, L., & Mia, L. (2005). Information technology and the performance effect of managers' participation in budgeting: evidence from the hotel industry. *International Journal of Hospitality Management, 24*(1), 21-39.

Wong, C. W., Wong, C. Y., & Boon-Itt, S. (2013). The combined effects of internal and external supply chain integration on product innovation. *International Journal of Production Economics, 146*(2), 566-574.

Xiao, Y., Zheng, X., Pan, W., & Xie, X. (2010). Trust, relationship commitment and cooperative performance: supply chain management. *Chinese Management Studies, 4*(3).

Yahya, M. N., Ahmad, N. N. N., & Fatima, A. H. (2008). Budgetary participation and performance: some Malaysian evidence. *International Journal of Public Sector Management, 21*(6).

Zainuddin, Y., Yahya, S., Kader Ali, N. N., & Abuenniran, A. S. (2008). The consequences of information asymmetry, task and environmental uncertainty on budget participation: evidence from Malaysian managers. *International Journal of Managerial and Financial Accounting, 1*(1), 97-114.

Zhang, Y., Zhao, C., & Pang, B. (2018). Budget allocation in coping with supply chain disruption risks. *International Journal of Production Research, 56*(12), 4152-4167.

Zhao, X., Lynch Jr, J. G., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. *Journal of consumer research, 37*(2), 197-206.

Research Instrument

Covid-19' disruptive impact

1. The COVID-19 disruption has negative impact on the operations' overall efficiency.
2. The COVID-19 disruption has negative impact on the lead time for delivery.
3. The COVID-19 disruption has negative impact on the supply's purchasing costs.

Participative budgeting

1. I have a big influence on the portion of the budget, which I am involved in the setting.
2. The staffs of the financial department provide many reasons to me when the budget is revised.
3. I frequently have budget-related discussions with the financial department.
4. I have a big amount of influence on the final budget.
5. I have important contributions to the budget.
6. The financial department frequently initiates budget-related discussions when budgets are being set.

Affective organizational commitment

1. I am willing to put a great deal of effort beyond that normally expected in order to help this organization be successful.
2. I talk up this organization to my friends as a great organization to work for.
3. I would accept almost any type of job assignment in order to keep working for this organization.
4. I found that my values and the organizations values are very similar.
5. I am proud to tell others that I am part of this firm.
6. This organization really inspires the very best in me in the way of job performance.
7. I am extremely glad that I chose this organization to work for over others I was considering at the time I joined.
8. For me, this is the best of all possible organizations for which to work.
9. I really care about the fate of this organization.

External supply chain integration

Customer integration

1. We and our main customers exchange proprietary information
2. We and our main customers inform each other about events affecting the other party.
3. We and our main customers regularly exchange information of supply and demand forecast.

Supplier integration

1. We and our main suppliers exchange proprietary information.
2. We and our main suppliers inform each other about events affecting the other party.
3. We and our main suppliers regularly exchange information of supply and demand forecast.

Internal supply chain integration

1. In our organization, cross-functional collaboration is always done.
2. In our organization, all decisions are made collaboratively and collectively.
3. In our organization, ffriendships and informal relationships are encouraged.

Supply chain resilience

1. We are able to cope with changes brought by the supply chain disruption
2. We are able to adapt to the supply chain disruption easily.
3. We are able to provide a quick response to the supply chain disruption.
4. We are able to maintain high situational awareness at all times.