The relationship among leadership, risk management, and business continuity in Bangkok's construction industry after the COVID-19 pandemic

Sipnarong Kanchanawongpaisan[1*] and Tikhamporn Punluekdej[1]

Abstract

This research investigated the influence of leadership management on the continuation of company operations in Bangkok's construction sector during the COVID-19 epidemic. It also emphasized the significance of risk management as an intermediary in the relationship above. The study examined various aspects of leadership, including vision, communication, motivation, decision-making, adaptation, team building, delegating, continuous development, and ethical conduct. A study using the G*Power software tool resulted in a sample size of 751 construction enterprises. The effect size was determined to be 0.3, with a power of 0.95 and 151 degrees of freedom. Structural Equation Modeling (SEM) using AMOS software was employed to demonstrate the substantial impact of leadership management on company continuity through risk management.

The statistical analysis results showed X^2 = 267.988, df = 106, X^2/df = 1.258, p = .053, GFI = .958, AGFI = .984, CFI = .973, TLI = .957, RMSEA = .048, RMR = .014, and NFI = .957. These findings suggested that leadership traits, including flexibility and ethical behavior, were critical in risk management and company continuity. This highlighted the need to incorporate thorough leadership and risk management practices to improve the long-term sustainability of enterprises. The findings underscored the importance of leadership styles that promote proactive risk management. Additionally, it proposed the incorporation of leadership and risk management as a means to enhance the resilience of corporate operations.

Keywords: leadership management, risk management, business continuity

Introduction

The COVID-19 pandemic has significantly and negatively affected various sectors globally, with the construction industry being one of the most severely affected (Khan, Fatima, Ramayah, Awan, & Kayani, 2021). The worldwide construction sector, which plays a substantial role in the global economy, had a sudden and unparalleled cessation, resulting in severe economic consequences (Margherita, & Heikkilä, 2021). In Bangkok, renowned for its vibrant construction industry, the impact of the pandemic was

[1] Faculty of Business Administration, Southeast Asia University

[*] Corresponding author. E-mail: Sipnarong.benz@gmail.com

Received: March 8, 2024; Revised: April 24, 2024; Accepted: May 8, 2024

especially significant, requiring a reassessment of fundamental business practices and policies (Gamil, Al-Sarafi, & Najeh, 2023). The pandemic has caused significant disruptions in the construction industry, including supply chain outages and constraints on the workforce (UOB, 2020). Based on research by ASEAN (2017), the building sector in Southeast Asia, particularly Thailand (Durongkaveroj, 2023), faced substantial obstacles due to lockdown measures and social distancing procedures (Mercuria, 2020). In Bangkok, these disruptions were exacerbated by a decrease in foreign investments and a deceleration in the real estate market (Fresh Editorial, 2022).

There is a lack of awareness of how effective leadership and risk management contribute to business continuity in the construction sector of Bangkok, particularly in the post-pandemic era (Pal, & Shaw, 2022). Traditionally, the construction industry has focused more on addressing acute crises than on long-term strategic planning and the importance of leadership in managing risks (Weerakoon et al., 2023). Although there is current literature on leadership, risk management, and business continuity as independent topics, there is a lack of complete research that examines how these three areas interact with each other in the context of post-pandemic recovery in the construction industry in Bangkok (Yarrow, 2023). This research seeks to connect leadership and risk management and analyze their combined impact on company continuity (Piwowar-Sulej, & Iqbal, 2023).

This study is vital because it is necessary to provide construction enterprises in Bangkok and other metropolitan centers worldwide with strong and flexible business strategies to handle future crises effectively (Antonakis, Avolio, & Sivasubramaniam, 2003). This research offers valuable insights into the interconnectedness of leadership, risk management, and business continuity, which may aid in developing more effective methods for recovering from the pandemic (Yarrow, 2023). This study adds to the broader discussion on recovery in the construction sector, providing practical consequences for industry professionals and policymakers.

Research objectives/questions

1. To investigate the impact of leadership management on business continuity
2. To examine the role of risk management as a mediating factor
3. To analyze the influence of specific leadership dimensions on risk management and business continuity

Research methodology

H1: Leadership management has a positive direct effect on Risk management

H2: Risk management has a positive direct effect.

H3: Leadership management has a positive indirect effect on risk management

Literature review

1. Business continuity management (BCM)

Business Continuity Management (BCM) is a critical framework for organizations to ensure uninterrupted business operations and to recover from disruptive events. In the construction industry, BCM is pivotal due to the high impact of potential disruptions (Low, Liu, & Sio, 2010). The COVID-19 pandemic has further highlighted the importance of robust BCM strategies (Margherita, & Heikkilä, 2021).

Evolution of BCM theories and practices: BCM has evolved significantly, with frameworks like the Business Continuity Institute's Good Practice Guidelines and ISO 22301 standards shaping its development. These models emphasize a proactive approach to risk management and business recovery (Drewitt, 2013).

BCM in the construction industry: The application of BCM in the construction industry is unique due to the sector's inherent risks, such as site accidents, supply chain disruptions, and project delays. Effective BCM strategies are essential for minimizing downtime and financial losses (Supriadi, & Pheng, 2018).

Impact of COVID-19 on BCM: The pandemic has brought new challenges and perspectives to BCM, especially in construction. Studies have shown a shift in BCM practices, focusing more on health and safety, remote working, and digital transformation (Margherita, & Heikkilä, 2021).

BCM and organizational resilience: BCM is crucial in building organizational resilience, enabling businesses to withstand and recover from disruptions. This resilience is essential in the construction industry, where project timelines and budgets are tightly constrained (Galaitsi et al., 2023).

In conclusion, BCM is vital to the construction industry's strategic planning, especially during the COVID-19 pandemic. Effective BCM practices ensure business continuity and contribute to long-term resilience and success for construction projects.

2. Leadership management

Leadership management is a multifaceted discipline that combines the art of leadership with the science of management. It is crucial in guiding organizations through challenges and achieving strategic goals. Effective leadership management is pivotal for project success in the construction industry, especially in dynamic environments like post-COVID-19 Bangkok (Yarrow, 2023).

Core leadership theories

Trait Theory: This theory posits that certain inherent traits, such as intelligence, adaptability, and integrity, make an effective leader (Carlyle, 1841). Recent studies have emphasized the importance of these traits in the construction industry, particularly in crises (Müller, & Turner, 2010).

Behavioral theory: Focusing on leaders' actions rather than their mental qualities or internal states, this theory categorizes leadership into autocratic, democratic, and laissez-faire (Lisdiono, Said, Yusoff, & Hermawan, 2022). In modern contexts, democratic leadership is more effective in managing construction projects due to its emphasis on collaboration (Ametepey, Frempong-Jnr, & Cobbina, 2022).

Contingency theory: This theory, Fiedler (1967) suggested that the effectiveness of a leadership style is contingent on the context and environment. Fiedler's Contingency Model is a notable example, proposing that leader effectiveness depends on the match between the leader's style and the degree to which the situation gives control to the leader. In Bangkok's volatile post-pandemic market, adaptable leadership styles are more effective.

Transformational leadership: This approach is characterized by leaders who inspire and motivate their followers to achieve extraordinary outcomes and, in the process, develop their leadership capacity (Bass, 1990). Transformational leadership has been particularly relevant in navigating the post-COVID-19 challenges in the construction industry.

Leadership in the construction industry is not just about managing tasks but also involves managing risks and ensuring business continuity. Effective leadership is linked to better risk management practices and business resilience. In Bangkok's construction industry, leaders with solid decision-making capabilities and ethical behavior are better equipped to manage risks and ensure business continuity post-pandemic (Habani, & Kamaruddin, 2021).

Therefore, the theories and concepts of leadership management provide a framework for understanding how leaders can effectively guide construction firms in challenging environments. Bangkok's construction industry's post-COVID-19 era presents unique challenges and opportunities, and applying these leadership theories can significantly impact businesses' success and sustainability.

3. Risk management theory

Risk management is a crucial discipline in various industries, particularly in construction, where the complexity and scale of projects can lead to significant risks. It involves identifying, assessing, and mitigating risks to ensure project success and organizational stability (Szymański, 2017). The COVID-19 pandemic has further highlighted the importance of robust risk management strategies in construction.

Core risk management theories

Uncertainty Theory: posits that uncertainty is an inherent aspect of business operations. In construction, this involves dealing with uncertainties related to project timelines, costs, and resource availability (Zheng, & Marly, 2016).

Decision theory: Decision theory in risk management focuses on making informed decisions under conditions of uncertainty. It involves evaluating the probabilities and impacts of different risks (Vegas-Fernandez, & Rodríguez Lopez, 2019).

Risk-return tradeoff theory: This theory suggests a correlation between the potential return on investment and the level of risk taken. In construction, this could involve decisions about undertaking high-risk, high-reward projects (Chen, 2023).

Risk management in construction: Risk management involves identifying potential risks, assessing their likelihood and impact, and implementing strategies to manage them. Key challenges include site safety, supply chain management, and regulatory compliance (Banaitiene, & Banaitis, 2012).

Risk management post-COVID-19: The pandemic has introduced new risk dimensions in construction, including health and safety regulations, remote work, and market fluctuations. This has necessitated a reevaluation of risk management strategies in the industry (Gamil, Al-Sarafi, & Najeh, 2023).

Therefore, Effective risk management in the construction industry, especially in the uncertain environment post-COVID-19, is about risk avoidance and identifying and leveraging opportunities arising from these risks (Pal, & Shaw, 2022).

Methodology

This research aimed to analyze the administrators of construction businesses in Bangkok, Thailand, with a workforce of over 400 individuals. The investigation included 660 construction locations (NSO, 2023). A survey was conducted on the population using the G*Power software tool, which yielded a sample size of 751 construction administrators. The effect size is 0.3 (Faul, Erdfelder, Lang, & Buchner, 2007), the statistical power is 0.95 (Hair et al., 2010), and df = [NI (NI+1)/2-NP] where 19(19+1)/2-39 then df 151 (Schumaker, & Lomax, 2010). The study used Structural Equation Modeling (SEM) using AMOS license software version 24 to illustrate the significance of the model. Stratified random sampling was used proportionally over 50 locations in Bangkok (Ghosh, 1958). The collective data was obtained via the administration of a questionnaire and the use of Google Forms. An investigation was carried out from January to April 2023.

Measurement

A pilot study was performed during November and December 2022, using a sample of construction managers. The pilot test had a total of 30 individuals. Unless otherwise specified, a 5-point Likert scale assesses all questions (Likert, 1932) except for demographic items participating in Leadership Management (LM). The questions cover various aspects such as Vision (LM1), Communication (LM2), Motivation (LM3), Decision-Making (LM4), Adaptability (LM5), Team Building (LM6), Delegation (LM7), Continuous Improvement (LM8), and Ethical Behavior (LM9) (Fiedler, 1967; Bass, 1990; Ametepey, Frempong-Jnr, & Cobbina, 2022). The mediating function consists of risk management, which encompasses risk identification (RM1), risk assessment (RM2), risk mitigation (RM3), risk monitoring (RM4), and risk culture (RM5) (Zheng, & Marly, 2016; Szymański, 2017; Gamil, Al-Sarafi, & Najeh, 2023). The elements that influence Business Continuity Management include Business Impact Analysis (BCM1), Business Continuity Planning (BCM2), Crisis Management (BCM3), Information Management and Technology (BCM4), and People and Culture (BCM5) (Low, Liu, & Sio, 2010; Margherita, & Heikkilä, 2021; Galaitsi et al., 2023). The items assessed reliability using a Cronbach's alpha coefficient score of .979.

Data analysis

The research used Structural Equation Modeling (SEM) to analyze the data and examine the offered hypotheses. A correlation analysis was first performed to investigate the bivariate correlations among all variables. The study used a hierarchical structure, facilitating a sequential comprehension of the individual contributions of each layer within the model toward elucidating business continuity management. This approach took into account both direct and indirect impacts. A robust maximum likelihood estimate was used in the study to address any non-normality present in the data. The evaluation of model fit adequacy was conducted by the use of several indices, such as the Chi-Square test, degree of freedom, relative Chi-square test, Goodness of Fit Index (GFI), Adjusted Goodness-of Fit Index (AGFI), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), Root Mean Square Residual (RMR), and Norm Fit Index (NFI).

Research instrument

In this study, the researchers used the research instrument derived from a literature review to identify the variables as follows:

Table 1 The variables of the study.

variables		references
latent	observed	
leadership management (LM)	vision (LM1) communication (LM2) motivation (LM3) decision-making (LM4) adaptability (LM5) team building (LM6) delegation (LM7) continuous improvement (LM8) ethical behavior (LM9)	(Fiedler, 1967; Bass, 1990; Ametepey, Frempong-Jnr, & Cobbina, 2022)
risk management (RM)	risk identification (RM1) risk assessment (RM2) risk mitigation (RM3) risk monitoring (RM4) risk culture (RM5)	(Zheng, & Marly, 2016; Szymański, 2017; Gamil, Al-Sarafi, & Najeh, 2023)
business continuity management (BCM)	business impact analysis (BCM1) business continuity planning (BCM2) crisis management (BCM3) information management and technology (BCM4) people and culture (BCM5)	(Low, Liu, & Sio, 2010; Margherita, & Heikkilä, 2021; Galaitsi et al., 2023)

(Table 1) outlines this study's latent and observed variables and their theoretical references. The model comprises three primary constructs: Leadership Management (LM), Risk Management (RM), and Business Continuity Management (BCM). Each construct is operationalized through multiple observed indicators. Leadership Management includes nine dimensions: vision, communication, and ethical behavior. Risk Management consists of five indicators, including risk identification and risk culture. Business Continuity Management also contains five indicators: crisis management and information technology. The variables were selected based on an extensive literature review to ensure theoretical rigor and empirical validity.

Conceptual framework

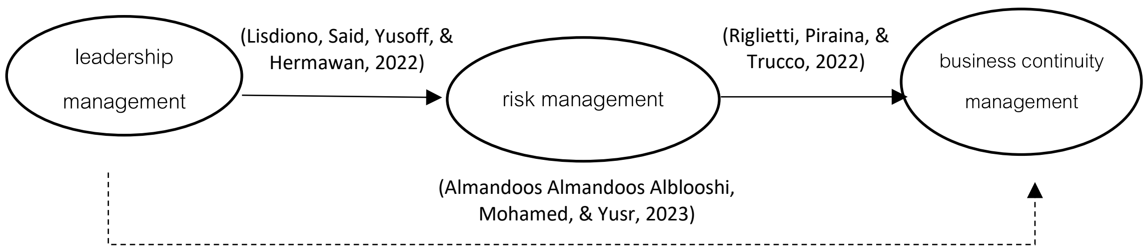

Figure 1 Conceptual framework.

Results

(Table 2) presents the demographic profile of the 751 respondents from Bangkok's construction sector. Most participants were male (66.31%), while females accounted for 33.69%. Regarding educational qualifications, most held a master's degree (56.86%), followed by bachelor degree holders (42.88%), and a small fraction held doctoral degrees (0.27%). In terms of job roles, project managers (32.49%) were the most represented, followed by site engineers (27.43%), project engineers (25.83%), and project directors (14.25%). Experience-wise, more than half had less than five years of experience (56.06%), with 31.82% having 6-12 years, and 12.12% having over 12 years of experience. This demographic distribution provides a comprehensive view of the managerial and professional backgrounds within the targeted industry segment.

Table 2 The demographics of respondents.

demographic	frequency	percentage
gender		
male	498	66.31
female	253	33.69
education		
bachelor degree	322	42.88
master degree	427	56.86
doctoral degree	2	0.27
job title		
site engineer	206	27.43
project engineer	194	25.83
project manager	244	32.49
project director	107	14.25
experiences		
less than 5 years	421	56.06
6-12 years	239	31.82
12 years above	91	12.12
total of respondents	751	100

(Table 3) displays the observed variables' correlations, reliability coefficients (Cronbach's alpha), descriptive statistics, and sample adequacy measures. All observed variables showed strong internal consistency, with alpha values above 0.87. Mean scores ranged from 3.55 to 4.04, indicating generally high agreement among respondents. The Kaiser-Meyer-Olkin (KMO) measure was 0.924, and Bartlett's test of sphericity was significant (χ^2 = 32,979.330, df = 325, $p < .001$), confirming the suitability of the data for factor analysis.

Table 3 Correlations among observed variables, alpha reliabilities (In parentheses), descriptive statistics, Kaiser-Meyer-Olkin measure of sampling adequacy, Bartlett's test of sphericity approx. Chi-square, degree of freedom, and significance.

variable		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1.	LM1	(.897)	.668*	.775**	.726*	.760**	.786**	.574**	.723*	.777**	.737**	.726**	.640*	.661**	.755*	.754*	.666*	.832**	.808*	.491**
2.	LM2		(.914)	.575*	.573*	.528*	.318*	.556**	.473*	.571*	.534**	.846**	.389**	.704*	.617*	.727**	.613*	.620*	.535*	.813**
3.	LM3			(.879)	.623**	.856**	.842*	.881**	.800*	.600*	.621**	.670*	.908**	.763*	.734*	.516**	.608*	.794*	.448*	.444**
4.	LM4				(.959)	.633*	.616**	.880*	.658*	.696*	.766**	.566*	.769*	.767*	.865*	.428**	.571*	.795*	.525*	.587*
5.	LM5					(.924)	.473*	.657*	.707*	.679*	.780*	.589*	.582**	.626**	.783*	.507*	.797*	.811*	.381*	.547**
6.	LM6						(.912)	.735**	.782**	.712*	.544**	.523*	.546*	.774*	.654*	.566*	.530*	.659*	.722**	.301*
7.	LM7							(.935)	.838*	.556**	.571*	.480**	.794**	.544**	.509*	.294**	.410*	.552*	.219**	.731*
8.	LM8								(.995)	.707*	.642**	.716*	.596**	.853*	.784*	.837*	.403**	.540*	.801*	.707**
9.	LM9									(.894)	.800**	.786*	.583**	.715*	.689**	.688*	.440*	.618*	.696**	.800*
10.	RM1										(.911)	.915**	.611*	.499**	.784**	.731*	.366**	.568*	.653**	.303**
11.	RM2											(.879)	.604**	.578*	.761*	.791*	.341**	.586**	.729*	.350**
12.	RM3												(.925)	.581**	.749*	.622**	.678*	.522*	.626**	.457**
13.	RM4													(.994)	.685**	.692**	.382*	.502**	.760**	.368**
14.	RM5														(.943)	.796*	.477**	.579*	.757*	.391**
15.	BCM1															(.933)	.489**	.636*	.854**	.601**
16.	BCM2																(.981)	.693*	.534*	.488*
17.	BCM3																	(.994)	.813**	.319**
18.	BCM4																		(.981)	.465*
19.	BCM5																			(.965)
$\bar{x}$		4.045	3.612	3.965	3.911	3.744	3.978	3.731	3.816	3.781	3.703	3.550	3.834	3.621	3.775	3.929	3.945	3.690	3.654	3.616
S.D.		.404	.509	.532	.493	.527	.493	.527	.499	.550	.538	.499	.550	.538	.523	.478	.510	.423	.602	.508
max		5.00	5.00	5.00	5.00	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67
min		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Kaiser-Meyer-Olkin measure of sampling adequacy																				.924
Bartlett's test of sphericity approx. chi-square																				32979.330
df.																				325
Sig.																				.000

(Table 4) summarizes the structural relationships among the study variables. Leadership Management has a substantial direct effect on Risk Management (β = .988, CR = 31.895), and an indirect effect on Business Continuity Management (IE = .993), confirming the full mediating role of Risk Management. The direct effect of Risk Management on Business Continuity Management is also strong (β= .951), underscoring its central role in sustaining operations. The model explains 99.4% of the variance in Risk Management and 99.2% in Business Continuity Management, indicating excellent model fit.

Table 4 Model summary.

dependent variables/	risk management				business continuity management			
independent variables	TE	DE	IE	C.R.	TE	DE	IE	C.R.
leadership management	.988	.988	-	31.895	.988	.000	.993	24.458
	(.031)	(.031)	-	-	(.031)	(.031)	(.031)	-
risk management	-	-	-	-	.951	.951	-	-
	-	-	-	-	(.043)	(.043)	-	-
R-square	.994				.992			
χ^2 = 267.988, df =106, χ^2/df = 1.258, p = .053, GFI = 958, AGFI = .984, CFI = .973, TLI =.957, RMSEA = .048, RMR = .014, NFI = .957								

(Table 5) presents the standardized factor loadings of all observed variables under their respective latent constructs. All items demonstrated strong loadings, indicating good construct validity. For Leadership Management, loadings ranged from .704 to 1.000, with the highest on Motivation (LM3 = 1.000) and Delegation (LM7 = .985). For Risk Management, loadings ranged from .643 to 1.000, with Risk Identification (RM1) showing the most substantial contribution. For Business Continuity Management, loadings ranged from .644 to 1.000, with Business Continuity Planning (BCM2) being the most influential. These high loading values confirm the reliability and convergent validity of the measurement model.

Table 5 Loading factors of observed variables.

observed	loading		
variables	leadership management	risk management	business continuity management
LM1	.770	-	-
LM2	.888	-	-
LM3	1.000	-	-
LM4	.741	-	-
LM5	.815	-	-
LM6	.704	-	-
LM7	.985	-	-

Table 5 Loading factors of observed variables. (continue)

observed variables	loading		
	leadership management	risk management	business continuity management
LM8	.768	-	-
LM9	.775	-	-
RM1	-	.1000	-
RM2	-	.739	-
RM3	-	.643	-
RM4	-	.779	-
RM5	-	.885	-
BCM1	-	-	.826
BCM2	-	-	1.000
BCM3	-	-	.765
BCM4	-	-	.740
BCM5	-	-	.644

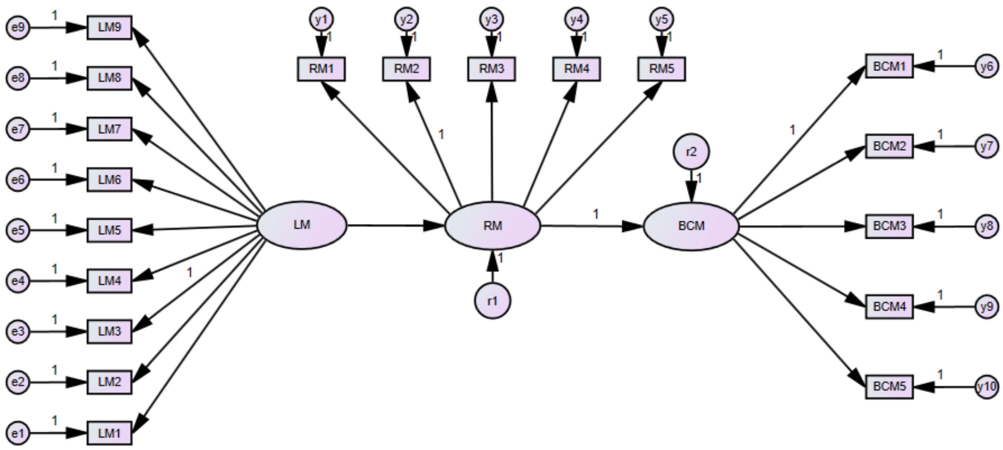

Figure 2 Research model analyzed by AMOS.

χ^2 = 267.988, df =106, χ^2/df = 1.258, p = .053, GFI = 958, AGFI = .984, CFI = .973, TLI =.957, RMSEA = .048, RMR = .014, NFI = .957

(Figure 2) shows that the positive fit indices indicate the research model's structural equation modeling (SEM) examination strongly aligns with the data. The correlation between Leadership Management and Risk Management is 0.99, suggesting a robust positive link. The ratio of the Chi-square statistic to the degrees of freedom (χ^2/df = 1.258) is much lower than the usually recognized threshold of 3, indicating that the model is a very suitable match. The p-value, slightly over the traditional threshold of significance (p = .053), does not compromise the model's validity. The fit indices, namely GFI (.958), AGFI (.984), CFI (.973), TLI (.957), and NFI (.957), demonstrate excellent agreement with the ideal value of 1, indicating a well-fitting model. Additionally, the low RMSEA (.048) and negligible RMR (.014) further support the conclusion of a well-fitting model. This research indicates that Leadership Management has a favorable effect on Risk Management, which subsequently improves Business Continuity Management within the organizational environment of this study.

Finding

According to the research objectives: 1) To examine the influence of leadership management on the continuity of business operations, the results demonstrate that effective leadership management is crucial for maintaining company operations in Bangkok's construction sector. Effective leadership is marked by a clear vision, making decisions decisively, and being adaptable. This kind of leadership directly affects an organization's ability to sustain business continuity, especially during difficult recovery phases after the epidemic. 2) To investigate the function of risk management as a mediating factor, the research illustrates that risk management plays a vital role in moderating the relationship between leadership management and company continuity. Effective leadership enables the implementation of complete risk management procedures, which include meticulous risk identification, appraisal, mitigation, and monitoring. An integrated approach to risk management is crucial for effectively executing business continuity solutions to examine the impact of several leadership dimensions on risk management and business continuity. 3) To analyze the Influence of Specific Leadership Dimensions on Risk Management and Business Continuity, the study emphasizes how certain leadership qualities, such as proficient communication, motivating techniques, team formation, work allocation, ongoing development, and ethical conduct, improve risk management procedures. These leadership attributes foster a proactive risk culture inside the firm. The correlations were validated using Structural Equation Modeling (SEM), which confirmed that leadership focused on effective risk management substantially influences company continuity.

Conclusion

This research demonstrates that leadership management is essential for guaranteeing the uninterrupted operation of businesses in Bangkok's construction sector, especially in the aftermath of interruptions such as the COVID-19 epidemic. The study results emphasize that critical attributes of successful leadership, such as a distinct vision, flexibility, decisive judgment, and ethical conduct, are essential for solid risk management strategies. These leadership attributes provide comprehensive identification, assessment, reduction, and surveillance of risks, bolstering corporate operations' continuity. The findings of this research are of utmost importance as they provide concrete proof that leadership management directly impacts risk management and, therefore, the continuation of company operations. Amidst the worldwide disruptions brought about by the COVID-19 epidemic, these discoveries emphasize the need for strategic leadership in managing crises and the essential role of adaptation in steering industries through difficult times. Adaptation is a crucial factor in building resilience and facilitating recovery. This research utilizes Structural Equation Modeling (SEM) to verify the connections between leadership characteristics, risk management, and business continuity. It is solid in the context of the construction industry. The technique provided is thorough and methodical, making it especially advantageous for the construction sector, which is renowned for its intricate projects and significant risks. This study addresses a notable deficiency in the current body of knowledge by illustrating the interrelated functions of leadership and risk management in maintaining business continuity, specifically in a post-pandemic situation. It also presents a distinct framework for improving operational stability and strategic crisis management in similar urban areas worldwide. This research provides valuable insights into leadership and risk management in the construction industry. It not only adds to the existing theoretical knowledge but also gives practical techniques backed by data to improve the sustainability and resilience of company operations.

Discussion

The research aligns with the current literature on the interplay between leadership and risk management. Pal, & Shaw (2022) noted that leadership practices profoundly affect organizational risk culture, affecting risk management effectiveness. Our research extends this by demonstrating a quantifiable impact on business continuity management, a relationship that has been theorized but not empirically tested in Bangkok's construction industry (Piwowar-Sulej, & Iqba, 2023). Furthermore, the critical role of leadership in fostering resilience, as discussed by Gamil, Al-Sarafi, & Najeh (2023), is supported by our SEM analysis, which indicates that leadership management activities directly contribute to risk management and business continuity practices.

Our findings also resonate with the broader implications suggested by the ISO 31000 framework, which posits that robust risk management is foundational to business continuity (International Organization for Standardization, 2018). As we found, the importance of adaptability and communication in leadership aligns with the crisis management recommendations by Szymański (2017), who emphasizes these leadership traits as pivotal during times of crisis. Regarding practical applications, our research suggests that construction firms should integrate leadership training with risk management processes. This strategy could yield significant benefits in terms of business continuity (Habani, & Kamaruddin, 2021).

In conclusion, our study not only corroborates the existing theories put forth in the literature but also provides empirical evidence from a post-pandemic perspective, thereby adding depth to the discourse on the cascading effects of leadership on risk management and business continuity (Ametepey, Frempong-Jnr, & Cobbina, 2022).

Research novelty

This research extends beyond traditional analyses by providing a unique perspective on the interconnectedness of leadership management, risk management, and business continuity in the post-COVID-19 era, specifically within the construction sector of Bangkok. This study not only bridges the gap in the literature by quantifying the impact of leadership on risk and continuity practices but also sheds light on the leadership attributes most effective in this context. Its focus on a sector and region undergoing significant pandemic-related challenges adds value to existing research, offering actionable insights for local and global applications in similar sectors.

The limitations of this research

1. Geographical and Sectoral Focus: The study's focus on Bangkok's construction industry limits its generalizability to other regions and sectors.

2. Cross-Sectional Design: The research employs a cross-sectional design, which may not fully capture the dynamic nature of leadership, risk management, and business continuity over time

3. Limited Variables: While the study comprehensively examines certain variables, it does not account for all potential factors influencing the relationship between leadership, risk management, and business continuity, such as external economic or political factors.

Suggestion

1. To generalize the findings, explore the impact of different leadership styles on risk and business continuity management in other industries and cultural contexts.

2. Conduct longitudinal studies to examine how the relationships between leadership, risk management, and business continuity evolve, especially in post-crisis recovery phases.

3. Investigate the role of digital transformation in enhancing the effectiveness of leadership and risk management strategies for business continuity.

4. Study the impact of external factors, such as governmental policies and global economic shifts, on the effectiveness of leadership in managing risk and ensuring business continuity.

References

Almandoos Alblooshi, M. A., Mohamed, A. M., & Yusr, M. M. (2023). Leadership, crisis management, and business continuity. *South Asian of Social Sciences and Humanities, 4*(1), 112-128.

Ametepey, S. O., Frempong-Jnr, E. Y., & Cobbina, J. E. (2022). Leadership style of construction project managers in Ghana. *International Journal of Technology and Management Research*, *7*(1), 53-71.

Antonakis, J., Avolio, B., & Sivasubramaniam, N. (2003). Context and leadership: An examination of the nine-factor full-range leadership theory using the multifactor leadership questionnaire. *The leadership quarterly, 14*(3), 261-295.

ASEAN. (2017). *ASEAN Integration report 2017.* Jakarta: ASEAN Secretariat.

Banaitiene, N., & Banaitis, A. (2012). Risk management in construction projects. In N. Banaitiene (Ed.), *Risk management - Current issues and challenges* (pp. 429-448). London: Intech.

Bass, B. (1990). From transactional to transformational leadership: Learning to share the vision. *Organizational Dynamics, 18*(3), 19-31.

Carlyle, T. (1841). *On heroes, hero-worship, and the heroic in history*. London: Chapman & Hall.

Chen, J. (2023). *Risk-return tradeoff: How the investment principle works*. Retrieved 07 March 2023, from Investopedia: https://www.investopedia.com/terms/r/riskreturntradeoff.asp

Drewitt, T. (2013). *A manager's guide to ISO22301.* Cambridge: IT Government Publishing.

Durongkaveroj, W. (2023). The Covid-19 pandemic in Thailand: With special reference to informal workers' problems. In C. Aspalter (Ed.), *Covid-19 pandemic* (pp. 213-228). Singapore: Springer.

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*(2), 175-191.

Fiedler, F. E. (1967). *A theory of leadership effectiveness.* Ney York: McGraw Hill.

Fresh Editorial. (2022). *Bangkok market report – impact of Covid-19*. Retrieved 20 August 2022, from Fresh Property: https://freshbangkok.com/bangkok-market-report-impact-of-covid-19/

Galaitsi, S., Pinigina, E., Keisler, J. M., Pescaroli, G., Keenan, J. M., & Linkov, I. (2023). Business continuity management, operational resilience, and organizational resilience: Commonalities, distinctions, and synthesis. *International Journal of Disaster Risk Science, 14*(6), 1-10.

Gamil, Y., Al-Sarafi, A., & Najeh, T. (2023). Post COVID-19 pandemic possible business continuity strategies for construction industry revival a preliminary study in the Malaysian construction industry. *International Journal of Disaster Resilience in the Built Environment, 14*(5), 640-654.

Ghosh, S. (1958). A note on stratified random sampling with multiple characters. *Calcutta Statistical Association Bulletin, 8*(2-3), 81-90.

Habani, M. A., & Kamaruddin, S. (2021). The influence of strategic leadership, business continuity planning and supply chain resilience on organizational performance: Instrument validation. *Business Management and Strategy, 12*(2), 228-237.

Hair, J. F., G. Tomas, H. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Partial least squares structural equation modeling (PLS-SEM) Using R.* Cham, Switzerland: Springer.

International Organization for Standardization. (2018). *ISO 31000:2018 - Risk management - Guidelines*. Geneva: ISO.

Khan, R., Fatima, T., Ramayah, T., Awan, T. M., & Kayani, Z. K. (2021). Community safety behavior in response to the Coronavirus Pandemic. *Illness, Crisis & Loss, 31*(1), 73-99.

Likert, R. (1932). *A technique for the measurement of attitude.* New York: The Science Press.

Lisdiono, P., Said, J., Yusoff, H., & Hermawan, A. A. (2022). Examining leadership capabilities, risk management practices, and organizational resilience: The case of state-owned enterprises in Indonesia. *Sustainability, 14*(1), 1-14.

Low, S. P., Liu, J., & Sio, S. (2010). Business continuity management in large construction companies in Singapore. *Disaster Prevention and Management, 19*(2), 219-232.

Margherita, A., & Heikkilä, M. (2021). Business continuity in the COVID-19 emergency: A framework of actions undertaken by world-leading companies. *Business Horizons, 64*(3), 1-14.

Mercuria. (2020). *Impact of COVID-19 on Bangkok real estate market 2020*. Retrieved 20 August 2022, from Mercuria Investment (Thailand): https://www.mercuriathailand.com/content/1195/impact-of-covid-19-on-bangkok-real-estate-market-2020

Müller, R., & Turner, R. (2010). Leadership competency profiles of successful project managers. *International Journal of Project Management, 28*(5), 437-448.

NSO. (2023). *Statistics on the number of cases, number of houses, and construction area of those permitted to construct Construction area for buildings and buildings not used*. Retrieved January 10, 2023, from National Statiscal Office Thailand: https://www.nso.go.th/nsoweb/index?set_lang=en

Pal, I., & Shaw, R. (2022). *Pandemic risk, response, and resilience: COVID-19 responses in cities around the world.* Oxford: Elsevier.

Piwowar-Sulej, K., & Iqbal, Q. (2023). Leadership styles and sustainable performance: A systematic literature review. *Journal of Cleaner Production, 382*, 1-14.

Riglietti, G., Piraina, M., & Trucco, P. (2022). The contribution of business continuity management (BCM) to supply chain resilience: a qualitative study on the response to COVID-19 outbreak. *Continuity & Resilience Review, 4*(1), 145-160.

Schumaker, R. E., & Lomax, R. G. (2010). *A beginner's guide to structural equation modeling*. New York: Taylor & Francis.

Supriadi, L. S., & Pheng, L. S. (2018). *Business continuity management in construction (Management in the built environment).* New York: Springer.

Szymański, P. (2017). Risk management in construction projects. *Procedia Engineering*, *208*, 174-182.

UOB. (2020). *Effected of COVID-19 toward construction business*. Bangkok: UOB.

Vegas-fernandez, F., & Rodríguez Lopez, F. (2019). Risk management improvement drivers for effective risk-based decision-making. *Journal of Business Economics and Finance, 8*(4), 223-234.

Yarrow, R. (2023). *Thailand's economic dilemmas in post-pandemic Asia*. Singapore: ISEAS.

Zheng, E., & Marly, M. (2016). Managing uncertainty in projects: A review, trends and gaps. *Revista de Gestão e Projetos, 7*(2), 95-109.