

Integrating knowledge management in sustainability risk management practices for company survival

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CHRONICLE

ABSTRACT

Article history:

Received: October 19, 2018
Received in revised format: November 18, 2018
Accepted: January 8, 2019
Available online:
January 8, 2019

Keywords:

*Knowledge management
Strategic resource
Sustainability risk management
Company survival*

Sustainability risk management (SRM) is an approach that manages the broad spectrum of risks arising from sustainability issues such as climate change, resource depletion and natural catastrophes. SRM is an extension to Enterprise Risk Management (ERM) that aims to maximize environmental, social and economic performances for a company's survival. In an SRM practice, knowledge management is a strategic resource for companies to sustain in the rapidly-evolved business environment. It provides a solution to address the unknown risks associated with environmental complexity. Thus, the aim of this study is to examine the moderating effect of knowledge management on the relationship between SRM critical factors (ERM bases and organizational resilience) and company survival among public listed companies (PLCs) in Malaysia. Partial Least Squares Structural Equation Modelling (PLS-SEM) technique is used to analyze the hypothetical model which is developed in this study. The result shows that knowledge management moderates the relationship between organizational resilience and company survival. This finding signifies that knowledge management is an important strategic resource to assist companies to develop effective risk management strategy. This will lead to better decision-making and risk controls which influence stakeholder value and company reputation. The study also finds that ERM bases and organizational resilience were significant towards company survival. Companies with strong ERM bases such as procedures, infrastructure and methods have higher chances of successful SRM implementation. Organizational resilience refers to the ability of a company to manage crises and disaster risks, which is crucial for a company's survival. This study has both theoretical and practical implications. The result of this study provides relevant insights on the value of knowledge management to meet stakeholder expectations. It also provides a better understanding of the relationship between SRM implementation, its critical factors and company survival.

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1. Introduction

The changes in business environment such as technological expansion and globalization are reshaping the business landscape and have increased pressure on companies to place greater emphasis on emerging sustainability risks (PricewaterhouseCoopers, 2013). Companies have yet recognized the impact of sustainability issues such as climate change, resources depletion and greenhouses gas emissions on their supply chains and stakeholders (Fink & Whelan, 2016). These issues bring both challenge and opportunity to risk managers as it requires a critical assessment to manage the emerging risks and other non-quantifiable risks, in addition to other types of risks, to achieve long-term business goals (Nigam

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& Ramos, 2008). In fact, emerging risks are no longer an uncertainty to deal with, rather than a critical risk that needs to be addressed because it will have a greater effect on a company's survival (Slack, 2012). Stakeholders demand that businesses take responsibility for the tremendous impact of their business operation on the environment and society. Despite such concerns, few studies agree that SRM, which is an extension to the ERM approach, may help companies address the growing sustainability risks that affect company survival (Anderson & Anderson, 2009; Yilmaz & Flouris, 2010; Beasley & Showalter, 2015, Ahn, 2015). SRM is a strategic approach of risk management which looks at risks and opportunities, a process that aligns the environmental, social and governance perspectives with the company's strategy. Driven by regulatory compliance and corporate governance requirements, many companies from various industries have started to implement an SRM program (Aziz et al., 2016). Implementing a successful SRM program requires knowledge management to improve the understanding of emerging risk and thereby support a company's risk decision making. Formerly, there were very few studies which examined the role of knowledge management in the risk management approach during its development and application (Rodriguez & Edwards, 2014). Knowledge management is considered as a strategic company resource (Chen & Huang, 2007) to enhance corporate performance and competitiveness for long-term company survival (Zipperer & Amori, 2011). Previous studies have shown that knowledge management helps an organization to have better risk management control (Rodriguez & Edwards, 2014). Knowledge sharing plays a vital role in avoiding new risks and provides a solution in addressing risks associated with environmental complexities in the organization (Hsu et al., 2013). This is because an individual's judgement normally fails to anticipate those risks as it creates uncertainty (Massingham, 2010; Butler et al., 2015). In this context, this paper aims to examine the moderating effect of knowledge management on the relationship between SRM critical factors (ERM bases and organizational resilience) and company survival in relation to Malaysian listed companies.

2. Literature review

2.1. Knowledge Management

The application of knowledge management in the risk management process received concerns at management level due to the complexity of the risk landscape (Alhawari et al., 2012). Dalkir and Liebowitz (2011, p.3) define knowledge management as deliberate and systematic coordination of an organization's people, technology, processes, and organizational structure in order to add value through reuse and innovation. Knowledge management refers to a process intended to achieve positive outcomes in the organization for the purpose of adding value (Holsapple & Joshi, 2004). Many organizations including private companies, public agencies and also non-profit entities have realized the value of knowledge management as an important tool for competitiveness, profitability and even their survival (Omotayo, 2015). Accordingly, Nonaka et al. (2000) identified two forms of knowledge which are explicit and implicit. Explicit knowledge is a set of codified knowledge in the form of organizational manuals, documents and databases whereas implicit knowledge represents knowledge in intangible form such as individuals' experience and points of view. Studies have shown that knowledge management is recognized as a strategic resource to enhance the risk management process to improve a company's success (Manab et al., 2012; Lai et al., 2012). Massingham (2010) indicated that knowledge management provides a solution to address unknown risks associated with environmental complexity since an individual's judgement usually fails to anticipate those risks, as it creates uncertainty. In addition, Manab et al. (2012) found that knowledge management is a critical success factor for ERM implementation in Malaysian listed companies. Lai et al. (2012) highlighted the role of knowledge management to successfully integrate sustainability and ERM process. They further clarified that an effective knowledge management process helps companies gain a sustainable competitive advantage in the marketplace and to respond to potential risks in the external environment. Indeed, companies can achieve long-term business success through application of knowledge management in an SRM approach to meet stakeholders' expectations. Thus, it can be concluded from the previous studies that knowledge management is important in SRM practices for surviving in a dynamic business environment (Paltrinieri et al., 2012, Fuller et al., 2014; Palermo et al., 2017).

2.2. Organisational Resilience

Organizational resilience is generally described as an ability of an organization to anticipate and plan ahead to deal with unexpected potential events through SRM approach for long-term company survival. According to PricewaterhouseCoopers (2013), a company needs to broaden her ERM process to include resilience to manage emerging social and environmental risks. Organizational resilience has risen in importance to help management identify relevant risk management strategies to cope with the emerging risks. It is an important aspect in risk management (Aven, 2014) to ensure companies have enthusiastic understanding of the risk environment, determine the ownership of risks, and enhance the component of risk management system to effectively respond to those risks on the radar (Van der Vegt et al., 2015). In particular, Mikes and Kaplan (2015) demonstrated that resilience should be the main concern of the company to envision the external risks because those risks are beyond the company's control. Furthermore, a number of studies have also shown that organizational resilience may help companies come out with strategic risk assessment to significantly reduce the uncertainties that may affect company survival (Burnard & Bhamra, 2011). A company that possesses strong resilience would be able to forecast the uncertainties earlier by lowering exposure of the risk events to ensure company survival (Burnard & Bhamra, 2011). Kinman (2012) identified four components of organizational risk resilience which are proactive risk assessment on emerging risk exposures, having strong risk governance at the board level; integrate risk with corporate strategy, and involvement of employees from all business units and key functional areas. Hence, resilience is important for a company to respond and adapt to the adverse effect of sustainability issues in a risky environment (Franken et al, 2014).

2.3 ERM Bases

Risk management bases determine the way a company establishes risk management processes and to improve company decision making (Funston & Wagner, 2010). According to Deloitte (2013), a risk management base serves as the "glue" that gives cohesion and consistency to an organization's individual risk management efforts. ERM bases consist of policies, procedures, processes and organizational structure to facilitate advancement of risk management capabilities. An appropriate risk management base is vital to enhance the capacity of a company to address a broad range of emerging risks and to improve the company's risk preparedness to ensure company survival (Locklear, 2012). Funston and Wagner (2010) indicated that an effective risk management base helps a company estimate future threat probabilities accurately and enhances its ability to survive. It also helps boards, senior executives and business units improve risk oversight, risk identification and risk measurement (Protiviti, 2006). According to the 2006 Towers Perrin Tillinghast survey, a majority of executives indicated that companies need to build a strong ERM infrastructure to improve their current ERM program. Manab et al. (2012) found that a risk management base is the most significant critical factor for successful ERM implementation. Thus, a company needs to develop effective risk policies and procedures, a business continuity plan, a balance scorecard to improve the ability of the organization to address all types of risk within the competitive business environment.

2.4 Company Survival

Companies are faced with an uncertain economic climate and unexpected catastrophic events, such as hurricane Sandy and the Volkswagen emission scandals which resulted in company survival being at risk. Sustainability has become a critical issue for many businesses and managements to be aware of the need to broaden company goals beyond the financial objectives (Bansal, 2005). In addition, institutional investors and other stakeholders now currently demand more information on environmental, social and governance (ESG) risk. Most of the risks from sustainability issues lies within the context of operational risks and poses greater impact on the company's survival (PricewaterhouseCoopers, 2013). These concerns have forced risk managers to perform extensive risk assessment on risks affecting company survival. Effective risk management is the backbone of company survival, thus companies need to include both risks and strategic opportunities related to sustainability factors as an important part of their risk management strategies (Mateescu et al., 2016). Ortiz-de-Mandojana and Bansal (2016)

identified that the companies engaged in sustainable business practices possess the ability to proactively mitigate risks of unexpected events and to sustain longer. SRM creates opportunities for companies to gain enlightened value maximization (shareholder and stakeholder value) and improve company reputation through better management of emerging risks and non-quantifiable risks for company survival. Many companies have adopted an ERM program to manage all types of risks holistically to increase shareholder value (Farrell & Gallagher, 2014). Although previous studies highlighted that ERM implementation enhanced shareholder value, this does not mean that ERM has been effectively implemented (Manab et al., 2013). According to Beasley and Showalter (2015), integrating sustainability and ERM are considered strategic initiatives to drive stakeholder value. In the context of SRM, it extends the concept of ERM to create value for all stakeholders because most of the risks result from the discrepancy between the stakeholders' and the company's objectives. This is because most of the risks from sustainability issues are resulted from the discrepancy between stakeholders and the company's objectives (Purdy & Lark, 2012).

3. Research framework and hypotheses

Based on the literature review discussed in this paper, the model proposed for test in this study is presented in Fig. 1 below:

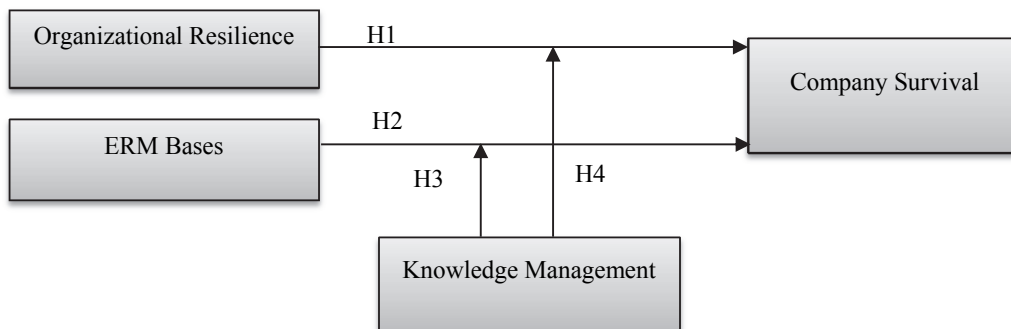


Fig.1. Research framework

Based on the theoretical argument presented, the study develops the following hypotheses:

- H₁ Organizational resilience positively influences company survival of PLCs in Malaysia.
- H₂ ERM bases positively influence company survival of PLCs in Malaysia.
- H₃ Knowledge management moderates the positive relationship between ERM bases and company survival of PLCs in Malaysia.
- H₄ Knowledge management moderates the positive relationship between organizational resilience and company survival of PLCs in Malaysia.

3.1. Methodology

A quantitative approach was employed to test the hypothesized model. The population of the study comprises the two non-financial sectors of the Malaysian listed companies which are environmentally sensitive and services. Environmentally sensitive companies which include chemical, construction, plantation, transportation, mining and resources, petroleum and industry products (Manaf et al., 2006) have been selected due to the greater environmental impact of their business operations to the ecosystem and community (Patten & Trompeter, 2003). On the other hand, the services sector comprises companies that offered public necessity in which risks and its management, and company performance have a beneficial effect on the public than other service sectors (Manab et al., 2012). In order to test the proposed research model and hypothesized relationship, the data was obtained using a stratified random sampling technique and there were 200 questionnaires distributed among the respondents, out of which 88 questionnaires were returned, thus achieving a response rate of 44 percent. To test the empirical relationship of the proposed research framework, partial least squares structural equation modelling (PLS-SEM) was employed. The PLS-SEM has been widely adopted in the risk management discipline (Ahmed & Manab, 2016; Abd Razak et al., 2016).

3.2. Results

The study represented 88 responses from the two sectors of public listed companies (PLCs) in Malaysia. Out of the 88 companies that have responded, 19.3 percent is from the service sector and 80.7 percent is from the environmentally sensitive sector. Table 1 shows the number of respondents according to type of company.

Table 1

Number of Respondent According to Type of Company (N=88)

Type of Company	Frequency	Percentage
Services	17	19.3
Environmentally Sensitive	71	80.7
Total	88	100.0

3.3. Assessment of Measurement Model

Fig. 1 presents the moderation analysis applying PLS product-indicator approach (Chin et al. 2003) to detect the moderating effect of knowledge management on the relationship between ERM bases, organizational resilience and company survival. Table 2 depicts the assessment of construct reliability and convergent validity for the variables in this study. The study used the factor loadings, composite reliability (CR) and average variance extracted (AVE) to assess convergence validity (Hair et al., 2010). The loadings for all items exceeded the recommended value of 0.6 (Chin et al., 1997). The composite reliability values of CS (0.898), ERMB (0.918), KM (0.943) and OR (0.87) are all above the recommended threshold value of 0.7. These are good indicators that all constructs possess internal consistency. The average variance extracted (AVE), which reflects the overall amount of variance in the indicators accounted for by the latent construct, were in the range of 0.575 and 0.806, exceeding the recommended value of 0.5 (Hair et al., 2010).

Table 2

Internal Consistency and Convergent Validity

Constructs	Items	Loadings	AVE	CR	Validity
Company's Survival (CS)	CS1	0.773	0.596	0.898	YES
	CS2	0.776			
	CS3	0.774			
	CS4	0.813			
	CS5	0.774			
	CS6	0.716			
ERM Base (ERMB)	ERMB1	0.801	0.737	0.918	YES
	ERMB2	0.927			
	ERMB3	0.857			
	ERMB4	0.844			
Knowledge Management (KM)	KM1	0.927	0.806	0.943	YES
	KM2	0.904			
	KM3	0.908			
	KM4	0.851			
Organizational Resilience (OR)	OR1	0.845	0.575	0.87	YES
	OR2	0.804			
	OR3	0.707			
	OR4	0.791			
	OR5	0.625			

Table 3 illustrates the assessment of discriminant validity. The discriminant validity of the measures is evaluated by examining the Henseler's heterotrait-monotrait (HTMT) (2015) criterion. Henseler's HTMT criterion imposes more stringent assessment than the earlier criterion. This indicates that the constructs are empirically distinctive from one another at HTMT_{0.85} threshold in which none of the confidence interval contains the value of one (Henseler, et al., 2015; Neef, 2005).

Table 3

HTMT criterion

	CS	ERMB	KM	OR
CS				
ERMB	0.569			
KM	0.567	0.565		
OR	0.573	0.687	0.514	

Criteria: Discriminant validity is established at HTMT $_{0.85}$

3.4. Assessment of Structural Model

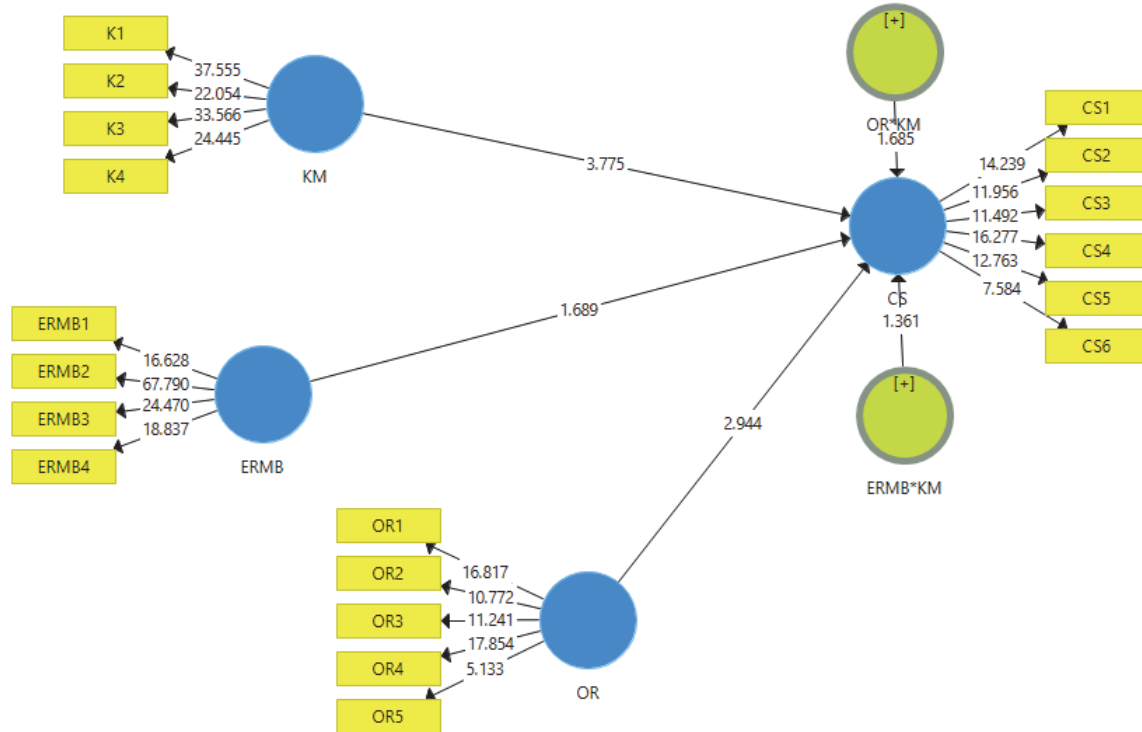
**Fig. 2.** Path Model Result

Fig. 2 shows the path model result of this study. Based on the bootstrapping result indicated in Table 4, the relationship between ERM bases is significant ($\beta=0.186$; $t=1.757$; $p<0.1$) for company survival. Also, the relationship between organizational resilience and company survival is significant ($\beta=0.321$; $t=3.024$; $p<0.01$). As such, the results provided evidence to support the hypotheses H_1 and H_2 . Similarly, the results of the moderation test have revealed a positive interaction ($OR \times KM$) effect ($\beta= -0.187$ $t=1.674$; $p <0.1$) between organizational resilience and company survival; as such, H_4 is supported. However, the interaction term ($ERMB \times KM$) is not significant ($\beta=0.159$; $t=1.288$; $p>0.10$), hence the hypothesis (H_3) is not supported.

Table 4

Path Coefficient Assessment

	Direct Effect (β)	StDev	T-Statistics	P Value	Decision
ERMB → CS	0.186	0.106	1.757	0.079	Supported
OR → CS	0.321	0.113	3.024	0.003	Supported
ERMB × KM → CS	0.159	0.11	1.288	0.198	Not Supported
OR × KM → CS	-0.187	0.106	1.674	0.095	Supported

Note: $t\text{-value}>1.96$ ($p<0.05$)*; $t\text{-value}>2.58$ ($p<0.01$ **)

Table 5 illustrates the assessment of coefficient of determination (R^2), the effect size (f^2), as well as the predictive relevance (Q^2) of exogenous variables in the endogenous variable in this study. The value of co-efficient of determination (R^2) for company survival is 0.415. This suggests that the exogenous variables in this study; namely ERM bases, knowledge, and organizational resilience explain 41.5% of variation in company survival. Overall, the Q^2 value of 0.212 for company survival, which is larger than 0, suggests that ERM bases, knowledge, and organizational resilience possess the predictive ability over company survival (Hair, et al., 2014). The results also show that exogenous variables in this study have a medium and small effect size on company survival.

Table 5

Determination of Co-efficient (R^2), Effect size (f^2) and Predictive Relevance (Q^2)

	<i>Determination Co-efficient</i>	<i>Predictive Relevance</i>	<i>Effect Size f^2</i>	
	R^2	Q^2	<i>CS</i>	<i>Effect Size</i>
FS	0.415	0.212		
ERMB			0.034	Small
KM			0.114	Medium
OR			0.04	Small

Fig. 3 presents the graph for interaction effect between organizational resilience and company survival. The graph shows that the impact of relationships between organizational resilience and company survival for high knowledge management is higher than low knowledge management.

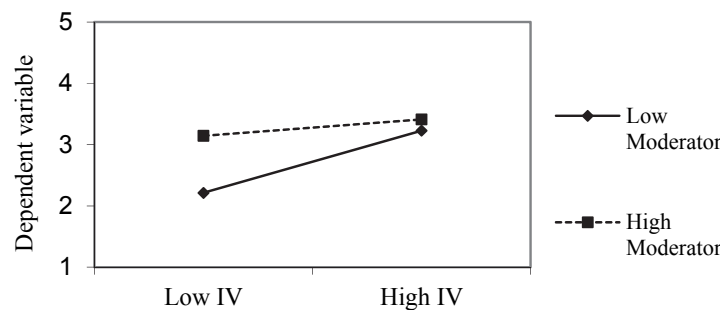


Fig. 3. Moderating effect of knowledge management on the relationship between organisational resilience and company survival

4. Discussion

The study provides both a theoretical and practical contribution for understanding the moderating effect of knowledge management on company survival. Findings from this study indicate that two variables (ERM bases and organizational resilience) have a positive effect on the company survival of the PLCs (supporting hypotheses 1 and 2). According to Kinman (2012), organizational resilience is crucial to help companies prepare for the worst event in an uncertain business environment. ERM bases was also found to be positively associated with company survival and the finding is in agreement with a study by Manab et al. (2012) which indicated that risk management base is the most important factor affecting the shareholder value. The hypothesis (H_4) concerning the moderating effect of knowledge management on the relationship between organizational resilience and company survival was supported. The finding suggests that knowledge management acted as a strategic company resource for supporting better risk identification and mitigation of future potential events which then ensure company survival. In other words, public listed companies (PLCs) with a high degree of knowledge management will ensure effective risk responses to reduce emerging threats affecting company objectives. The study also found that the interaction effect between ERM bases and knowledge management was insignificant, although there was a positive relationship between ERM bases and company survival. The failure of knowledge management to moderate the relationship between ERM bases and company survival might

be because the risk managers are complacent with their status quo and implementing risk management only for the purpose of complying with corporate governance requirements. Besides, too few companies are effectively identifying, evaluating and assessing emerging risks as part of their risk management strategy due to a lack of tools and data (Boultwood, 2016; Lelic, 2002). According to Rodriguez and Edwards (2014), a lower degree of knowledge management in the ERM process may lead to ERM being implemented in silos within the organization.

5. Conclusion

The study shows that knowledge management strengthens the positive relationship between organizational resilience and company survival. Therefore, it is necessary to ensure the importance of the knowledge management process in an organization to avoid any negative consequences that may jeopardize company survival. In addition, without a high degree of knowledge management process in an organization, risk culture is unable to be successfully developed, and hence becomes a barrier for implementing the SRM program. The findings of this study may help risk managers understand the strategic role of knowledge management in SRM practices to mitigate unexpected impacts of emerging risks. Companies that have strong ERM bases may be more concerned about breaking silos in ERM implementation and thus may have better knowledge management process to implement SRM effectively. Even though the results of the study tremendously show that knowledge management is a critical moderator between organizational resilience and company survival, there are limitations to the study. First, the sample of the study only covers two sectors of non-financial companies. Second, there may be other factors to support integration of knowledge management in SRM practices that were not reflected in this study. Therefore, there may be other variables to help further explain the relationships observed in future studies. In addition, further expansion to consider financial companies would also provide additional direction for research.

Acknowledgement

This research was part of a research project fully funded by Fundamental Research Grant Scheme (FRGS) from Ministry of Education, Malaysia

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