

Relationship of Supply Chain Integration and Supply Chain Risk Management among Malaysian Small and Medium Enterprises

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Abstract

Risk is an inevitable situation where it occurs due to an uncertain event and it causes to the damage and loss. The involvement of the supply chain integration and supply chain risk management in handling the disruptions playing a pivotal role in firms where, it is a way to control unexpected situation and reduce to the vulnerability. Thus, this study exploring about the effect of supply chain integration and supply chain risk management among Malaysian Small and Medium Enterprises (SMEs). This study using quantitative approach which applied exploring research design. Instrument was used in this research is questionnaires with 5 Likert scales. A total of 211 respondents have been selected according to the criteria stated, and random sampling used. The criteria of the respondents are a manager or someone who are knowledgeable about supply chain management in their firm. PLS-SEM was used for analyses the data of this study. As a result, shows ($\beta=0.466$, $t=6.202$ and $p=0.000$). Therefore, there is a significant relationship between supply chain integration and supply chain risk management has found in this study.

Keywords

Supply chain integration, Malaysian small and medium enterprises, and Supply chain risk management

1. Introduction

The highly competitive business environment and economic challenges can influence supply chain activities and performance, especially in small-medium enterprises (SMEs). Furthermore, globalisation and information technology can affect the world economy by creating healthy, sustainable, and rapid supply chain management (Xu et al. 2014). The pressures of reducing the trade barriers while advancing in transportation and information and communications technology to grow supply chain companies beyond the national level (Golini and Kalchschmidt, 2011). The global supply chain analysed the different perspectives such as global value chains, networks, and double multichip on systems by focusing on the firm view, especially in managing the source, manufacturing, and distribution on the global scale (Golini and Kalchschmidt, 2011).

In Malaysian, SMEs plays an essential role in economic development where the 90% of the businesses was form by the SMEs, about 32% of the SMEs contributes to the gross domestic product (Gunto and Alias, 2013). The SMEs consider as a national economy backbone, it helps to improve the country social and political stability and serves as a crucial growth engine in many countries (Barwani et al. 2014). Malaysian SMEs have great potential to develop significant domestic sourcing by integrating the supply chain to support the nation's economy (Ha et al. 2016; Chain et al. 2014). The Malaysian government is focused on SMEs' growth and development to achieve Vision 2020 of

becoming a high-income nation (Tehseen and Ramayah, 2015). SMEs are essential in developing countries because they aid the economic growth and income distribution and improve economic structure during the country's downturns (Abdullah and Manan, 2011).

Munir et al. (2020) argued that existing literature does not provide conclusive evidence of the association between supply chain integration and supply chain risk management. Furthermore, there is no empirical quantitative study supporting the claim and analysing the supply chain integration as an antecedent of supply chain risk management (Munir et al. 2020). Therefore, this study focused on the relationship between supply chain integration and supply chain risk management among Malaysian SMEs.

2. Supply chain integration and supply chain risk management

The core elements of supply chain integration are coordinate, combine, configure, and integrate (Jajja et al., 2018). Vickery et al. (2013) describe supply chain integration as a set of managerial and organisational activities that enables integration, learning, sensing, and coordinating. These activities cut across intra-firm and inter-firm, thus providing a network of closely linked partners (Jajja et al., 2018). The close partnerships create a shared understanding of the need to efficiently and effectively identify and interpret opportunities in the environment. The network of partners also feeds a continual stream of new information to enhance the existing supply chain process and develop new ones to respond to opportunities (Allred et al., 2011). For firms to build a competitive advantage in rapid and unpredictable markets, there need to integrate, build, and reconfigure the supply chain process internally and externally (Lee and Whang, 2004). Although arguments have been made for the importance of supply chain integration in a market of uncertainty, there are still limited studies supporting it (Gligor et al. 2016; Jajja et al., 2018).

Supply chain risk affects the distribution flow of information, materials, finance, and products within the supply chain's activities, and it has a wider scope than that of a single firm (Munir et al. 2020). Supply chain risk management literature has revealed that integrative activities can reduce supply chain risk, thereby presenting a relationship between integration and risk (Abrahamsson et al. 2015; Faisal et al. 2007). As the supply chain network becomes even more complex and competitions increase in the global market, it has become critical to implement supply chain integration to mitigate supply chain risk (Jajja et al., 2018). While supply chain integration might provide solutions to mitigate supply chain risk, studies have also revealed that internal and external integration positively affects supply chain agility which aids in lessening supply chain risk (Braunscheidel and Suresh, 2009).

There is still a lack of empirical studies on the relationship between supply chain integration and supply chain risk. Munir et al. (2020) stated that the gap between supply chain integration and supply chain risk should be investigated. Although there are theoretically established studies on supply chain integration aiding to alleviate the risk and improve supply chain risk, there is no empirical quantitative study to support the claim that supply chain integration is an antecedent in supply chain risk. Additionally, the argument regarding the integration of processes across multiple firms provides economic and competitive advantages leading to inconsistent results for the relationship between supply chain integration and operational performance. Therefore, this study anticipates that supply chain integration positively influences supply chain risk.

3. Data collection

The hypothesis was tested using questionnaire adapted from Flynn et al., (2010). The criteria of the respondent selected in this research was knowledgeable in the area of supply chain in their firm and the target of the respondent was SMEs listed in Federation Malaysian Manufacturing (FMM). The questionnaire was distributed by email and mail to the respondents.

4. Measurement model analysis

To analysis the hypothesis of supply chain integration and supply chain risk management among Malaysian SMEs, SEM-PLS was used for the examination. The measurement model was tested for the validity of the constructs and the reliability, before proceed to test the structural model. The confirmatory of factor analysis (CFA) was carried out to examine and proposed of the factor structure and the CFA if this research shown that reasonable of good model fit. Table 1 indicates the value of Composite reliability (CR), and Average Variance Extracted (AVE) of the constructs (Table 1).

Table 1. Measurement model

Constructs	CR	AVE
Supply chain integration	0.934	0.505
Supply chain risk management	0.931	0.511

The Table 1 shown the construct meet the threshold value for CR and AVE where the CR for supply chain integration is 0.934 and for supply chain risk management is 0.931 and the result for the AVE for supply chain integration 0.505 and supply chain risk management is 0.511. According to Hair et al., (2017), CR are greater than 0.70 and AVE are greater than 0.50 indicates the constructs meet reliability and highly acceptable.

5. Structural model analysis

To analysis the structural model, SEM-PLS (version 3.2.8) modeling software were used in this research. The results of this research was found there is a significant relationship between supply chain integration and supply chain risk management among Malaysian SMEs. The results have found the relationship is positively and statistically significant ($\beta=0.466$, $t=6.202$ and $p=0.000$). Hair et al. (2017) stated the difference value of path coefficient and t-statistical value for assessing the research model's hypotheses. Path coefficients are evaluated by the standard magnitude values of +1 to -1. If the path coefficient value is near to +1, then it means a very strong positive relationship. If the value is near to -1, it means there is a very strong negative relationship. On the other hand, if the value is very close to zero (0), it shows a very weak relationship. Similarly, the significance level or p-value is less than 0.05 (5%) and the t-statistical value is more than 1.96, which means it is significant. The findings have confirmed that the supply chain integration has a significant effect on improving the supply chain risk management among Malaysian SMEs. Thereby, the results lead to the acceptance of the hypothesis (Figure 1).

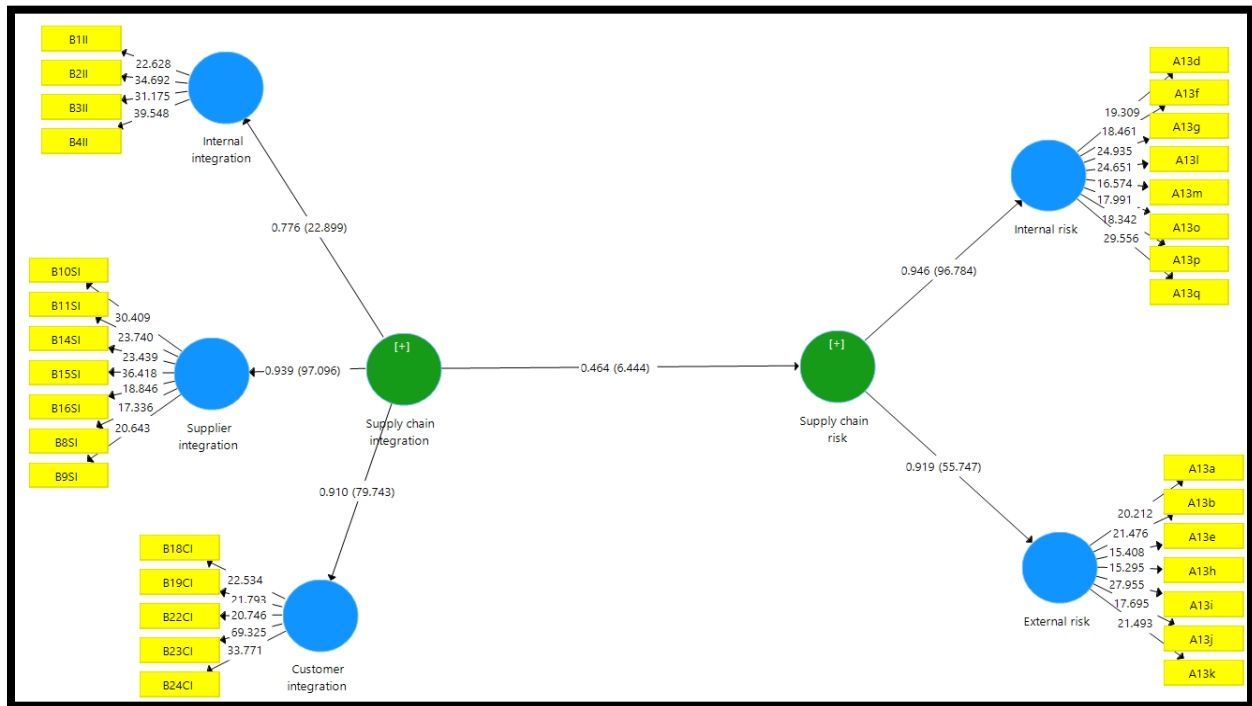


Figure 1. Relationship between supply chain integration and supply chain risk management

6. Discussion

This research found the relationship between supply chain integration and supply chain risk management has a positively significant relationship between the variables among Malaysian SMEs. The findings have proved the supply chain integration represented by three dimensions: internal integration, supplier integration, and customer integration

for enhancing the effectiveness of the supply chain risk in Malaysian SMEs. In other words, supply chain integration motivating of managing the risk of supply chain. There is a few study in integration of supply chain and the supply chain risk management in empirical study.

This study has found the supply chain integration has a significant effect on the supply chain risk management among Malaysian SMEs. Similar to the study by Munir et al. (2020), the dimensions of supply chain integration, internal integration, supplier integration, and customer integration positively affect supply chain risk. Supply chain integration helps in mitigating the risks and also improving the supply chain risk management, which are the supplier integration and customer integration help in reducing the information distortion and leading in accurate of the information in supply chain activities such as the accurate of forecasting of the demand, the efficiency of the allocation of resources and lowering the bullwhip effect (Schoenherr and Swink, 2012).

The study by Wiengarten et al. (2016) has differ result was rejected the relationship between supply chain integration and supply chain risk management, where they found the supply chain risk may not able to complemented their supply chain integration because of the weak rule of law environment. Supported by the research study of Bozarth et al. (2008) has found the supply chain integration especially the supply chain delivery risk has negatively related.

Thus overall as the model was fit satisfying the confirmatory factor analysis criteria it is confirmed that the supply chain integration positively influences the supply chain risk of Malaysian SMEs.

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Biographies

Avlyin Jay Sumayong is a Doctoral student at Department of Technology Management and Business at Universiti Tun Hussein Onn Malaysia, Johor Bahru, Malaysia. She currently doing her research in area of Supply Chain Management. She was born on 19 April 1988, in Sabah, Malaysia. Completed Bachelor degree in Technology Management Major in Production Operation at Universiti Tun Hussein Onn Malaysia, in 2013 and earned her Master Degree in Education of Technical and Vocational also from Universiti Tun Hussein Onn Malaysia, in 2015. In 2017 to 2019 she working as a lab instructor for subject Total Quality Management and Production Operation. While doing her PhD she working in Majlis Bandaraya Shah Alam Selangor since 2019 until 2021 at department of human resource.

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