

MEDIATING EFFECT OF SUPPLY CHAIN RISK MANAGEMENT AND
INFORMATION SHARING ON THE RELATIONSHIP BETWEEN SUPPLY
CHAIN INTEGRATION AND PERFORMANCE IN MALAYSIAN SMALL AND
MEDIUM ENTERPRISES

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DEDICATION

To my beloved parents, who have always supported me and encouraged me to pursue my dreams. You have been my constant source of inspiration and guidance, and I owe all my success to your unwavering love and care.

To my loving family especially my siblings, who have been my pillars of strength and a source of happiness. Your presence in my life has made all the difference, and I am forever grateful for your unconditional love and support.

To the love of my life, who has been my partner in all my joys and sorrows. Your unwavering support and understanding have made my life complete, and I cannot imagine a life without you.

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ABSTRACT

Small and medium enterprises (SMEs) play a crucial role as the backbone of the Malaysian economy. The integration of supply chain activities is an important aspect of a firm to enhance its supply chain performance. However, there is still much to explore about the role of supply chain integration in the performance of SMEs. Furthermore, there is a lack of literature that has studied the mediating role of supply chain risk and information sharing in the relationship between supply chain integration and supply chain performance. Therefore, this study aims to address the research gaps through a quantitative study. Random sampling technique was used to collect the data from respondents. A total of 242 responses were collected via a questionnaire from SMEs listed in Federation of Malaysian Manufacturers' directory. SPSS and SmartPLS software were used to analyse the collected data. Findings revealed that there is a significant relationship between supply chain integration and supply chain performance. Similarly, a significant relationship between supply chain integration and supply chain risk management as well as supply chain integration and information sharing were found. In addition, information sharing had a significant relationship with supply chain performance. However, insignificant relationship is found between supply chain risk management and supply chain performance. The findings showed that supply chain risk management did not mediate the relationship between supply chain integration and supply chain performance, whereas information sharing did mediate the relationship between supply chain integration and supply chain performance. This implies that to enhance the performance of SMEs supply chain, it is important to emphasise on supply chain integration and information sharing.

ABSTRAK

Perusahaan Kecil and Sederhana (PKS) memainkan peranan penting sebagai tulang belakang ekonomi Malaysia. Integrasi aktiviti rantai bekalan adalah aspek penting bagi firma meningkatkan prestasi rantai bekalan. Walaubagaimanapun, terdapat jurang pengetahuan tentang peranan integrasi rantai bekalan dalam prestasi PKS dalam kajian sedia ada. Selain itu, kajian mengenai peranan risiko rantai bekalan dan perkongsian maklumat sebagai perantara dalam hubungan di antara integrasi rantai bekalan dan prestasi rantai bekalan masih kurang. Oleh itu, kajian ini bertujuan untuk menangani jurang pengetahuan dan penyelidikan ini melalui kajian kuantitatif. Teknik persampelan rawak digunakan untuk mengumpul data dari responden. Sebanyak 242 maklum balas telah dikumpul melalui soal selidik dalam kalangan PKS yang tersenarai dalam direktori *Federation of Malaysian Manufacturers*. Perisian SPSS dan SmartPLS digunakan untuk menganalisis data yang dikumpul. Hasil kajian menunjukkan bahawa terdapat hubungan yang signifikan antara integrasi rantai bekalan dan prestasi rantai bekalan. Dapatan yang signifikan turut diperolehi bagi hubungan diantara integrasi rantai bekalan dan pengurusan risiko rantai bekalan serta integrasi rantai bekalan dengan perkongsian maklumat. Selain itu, perkongsian maklumat mempunyai hubungan yang signifikan dengan prestasi rantai bekalan. Walaubagaimanapun, hubungan yang tidak signifikan diperolehi antara pengurusan risiko rantai bekalan dan prestasi rantai bekalan. Hasil dapatan menunjukkan bahawa pengurusan risiko rantai bekalan tidak memainkan peranan sebagai perantara dalam hubungan antara integrasi rantai bekalan dan prestasi rantai bekalan. Sementara itu, perkongsian maklumat memainkan peranan sebagai perantara dalam hubungan antara integrasi rantai bekalan dan prestasi rantai bekalan. Ini bermakna adalah penting untuk PKS menekankan aspek integrasi rantai bekalan dan perkongsian maklumat bagi meningkatkan prestasi rantai bekalan sektor tersebut.

TABLE OF CONTENTS

TITLE	i
DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGEMENT	iv
ABSTRACT	v
ABSTRAK	vi
TABLE OF CONTENTS	vii
LIST OF TABLES	xii
LIST OF FIGURES	xiv
LIST OF APPENDICES	xvi
LIST OF ABBREVIATIONS	xvii
CHAPTER 1 INTRODUCTION	1
1.1 Introduction	1
1.2 Background of study	2
1.3 Problem statement	6
1.4 Research questions	9
1.5 Research objectives	10
1.6 Scope of the study	10
1.7 Significance of study	10
1.8 Definitions of key terms	11
1.8.1 Supply Chain Integration	11
1.8.2 Supply chain risk management	11
1.8.3 Information Sharing	12
1.8.4 Supply Chain Performance	12
1.9 Organisation of thesis	12
1.10 Summary	12

CHAPTER 2 LITERATURE REVIEW 14

2.1	Introduction	14
2.2	Supply chain management	14
2.3	Supply chain integration	16
2.3.1	Dimensions of supply chain integration	17
2.4	Supply chain risk management	25
2.4.1	Dimension of supply chain risk management	30
2.5	Information sharing	35
2.6	Supply chain performance	37
2.6.1	Measurement of supply chain performance	38
2.6.2	Supply chain performance model	40
2.7	Previous research on the relationship between supply chain integration, risk management, information sharing and supply chain performance	58
2.8	Theoretical foundation	61
2.8.1	Contingency theory	62
2.8.2	Information processing theory	63
2.9	Research theoretical framework and hypothesis development	65
2.9.1	Supply chain integration and supply chain risk management	66
2.9.2	Supply chain risk management and supply chain performance	67
2.9.3	Supply chain integration and information sharing	69
2.9.4	Information sharing and supply chain performance	70
2.9.5	Supply chain integration and supply chain performance	71

2.9.6	Supply chain risk management mediating the relationship of supply chain integration and supply chain performance	73
2.9.7	Information sharing mediating the relationship of supply chain integration and supply chain performance	75
2.10	Summary	77
CHAPTER 3 METHODOLOGY		79
3.1	Introduction	79
3.2	Research design	80
3.3	Research Procedure	80
3.3.1	Research instruments	81
3.3.2	Preliminary study	86
3.3.3	Real study	93
3.4	Data analysis	95
3.4.1	Structural equation modelling (SEM)	96
3.4.2	Measurement Model	102
3.4.3	Hypothesis testing (Direct Effect)	104
3.4.4	Hypothesis testing (Mediating Effect)	104
3.5	Summary	105
CHAPTER 4 ANALYSIS AND FINDINGS		106
4.1	Introduction	106
4.2	Survey questionnaire administration	106
4.3	Demography of respondents'	107
4.4	Missing value analysis	110
4.5	Exploratory factor analysis	110
4.6	Reliability analysis	112
4.7	Normality test	112
4.8	Descriptive analysis results	113
4.8.1	Supply chain integration	114
4.8.2	Supply chain risk management	115
4.8.3	Information sharing	117

4.8.4	Supply chain performance	118
4.9	Measurement model using Smart-PLS	120
4.9.1	Reliability analysis (Internal consistencies)	121
4.9.2	Validity test	122
4.10	Analysis of the structural model	126
4.10.1	Significance of path coefficient	127
4.10.2	Assessing the determination of R^2	129
4.10.3	Assessing the effect size (f^2)	130
4.10.4	The predictive relevance Q^2	130
4.10.5	Analysis of mediation effect	131
4.10.6	Variance accounted for (VAF)	132
4.10.7	Goodness of fit (GoF)	133
4.11	Testing of the research hypothesis	134
4.11.1	Hypothesis 1	135
4.11.2	Hypothesis 2	135
4.11.3	Hypothesis 3	136
4.11.4	Hypothesis 4	137
4.11.5	Hypothesis 5	138
4.11.6	Hypothesis 6	139
4.11.7	Hypothesis 7	140
4.12	Conclusion on the hypothesis testing	141
4.13	Summary	142
CHAPTER 5 DISCUSSION AND CONCLUSION		143
5.1	Introduction	143
5.2	Summary of the findings	143
5.3	Research discussions	144
5.3.1	Supply chain integration and supply chain risk management	145
5.3.2	Supply chain risk management and supply chain performance	145
5.3.3	Supply chain integration and information sharing	146

5.3.4	Information sharing and supply chain performance	147
5.3.5	Supply chain integration and supply chain performance	148
5.3.6	Mediating effect of supply chain risk management between supply chain integration and supply chain performance.	148
5.3.7	Mediating effect of information sharing between supply chain integration and supply chain performance.	149
5.3.8	Summary of the research finding	150
5.4	Research contribution	151
5.4.1	Contribution to the knowledge	151
5.4.2	Contributions to the industry	152
5.5	Limitation of research	153
5.6	Suggestion for future research	154
5.7	Conclusion	154
	REFERENCES	156
	APPENDICES	195
	VITA	



LIST OF TABLES

2.1	Measurement items of internal integration	20
2.2	Measurement items for supplier integration	22
2.3	Measurement items for customer integration	24
2.4	Definitions of supply chain risk management	28
2.5	Supply chain risk items	33
2.6	Summary of supply chain model.	45
3.1	Level of Likert Scale used	82
3.2	Section in Questionnaire	82
3.3	Measurement items for supply chain risk management	83
3.4	Measurement items for supply chain integration	84
3.5	Measurement items for information sharing	85
3.6	Measurement items for supply chain performance	85
3.7	Pilot test	87
3.8	Significant of factor loading based on sample size	91
3.9	The reliability value (Bond & Fox, 2015)	92
3.10	The Rules of Thumb for selecting the Partial Least Square SEM (Ramayah <i>et al.</i> , 2016)	97
3.11	Step of PLS-SEM model evaluation	98
3.12	Measurement constructs	98
3.13	Goodness of fit indices	101
3.14	Model fit criterion, accepted level and interpretation (Ramayah <i>et al.</i> , 2018)	102
3.15	Steps for analysis of mediation effect	105
4.1	Survey questionnaire administration	107
4.2	The summary of survey characteristic of respondent	107
4.3	Factor analysis of supply chain risk management	111

4.4	Reliability analysis	112
4.5	Normality analysis of skewness and kurtosis	113
4.6	Mean and standard deviation for each variable	113
4.7	Mean standard deviation of supply chain integration	114
4.8	Mean and standard deviation of supply chain risk	116
4.9	Paired-samples t-test	117
4.10	Paired Samples Statistics	117
4.11	Mean and standard deviation for information sharing	118
4.12	Mean and standard deviation of supply chain performance	118
4.13	Reflective construct reliability	122
4.14	Item cross-loadings and AVE for constructs.	123
4.15	Discriminant validity using Fornell and Lacker Criterion	125
4.16	HTMT Criterion	126
4.17	Level of path coefficient	127
4.18	Results of structural model path coefficient	128
4.19	Results of R2	129
4.20	Results of f2	130
4.21	Results of Q2	131
4.22	Summary of the results of mediation analysis	132
4.23	Variance Accounted For (VAF)	133
4.24	Model fit	134
4.25	Findings of research hypothesis testing	134
4.26	Summary of research hypothesis	142
5.1	Summary of research finding	150

LIST OF FIGURES

1.1	Malaysia GDP (RM billion) and annual percentage change (%)	3
1.2	Contribution of SMEs in Malaysian Economy	4
2.1	Supply chain integration (Kumar et al., 2017)	16
2.2	Supply Chain Operations Model (Hugos, 2006)	51
2.3	Research Framework	66
3.1	Research procedure of the study	81
3.2	A common approach preliminary data analysis	89
3.3	Krejcie and Morgan table determining sample size	94
3.4	Conducting the research questionnaires	95
4.1	Measurement model	121
4.2	Structural Model T-Statistical	128
4.3	Relationship between supply chain integration and supply chain risk management	135
4.4	Relationship between supply chain risk management and supply chain performance	136
4.5	Relationship between supply chain integration and information sharing	137
4.6	Relationship between information sharing and supply chain performance	138
4.7	Relationship between supply chain integration and supply chain performance.	139
4.8	Mediating role of the supply chain risk management between the relationship supply chain integration and supply chain performance	140

4.9	Mediating role of the information sharing between the supply chain integration and supply chain performance	141
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LIST OF APPENDICES

APPENDIX	TITLE	PAGE
A	Copy of cover letter and research questionnaire for respondents	196
B	SPSS output for factor analysis for supply chain integration, supply chain risk, information sharing and supply chain performance	205
C	SPSS output for reliability for supply chain integration, supply chain risk, information sharing and supply chain performance	220
D	SPSS output for mean for supply chain integration, supply chain risk, information sharing and supply chain performance	233
E	SPSS output for paired samples for the actual level and important level of supply chain risk	237
F	PLS output for the second order second order for supply chain integration	249

LIST OF ABBREVIATIONS

<i>FMM</i>	-	Federation of Malaysian Manufacturing
<i>GDP</i>	-	Gross Domestic Product
<i>SCOM</i>		Supply Chain Operations Model
<i>SCOR</i>	-	Supply Chain Operations Reference
<i>SEM</i>	-	Structural Equation Modelling
<i>SMEs</i>	-	Small Medium Enterprises



PTTA UTHM
PERPUSTAKAAN TUNKU TUN AMINAH

CHAPTER 1

INTRODUCTION

1.1 Introduction

Supply chain integration is important part in Small and Medium Enterprises (SMEs) facilitate the provision of products and services to the end consumer. The integration can improve the performance of firms' supply chain, especially in today's highly competitive business environment and economic condition. 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 lowering trade barriers while progressing in transportation, information, and communication technology must be addressed to expand companies supply chain beyond the national level (Golini & Kalchschmidt, 2011).

Modern firms are increasingly dependent in complex networks of supply chain partners to deliver goods and services in the accurate quantity at the right time and place under persistent cost and quality pressures (Munir *et al.*, 2020). The fast changing and complex environment as well as complicated operational strategies of firms contribute to the high level of vulnerability in supply chain. Effective supply chain management through integration, collaboration and risk management is therefore necessary for firms enhance their competitive performance. The need to overcome these challenges in managing supply chain are especially important for SMEs as they make up the largest proportion of industry sector in Malaysia, which will have a direct impact on the country's economy.

The supply chain consists of firm collaboration in order to improve the overall operating efficiency. There is still much to explore in the role of supply chain risk management and information sharing in enhancing supply chain performance. In addition, there is a lack of literature that has incorporated supply chain risk management and information sharing as a mediating variable in understanding the relationship between supply chain integration and supply chain performance. As a result, in this study, supply chain integration, supply chain risk, and information sharing are examined as independent variables, while supply chain performance is examined as a dependent variable. This chapter is intended to give an overview of the background, the problem statement, the research questions, research objectives, scope, definition of key terms used in this study, and the organisation of this thesis.

1.2 Background of study

In Malaysia, SMEs play an essential role in economic development where 90% of the businesses are formed by SMEs and about 32% of the SMEs contribute to the gross domestic product (Gunto & Alias, 2013). SMEs are considered as the national economic backbone that helps to improve the country's social and political stability and serve as a crucial growth engine in many countries (Al 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). Prime Minister Datuk Seri Anwar Ibrahim also stress that the government policy focus on the improving the capability of the SMEs sector (Ying & Adilla, 2023). Furthermore, SMEs are essential in developing countries because they aid economic growth and income distribution and improve economic structure during the country's downturns (Hassen, Abd Rahim, Shah, 2019).

SMEs is very important to the development of the country where the SMEs provide the opportunities in term of job and in directly it helps to increase the economy of the country. According to Claire (2022) the Prime Minister Datuk Seri Ismail Sabri Yaakob mentioned that the government plan for SMEs by 2025 SMEs will contribute 45% to the Malaysian gross domestic product (GDP) which is in line with the 12th

Malaysian Plan. In 2019 the Malaysian SMEs contributed 39% of the Malaysia GDP before it was affected by the covid-19 pandemic. The Malaysian GDP in 2020 contracted by 5.6%, as compared to in 2019, when the GDP was 4.3%. In March 2020, the government implemented the Movement Control Order (MCO) phases to contain the outbreak of the Covid-19 (Mahidin, 2021). Thus, the performance of economic activities such as domestic supply and demand factors was affected and influenced the external sector, which led to the Malaysian economy recording negative growth in the year 2020. The private sector drove the domestic demand. Despite the challenging external environment, Malaysian SMEs have remained resilient in their contribution to the GDP and can maintain a respectable growth economy in 2020 (Mahidin, 2021). The GDP of 2020 shown in Figure 1.1.

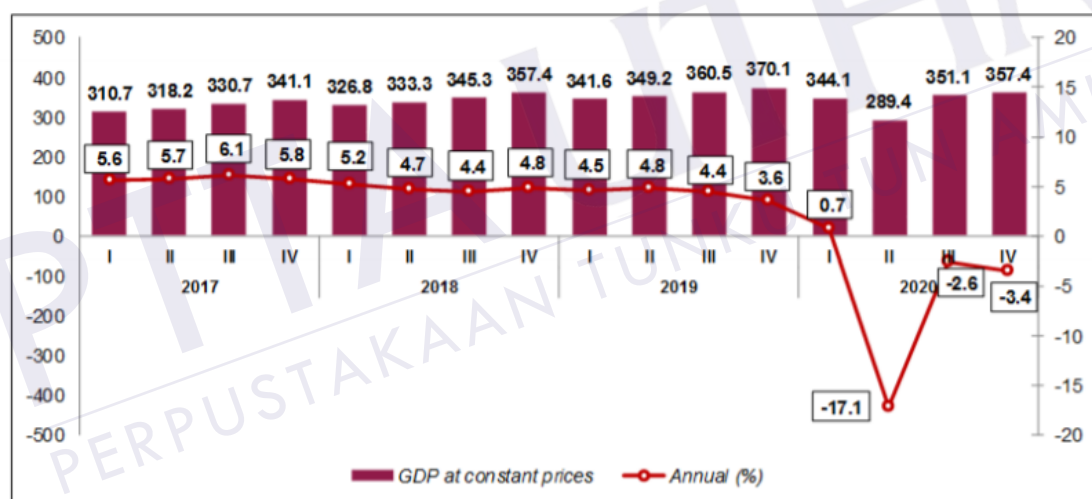


Figure 1.1: Malaysia GDP (RM billion) and annual percentage change (%) (DOSM, 2020)

As shown in Figure 1.1 from year 2017 to year 2020, it shows the decline of the economy, especially in the year 2020. In 2020, the service sector recorded a negative growth of 5.5%, followed by the manufacturing sector, which contracted 2.6%, the agriculture sector, which recorded a decline of 2.2%, the construction sector, which decreased to 19.4%, and mining and quarrying at negative 10% (Mahidin, 2021). The implications of the COVID-19 pandemic have affected the economy, disposable income, which indicates a slowdown, and decreased the Gross National

Income (GNI) per capita from RM45, 212 in 2019 to RM42, 531 in 2020, which led to a reduction in domestic consumption expenditure (Mahidin, 2021).

SME GDP	SME Exports	SME Employment
RM552.3 bil [38.9% share]	RM176.3 bil [17.9% share]	7.3 mil workers [48.4% share]*
<i>(2018: RM522.1 bil)</i> <i>[38.3% share]</i>	<i>(2018: RM171.8 bil)</i> <i>[17.3% share]</i>	<i>(2018: 7.1 mil workers)</i> <i>[48.0% share]*</i>

* revised methodology

Figure 1.2: Contribution of SMEs in Malaysian Economy (DOSM, 2018)

Malaysian SMEs contributed 38.9% of RM552.3 billion to GDP in 2019, a slight increase from the previous year's contribution of 38.3% of RM522.1 billion. SMEs contributed to GDP through domestic demand, investment activities, particularly consumption, and additional financial assistance (Mahidin, 2021). Although SMEs are smaller in size, they still have an advantage in management flexibility, resilience, strong reactive ability, and vitality to compete with local and international enterprises (Jaharuddin, Mansor & Yaakob, 2016). Still there are many challenges faced by the SMEs due to the Covid-19 pandemic such as higher operating costs caused by the increase in fuel price as well as unstable political condition. Unstable political causes the delay of the investment inflows and its detriment the SMEs (Vaghefi & Jo-Yee, 2021). In addition, SME Corp Malaysia & Huawei (2018) stated that the smaller firms tend to lack resources and funding needed to upskill and reskill their workers.

There is an important benefit of supply chain integration in firm in term of flexibility it allows different parties to step in to help each other to maintain efficiency and productivity levels (Morrow, 2020). The supply chain that is not integrated are more likely to perform tasks unnecessary and redundant tasks. With the supply chain integration, it can help the organisation to work efficient and productively in short term and long term. Supply chain integration also centralised the data which to ensure the different third-party participants in supply chain are working with the same

information. The short term and long-term benefits of data centralisation include the ability to pinpoint areas of inefficiency and improving both sale and demand forecast accuracy. Besides that, supply chain integration boosts transparency capabilities, which in turn increase the efficiency, effectiveness, and productivity in businesses where the supply chain can clearly view in real time the activities and processes that one another doing. Supply chain integration can also provide a significant benefit to profit margins for all third-party businesses involved (Morrow, 2020). In addition, when the businesses work together, they are more likely to gain competitive advantage by discovering innovative solutions. The creative solutions can translate into substantial financial rewards that benefits all third-party participants within the supply chain (Morrow, 2020).

According to Tehseen and Ramayah (2015), the Malaysian economy is mainly dependent on the manufacturing and service sector. The Malaysian manufacturing sector is ranked 23rd in the world and 17th in the world's largest export (Tehseen & Ramayah, 2015). Malaysian manufacturing ranked 7th in the year 2021 with \$87.55 billion, which is an increase of 16.61% from 2020. In the year of 2022 Malaysia ranked 39th in the world. The growth in sales value for each manufacturing sector in Malaysia are as follows: Electricals & Electronics Product (24.7%), Petroleum, Chemical, Rubber & Plastic Product (27.2%), Transport Equipment & Other Manufactures (21.6%), Wood, Furniture, Paper Products & Printing (12%), Textile, Wearing, Apparel, Leather & Footwear (9.7%), Non-Metallic Mineral Products, Basic Metal & Fabricated Metal (9.5%) and Food, Beverages & Tobacco Products (7.1%) subsectors (DOSM, 2022). Tehseen and Ramayah (2015) stated that Malaysia's manufacturing and service sector has a problem maintaining quality, fast delivery of products, and sustaining competitiveness. The SMEs' other challenges are the limitations posed by their low competitiveness, financial performance, insufficient agility, low productivity, and low-quality output of the product. This caused a lack of capability to meet the globalisation requirement standard (Jahharuddin *et. al.*, 2016; Smith, & Ulu 2017).

Rapid changes in environments, technological advancements, and market globalisation shape companies' awareness to optimise the overall performance of the supply chain rather than the individual organisation (Manfredi & Capik, 2022).

Costantino *et al.* (2015) reported the lack of coordination between each partner in an organisation without considering other partners' effect, thereby negatively affecting the supply chain activities and the performance. Many studies have shown that supply chain integration can improve the supply chain performance of firms related to operations, profit, finance, and customer service (Flynn *et al.*, 2010; Cao, Hou & Zhao, 2015; Alshurideh *et al.*, 2022). Abdallah *et al.* (2021) found no consensus on effect supply chain integration on the supply chain performance. The lack of coordination in the supply chain can cause various inefficiencies, like the bullwhip effect and inventory instability (Costantino *et al.*, 2014).

Wong *et al.* (2015) pointed out that 60% of companies cannot achieve their expected return on investment from the supply chain's technological expenses. Chibba, (2015) argue that the measures do not capture the overall performance of the supply chain, nor do they indicate opportunities for increasing the competitiveness of customer value and the value of each actor in the supply chain. Moreover, Duffy *et al.* (2015) claimed that the lack of information infrastructure makes it difficult for firms to collect information from collaborating partners. Information sharing is a critical part of supply chain management because it guides firms to increase effectiveness (Spaho, 2016). Therefore, this research aims to investigate the role of supply chain risk management, information sharing and supply chain integration on the performance of Malaysian SMEs.

1.3 Problem statement

There are a few research that have investigated the role of various factor of supply chain integration. The research found that the supply chain integration offers numerous benefits to firms, suppliers, and customers as it enhances effectiveness and efficiencies of the supply chain operation. Supply chain integration is a critical factor in the success of business, particularly in SMEs. The integration of the supply chain in Malaysian SMEs has been crucial for enhancing the competitiveness and productivity of the businesses. According to the Dahlan & Rahman (2022), the effectiveness of the supply chain integration has been identified as a significant driver for SMEs to achieve the

sustainability of their competitive advantage. The integration process involves the synchronisation of the activities across all stages of the supply chain which can lead to better coordination, communication, and collaboration among supplier, manufacturers, distributors, and retailers. However, the supply chain integration in Malaysian SMEs is often hampered by the various challenges. It is crucial to implement the supply chain integration in firm to enhance the performance of firm. Some researchers tried to investigate the implementation of supply chain integration in Malaysian SMEs but the effectiveness of supply chain integration as a core function on the organisation is still questionable. This is due to the lack of appreciation of how supply chain integration drive changes in the business processes for better quality service, efficiency, and cost reduction in SMEs (Setyaningsih, & Kelle, 2021). Besides, the other issues in supply chain integration for Malaysian SMEs is the lack of collaboration and communication among supply chain partners. Abdul Rahman *et al.* (2022) stated the Malaysian SMEs facing a challenge in integrating with their partners due to the differences in culture, communication barriers, and limited resources. This causes to the lack of transparency, leading to delays, misunderstanding, and supply chain disruptions.

Supply chain risk management is also crucial for firm to address the risk faced by companies and identify the potential risks that might arise from the various events (Mustafa & Yaakub, 2020). The risk of covid-19 pandemic impact on the SMEs firm has been immense (Vaghefi & Jo-Yee, 2021). According to Vaghefi and Jo-Yee (2021) in year 2021, the performance of business 21% expecting poor and 25% are optimistic. Lim and Ng (2022) stated most of the common risks faced by the SMEs includes quality issues, delivery delays, financial risks, and supply chain disruptions. The risks can have severe consequences, such as increased costs, reputational damage, and the loss of customers. According to the study by Fauzi *et al.* (2022), they found the SMEs in Malaysia often focus on the short-terms risks such as price fluctuation and supply chain disruptions, and do not have a long-term strategy to manage the risks such as political instability, natural disasters, and cyber threats. Besides that, SMEs facing the risk of higher operating cost because of higher fuel prices and complications from the pandemic and the political risk that have surfaced is another threat to the Malaysian SMEs. When the ASEAN countries engaged in fierce competition to attract foreign investment the unstable political condition in Malaysia can deter and delay the

investment inflows, which is detrimental to the SMEs (Vaghefi & Jo-Yee, 2021). Therefore, it is important to strengthen the integration of the local firms into the global value and supply chain for the SMEs firm to become more competitive on the international stage (Vaghefi & Jo-Yee, 2021). Even from the qualitative studies perspective, factors affecting supply chain integration in Malaysian SMEs had been researched. But there is a little research that examine the precise circumstances surrounding supply chain integration in SMEs.

Budiarto, Prabowo, and Herawan, (2017) stated the firms are unable to appreciate how supply chain integration can change business processes through cost efficiency and service quality due to a lack of knowledge in supply chain management. It also makes firms incapable of using supply chain integration to deal with the financial affairs, fast product delivery, and productivity, thus making them unable to meet the globalisation standards requirement (Setyaningsih, & Kelle, 2021). Besides, the lack of information sharing in firms leads to the inefficiency of the organisation's coordinated action (Lotfi *et al.*, 2013) and not much is known about the supply chain risk faced by Malaysian automotive SMEs (Hudin *et al.*, 2017).

Meanwhile, in supply chain management, information sharing is crucial for improving the performance of the company and critical issue in supply chain integration for Malaysian SMEs. According to Ong and Lim (2022), the lack of information sharing among supply chain partners has been identified as a significant barrier to achieve the effectiveness of the integration. The issue arises due to the lack of trust, communication barriers, and inadequate technology infrastructure. Idris *et al.* (2022) stated the Malaysian SMEs lack trust in their partners which can lead to the reluctance to share the information that hinders supply chain visibility and the coordination. According to Duffy *et al.* (2015), there is a scarcity of studies on supply chain integration methods, particularly in terms of data collection between partners. The lack of information sharing in firms leads to the inefficiency of the organisation coordinated action (Lotfi *et al.*, 2013). In addition, Abdallah *et al.* (2021) stated there was no consensus on the effect of supply chain integration on supply chain performance from existing literature. Further, Chibba (2015) added that the supply chain's overall performance does not show the opportunities in increasing the competitiveness and customer value in supply chain management. On the other hand,

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Avlyin completed her PhD at Universiti Tun Hussein Onn Malaysia, Faculty of Technology Management and Business. Her research focuses on the mediating effect of supply chain risk management, information sharing on the relationship between supply chain integration and supply chain performance among Malaysian SMEs. This research has significant practical implications for business, especially small and medium-sized enterprises, that are looking to improve their supply chain performance. In addition to her academic pursuits, Avlyin is also working as a lecturer at University Technology Sarawak.