

International Lecture Series: 19 January 2023

Supply Chain Risks and Sustainable Competitiveness in Malaysian Freight Logistics Services

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Supply Chain Risks and Sustainable Competitiveness in Malaysian Freight Logistics Services

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Kanagi holds a Doctorate in Business Administration from University of South Australia. A versatile educator and researcher, she has about 20 years of teaching experience in higher education. She held managerial positions in multinational companies for 10 years, in manufacturing sector prior to joining the academia.

Kanagi has published widely in the area of operations and supply chain management in numerous ISI WoS journals. Kanagi was a visiting research scholar at University of Nevada, Las Vegas, USA and was attached as a Consultant at Agile Management Consultancy. Kanagi was awarded the Highly Commended Paper of the year by Emerald Literati Network in 2016. She has presented papers at international conferences, which include the reputable IEEE conferences..



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Supply Chain Risks and Sustainable Competitiveness in Malaysian Freight Logistics Services

Abstract

The global supply chain management has become more complex due to the disruptions caused by COVID-19 and economic crises worldwide and the pressure of effective management of space, information, & time. Around 80 per cent of global trade by volume and over 70 per cent of global trade by value are carried by sea and are handled by ports worldwide. This indicates the global industries' and supply chain's heavy reliance on freight logistics. The role of supply chain risk management to prevent and manage supply chain disruptions from the perspective of freight logistics services companies is significant. The impacts of supply chain recurrent and disruptive risks on the sustainability competitiveness in the freight logistics sector will be discussed in this guest lecture

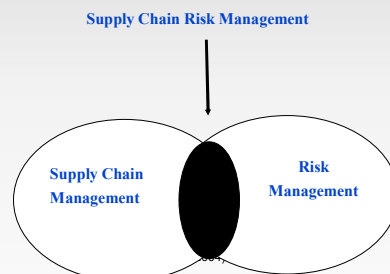
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- Supply Chain Risk Management (SCRM) defined as “the identification and management of risks for the supply chain through a coordinated approach among the supply chain members to reduce the supply chain vulnerability as a whole”. (El Baz & Ruel, 2021)



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- Freight logistics is composed of the dynamics of movement and handling of goods, specifically in transportation services, which include truck, freight rail, freight air, inland water-ways, marine shipping, and pipelines. In addition, freight logistics also include logistics and warehouse services such as consignment, storage, inventory management, and packaging

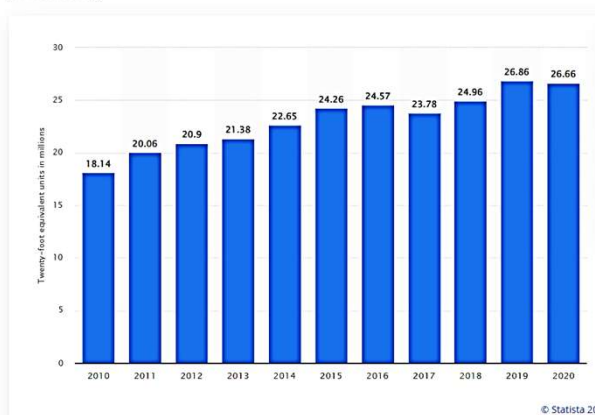
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Container port throughput in Malaysia from 2010 to 2020, (TEU)
(in millions)



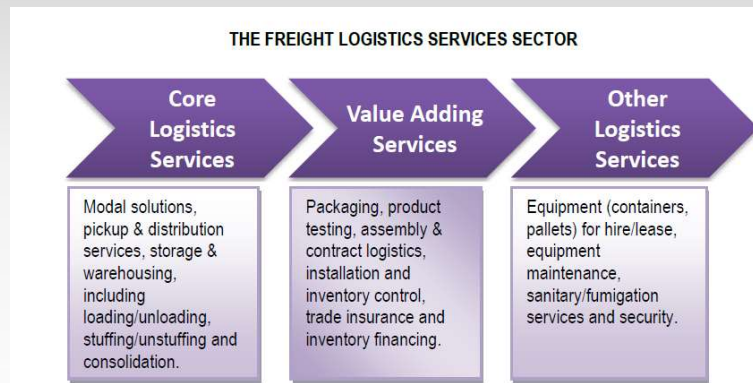
<https://www.worldshipping.org/top-50-ports>

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COMPONENTS OF FREIGHT LOGISTICS SERVICES

	Outbound	Internal	Inbound
Transport			
Storage/warehouse	Storage	Stacking/unstacking	Value-adding activities
Packaging	Added packaging	Material transfer activities	Consolidation/deconsolidation
Inventory & Financing	Capital costs	Inventory service costs (tax and insurance cost)	Storage space costs
	Inventory risk costs (Obsolescence, damage, pilferage and relocation)		
Administration	Staff or labour cost	Indirect management and support staff	Value or investment in goods in a logistics system
Management & Control	Physical form changes required for effective and/or safe transport, storage	Information and telecommunications integration	Logistics system management
Others	Unavailability of goods (when required).		

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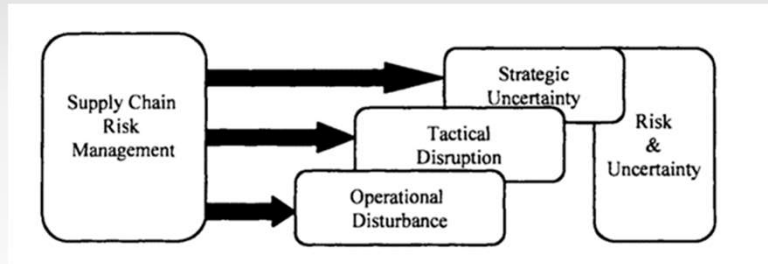
Source: UNESCAP

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- Risks within a supply chain can be classified along a continuum as shown
- Operational disturbance, tactical disturbance, and strategic uncertainty as the three points in the mentioned continuum.

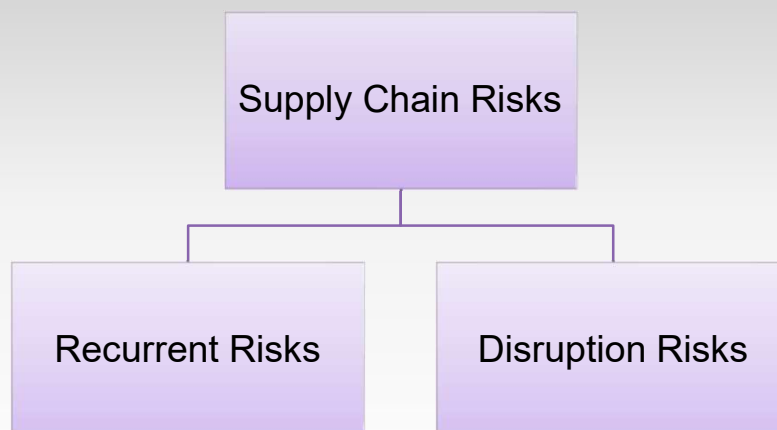


Source: Ritchie and Brindley (2004)

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Recurrent Risks

Demand Risk

- Disruptions from customers (downstream side)

Supply Risk

- Disruptions from the upstream side

Process Risk

- uncertainties that may arise during production like machine failure, labour problem and IT-infrastructure breakdown.

Control Risk

- uncertainty related to control for processes - misapplication of the rules, systems, poor order quantities.

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Disruptions Risks

- Current trends in SCM have made supply chains more vulnerable now to disruptions.
- The unprecedented supply chain disruption caused by COVID-19 has had severe operational and financial consequences
- This has increased the importance of the role for risk and disruption management.
- The disruptions at inland terminals could create a significant impact in maritime and logistics operators

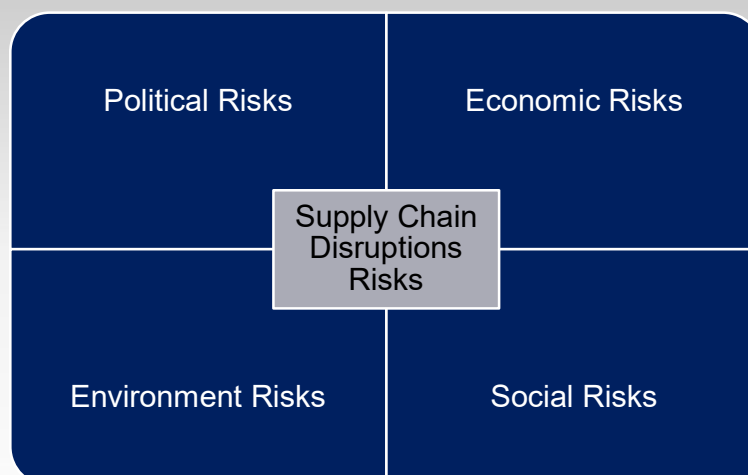
(Notteboom et al. (2021

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- A disruption in the supply chain is usually beyond the control of a manager and having them affects the cost efficiency of a supply chain
- Disruptions risks can negatively affect the operation of an organization, assets, and infrastructures of the of a supply chain.
- Supply chain disruptions risk management may lead to future efficient behavior towards sustainable competitiveness for freight logistics industry

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Disruptions Risks – Political risks

- Political risks refer to changes in the political realm which can influence the probability of a business to achieve its objectives.
- Political risks pose threats like financial losses or disruptions to an organization related to non-market factors like policy and restrictions.
- Political risks can also be about events related to political instability like terrorism and civil war

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Disruptions Risks – Economic Risks

- Economic risks refer to the economic situations which influence the outcomes of financial transactions and international trade that a container liner shipping firm serves
- Macroeconomic risk from the point-of-view of a freight logistics operators refer to the GDP of every employed individual, GDP current account, exchange rate fluctuation, inflation rate, and industrial production
- Micro-economic performance refers to the fluctuation in freight rate, fluctuation in bunker price, and cost of labour. These indicators directly create an impact on the operational costs of freight and logistics operators

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Disruptions Risks – Social Risks

- Freight logistics operates all around the world connecting several countries.
- This makes freight logistics firms vulnerable to high-risks in dealing with social risks of various countries.
- labour quality and availability in the market, work culture, risk reputation, and religious/ethnic tensions are the identified four critical areas which directly affect the sustainability of the firms

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Disruptions Risks – Natural Hazard Risks

- Natural calamities like earthquakes, tsunamis, and severe storms also cause delay in operations, port destruction, cease of operations, and even service platform loss (Galili et al., 2021; Pribadi et al., 2021; Zheng et al., 2021).
- Five categories, namely geophysical, meteorological, hydrological, climatological, and biological disasters

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Disruptions Risks

Natural hazard Risks

Geophysical disasters include earthquakes, tsunamis, and ash fall from volcanic eruptions.

Meteorological disasters include severe storms and tornadoes.

Climatological disasters refer to extreme temperature changes, climate change, and haze.

Hydrological disasters are coastal floods and sea surges are

Biological Disasters include Insect infestation & epidemic/pandemic diseases

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Risk Mitigation Strategies

- Risk mitigation strategies refers to the process of planning and developing methods and actions to reduce the likely adverse effects of a disruption



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Risk Mitigation Strategies

- Information sharing for risks is a critical component of a supply chain because information is utilized for communication and coordination with other supply chain partners
- Collaborative relationships is relation between among supply chain partners that having trustworthiness and commitment for long-term cooperation along with a willingness to share risks in order to manage the risk effectively in supply chain
- Logistics social responsibility includes community, environment, ethics, diversity, human rights, and safety
- Knowledge and skill about risks is the understanding of supply chain risks to make better decision through risk management process : risk identification and analysis, risk assessment, decision of risk management actions, risk monitoring and control

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Sustainable freight logistics competitiveness

- Sustainable freight logistics competitiveness is described as the capability of the companies and industries to remain competitive, and in turn, show the improvement ability and protection of their current position related to rivalries active with the same market



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Sustainable Freight Logistics Competitiveness	
Operations Efficiency	<ol style="list-style-type: none"> 1. Service quality 2. On Time delivery 3. Meeting the cost 4. Meeting the demand 5. Extended value chain
Natural Capital	<ol style="list-style-type: none"> 1. e-technology 2. Green logistics 3. Geographical location 4. Ecosystem 5. Fuel efficiency
Social impact on team and Stakeholder	<ol style="list-style-type: none"> 1. Learning and growth 2. Team Productivity 3. Professionalism 4. Competitiveness 5. Worker employability
Governance Efficiency	<ol style="list-style-type: none"> 1. Reputation 2. Profitability 3. Market Performance 4. Infrastructure Support 5. Logistics tourism
Intellectual Capital	<ol style="list-style-type: none"> 1. New freight logistics markets 2. New freight logistics products 3. New freight logistics technologies 4. New freight logistics services 5. Creation of intangible resources

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Perceived supply chain risk management and sustainable freight logistics competitiveness

- Research conducted in Malaysian Logistics Services
- Malaysian freight logistics companies' perception of supply chain risk management
- Survey, 144 respondents
- The top management participants from operations and supply chain departments were considered. Malaysian freight logistics practitioners employed by their respective companies for at least three years
- Analysis: SEM

Source: Working Paper

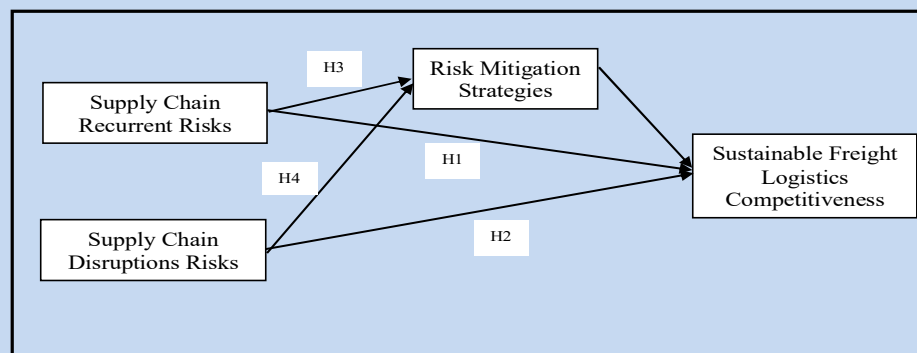
Ong, K. Y., Zailani, S., & Kanapathy, K. (2023). Perceived supply chain risk management and sustainable freight logistics competitiveness, University of Malaya



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Research Model



Source: Working Paper

Ong, K. Y., Zailani, S., & Kanapathy, K. (2023). Perceived supply chain risk management and sustainable freight logistics competitiveness, University of Malaya



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Primary business of the company	Freq (%)	Primary business of the company	Freq (%)
Carriers		Terminal Operators	
Shipping Lines	2 (0.45)	Ports	0 (0)
Container Hauliers	12 (2.71)	Airports	8 (1.81)
Railways	1 (0.23)	Freight Terminal	8 (1.81)
Airlines	0 (0)		
Carrier Intermediaries		Cargo Intermediaries	
Shipping Agents	38 (8.60)	Airfreight Forwarding Agents	29 (6.56)
Airport Ground Handling Agents	22 (4.98)	Sea Freight Forwarding Agents	30 (6.79)
Freight Broker	25 (5.66)	Custom Agents	39 (8.82)
		Warehouse	38 (8.60)
Ancillary Freight Logistics Services Providers		Inland Water Transports	
Courier Services	17 (3.85)	Tugs	6 (1.36)
Lorry Transport	25 (5.66)	Barges	4 (0.90)
Movers	15 (3.39)	River Boats	10 (2.26)
Last Mile Delivery	26 (5.88)		
Packaging Materials	13 (2.94)		
Equipment Handling	22 (4.98)		
Maintenance Repairs	18 (4.07)		
Other Business Support Services			
Security	10 (2.26)		
Insurance	12 (2.71)		
Information Technology	6 (1.36)		
Education & Training	6 (1.36)		
Others	0 (0)		

Source: Working Paper

Ong, K. Y., Zailani, S., & Kanapathy, K. (2023). Perceived supply chain risk management and sustainable freight logistics competitiveness, University of Malaya



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Major type of products managed by the company	Freq (%)	Major type of products managed by the company	Freq (%)
Construction	20 (5.78)	Electrotechnical	18 (5.20)
Chemical	29 (8.38)	Wood and Paper	21 (6.07)
Food Products	34 (9.83)	Textiles	12 (3.47)
Manufactured products	59 (17.05)	Metal	14 (4.05)
Raw Materials and Fuels	20 (5.78)	Pharmaceuticals and cosmetics	23 (6.65)
Clothing	21 (6.07)	Others	33 (9.54)
Machineries	42 (12.14)		

Source: Working Paper

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- The results of this study suggest that the disruptive risks perceived in the supply chain have impacted the competitiveness of sustainable freight logistics, mediated by risk mitigation strategies.
- However, it was found that risk mitigation strategies did not mediate the influence of perceived supply chain recurrent risks on sustainable freight logistics competitiveness.
- **The management of disruptive risks in the supply chain is the most imperative criterion of supply chain risk management for freight logistics companies, which is also showed in the structural equation modelling**

Source: Working Paper

Ong, K. Y., Zailani, S., & Kanapathy, K. (2023). Perceived supply chain risk management and sustainable freight logistics competitiveness, University of Malaya

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Q & A



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