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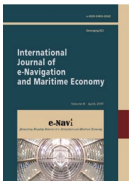

Original article

Evaluating Risks in Container Shipping from Shippers' Viewpoint: A Case Study of Northern Vietnam

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Abstract

The role of container shipping is proven to be crucial for in moving goods across oceans and seas to satisfy human demand around the world. Recently, the emergence of unexpected events such as the Covid-19 pandemic or the blockage of the Suez Canal has brought a variety of challenges to global economic activities, and container shipping is no exception. Therefore, this paper aims to discover the difficulties faced by shippers when sea transport is chosen as a method to deliver their containers in the new context. The study is conducted in the north of Vietnam and involves interviewing specialists and experienced export managers to identify the possible risks associated with container shipping. Then, a survey is conducted among those in the shipping industry, including manufacturers, freight forwarders, and trading companies, among others. Answers are ranked on a Likert scale and a probability and impact matrix is applied, facilitating the evaluation of container shipping risks. As a result, this study is expected to bring a deeper understanding of the risks faced by shippers when they export their containers, with possible solutions also presented. Meanwhile, shipping service providers are aware of their customers' experiences and for this reason can improve their service quality or develop new services to enhance customer satisfaction.

Keywords: risk evaluation, container shipping, Northern Vietnam

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1. Introduction

In 21st century, several unexpected events have alarmed human being awareness of a possible disruption in our lives, ranging from daily eco-social activities within national borders to the flow of commodities worldwide. The emergence of Covid-19 pandemic on global scale or the block of Suez Canal by giant container ship are outstanding circumstances to prove the fact that bottleneck might appear at any location, in any industry, causing negative impacts on the other parts of the globe network. The movement of manufacturing facilities in MNCs' supply chains, sudden fluctuation in demand for goods and services in different markets, the limited flow of materials between continents, etc are some of proven consequences. Those have placed a variety of challenges to global economic activities and huge pressure on the global logistics system. In this context, container shipping as a main method for cargo transportation globally is of non-exception. Shipping lines, who directly face with this challenge, have adopted many solutions such as selling old vessels, upgrading load capacity of vessels, M&A, horizontal strategic alliance, changing shipping route, re-scheduling, etc in order to fill the space on ships. Meanwhile, shippers who are manufacturers, freight forwarding, trading companies, etc, need to adapt and look for a solution to assure their inbound and outbound flow. This paper aims to discover feasible risks which shippers might deal with when sea transport is chosen as a method to deliver their containers between continents in the current context.

2. Literature review

There have been various studies in container shipping risks. Risks are unexpected events which may cause harm to the flow of goods or parties involved in this process. Various types of risk in relation to container shipping were identified, namely technical risk, market risk, business risk, and operational risk (Ewert, 2008). (Drewry, 2009) introduced a list of business process risks and asset risks in container transport and logistics, including documentation, booking and invoicing errors, errors in customs regulatory compliance and in security compliance, strikes and transport congestions, theft and cargo loss or damage, piracy, and terrorist attacks. From a logistics viewpoint, (Chang, 2015) classified container shipping operation risks into three categories: information flow, physical flow, and payment flow. (Son Nguyen, 2020) has listed twenty-eight potential risks and 47 connections were identified in three groups of initiative, transitional and sequel. Some authors tried to clarify risks of different players in shipping and logistics like (Chia-Hsun Chang, 2016) (Elzarka, 2019). Then, lots of efforts were contributed to measure the consequences and mitigate possibility of risks (Son Nguyen H. W., 2018), (Son Nguyen P. S.-L., 2020), (Son Nguyen P. S.-L., 2020), (Chia-Hsun Chang J. X., 2019). The above studies have provided a valuable insight into risks in container shipping. Though, the emphasis was placed on operational risk factors faced by a container shipping company, these findings create a helpful basis for future research.

3. Methodology

3.1 Risk identification

This paper developed a system of possible risk for shippers in container shipping. In this research, shippers are freight forwarding companies, logistics companies, export factories, trading companies and/or their representatives, who arranges and handle the process to bring the containerized shipment from original warehouse/facility/premises to on board the vessels. Shippers must conduct a number of activities which can be named as booking, shipment preparation, custom clearance, inland transportation, information communication, and payment under the influence of various factors internally and externally. By locating potential risks originated from internal and external environment, readers can easily capture the flow of experiences and issues which shippers usually deal with. Several in-depth interviews with specialists involved in this industry were conducted. Selected managerial and operational positions in freight forwarding companies, logistics companies, export factories, trading companies, and specialists were interviewed to come up with a concrete list of popular risks in container shipping.

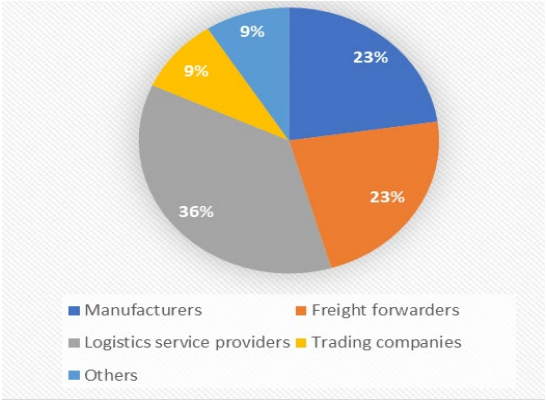
3.2 Risk evaluation

A decent survey was conducted with different shippers to evaluate risks factors in container shipping. The questionnaire was designed based on the list of popular risks in container shipping. The questions allow interviewees to select risks which they deal with more often, then to weight the seriousness of each risk factor on the scale of five. Forty shippers located in the North of Vietnam were chosen to collect answers. Those are reputable manufacturers and cargo handling service providers, trading companies who have a stable flow of exports to different markets in America and Europe. Thus, they can provide wide experiences in container shipping. After nearly one month of sending the questionnaire, there were only twenty-two feedbacks received.

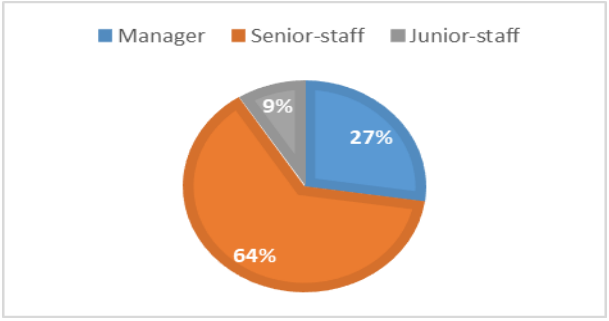
A questionnaire was sent to forty representatives and twenty-two responses were collected (table 1). Those representatives are at least 5-year experienced in the industry and directly involved in the shipping activities at their companies so that their contribution would be valuable to the research. The proportion of participants are described in diagram 1 in different aspects such as business activities, years of experience and position. Among those participants, manufacturers and trading companies occupied 32%, while freight forwarders and logistics service providers account for 59%. This ratio is acceptable as freight forwarding and logistics companies are usually authorized by exporters or importers to arrange transportation and documentary work to deliver containers on board. Most of interviewees are senior-staffs, occupying 64%, followed by managerial position with 27% and junior staff with 9%. On the other hand, all participants have at least 5 years of experience in the industry with 59% of corespondents are 10-year experienced. The diversity and quality of interviewees help to assure the liability and correctness of the research.

Table 1. Diversity of survey participants

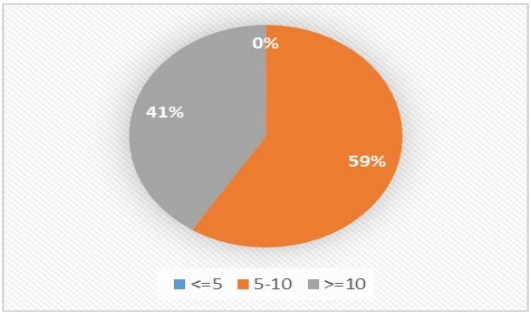
No.	Participants	Quantity
1	Manufacturers	5
2	Freight forwarders	5
3	Logistics service providers	8
4	Trading companies	2
5	Others	2
	Total	**22**



a, By business activities



b, By position



c, By year of experience

Diagram 1. Proportion of different types of participants joining the survey

Collected answers are ranked on Linkert scale and Probability and Impact matrix is applied to evaluate risks. Probability and Impact matrix is common tool used in several research for risk evaluation and management. Every risk event, whether it is a threat

or an opportunity, has two characteristics: the probability that it might happen and the impact it would have if it did happen (Management, 2007).

The probability and impact scores are used to calculate ranking value for every risk event as Eq.1.

Risk ranking value = Probability score x Impact score (1)

The results are expected to reveal the most frequent risks, most serious consequences, so that threats and opportunities will be revealed (table 3). This creates a foundation for every parties in container shipping to join a hand to improve the experience of shippers.

Table 2. Risk criteria table

Scale	Probability	Probability score	Impact on Project			
			Schedule	Cost	Scope	Impact score
VLO	<10%	0.1	<2 weeks	<1%	Temporary defects, causing minor short term consequences	0.05
LO	10 to <30%	0.3	2 weeks to <1 month	1% to <2%	Product performance shortfall in area of tertiary (minor) importance	0.1
MED	30 to <50%	0.5	1 month to <2 months	2% to <4%	Product performance shortfall in area of secondary importance	0.2
HI	50 to <70%	0.7	2 months to <4 months	4% to <8%	Minor product performance shortfall in area of primary (critical) importance	0.4
VHI	70% plus	0.9	4 months plus	8% plus	Significant failure of product to meet one of its primary (critical) purposes	0.8

Source: (Management, 2007)

Table 3. Risk analysis scheme

Probability		Threats					Opportunities				
	0.90	0.05	0.09	0.18	0.36	0.72	0.72	0.36	0.18	0.09	0.05
	0.70	0.04	0.07	0.14	0.28	0.56	0.56	0.28	0.14	0.07	0.04
	0.50	0.03	0.05	0.10	0.20	0.40	0.40	0.20	0.10	0.05	0.03
	0.30	0.02	0.03	0.06	0.12	0.24	0.24	0.12	0.06	0.03	0.02
	0.10	0.01	0.01	0.02	0.04	0.08	0.08	0.04	0.02	0.01	0.01
		0.05	0.10	0.20	0.40	0.80	0.80	0.40	0.20	0.10	0.05
		Impact									

Source: (Management, 2007)

In this study, risk events are evaluated via probability scale and impact scale. Probability scale ranges from Never – Rarely – Sometimes – Often – Usually in accordance with probability score of 0.0 – 0.3 – 0.5 – 0.7 – 0.9. Similarly, there are five levels of impact scale, including Negligible – Low – Moderate – High – Extreme and impact scores are 0.0 – 0.3 – 0.5 – 0.7 – 0.9 respectively.

4. Research findings

4.1 List of possible risks in container shipping from shipper viewpoints

In the first step of the research, several interviews were conducted to to identify possible risks in container shipping from shippers' viewpoints. Through interviewing six professionals in different sectors of container shipping, there are 26 risk possibilities revealed internally and externally as in the table 4. Notably, risks are classified in accordance with its source – the players involved in the cargo flow, including various players such as carriers, port operators, banks, customs, etc.

To make it easier for later analysis, each risk is given a recognition code which is composed of two capital letters and a number. Particularly, SH stands for shippers, SL – shipping lines, SP – seaports, BA – banks, CU – customs and OT – others.

4.2 Container shipping risk evaluation

In the second step of the research, questionaires were sent and 22 responsed were collected. The research has revealed that each participant has experienced different risk events. Diagram 2 shows the number of participants have dealed with risk event. It can be seen that SL1, SL3, SL5, SL10, SP4, OT2 are the most common risk happened to shippers in container shipping. In other words, shipping lines and seaports have big influence on the flow of export containers.

After calculation average value for probability score, and impact score, ranking value are presented in Table 5 below. Using scatter chart (diagram 3), it is clearly to identify four risk events (SL1, SL3, SL5, SP4) having outstanding ranking values. Which means emphasis should be put on those events to prevent harms to shipper. Interestingly, these four risks are also popularly encountered by shippers especially after the emergance of global spread events such as Covid-19 pandemic and Suez Cannal block.

Table 4. Shipper's risks in container shipping

	CODE		CONTENT
SHIPPERS	SH	1	Wrong delivered shipment
		2	Late document submission
		3	Errors in documentary work
		4	Failure in cut off export containers
		5	Charge for making mistake
SHIPPING LINES	SL	1	Unavailable space on board
		2	Booking cancelation by exporter
		3	Empty container shortage
		4	Dissatisfied empty container quality
		5	High freight rate
		6	Long delay time
		7	Long omit time
		8	High delay frequency
		9	Long service time at shipping lines office
		10	Unfixed shipping schedule
SEAPORT	SP	1	Movement of seaports to further location
		2	E-port system overload
		3	Bureaucracy
		4	Limited support scheme for businesses
		5	Less free-time
CUST	CU	1	Customs declaration system disruption
		2	Long customs clearance time
BANK	BA	1	Online payment system instability
		2	Limited physical places for fee payment
OTHE	OT	1	Increase in domestic transportation costs
		2	Safety issue against disease pandemic

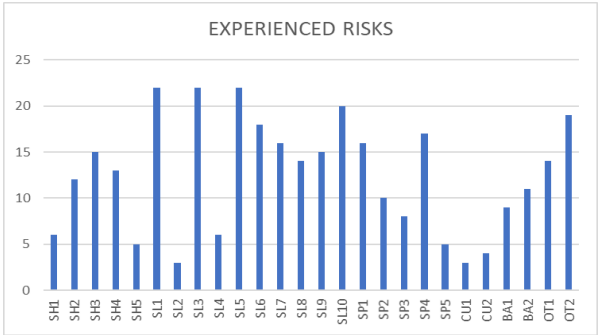


Diagram 2. Container shipping risks faced by shippers in Northern Vietnam since 2019

Table 5. Ranking value of container shipping risks from shipper perspective

Risk	Probability score	Impacts score	Ranking value
SH1	0.08	0.12	**0.01**
SH2	0.20	0.20	**0.04**
SH3	0.30	0.21	**0.06**
SH4	0.26	0.40	**0.10**
SH5	0.08	0.05	**0.00**
SL1	0.58	0.64	**0.37**
SL2	0.04	0.05	**0.00**
SL3	0.65	0.65	**0.42**
SL4	0.09	0.18	**0.02**
SL5	0.58	0.60	**0.35**
SL6	0.39	0.44	**0.17**
SL7	0.33	0.47	**0.15**
SL8	0.25	0.47	**0.12**
SL9	0.45	0.21	**0.09**
SL10	0.44	0.22	**0.10**
SP1	0.54	0.19	**0.10**
SP2	0.29	0.28	**0.08**
SP3	0.17	0.16	**0.03**
SP4	0.53	0.55	**0.29**
SP5	0.18	0.09	**0.02**
CU1	0.08	0.05	**0.00**
CU2	0.09	0.07	**0.01**
BA1	0.25	0.12	**0.03**
BA2	0.39	0.11	**0.04**
OT1	0.35	0.26	**0.09**
OT2	0.59	0.22	**0.13**

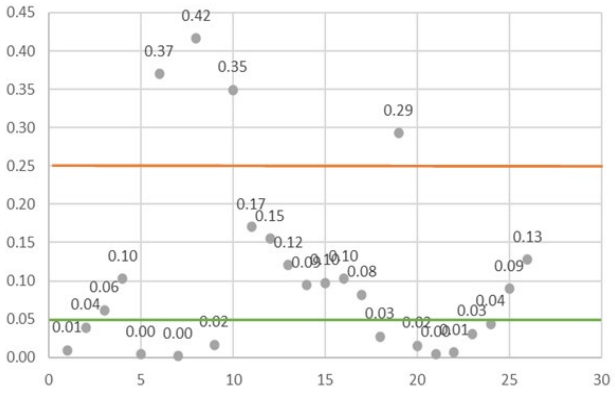


Diagram 3. Distribution of ranking value

5. Discussion and Conclusions

In the new context with dramatical changes in global supply chain, every player must be flexible and adaptable. Meanwhile, several challenges often come along with opportunities, risk management is of great

necessity. The research has tried to identify different risk which shippers might encounter in container shipping and applied Probability and Impacts matrix to evaluate those risk events.

Results revealed that major threats come from shipping line and seaport, including unavailable space on board, empty container shortage, high freight rate and limited support scheme for businesses. It has been years that the shipping industry suffer low freight rate, leading to the trend of enhancing shipping capacity of new vessels or old vessel demolition. At present, increased demand for sea transport and higher fuel costs lead to higher freight rate. On the other hand, the flow of commodity from Asia to other continents such as Europe, America or Australia has shown a sharp increase after extreme efforts of Governments to control Covid-19 disease. Congestion at ports, especially at transit points, are serious problem. Port authority has adapted various methods such as 24/7 working hours, more working shift, reduced free-time at yard, etc. However, the return flow is limited, causing imbalance of empty containers at ports. This makes it difficult for shippers in Vietnam to maintain a smooth flow of export without a suitable carrying facility. Also, it is very difficult to get booking confirmation without reasonable explanation from shipping lines. At the same time, shippers expect to get more support from Port Authority in term of paperwork and payment method. In case of errors in documents or wrong payment made, shippers must send request to port then wait for unexpected time for conclusion, causing a waste of time and efforts. This raised the awareness of shipping lines and PA in improving their operation thus mitigate possible risks to their customers – shippers.

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