
Factors Affecting the Risk of Logistics Service Provider (Inland Transport Service) in Thailand: A Case Study of a Northeastern Transport Association

ปัจจัยที่ส่งผลกระทบต่อความเสี่ยงของบริษัทผู้รับขนส่งสินค้าทางถนนในประเทศไทย
กรณีศึกษา สมาคมผู้ประกอบการขนส่งสินค้าภาคอีสาน

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Abstract

The objectives of this research were to study the condition and level of internal and external factors that affect the risk, context and operating conditions, threats to the risks affected to operations and provide risks management for Logistics service provider (Inland service). Using questionnaires to collect data report with descriptive, inference statistics and structural equations model. The sample was 341. The analysis of the five forces model by decreasing were buyer power (Force3) threat of new Entry (Force2) threat of substitution (Force5) competitive rivalry (Force1) supplier power (Force4). Measuring the impact of various risk factors 9 observable variables by decreasing were threat of buyer power (IM3) threat of new entry (IM2) impact corporate opportunity response (IM8) threat of substitution (IM5) threat of supplier power (IM4) threat of competitive rivalry (IM1) corporate weakness impact (IM7) corporate Strengths Impact (IM6) corporate Threats Impacts (IM9).

Keywords: Risk Management, Logistics Service Provider (Inland Service),

5 Forces Model and SWOT Analysis

บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อศึกษาสภาพและระดับของปัจจัยภายในและภายนอกที่ส่งผลกระทบต่อความเสี่ยง บริบทและสภาพการดำเนินงาน ปัจจัยภัยคุกคามที่ต่อความเสี่ยงที่ส่งผลกระทบต่อการค้าเงินงาน เพื่อจัดลำดับความเสี่ยงและปัจจัยที่เกี่ยวข้องที่มีผลต่อการดำเนินงานพัฒนาทางในการจัดการความเสี่ยงให้เหมาะสมสำหรับผู้รับขนส่งสินค้าทางถนน ในประเทศไทย จำนวน 341 บริษัท โดยเป็นการเก็บรวบรวมข้อมูล วิเคราะห์ข้อมูล ใช้ค่าสถิติเชิงบรรยาย สถิติเชิงอนุมานและโมเดลสมการโครงสร้างปัจจัยเชิงสาเหตุ กลุ่มตัวอย่างที่ใช้ในการศึกษาคือบริษัทสมาชิกสมาคมผู้ประกอบการขนส่งสินค้าภาคอีสาน ผลการวิเคราะห์โมเดลการวัดปัจจัยกดดันที่มีน้ำหนักความสำคัญมากที่สุด คือ อำนาจต่อรองของลูกค้า ภัยคุกคามจากคู่แข่งหน้าใหม่ ภัยคุกคามจากสินค้าทดแทนหรือการบริการที่ทดแทนกันได้ การแข่งขันระหว่างคู่แข่งชั้นอุตสาหกรรมเดียวกัน อำนาจต่อรองของซัพพลายเออร์ ตามลำดับ การวัดผลกระทบที่เกิดจากปัจจัยต่าง ๆ ของความเสี่ยง ตัวแปรที่มีน้ำหนักความสำคัญมากที่สุด คือ ผลกระทบภัยคุกคามจากอำนาจต่อรองของลูกค้า ผลกระทบภัยคุกคามจากคู่แข่งหน้าใหม่ ผลกระทบการตอบสนองต่อโอกาสของบริษัท ผลกระทบภัยคุกคามจากสินค้าทดแทนหรือการบริการที่ทดแทนกันได้ ผลกระทบอำนาจต่อรองของซัพพลายเออร์ ผลกระทบการแข่งขันระหว่างคู่แข่งชั้นอุตสาหกรรมเดียวกัน ผลกระทบจุดอ่อนของบริษัท ผลกระทบจุดแข็งของบริษัท ผลกระทบอุปสรรคของบริษัท ตามลำดับความสามารถของการจัดการความต่อเนื่องทางธุรกิจกับผลกระทบที่เกิดจากปัจจัยต่าง ๆ ของความเสี่ยง จากผลวิเคราะห์พบว่า การจัดการความต่อเนื่องทางธุรกิจไม่ได้มีอิทธิพลต่อการจัดการผลกระทบที่เกิดจากปัจจัยต่าง ๆ ของความเสี่ยง

คำสำคัญ: การจัดการความเสี่ยง, ผู้รับขนส่งสินค้าทางถนน, ปัจจัยกดดันทั้ง 5 และการวิเคราะห์สภาพแวดล้อมและศักยภาพขององค์กร

Introduction

Thailand's Logistics Development Strategic Plan No.3 (2017-2021) has been formulated under the 20-Year National Strategy Framework and the 12th National Economic and Social Development Plan (2017-2021) with an objective of improving Thailand's logistic system to be the regional trade, service, and investment center. The strategy consisted of 3 main strategies including (1) Developing the supply chain (2) Developing the foundation structures and facilities (3) Developing logistics support factors. These 3 strategies are for supporting the competitive abilities and integration between departments and various development partners involved in driving the logistics system development strategy to be more effective and efficient. This is in complement with the prediction from inland transportation businesses in 2018 that the logistics value will reach from 145,100 to 147,300 baht, which is 5.3 - 7.3 percent growth from the previous year (137,700 baht). The inland transportation businesses predicted that the growth will continue continuously from the investment of the public and government sectors, as well as the support from E-commerce that was growing rapidly. Additionally, there are challenges from a retardation in exports from 2017, which is likely to hold back the inland transportation businesses in 2018, but still continue to expand similarly to the previous year (Kasikorn Research Center, 2017). For the implementation of this strategy, there is still a gap in operation, which is the assessment and planning of risk management.

When considering the past decades on logistics risk management, a mention of inland transportation risks has gained a very high amount of attention from academic circles. The previous

study has mentioned various risks in transportation such as technical risks, marketing risks, business risks, and operational risks. Technical risks are commonly including losses from activities such as design of equipment and facilities in the logistics industry. Marketing risks are including income and investment risks (Wang, F; et al., 2019), meaning unexpected changes of demands and supplies (Fan and Stevenson, 2018). Business risks are related to the characteristics of business such as future prices, sales, and production costs. Operational risks are “Probability of events related to the company, focuses that might affect inner capability of the company in productivity and quality of services or productions, and/or the ability to make profit of the company” (Đalić et al, 2020). Basically, these risks arise from the transportation process, but there still remains the study gap on viewing the basic concepts of business administration that will enable businesses to strategize against those risks.

Even if most companies have decent risk management, there might be unexpected and uncontrollable events. Under aforementioned situations, companies must focus on the root of the problems, the development of strategies, and planning the measurements against the risks. One of the most important strategic planning methods is SWOT analysis. This research therefore focused on the study on adapting SWOT analysis for analyzing factors affecting the risk of logistics service providers in Thailand in association with Five-Forces Model industry analysis. The model consists of five forces that dictate the competition in an industry. These forces are the fundamental of industrial competition. Therefore, the strongest force will dictate the ability to make profit in an industry and the importance of strategy planning. Until now, the Five-Forces Model, which is the foundation of this study, is an influential framework that was used widely for measuring the attractiveness of an industry to allow a business to survive continuously in case of it being threatened by any factor.

Methodology

Data collection

Data collection was conducted in October to December 2019. In total, 341 recruited from logistics service provider (inland transport service) in Thailand. Participants were recruited with non-probability sampling methods, since random assignment is sufficient for experimental studies.

Confirmatory Factor Analysis

A confirmatory factor analysis (CFA) was used for indicating and measuring a hypothetical model of one or more factor structures in which each model indicating factors that could not be observed to define the covariance within the set of observed variables (Keith and Reynolds, 2018). Many researchers recommended using CFA for indicating the existence of a single structure subject to a set of measures (Brown, 2015). CFA helped the researcher overcome many limitations related to EFA. Moreover, CFA also reveals the data of (1) Correlated general perception pairs (2) Observed variables are influenced by mutual perception (3) Observed variables are influenced by error distance factor (4) Which pairs and errors are related.

Structural Equation Modeling (SEM)

In the second step of this article, SEM was used and analyzed the relationship between BCM and effects of empirical risks. SEM is a collection of statistical models that simplify and explain relationships between multiple latent variables. SEM examines the relationships between many dependent and independent variables simultaneously (Mueller and Hancock, 2018). Therefore, SEM was used in many fields and became an analysis necessary for academic research (Keith and Reynolds, 2018). Moreover, Kline (2015) called SEM a causal modeling, a causal analysis, simultaneous modeling of equations, and structural covariance analysis with path analysis and CFA technique. SEM was therefore suitable for this researcher more in the analysis of the relationships between many dependent and independent variables as hypothesized in the proposed research model. SEM was used in this research to examine the statistical relationships between the tests of each factor and between recognizing independent and dependent variables. The first reason for choosing SEM for analyzing data is to present a systematic mechanism to examine the relationship between structures and indicators and to test the relationship between structures in a single model (Kline, 2015). The second reason is to present an effective and strict statistical technique for managing complicated models (Jacobucci et al., 2016). In SEM, the relationships between observable and innate variables will be validated using Confirmatory Factor Analysis (CFA), also known as the structural relationship measurement and testing model using a structural model. There are two broad approaches used in the CFA to assess models of measurement: (1) Goodness-of-Fit Index (GOF) and (2) Evaluation of Validity and Reliability of Measurement Models (Kline 2015). Therefore, this study used a measurement model to measure validity and reliability.

Measurement and Descriptive statistics

Table 1: Measurement and Descriptive statistics

Business continuity management (BCM)		Number of items	\bar{X}	(S.D.)	Skewness	Kurtosis
BCM1	Resource analysis	2	3.54	0.63	0.182	0.816
BCM2	Risk analysis	3	3.59	0.63	0.029	-0.479
BCM3	Business continuity development	2	3.87	0.59	-0.184	-0.175
BCM4	Operational continuity management	3	3.83	0.58	-0.480	0.248
BCM5	Maintain the continuity plan	2	3.77	0.71	-0.083	-0.356
IM1	Threat of competitive rivalry	5	4.13	0.54	-0.346	-0.563
IM2	Threat of new entry	5	3.73	0.68	-0.164	0.041
IM3	Threat of buyer power	6	3.19	0.89	0.036	-0.325
IM4	Threat of supplier power	4	3.62	0.63	0.110	-0.099
IM5	Threat of substitution	3	3.23	0.96	0.060	-0.460

Business continuity management (BCM)		Number of items	\bar{x}	(S.D.)	Skewness	Kurtosis
IM6	Corporate Strengths Impact	6	3.24	0.48	0.785	0.922
IM7	Corporate weakness impact	9	3.26	0.50	-0.097	-0.242
IM8	Impact corporate opportunity response	5	3.56	0.89	-0.093	-0.572
IM9	Corporate Threats Impacts	11	3.48	0.36	0.223	0.220

The assessment of measurement model

H₁: Business continuity management (BCM) is positively related to Risk Impacts

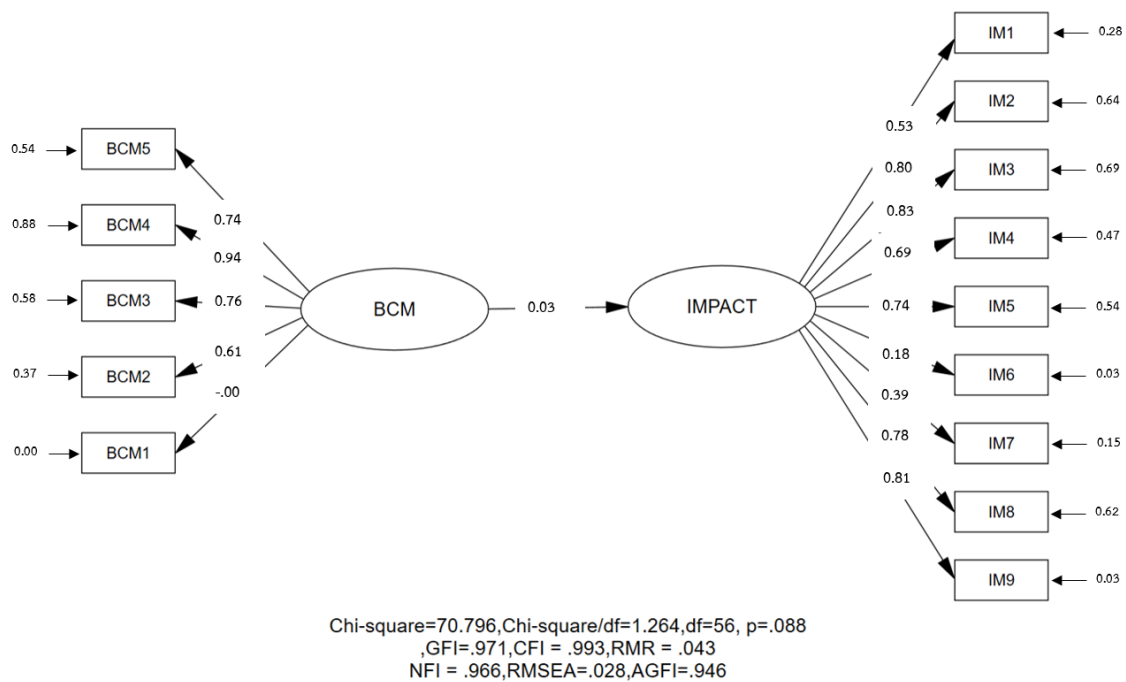


Figure 1: The assessment of measurement model. Source: Weerapong, Prin (2021)

Table 2: Testing the model fit

Model fit indices	Recommended acceptable level	Indices value	
		BCM	Risk Impacts
X ² /df	> 3	0.943	1.481
RMSEA	<0.08	0.000	0.038
GFI	>0.90	0.997	0.985
AGFI	>=0.80	0.983	0.957
CFI	>=0.90	1.00	0.993

Table 3: Result CFA measurement model illustrates that almost all of the estimated coefficients are statistically significant, except for measurement model (BCM and Risk Impacts) (rejecting BCM1)

Variables	Result				
	Factor estimate	Error term	t-value	Sig.	R ²
BCM1	-0.009	0.044	-0.155	0.877	0.000
BCM2	0.608	0.063	11.303	***	0.369
BCM3	0.763	0.037	14.877	***	0.581
BCM4	0.936			***	0.876
BCM5	0.732	0.044	14.458	***	0.535
IM1	0.532			***	0.283
IM2	0.794	0.189	10.014	***	0.631
IM3	0.837	0.309	8.428	***	0.701
IM4	0.691	0.177	8.615	***	0.477
IM5	0.723	0.313	7.711	***	0.523
IM6	0.172	0.102	2.844	0.004	0.030
IM7	0.395	0.122	5.596	***	0.156
IM8	0.786	0.284	8.580	***	0.617
IM9	0.165	0.077	2.696	0.007	0.027

Table 4: Result Structural equation model

Path relationship	Result				
	Factor estimate	Error term	t-value	Sig.	R ²
BCM1 <--- BCM	-0.002	0.036	-0.043	0.965	0.000
BCM2 <--- BCM	0.609	0.061	11.679	***	0.371
BCM3 <--- BCM	0.762	0.037	15.039	***	0.580
BCM4 <--- BCM	0.937				0.877
BCM5 <--- BCM	0.735	0.044	14.691	***	0.541
IM1 <--- IMPACT	0.528				0.278
IM2 <--- IMPACT	0.798	0.195	9.827	***	0.638
IM3 <--- IMPACT	0.833	0.315	8.276	***	0.694
IM4 <--- IMPACT	0.685	0.180	8.463	***	0.469
IM5 <--- IMPACT	0.735	0.324	7.632	***	0.540
IM6 <--- IMPACT	0.175	0.103	2.88	0.004	0.031
IM7 <--- IMPACT	0.389	0.122	5.578	***	0.152

Path relationship	Result					
	Factor estimate	Error term	t-value	Sig.	R ²	
IM8 <---	IMPACT	0.784	0.291	8.426	***	0.615
IM9 <---	IMPACT	0.181	0.076	3.009	0.003	0.033
IMPACT <---	BCM	0.029	0.011	0.485	0.627	0.001

Results and Discussion

Looking at the five forces, when considering the results of sorted research results in which respondents commented on the factors affecting the company, it was found that the bargaining power of customers could be clearly seen in major customers which normally have high bargaining power and could define their own conditions and agreements. If a logistics company insisted on not responding to the demands of the customers, it may cause them to turn to other logistics companies (Safaei et al, 2018). However, if a logistics company complied and discounted the goods, their income would also decrease. Both of these factors would cause the income of the logistics company to decrease, especially for the logistics companies that already have a small number of customers that the customers would have higher bargaining power. It would be even more concerning if the customers were to group up and bargain with what they wanted. The uncertainty of pick-up points and the amount of transportation of customers is also an important situation a logistics company has to face in the present days. The threat from new competitors: New competitors in the market affect threats as there are more competitors whether it be the investment of new competitors, investment in new technologies, and reachability of the modern logistics market that was growing with new door-to-door service that responds to the demands of the customers through online trading (Ong et al., 2018; Yao, 2017). Relationships of new businesses and investment of the world's large logistics companies have participated in the regional transportation market continuing from their existing businesses such as the multinational companies and made the market share the company previously received diminished. For small logistics businesses, they have to create strategies to cope with such situations, such as being small to be able to directly access the customers more, which may build long-term customer relationships (Oláh et al, 2018). The threat of substitute products or services: In the logistics business, it is not limited to inland transportation but also includes air transportation, oversea transportation, and train transportation as well depending on the requirements of customers if they want speed, cost-saving, or security. Therefore, to prevent the threat of substitute products or services, a logistics company must collect the demands of customers and respond to them as best as possible to increase security, suitable cost, and rapid shipping for the customers (Wang, M., 2018).

Competition between competitors in the same industry: Intense competition would not benefit the entrepreneurs in the same industry as it means a decrease in the market share, and a

decrease if market share means a decrease in the income as well, which dictates the intensity of the competition (Chen et al., 2017). However, research studies found that the intensity of logistics business competition in the case study could be planned and controlled by gathering together and creating a logistics confederation. Supplier bargaining power: In the logistics business, the suppliers are drivers and maintenance personnel. Suppliers therefore do not have much impact on the business. Because there are many drivers, their share of incomes is mainly from the round of transportation. If the employees have not transported goods, they will not receive wage from the total of goods they are responsible to. Therefore, if the company has good service usage, the distribution center will benefit in return as well (Rauch et al., 2015). This makes the bargaining power of suppliers low. For maintenance, each company will find replacement parts from the regular sellers that the transporter trusts or look for parts that are comparable to the original from a general dealer. Environment and potential analysis: When considering the sorted research results in which respondents comment on the factors impacting the company, it was found that for strengths, the customers trusted in the transportation service, which has good relationship with the customers from quick transportation and familiarity with the driver (Govindan and Chaudhuri, (2016). For weaknesses, the respondents commented that the price of transportation is the same as its competitors and customers can choose other logistics companies easily, making it unable to compete with international logistics companies as they could reach the target groups much deeper than current entrepreneurs. Also, communication within the company required improvement both in terms of transport-related documents such as bill of lading, invoicing documents, and shipping documents, which are important documents the transporters attach to claim the freight. Additionally, road quality was also a factor that caused damages during transportation, delaying it at the end (Govindan and Chaudhuri., 2016). For opportunities, Thailand's economy has a tendency to expand and Thai government also supports logistics businesses. The company saw that such a policy is a general policy That has not directly supported entrepreneurs, some regulating or easing laws are not yet conducive for business in the point of view of the company. For threats, the current political situation in Thailand was yet to be stabilized and the government could not resolve the economic problems, making logistics entrepreneurs concerned about its effect on the supply chains of the products first. The producers could not predict a precise productivity, directly affecting the raw materials that have to be fed to the factories through transportation. Moreover, when producing finished products, there is no guarantee that the market will be able to support them (Liu, 2017). Additionally, Thailand was affected by the pandemic at the beginning of 2020. Therefore, entrepreneurs view it as one of the main reasons of retardation in the amount of transportation in Thailand. Business continuity management is a risk management that affects many aspects of inland transportation. It was found that the level of analysis, planning, and operations of the transporters was yet at the level that could manage those impacts. The first factor is that the transporters still lacked the organizational structures that could manage risks from both predictable and unpredictable

situations because the structure of the logistics companies were a structure of a small company that was developed from a family business, making the clarity of duties to be blurred and the decision-making authority was at the center (Soušek, et al., 2017).

The second factor is that most companies still lacked categorization, importance awareness, and solution to problems according to the type of risk objectively, which is a result caused by the first factor. The third factor is the training and implementation of risk management in the logistics companies that still focused on solving immediate problems and still lacked preventive planning such as preventive maintenance that will improve the effectiveness of trucks to be increased (Soušek, et al., 2017). For risk management practices within the context of the logistics service providers in Thailand, the researcher had interviewed academicians and transporters at the supervisory. This could be summarized as follows: Most logistics companies with Thai owners could attract customers by closeness and trust in the number of trucks and years of establishment. These companies are facing threats that reduce their market shares with one of the main issues was the bargaining of customers with support data that competitions among regular logistics businesses or affiliated trucks that used to run with those logistics companies proposed the price to the owner of the goods when those transportation contracts expired by reducing transportation fee, increase the amount of transported goods and round, reducing the income as a result and depend on long-term contracts. Another reason is the entrance of international businesses which are large logistics companies are expanding the transportations, types of trucks, and services (Yao, 2017). These companies will have more systematized requirements and regulations that were offered to the goods owner than companies with Thai owners, making goods owner trust in the services according to these principles and would not invest in assets but will relying on finding affiliate truck services with Thai owners to run with by creating agreements and regulations such as PPE equipment and training programs that the affiliated truck service owners must pay themselves.

In the risk management, the informants commented on the management of both predictable and unpredictable risks that it was an immediate problem solving that has no prediction or has not been planned with preventive strategy because the company structure is not standardized and all decision-making was done by the owner and most of risk management, as well as the impacts, have no preventive strategy (Giannakis and Papadopoulos, 2016). Most transporters are willing to accept those risks as they have not much bargaining power with their customers.

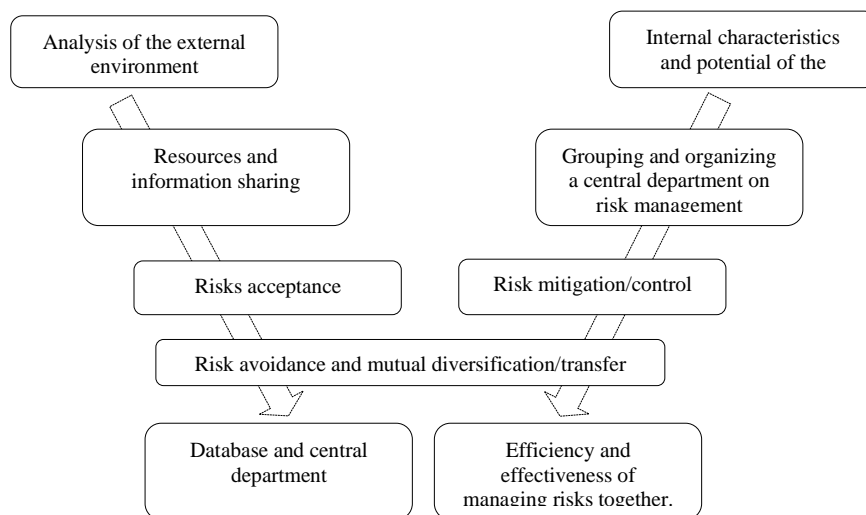


Figure 2: Risk management model of Logistics Service Provider. Source: Weerapong, Prin (2021)

Conclusion and Recommendation

For those interested, the results of research into the risk assessment study to compare the logistics model by adding other scholarly content or concept other than this research, meet a variety of research purposes. That users can apply research data to be more effective and targeted.

This study, the researcher mostly reviews relevant literature from secondary sources from domestic literature to match the Thai context. Those who will apply the research results must take into account such limitations.

This research study was conducted to collect data from questionnaires to executives such as transportation supervisors, transportation manager level, logistics manager or organization executives. The executive has an important role in the administration and the person is aware of any information regarding the business, which is exactly what the researchers want to study. Therefore, it is the most suitable person to provide information. Thereby, those who will apply the research must take into account the limitations related to the said data.

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