



The future of Thailand's international logistics: A literature review

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Abstract

International logistics management in Thailand has faced chronic problems, which have affected the competitiveness of Thailand in the world market. This research, therefore, examines the overview, trends, issues, and solutions for the same. The research design follows the PRISMA concept to select and analyze extant articles. Inclusion criteria were articles mainly in TCI 1, and 2 databases, using keywords searched such as “international logistics”, “international trade”, “border trade”, “international transport”, and “import-export”. A total of 82 articles were obtained for full-scale research and analyzed using content analysis and thematic analysis methods. We found that the authors mainly used the interview, questionnaire, and literature review methods to observe a single unit in the supply chain, such as a manufacturer or an export agent. Commonly, Thai business entrepreneurs have inadequate knowledge of import-export, legal matters, customs formalities, foreign languages, and information technology. During this decade (the late 2010s to the early 2020s), government interventions have increased difficulties for businesses due to the following reasons: (1) entering the ASEAN Economic Community; (2) border trade; (3) inconsistencies between outdated Thai laws and the Incoterms tradition; and (4) transparency. Moreover, the Thai government sector needs restructuring to be more effective to meet global standards, which will solve these issues. Thus, this is the most critical area for future research. Positive changes will enable more qualified private sector operations throughout the supply chain, allowing smoother goods, information, and finance flows.

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Introduction

International logistics (or international freight) is increasingly important in the global supply chain. This is

because logistics management's efficiency can facilitate the fast movement of raw materials or products across national borders. Therefore, this increases customer satisfaction and sustainable corporate growth. Exporting goods to foreign countries generates income in the form of foreign currency. When the cost of producing a product in the country is higher than that in other countries, imports allow the country to get quality products at a lower price.

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In Thailand, most outbound shipments are transported via sea transport. This is the cheapest mode of transportation to move large quantities of goods at a time (Puttiworn, 2020). Hence, most researchers focus on this mode of transport. The import and export of goods involve various logistical activities, starting from collecting goods from producers and transporting them to consumers in the destination country. Below is the supply chain example of sugarcane farmers in the Ratchaburi province (Phromhitathorn & Dunlayawijak, 2020) (Figure 1). The intermediaries purchase sugarcane from farmers and send it to a sugar factory in Ratchaburi province to be processed into refined sugar. The factory then exports the sugar to customers in Japan.

Over the past decade, Thailand has faced many challenges that have affected international trade. These include joining the ASEAN Economic Community (AEC), the COVID-19 pandemic, and using the new International Commercial Terms 2021 (Incoterms) instead of the 2011 terms, among others. Entrepreneurs are yet to adapt to these dramatic changes and are seeking better solutions. After Thailand joined the AEC in 2015, the national economy expanded significantly and generated income for businesses (Boonchoo, 2015). However, the country also faced many problems during this expansion. Duangphastra (2020) revealed problems that included: (1) the quality of logistics infrastructures such as roads, border checkpoints, customs; (2) institutional and regulatory links; (3) non-tax measures; and (4) goods in transit and interstate transport.

The spread of COVID-19 has slowed down the economy, interrupted sea freight, and increased the shortage of shipping containers worldwide. Many employees have been laid off by organizations, to save on spending. Shipping companies incur additional costs from the mooring and acquiring of containers. However, the first two years of the pandemic saw a decrease in the demand for oil in the world market, therefore, the oil price reduced transportation costs (Sorasit & Chaowarat, 2021).

Importers and exporters have to face many difficulties, including the selection of multimodal transport, communications, complex customs clearances, and related documents. Thailand's competitiveness in the global market is decreasing because it cannot meet the following global requirements: (1) an efficient international logistics system; (2) transportation infrastructure; (3) integration of logistics between Government agencies; (4) customs clearance; (5) diversity of logistics service providers; and (6) logistics service providers' capacity (Boonthod & Santiwarangkana, 2018; Dokmai & Sriwilai, 2020). Entrepreneurs prefer using the services of Third-Party Logistics Providers (3PL) to help expedite import-export operations at lower costs (Theppitak, 2015, 2018). Government support is essential to improve the import-export trade of Thailand, and in particular, the customs department, which promotes the potential of international trade by inspecting goods across the border to ensure minimum safety for import-export business (Pondee & Vaisamruat, 2020).

The Department of International Trade Promotion (2021) believes that "Thailand's competitiveness in international trade will be 1 in 5 of Asia by 2027".

Initially, we found the problems mentioned above that hinder the development of international logistics systems. Hence, we reviewed more documents to understand the national issues to better identify solutions. Many articles focused on specific areas and did not opt for a national-level perspective. For instance, Laiprakobsup and Nantavieng (2016) studied the impact of price intervention policies and free trade zones on rubber in Thailand. Thailand's research still lacks a broader perspective on the national supply chain. Thus, this study aimed to address this. Policymakers can use the research results to develop effective strategies.

Therefore, central objectives were set as follows:

1. to understand the overview of the Thai research direction in international logistics,
2. to understand significant problems, and identify solutions at policy and operational levels, and for businesses, and,
3. to investigate the gaps for future research.

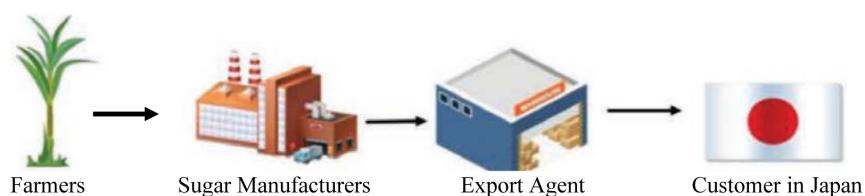


Figure 1 Sugar production supply chain

Source: Adapted from Phromhitathorn and Dunlayawijak (2020)

Methodology

To meet the research objectives of this study, we followed the PRISMA (preferred reporting items for systematic reviews and meta-analyses) concept. The PRISMA concept helps assess, select, and compile relevant research (Machi & McEvoy, 2021). Our research objective was to understand the patterns and trends of international logistics studies in Thailand. Therefore, we searched the central research database of Thailand (Thai Journals Online–Thaijo) (Figure 2).

The search process was conducted from December 1, 2021 to January 15, 2022. Articles published after this period were excluded from the study. First, we used the keyword “international logistics” (in Thai) and found 89 articles (Figure 2). Next, we removed duplicates, then selected the articles based on the following inclusion and exclusion criteria: selected papers should be in Thaijo database accredited to TCI 1 and TCI 2 bases during 2013–2022 (10 years) to ensure research with latest information. The study aims to examine the impact of international trade policies/regulations and situations in Thailand. These articles were later screened by their titles and abstracts and

were finally selected through quality assessment. Only 24 articles met our structured measures. As this is an insufficient number of papers to be reviewed, we extended the period to 2001 (22 years), and other sources of information were added, such as theses and dissertations. Different keywords were adopted, such as “import-export,” “international trade in the AEC,” “Thai border trade,” and “incoterm.” Ultimately, 82 articles were selected to be included in the qualitative analysis.

Four researchers read, reviewed, and selected research that met the above criteria. Reviewing articles by the researcher panel can ensure validity and reliability of the data analysis (Gorman et al., 1997). Thereafter, the research team put the data into Excel tables to facilitate analysis. The reviews capture the meanings of certain words, word groups, or messages, and are sorted along with the developed themes. Significant themes are as follows: (1) title (topic); (2) author; (3) year of publication; (4) research topic; (5) industry; (6) research method; (7) research results; and (8) the strengths and weaknesses of each research study. Subsequently, researchers counted frequency, created graphs, and interpreted the results. Thereafter, content and thematic analysis were adopted (Miles & Huberman, 1994).

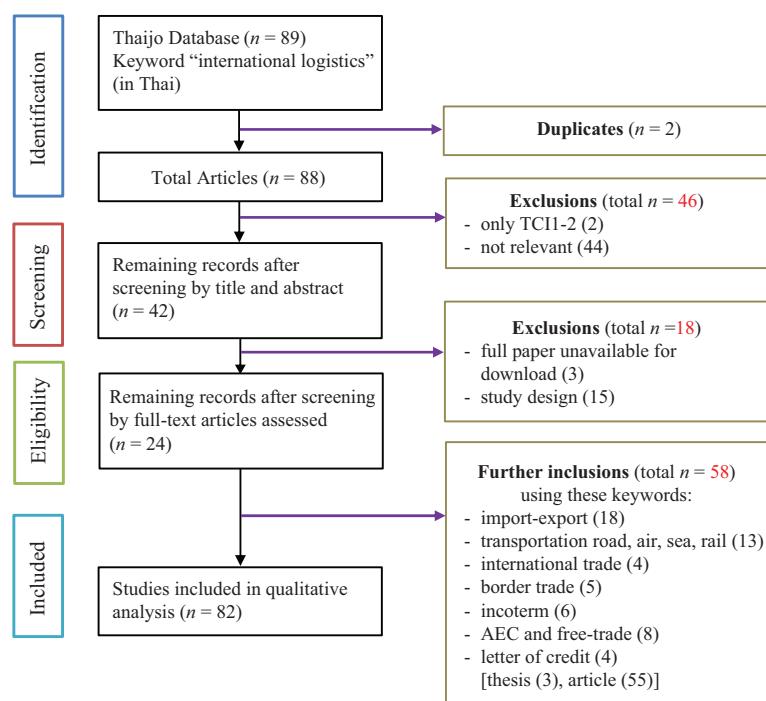


Figure 2 PRISMA diagram
Source: authors (2022)

Distribution of Papers

This section presents the distribution of 82 papers by year, research topic, type of industry, and research method. The analysis found that the year 2020 saw the greatest number of articles published (13), followed by 2019 (10), and 2017 (10) (Figure 3). This could be due to the Covid-19 pandemic obstructing import-export, border trades, and tourism (Bank of Thailand, 2022). Many economic activities had to be halted, resulting in a more significant impact compared to previous years. As a result, scholars paid more attention to this.

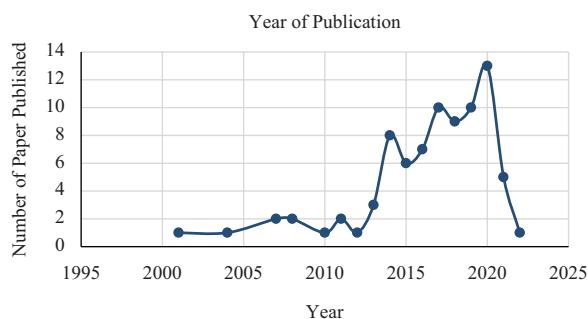


Figure 3 Distribution of papers by year of publication

The 82 articles contained six research topics (Figure 4 and Table 1), many of which studied more than one topic. For example, the research entitled “the risk management of the logistic business of water transportation operators on the Chao Phraya River to Cambodia” (Yuwawech & Thamalee, 2020) consisted of 3 topics as follows: (1) import-export factors; (2) border trade; and (3) logistics providers. Import-export factors received the most attention (46 studies, 38.02%), followed by logistics providers (18 studies, 14.88%), and entry to the AEC (18 studies, 14.88%). This result consisted of the national direction and the growth of the global economy. Selected articles studied eight industries where international trade received the most attention

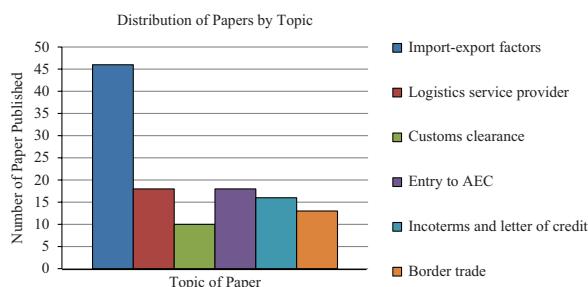


Figure 4 Distribution of papers by topic

(24 studies, 28.92%) (Figure 5 and Table 1). The authors used three methods to collect data: interviews (32 studies, 20.92%), questionnaires (26 studies, 16.99%), and literature reviews (64 studies, 41.83%). Other methods (31 studies, 20.26%) included the fixed market-share model, common equilibrium models, and GTAP models, among others (Figure 6 and Table 1). Interestingly, most of the research adopted more than one method, such as interviews and questionnaires.

Table 1 Distributions of papers by topic, industry, and research method

Issue	Volume	Percentage
1. Topic		
Import-export factors	46	38.02
Logistics service provider	18	14.88
Customs clearance	10	8.26
Entry to AEC	18	14.88
Incoterms and letter of credit	16	13.22
Border trade	13	10.74
Total	121	100.00
2. Industry		
Import-export	22	26.51
International trade	24	28.92
International transport	19	22.89
Agriculture	6	7.23
Air transport	5	6.02
Water transport	3	3.61
Transportation cost	2	2.41
Land transport	1	1.20
Tourism	1	1.20
Total	83	100.00
3. Method		
Interview	32	20.92
Survey-Questionnaire	26	16.99
Literature Review	64	41.83
Others	31	20.26
Total	153	100.00

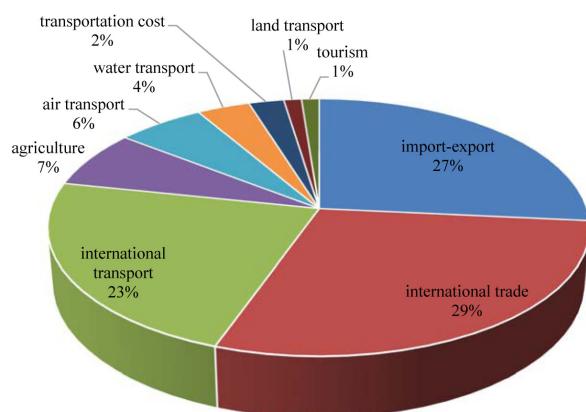


Figure 5 Distribution of papers by industry

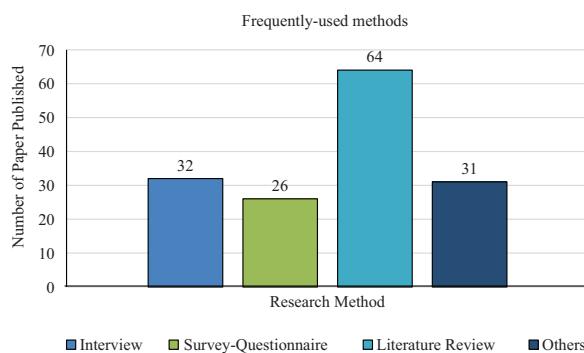


Figure 6 Distribution of papers by research method

Discussions

Research Topics

Of the 82 articles, 14 studied specific export products. Studies examined products such as rice (4 studies), rubber (1 study), coconut (1 study), cassava (1 study), fruits and vegetables (1 study), sugar (1), and Thai food/halal food (4 studies). They mainly investigated: (1) competitive factors affecting import/export; and (2) customer behavior, to generate strategies for entrepreneurs and policymakers.

Rice export strategies of Thailand to ASEAN by Laosunthorn et al. (2016) is an example of the research topics examined. This study interviewed 12 government officers and 80 exporting entrepreneurs. The findings suggested increasing: (1) public relations; (2) cost reductions; and (3) the production quantity and quality of rice, especially Thai jasmine rice. Apart from widely-accepted Thai foods, halal foods also have high export potential (Pom-iem & Sarntisart, 2021). Chatburanontachai (2020) stated that Thailand has the following strengths: (1) a national food safety strategy; and (2) good coordination of all units in the supply chain for food safety standards.

There is interest in the agricultural sector because it is rooted in the economy of Thailand. In 2021, the agricultural sector accounted for 32.62 percent of the total workforce and was expected to grow (Ministry of Labor, 2022). Additionally, Thailand is one of the world's top ten exporters of agricultural products (Department of Trade Negotiation, 2022). However, not enough attention has been paid to other agricultural products such as spices and herbs. Agricultural products accounted for only 9.60 percent of total exports, while industrial products had the most significant proportion (79.49%) (Table 2) (Office of Permanent Secretary, Ministry of Commerce, 2021).

Thus, one can question whether the national research direction needs to be more in line with the export trends.

Research Method

As mentioned, there were three main methods. In cases where researchers reviewed secondary data, their focus was on other research, country policies, government operations, law and regulations, court judgments, and so on. The purpose was to determine the aspects of the problem that must be resolved. The interview method was used by most studies to collect primary data because it provides useful insights to understand the phenomenon. Scholars often studied: (1) only one type of organization in the supply chain, such as a manufacturer or exporter or logistics service provider; and (2) one type of industry. Incomplete information regarding the entire supply chain increases the difficulty of portraying the true reality of supply chains or international logistics in Thailand.

Import-Export Factors

Reviewing extant literature brought up the following factors affecting import-export: (1) industrial strategy; (2) international trade policy of both importing and exporting countries (such as free trade areas); (3) prices of particular products; (4) costs (such as transportation and crude oil prices); and (5) others factors such as drought conditions (in the case of agricultural products), among others. (Pom-iem & Sarntisart, 2021; Srijek & Boonyanam, 2022). In the case of importing grapes, Sakolwitayanon (2008) said that the free trade area (FTA) with the United States led to reduced import taxes. Therefore, the price of the US grape was lower than that of the Thai grape and hence was more preferred among Thais. This situation impacted grape growers and other businesses in the same supply chain, such as fertilizers and pesticides. Therefore, many Thai researchers have raised the issue of improving government cooperation and support. However, the Thai government has continued to join other FTA agreements.

Table 2 Structure of Thai export products 1992–2021 (Jan - Dec)

Type of Product	Percent
Agricultural products	9.60
Agro-industrial products	7.11
Industrial products	79.49
Mineral products and fuel	3.80
Total	100.00

Source: Office of Permanent Secretary, Ministry of Commerce (2021)

Some authors indicate fraud and economic crimes as critical obstacles. Three crimes include: (1) the use of forged documents (e.g. forgery of bills of lading); (2) maritime fraud (e.g. the insured deceives the insurer through misrepresentation); and (3) the diversion of the vessel (Praithong, 2011). The root cause is that Thai law does not cover these areas, and government officials still lack knowledge and understanding. Therefore, they have not kept up with the various forms of fraud significantly affecting the Thai entrepreneurs.

Difficulties in Customs Formalities

The chief difficulty of international logistics is how to prepare import/export documents to comply with customs formalities strictly (Puttiworn, 2020; Tiansangfa, 2014). An example of a common error was wrong information when creating export declarations (e.g., incorrect classification of goods, contact, packing, and payment). Some packing lists did not match the export entries. These problems delay the removal of goods from the port, affecting the goods receiving process of customers. Therefore, the customer can claim the return shipping cost from the company that has insured the time. The exporter also needs to pay additional rent for warehouse space where the products are overdue. Several factors can cause these problems, including: (1) from exporter: inexperienced staff; (2) from customs broker: poor communication, information systems, time and data accuracy; and (3) from customs procedures: the complexity of the system and a large number of documents (Tiansangfa, 2014). Puttiworn (2020) suggested businesses should request customers for export information and other relevant documents used for issuing a freight bill at least 1–2 days in advance before the ship's departure.

Logistics Service Provider; Container Yard, and Multimodal Transport

The abovementioned difficulties led businesses to use logistics providers' services to reduce the hassle and costs. Logistics service providers are intermediaries in charge of freight (land, sea, road, and rail), warehousing, shipping, container services, financial services, and documentation (Khumrat, 2017) (Figure 7). Multimodal carriers are liable for loss, damage, and delay. Under this topic, scholars often studied the criteria to select logistics providers, which are also part of the strategies to improve the logistics provider industry.

The logistics service provider can operate multimodal transport, including land, water, air, and rail. For instance, the rice grown in the central part of Thailand is firstly transported in rivers, then carried by truck or train to customers or neighboring countries (Tanachodrungsatis, 2014). In the past 5–10 years, FTA has led to greater competition in the transportation agent industry, particularly from foreign companies with more efficient technology and better transportation systems (Theppitak, 2018). Most Thai sea freight forwarders understand the impact of entering the AEC (Theppitak, 2018), while Thai truck operators lack knowledge (Theppitak, 2015), leading to lower competitiveness among truck operators. Improving efficiency in the container shipping industry is crucial because there has been an increase in longer lead times in empty shipping containers (Phajon et al., 2020). This issue has an impact on: (1) cost of transportation (higher); (2) traffic congestion inside container yards and public roads (increased); (3) the schedule of packing products at the factory and returning the full and empty containers; and (4) the schedule of ship arrival and departure.

The customer mainly selects professional logistics providers by considering: (1) reliability; (2) assurance; (3) tangibility; (4) empathy; (5) responsiveness; and (6) shipping costs (Khumrat, 2017). Customers expect the agent to solve immediate problems, have good information technology capabilities, be well-integrated systematically, and have financial stability (Khumrat, 2017; Phajon et al., 2020).

Entry to the ASEAN Economic Community (AEC)

The AEC consists of 10 countries: Thailand, Myanmar, Laos, Vietnam, Malaysia, Singapore, Indonesia, Philippines, Cambodia, and Brunei. AEC merged these countries in 2015 to increase their negotiation power with other countries. The report in 2020 stated that Thailand exported goods worth \$140,826 million to

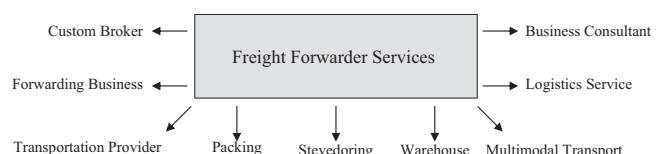


Figure 7 The role of the freight forwarder
Source: Khumrat (2017)

partner countries, which marks an increase in volume by 125 percent compared to the year 2005 (Department of Trade Negotiation, 2022).

The AEC supports the free movement of goods, services, investment, skilled labor, and capital, causing greater intense competition in the market. Many authors have critiqued that there have been trading barriers between member countries which has affected various industries in Thailand (Boonchoo, 2015; Chaipipat, 2013; Theppitak 2015). For small and medium businesses, Boonchoo (2015) recommended starting international trade by entering the CLMV market (Cambodia, Laos, Myanmar, and Vietnam). They are close neighbors of Thailand with lower intense competition. However, other studies do not agree with this.

Jiraratsathit (2016) explored the border trade of Chiang Rai adjacent to Myanmar, Lao PDR, and China (Southern part), and pointed out several major obstacles such as: (1) trade barriers policy of Myanmar and Lao PDR that stipulate trade control measures for both imports and exports; (2) different import and export formalities, and strict practices and high cross-border fees of each border trade route; (3) transport barriers; and (4) entrepreneurial potential. This result consists of Laosunthorn et al. (2016), who revealed that ASEAN countries had adopted non-tariff measures for rice imports and exports to protect the domestic agricultural industry. Therefore, this is not beneficial for Thai rice exports, and no clear solution has been found so far.

Border Trade

Thailand has 38 provinces adjacent to the border area, connected to four countries: Cambodia, Laos, Myanmar, and Malaysia. As Thailand has a geographical advantage, it has shorter transportation distances and lower delivery costs than neighboring countries. Additionally, these countries are: (1) sources of discharging products that are oversupplied in the Thai market; and (2) sources of cheap raw materials that feed into domestic factories (Piyanusorn & Theppanya, 2015). Thai products are considered trendy, and examples include the Lao people's affinity for the Thai computer memory unit, energy drinks, fruits and vegetables, and other consumer products used daily (Sungjapo, 2018).

Many scholars have studied border trade including Jiraratsathit (2016), Piyanusorn and Theppanya (2015), Boonthod and Santiwarangkana (2018), Sungjapo (2018), Senphuwa (2019), Permboon et al. (2019), and all agree that the Thai border trade has been facing serious

problems which include: (1) lack of support from government agencies; (2) overcrowded market; (3) financial investments; (4) increasing customer stimulation; (5) cost of logistics management; (6) limited freight transport; and (7) developing language skills of entrepreneurs. Duangphastra (2020) suggested that the government should establish committees comprising of various professions to solve specific problems such as border trade and transport.

Legal Issues and Incoterms

On this topic, many researchers have studied legal issues, regulations, conventions, incoterms (terms of international delivery of goods), and so on, emphasizing sea transportation. Most of the research agreed that provisions, terminologies, and contracts used in Thailand are inconsistent with international trade customs (Pianwattanakulchai, 2019; Raksakulwithaya, 2015). These trade customs have received international recognition but cannot be reinforced in Thai courts. Incoterms determine responsibilities, duties, and obligations between buyers and sellers in the transportation of goods. The terms were first introduced worldwide in 1936, and have been revised several times since (Manomaiudom, 2014). The current version, Incoterms 2020, was used in 2020. Rungsuwanrat (2020) states that if a seller changes the term from EXW to CIF, the business will be able to make the most profit. This is an example of incoterm usage. EXW or ex-works refers to the seller is only required to deliver goods at a predetermined location), and CIF or cost insurance and freight delivery point means the charges paid by a seller to cover the costs, insurance, and freight of a buyer's order while the cargo is in transit.

Most Thai businesses accept and adhere to the incoterms but may not strictly follow the terms. For instance, during transport in the sea line, goods were damaged by water flooding into the containers. At that time, the shipping agent of the exporting country was responsible for it. The selling contract mentioned the term FOB (delivered on board at the export port). The question arises, who is obliged to file claims with the insurance company? There were two further questions: (1) did both buyer and seller understand the term FOB?; and (2) did they need to use it strictly?

When there is an international trade dispute between parties in Thai courts, the court will consider whether the contract contains incoterms (Raksakulwithaya, 2015). The Supreme Court Judgment No. 2122/2499 ruled that *"If it does not appear that one of the parties already knew*

about the commercial bank's customs, the court cannot reinforce such customs". Accordingly, incoterms that are treated as commercial customs cannot be truly enforced in Thai courts (Manomaiudom, 2014; Raksakulwithaya, 2015).

On this topic, it can be concluded that Thai laws concerning international trade are not explicitly stipulated, hence the court applies the Civil and Commercial Code, some of which is inconsistent with international trade practices. Therefore, the judgments of Thai courts conflicted with international trade practices, resulting in many negative consequences (Kruea-saeng, 2007).

Conclusion and Recommendation

This study gives an overview of trends, issues, and solutions related to international logistics management in Thailand. The PRISMA model was adopted to report the wide array of our systematic review. Eighty-two relevant articles, mainly published in the last five years, were analyzed. The results of the qualitative analysis highlighted that Thai logistics performance is still inferior to that of neighboring countries such as Singapore and Malaysia, among others. Apart from the chief obstacles of the government, such as choosing the wrong direction, being restricted by inappropriate laws, and providing insufficient support to entrepreneurs, another obstacle is both the government's and entrepreneurs' lack of knowledge regarding the international trade system and its traditions. These issues can be traced back to more than two decades and are expected to grow in the future.

Therefore, it seems difficult to achieve the projected goal: "Thailand's competitiveness in international trade will be in the top five for Asia by 2027" (Department of International Trade Promotion, 2021). We believe that structural improvement is not only the responsibility of the government but also of higher education institutions, scholars, and entrepreneurs. Thai universities should develop the necessary interface with government agencies to develop short training courses for entrepreneurs in areas such as customs formalities and documents, international logistics and trade, legal regulations, and language skills. The government must hear and act on entrepreneurs' difficulties and suggestions. Re-engineering government culture and systems as a rapid response to change and growing uncertainty should be addressed, which can be effectively supported by scholars.

This research focuses on Thai international logistics, mainly before 2022. We find that two areas, including COVID-19 and innovation factors, are still under-observed. Since 2019, the world's logistics and supply chains have faced high risks and uncertainties due to the disruption caused by the COVID-19 pandemic. Thai scholars should consider how Thai entrepreneurs have adapted to these dramatic changes. Additionally, more innovative factors, such as international security and trade conflicts, high-speed logistics, digitalization, and environmentally friendly logistics, cannot be neglected.

Conflict of Interest

The authors declare that there is no conflict of interest.

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