

THE EFFECTS OF TRADE LOGISTICS ON EXPORTS,  
MARGINS OF TRADE AND VERTICAL  
SPECIALISATION: THE CASE OF THAILAND

BY

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## ABSTRACT

Efficient, fast, and low-cost trade logistics have become crucial in international trade, especially with the growth of global production networks (GPNs). Trade logistics enhances the international competitiveness of a country, through shortening time taken to export, improving certainty, and reducing trade transaction costs. This study examines the impact of trade logistics on Thailand's export at aggregated and disaggregated sectoral levels, extensive export margin, intensive export margin and vertical specialisation (import of inputs content of export). It employs an augmented gravity model using panel data over 13 years and 58 country pairs between Thailand and its trading partners using a Poisson Pseudo Maximum Likelihood (PPML) estimator. Seven indicators are used as proxies for trade logistics, which include the overall logistics performance index (LPI) and its six components: 1) customs, 2) infrastructure, 3) international shipment, 4) logistics quality and competence, 5) tracking and tracing, and 6) timeliness. In addition, this study also conducts a focused group discussion and interviews with relevant trade logistics agencies and major industrial players to see whether the results are in line with empirical estimation results. The initial empirical result indicates that overall LPI and its three components (customs, infrastructure, and tracking and tracing) of Thailand and its trading partners are the significant factors in promoting the aggregated export of Thailand. The aggregated export of Thailand responds to improvement in customs of Thailand and its trading partners the most. A further investigation shows similar results across sectors. The machinery and transportation equipment export of Thailand is positively affected by the improvement in customs, as well as tracking and tracing of Thailand and its trading partners, while food and chemical sectors benefit from the improvement in customs of Thailand and its trading partners. Furthermore, the improvement in the overall LPI and its six components increases the extensive export margin as well as vertical specialisation of Thailand, while the improvement in overall LPI, customs, infrastructure, tracking and tracing of Thailand and its trading partners promotes intensive export margin of Thailand. The findings from the focused group discussion and interviews reiterate the empirical estimation results. The main policy implication is to enhance the investment in Thailand's e-custom paperless and National Single Window (NSW) in order to promote export and vertical specialisation of Thailand.

## ملخص البحث

أصبحت الخدمات اللوجستية التجارية الفعالة والسريعة ومنخفضة التكلفة أمراً بالغ الأهمية في التجارة الدولية، وتعزز اللوجيستيات التجارية القدرة التنافسية الدولية (GPNs) لا سيما مع نمو شبكات الإنتاج العالمية لأي بلد، من خلال تقصير الوقت المستغرق في التصدير، وتحسين اليقين، وخفض تكاليف المعاملات التجارية. تبحث هذه الدراسة في تأثير لوجستيات التجارة على التصدير على المستويات القطاعية المجمعة والمفصلة، وهامش التصدير الواسع، وهامش التصدير المكثف، والتخصص الرأسي (استيراد محتوى المدخلات للتصدير). كما يستخدم نموذج الجاذبية المعزز باستخدام بيانات اللوحة على مدار 13 عامًا و 58 زوجًا من البلدان بين Poisson Pseudo Maximum Likability تايلاند وشركائها التجاريين باستخدام مقدر تُستخدم سبعة مؤشرات كوكلاء للخدمات اللوجستية التجارية، والتي تشمل مؤشر الأداء (PPML). ومكوناته الستة: 1) الجمارك، 2) البنية التحتية، 3) الشحن الدولي، 4) الجودة (LPI) اللوجستي الشامل والكفاءة اللوجيستية، 5) التبع والتعقب و 6) حسن التوقيت. بالإضافة إلى ذلك، تجري هذه الدراسة أيضًا مناقشة جماعية مركزة ومقابلات مع الوكالات اللوجستية التجارية ذات الصلة واللاعبين الصناعيين الرئيسيين لمعرفة ما إذا كانت النتائج تتماشى مع نتائج التقدير التجريبية. تشير النتيجة التجريبية الأولية إلى أن مؤشر أداء السوق الإجمالي ومكوناته الثلاثة (الجمارك، والبنية التحتية، والتبع والتعقب) لتايلاند وشركائها التجاريين هي العوامل المهمة في تعزيز الصادرات المجمعة لتايلاند. يستجيب التصدير الإجمالي لتايلاند للتحسن في الجمارك في تايلاند وشركائها التجاريين أكثر من غيرهم حيث يظهر تحقيق آخر نتائج مماثلة عبر القطاعات. يتأثر تصدير الآلات ومعدات النقل في تايلاند بشكل إيجابي من خلال التحسن في الجمارك، فضلاً عن تتبع وتعقب

تايلاند وشركائها التجاريين، بينما يستفيد قطاعا الأغذية والكيميائيات من التحسن في الجمارك في تايلاند وشركائها التجاريين. علاوة على ذلك، فإن التحسن في مؤشر أداء السياسة الإجمالي ومكوناته الستة يزيد من العام والجمارك LPI هامش التصدير الواسع وكذلك التخصص الرأسي لتايلاند، في حين أن التحسن في والبنية التحتية وتتبع وتعقب تايلاند وشركائها التجاريين يعزز هامش التصدير المكثف لـ تايلاند. بالمناسبة، وجدت هذه الدراسة أن مناقشة المجموعة المركزة ونتائج المقابلات تتماشى مع نتائج التقدير التجريبي. تتمثل مضمون السياسة الرئيسة في مواصلة الاستثمار في تايلاند الإلكترونية المخصصة للورق والنافذة الوطنية الوحيدة. من أجل تعزيز التصدير والتخصص الرأسي لتايلاند (NSW).



## **APPROVAL PAGE**

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## DECLARATION

I hereby declare that this dissertation is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

Sufiana Sarisae

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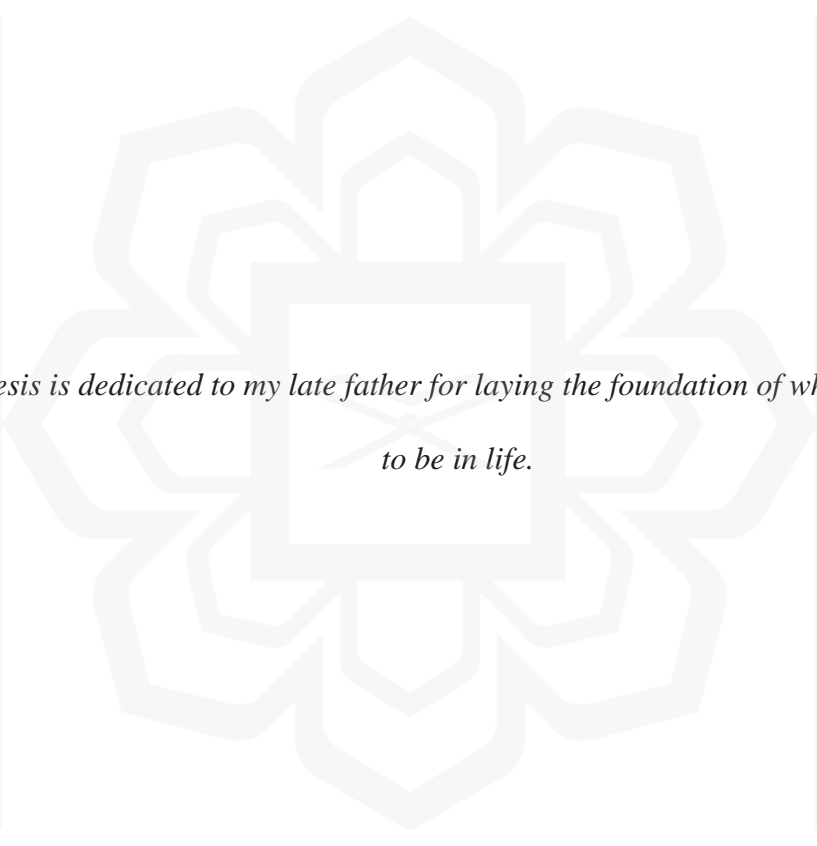
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*This thesis is dedicated to my late father for laying the foundation of what I turned out  
to be in life.*



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# TABLE OF CONTENT

Abstract .....	ii
Abstract in Arabic .....	iii
Approval Page .....	v
Declaration .....	vi
Copyright .....	vii
Dedication .....	viii
Acknowledgements .....	ix
Table of Content .....	x
List of Tables .....	xiii
List of Figures .....	xiv
List of Abbreviations .....	xvi
<b>CHAPTER ONE: INTRODUCTION .....</b>	<b>1</b>
1.1 Introduction .....	1
1.2 Problem Statement .....	7
1.3 Research Questions .....	13
1.4 Objective of the Study .....	14
1.5 Significance of the Study .....	14
1.6 Organization of the Study .....	16
<b>CHAPTER TWO: OVERVIEW OF THAI ECONOMY .....</b>	<b>18</b>
2.1 Introduction .....	18
2.2 The Evolution of Thai Economy .....	18
2.3 Structural Change in Thailand's Economy .....	23
2.4 Thailand's International Trade .....	25
2.4.1 Export of Thailand in Comparison with Thailand's Five Major Trading Partners and Five ASEAN Countries .....	30
2.4.2 Vertical Specialisation (Import of Inputs Content of Export) of Thailand in Comparison with Thailand's Five Major Trading Partners and Five ASEAN Countries .....	40
2.5 Thailand's Trade Logistics Performance .....	42
2.5.1 Overall LPI .....	47
2.5.2 Customs .....	50
2.5.3 Infrastructure .....	52
2.5.4 International Shipment .....	54
2.5.5 Logistics Quality and Competence .....	56
2.5.6 Tracking and Tracing .....	57
2.5.7 Timeliness .....	59
2.6 Concluding Remarks .....	60

<b>CHAPTER THREE: LITERATURE REVIEW .....</b>	<b>61</b>
3.1 Introduction .....	61
3.2 Determinants of Trade .....	61
3.2.1 Gravity Variable.....	68
3.2.1.1 Gross Domestic Product (GDP).....	69
3.2.1.2 Population .....	70
3.2.1.3 Distance.....	72
3.2.1.4 Reginal Trade Agreement (RTA) .....	72
3.2.1.5 Common Land Border .....	73
3.2.1.6 Exchange Rate .....	74
3.2.1.7 Tariffs.....	75
3.2.1.8 Trade Promotion Agency .....	75
3.2.1.9 Trade Logistics and Its Measurement Tools .....	76
3.3 Empirical Literatures on The Impact of Trade Logistics on Trade Flows .....	79
3.3.1 The Impact of Trade Logistics on Export .....	79
3.3.2 The Impact of Trade Logistics on Extensive and Intensive Export Margins .....	82
3.3.3 The Impact of Trade Logistics on Vertical Specialisation.....	85
3.4 Concluding Remarks .....	91
 <b>CHAPTER FOUR: DATA AND RESEARCH METHODS .....</b>	 <b>93</b>
4.1 Introduction .....	93
4.2 Hypothesis .....	93
4.3 Model Specification and Variable Description .....	94
4.4 Data .....	108
4.4.1 Dependent Variables .....	109
4.4.2 Trade Logistics .....	111
4.4.3 Other Explanatory Variables .....	112
4.5 Methods .....	114
4.5.1 Estimation Methods .....	114
4.5.2 Focused Group Discussion and Interview .....	116
4.6 Concluding Remarks .....	117
 <b>CHAPTER FIVE: RESULTS AND DISCUSSION .....</b>	 <b>118</b>
5.1 Introduction .....	118
5.2 Regression Results and Discussion of Findings .....	118
5.2.1 Trade Logistics on Export .....	119
5.2.1.1 Trade Logistics on Export of Thailand at Aggregated Level.....	119
5.2.1.2 Trade Logistics on Thailand’s Machinery and Transportation Equipment Export.....	134
5.2.1.3 Trade Logistics on Thailand’s Food Export .....	141
5.2.1.4 Trade Logistics on Thailand’s Chemical Export .....	147
5.2.2 Trade Logistics on Extensive and Intensive Export Margin of Thailand .....	151
5.2.2.1 Trade Logistics on Extensive Export Margin of Thailand .....	151

5.2.2.2 Trade Logistics on Intensive Export Margin of Thailand	156
5.2.3 Trade Logistics on Vertical Specialisation of Thailand	160
5.3 Focused Group Discussion and Interview Results	164
5.3.1 Background of Focused Group Discussion and Interview Participants	164
5.3.2 The Development Thailand's Trade-Related Logistics and Its Impact on Thailand's Trade	166
5.3.2.1 Customs and National Single Window (NSW)	169
5.3.2.2 Infrastructure	175
5.3.2.3 Tracking and Tracing and Timeliness	179
5.3.3 The Capacity of Thai SMEs in Terms of Trade Logistics	180
5.3.4 Challenges and Key Problems in Exporting and Importing of Thailand during Covid-19	182
5.4 Concluding Remarks	186
<b>CHAPTER SIX: CONCLUSIONS AND POLICY RECOMMENDATIONS</b>	<b>189</b>
6.1 Introduction	189
6.2 Summary of the Findings	189
6.2.1 The Impact of Trade Logistics on Export of Thailand at Aggregated and Disaggregated Sectoral Levels	190
6.2.2 The Effects of Trade Logistics on Extensive Export Margin and Intensive Export Margin of Thailand	192
6.2.3 The Relationship between Trade logistics and Vertical Specialisation of Thailand	193
6.3 Policy Implications of the Findings	197
6.4 Contribution from the Study	201
6.5 Suggestions for Future Studies	203
<b>REFERENCES</b>	<b>205</b>
<b>APPENDIX I: LIST OF 58 COUNTRY PAIRS OF THAILAND'S TRADING     PARTNERS</b>	<b>234</b>
<b>APPENDIX II: LIST OF THAILAND'S EXPORT SHARED BY SECTOR (%)</b>	<b>235</b>
<b>APPENDIX III: DESCRIPTIVE STATISTICS</b>	<b>236</b>
<b>APPENDIX IV: UNIT ROOT TEST RESULTS</b>	<b>237</b>
<b>APPENDIX V: MODIFIED WALD TEST RESULTS FOR GROUPWISE     HETEROSKEDASTICITY</b>	<b>238</b>
<b>APPENDIX VI: LIST OF RELEVANT TRADE LOGISTICS AGENCIES AND     MAJOR INDUSTRIAL PLAYERS IN THAILAND JOINING IN     FOCUSED GROUP DISCUSSION AND INTERVIEWS</b>	<b>239</b>
<b>APPENDIX VII: LIST OF FOCUSED GROUP DISCUSSION AND INTERVIEW     QUESTIONS</b>	<b>242</b>

## LIST OF TABLES

Table 2.1	The Structure of Thailand's Output by Sectors (% of GDP)	25
Table 2.2A	Logistics Performance of Five ASEAN Countries in 2007 and 2018	49
Table 2.2B	Logistics Performance of Five Thailand's Major Trading Partners in 2007 and 2018	50
Table 4.1	Description of Variables and Data Sources	101
Table 5.1	Result of Trade Logistics (Overall LPI and Its Six Components) on Aggregated Export of Thailand	119
Table 5.2	Result of Trade Logistics (Overall LPI and Its Six Components) on Machinery and Transportation Equipment Export of Thailand	134
Table 5.3	Result of Trade Logistics (Overall LPI and Its Six Components) on Food Export of Thailand	141
Table 5.4	Result of Trade Logistics (Overall LPI and Its Six Components) on Chemical Export of Thailand	147
Table 5.5	Result of Trade Logistics (Overall LPI and Its Six Components) on Extensive Export Margin of Thailand	151
Table 5.6	Result of Overall Trade Logistics (Overall LPI and Its Six Components) on Intensive Export Margin of Thailand	156
Table 5.7	Result of Overall Trade Logistics (Overall LPI and Its Six Components) on Vertical Specialisation of Thailand	160

## LIST OF FIGURES

Figure 1.1	Export of Goods and Service of Thailand and Three Emerging Countries: (Million USD, Constant Price 2010)	5
Figure 2.1	Net Foreign Direct Investment (FDI) (BoP, Billion USD)	22
Figure 2.2	Real GDP growth and per capita GDP of Thailand, 1961-2020	24
Figure 2.3	Thailand's Exports, Imports and Trade Balance Value of Goods and Services (Billion USD)	27
Figure 2.4	Thailand's Export and Imports of Goods and Services (% of GDP)	29
Figure 2.5A	Export of Goods and Service of Thailand in Comparison with Thailand's Five Major Trading Partners, during 2007-2019 (Million USD)	31
Figure 2.5B	Export of Goods and Service of Thailand in Comparison with Five ASEAN Countries, during 2007 – 2019 (Million USD)	33
Figure 2.6A	Extensive Export Margin (EM): Number of Products Exported of Thailand in Comparison with Thailand's Five Major Trading Partners, during 2007 – 2019 (Unit)	36
Figure 2.6B	Extensive Export Margin (EM): Number of Products Exported of Thailand in Comparison with Five ASEAN Countries during 2007 – 2019 (Unit)	37
Figure 2.7A	Intensive Export Margin (IM): Average Value of Exports per Product Traded of Thailand in Comparison with Thailand's Five Major Trading Partners, during 2007 – 2019 (Million USD)	38
Figure 2.7B	Intensive Export Margin (IM): Average Value of Exports per Product Traded of Thailand in Comparison with Five ASEAN Countries, during 2007 – 2019 (Million USD)	39
Figure 2.8A	Vertical Specialisation (VS): the Imported Raw Materials, Intermediate Goods and Capital Goods Content of Export of Thailand in Comparison with Thailand's Five Major Trading Partners, during 2007 – 2019 (Million USD)	41

Figure 2.8B	Vertical Specialisation (VS): the Imported Raw Materials, Intermediate Goods and Capital Goods Content of Export of Thailand in Comparison with Five ASEAN Countries, during 2007 – 2019 (Million USD)	42
Figure 2.9	Thailand’s overall LPI and Its Six Components across Years	46
Figure 3.1	Vertical Specialisation	87
Figure 4.1	Conceptual Framework	107



## LIST OF ABBREVIATIONS

ADB	Asian Development Bank
AEC	ASEAN Economic Community
AEMLI	Agility Emerging Markets Logistics Index
AI	Artificial Intelligence
AMSs	ASEAN Member States
APEC	Asia–Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
ASW	ASEAN Single Window
ATK	Antigen Test Kit
BMR	Bangkok Metropolitan Region
BOI	Board of Investment
BRI	Belt and Road initiative
CEFTA	Central European Free Trade Agreement
CEPII	Centre d'Etudes Prospectives et d'Informations Internationales
CC	Catch Certificate
CES	Constant-Elasticity-of-Substitution
CIQ	Customs, Immigration and Quarantine
CEPR	Centre for Economic Policy Research
CLMV	Cambodia, Laos, Myanmar and Vietnam
CPI	Corruption Perception Index
COMESA	Common Market for Eastern and Southern Africa
COO	Certificate of Origin
DFT	Department of Foreign Trade
DGA	Digital Government Development Agency
DITP	Department of International Trade Promotion
EDI	Electronic Data Interchange
EEC	Eastern Economic Corridor
ERIA	Economic Research Institute for ASEAN and East Asia
ETI	Enabling Trade Index
EV	Electronic Vehicle
FCL	Full Container Load
FDA	Food and Drug Administration
FDI	Foreign Direct Investment
FPEs	Factor Price Equalisation
FTAs	Free Trade Agreements
GACC	General Administration of Customs of China
GCC	Gulf Cooperation Council
GCI	Global Competitiveness Index
GDP	Gross Domestic Product
GETR	Global Enabling Trade Report
GIN	Government Information Network
GIT	Gem and Jewellery Institute of Thailand



GMS	Greater Mekong Subregion
GPNs	Global Production Networks
GPS	Global Positioning System
GVCs	Global Value Chains
HS	Harmonised System
IBID	Institute of Business and Industrial Development
ICT	Information and Communication Technology
ILPI	Integrated Logistics Performance Index
IMD	International Institute for Management Development
IoT	Internet of Things
ISI	Import Substitution Industrialisation
IT	Information Technology
ITC	International Trade Centre
ITD	International Institute for Trade and Development
ITF	International Transport Forum
JV	Joint-Venture
LCL	Loose Container Load
LDCs	Less Developed Countries
LPI	Logistics Performance Index
LSCI	Thailand's Liner Shipping Connectivity Index
LSPs	Logistics Service Providers
LTDP	Logistics Training and Development Programs
MCPD	Marines Catch Purchasing Document
MDCs	More Developed Countries
MIT	Middle-Income Trap
MIU	Machinery Intelligence Unit
MOC	Ministry of Commerce
NESDB	National Economics and Social Development Board
NESDC	National Economics and Social Development Council
NGOs	Non-Government Organizations
NICs	Newly Industrialised Countries
NSW	National Single Window
NTBs	Non-Tariffs Barriers
NTMs	Non-Tariff Measures
OECD	Organisation for Economic Co-operation and Development
OFFO	Oil Fuel Fund Office
OIC	Organisation of the Islamic Cooperation
OLS	Ordinary Least Squares
OTOP	One Tambon One Product
PAT	Port Authority of Thailand
PCA	Principal Component Analysis
PIDS	Philippine Institute for Development Studies
PPML	Poisson Pseudo Maximum Likelihood
REER	Real Effective Exchange Rate
RFID	Radio Frequency Identification
RTA	Regional Free Agreement
SEA	Southeast Asia

SMEs	Small Medium Enterprises
SSA	Sub-Saharan Africa
TACBA	Thai Authorised Customs Brokers Association
TCES	Thai Customs Electronic System
TEEI	Thai Electrical and Electronics Institute
TFA	Trade Facilitation Agreement
TIFFA	Thai International Freight Forwarders Association
TIDMP	Thailand Infrastructure Development Master Plan
THB	Thai Baht
THAIFEX	Thailand Food Exhibition
TNSC	Thai National Shipping's Council
TRAINS	Trade Analysis Information System
UAE	United Arab Emirates
UK	United Kingdom
UN	United Nation
UNCTAD	United Nations Conference on Trade and Development
UOB	United Overseas Bank
US	United States
USA	United States of America
USD	United States Dollar
VS	Vertical Specialisation
WCO	World Customs Organization
WTO	World Trade Organization
WDI	World Development indicator
WITS	World Integrated Trade Solution

# CHAPTER ONE

## INTRODUCTION

### 1.1 INTRODUCTION

Since the 1960s, Thailand adopted various industrial policies in its aspiration to be a higher income and industrialising nation. In the early 1980s, Thailand implemented a full scale of export promotion programmes and various investment incentives to promote its industrialisation; and subsequently export. The ultimate aim of promoting the industrialisation and export of Thailand is to generate employment and national income to the country. As a result of this enhancement, Thailand's manufactured goods exports rose notably. By the mid-1980s, Thailand's manufactured goods export surpassed its agricultural goods export. The success of Thailand's export was apparent by the late 1980s, when Thailand experienced commendable economic growth and development (Jiranyakul and Branmasrene, 2002).

Since then, Thailand has basically been able to attract foreign investors, especially those which were from Japan and the United States (US). Most of these countries chose to invest and move their production base to Thailand as the country had plenty of cheap workforce and its strategic geographical location is in the middle of mainland Southeast Asian countries as well as in the centre of the Great Mekong Subregion (GMS) (Anjanant, 1987; and KPMG, 2018). Subsequently, Thailand has participated in global production networks (GPNs)<sup>1</sup>; and it has played a significant role to the Thai economy, especially

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<sup>1</sup> According to Coe et al. (2008), global production networks (GPNs) refer to “a nexus of interconnected functions, operations and transactions through which a specific product or service is produced, distributed and consumed”. The GPNs not only encompasses the

through export growth which enhanced employment and income of the country. Today, Thailand is an export-driven economy (Nidhiprabha, 2017), where its total export accounted for about two-thirds of its Gross Domestic Product (GDP) (World Bank, 2018).

In addition, Thailand has also participated in the global value chains (GVCs) or the GPNs. The trend of the GPNs spreads across many countries around the world in which one particular country specialises in one or some particular stages of a good's production sequence. The linkages of all sequences are also known as vertical specialisation (VS) or global production sharing. Kelly and Cava (2014) consider global supply (value) chains as the production networks that span multiple countries with at least one country imports the imported inputs and exports the outputs. In this current economic situation and to produce a single product, the production has to cross several countries especially with a country that specialises in a particular phase or component of the final product. According to Hummels et al. (2001), vertical specialisation refers to the use of imported inputs in producing goods that are exported. Yamashita (2011) defined global production sharing as a split of the vertical integration of production crossing the borders. Over the past years, this global production sharing has been a crucial surface of economic globalisation and the diversification of production activities. Lately, it has become a key driver of a rapid growth in trade of parts and components, especially between developed and developing countries. As a result, the use of imported inputs in producing exported goods can play a significant role in promoting trade flows among various countries. Baldwin and Taglioni (2011) suggested that trade in intermediate goods has played an important role in global trade flows since 1965, particularly in the auto parts industry; and it was in the form of proportional to trade in final goods.

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connection among the firms from upstream to downstream process in the transnational production of economic values, but it includes all kinds of networks, including firms, government agencies, consumers, non-government organisations (NGOs), labour unions etc. (Coe and Yeung 2015).

Thailand has also relied heavily on the import of inputs from overseas, especially those which are used in supporting the production of its exported goods such as raw materials, intermediate goods, and capital goods. According to the data from the Ministry of Commerce, Thailand and World Integrated Trade Solution (WITS), Thailand has imported raw materials, intermediate goods, and capital goods approximately 70% of its total import. This shows that Thailand has participated in the vertical specialisation. However, the VS would not work effectively in a weak trade logistics environment (Shepherd, 2016). Understandably, inefficient and under-developed trade logistics would increase the costs of trading, thus resulting the total cost of production to increase. In addition, inefficient trade logistics also causes difficulties for manufacturers in Thailand, both local and foreign firms, to produce goods and services at international competitive levels. Inherently, relevant and effective policies in upgrading and developing trade logistics are crucial in enhancing Thailand's competitiveness, especially in the context of the GPNs or VS, or where goods have to cross borders for many times.

Despite the great effort and success for the past several decades, Thailand has currently faced various challenges in enhancing its export such as rising wage rate in Thailand, intense competition in global markets, less efficiency in trade logistics systems and so on. With these challenges, it is relatively difficult for Thailand to sustain its export competitiveness in global markets. Although Thailand used to have a comparative advantage in terms of the availability of cheap raw materials and labour costs in the past (Anjanant (1987), the country is now facing the issues of high wage rates as a result of rapid economic growth during economic booming in the past (Organisation for Economic Co-operation and Development: OECD, 2022). The economic growth in the past did not seem to produce a skilled workforce in Thailand. This has basically created a serious problem for Thailand as the unskilled labourers in Thailand come with a high wage rate. In terms of productivity, however, the unskilled labourers in Thailand are still unable to compete with the skilled workers in developed countries such as Taiwan and South Korea.

Besides, Thailand is also facing an issue of ageing population. It is projected that Thailand's ageing population with the age of 60 years old and above would increase from 13% in 2010 to 33% in 2040 (Economic Research Institute for ASEAN and East Asia: ERIA, n.d.). This seems to affect the Thai economy in terms of attracting foreign direct investment (FDI) in the future. According to the World Bank, although the trend of Thailand's FDI net inflows is still moving upward. However, the trend of Vietnam's FDI net inflows are much steeper than Thailand. This seems to put a serious pressure on both the Thai government and private sector in Thailand as it could reduce the production capacity of Thailand; and hence export. Besides, Vietnam is another developing country which could be considered Thailand's trade major competitor, as it still has plenty of workers with low wages rate (Kumagai, 2019). Consequently, this would basically reduce the competitiveness of Thai products in the international market; and eventually Thailand's export.

In addition, there has been intense competition in the global market in recent years (Ayob and Senik, 2015). This seems to be the consequence of weak demand and excess supply in the global market. Thailand's exports have also been affected by competition from emerging economies such as China, India, and Vietnam. Figure 1.1 indicates that although the trend of Thailand's export has still been increasing, its export expansion has remained modest for almost a decade. Whilst, China's export value has increased significantly over the last two decades; and India's export has also improved notably and surpassed Thailand's export since 2003. Although Vietnam's export is currently lower than Thailand's export, the trend of its export is moving upward and it might surpass the export of Thailand at any time soon. This shows that Thailand is currently at-risk position in terms of export performance. This could be due to the similarity of the products among the Association of Southeast Asian Nations (ASEAN) countries, China, South Korean and India that pose intense competition to the countries in this region, including Thailand (Nasrudin et al., 2014). With this intense competition, it is quite challenging for Thailand to secure and increase its market share in international markets.

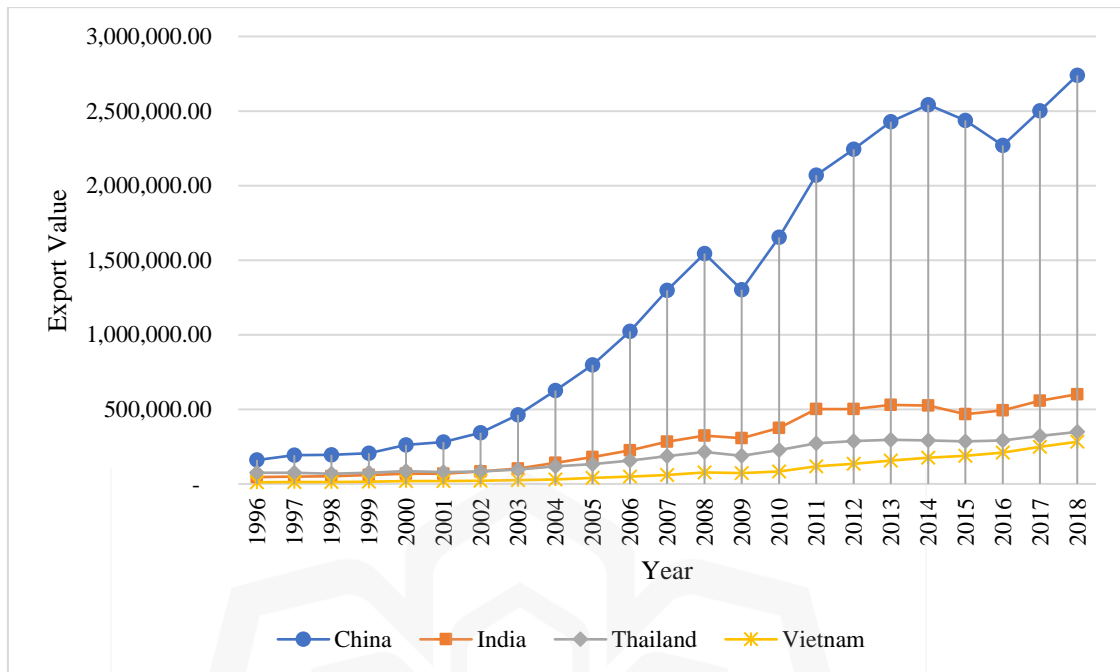


Figure 1.1: Export of Goods and Service of Thailand and Three Emerging Countries: (Million USD, Constant Price 2010)

Source: Author's calculation based on the data from World Bank, as of January 2019

Furthermore, Thailand is also facing challenges in terms of the efficiency of trade logistics systems. Liu (2016) revealed that the efficiency of Thailand's trade logistics system was relatively low; and hence its logistics costs in relation to its GDP was remarkably high. This high logistics cost has basically affected both industrial structure and spatial distribution of the economy; hence greatly constrained sustainable development of the Thai economy. Although the Thai government has put proactive efforts in developing the infrastructure and trade logistics in Thailand, the improvement does not seem to be satisfactory. Sukdanont et al. (2009), as cited in Rudjanakanoknad et al. (2014), found the inefficiency of Thailand's ports. Rudjanakanoknad and Suksirivoraboot (2012) reiterated this finding by pointing out that the problems faced by exporters in Thailand's ports are contributed by inefficient management and procurement processes in the ports. This shows that the efficiency level of Thailand's trade logistics is relatively low. Such inefficiency

resulted in high trade costs and prolonged time to process the export of Thailand. Consequently, the exporters (or importers) in Thailand have to incur high trading costs that inevitably affected their international competitiveness. Even though the logistics costs in Thailand have reduced from approximately 18% of GDP in 2007 to 14% of GDP in 2020 (NESDB, 2009; and NESDC, 2021)<sup>2</sup>, it is still considerably high in comparison to developed countries which are about 5 to 10% of their GDP (Suthiwartnarueput, 2007).

According to the World Bank, the exporters in Thailand need 44 hours with a cost of USD 223 to meet the export border compliance; and 11 hours with a cost of USD 97 to comply with the export documentary compliance. Whilst, the lead time for the exporters in Laos to meet border compliance is only 9 hours, Singapore (10 hours), Malaysia (28 hours), and the Philippines (42 hours). Likewise, the exporters in Singapore need only 2 hours for the export documentary compliance and Malaysia (10 hours). For the cost to export, the exporters in Laos and Singapore have to pay USD 140 and USD 213, respectively, to meet the export border compliance. Similarly, the exporters in Malaysia, Singapore, and Philippines have to pay USD 36, USD 37 and USD 53, respectively, to comply with the export documentary compliance. On the other hand, the importers in Thailand requires 50 hours and USD 233 to meet the import border compliance as well as 4 hours and USD 43 to comply with the import documentary compliance. In comparison, the importers in Cambodia need only 8 hours to meet border compliance, Laos (11 hours), Singapore (33 hours) and Malaysia (36 hours). Meanwhile, the lead time for the importers in Singapore to meet the import documentary compliance is 3 hours, just slightly lower than in Thailand. For the cost to import, it requires USD 233 for the importers in Thailand to meet import border compliance which is higher in comparison to Malaysia (USD 213) and Laos (USD 224), while it needs USD 43 for importers in Thailand to comply with the import documentary compliance which is higher than in Singapore that is USD 40.

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<sup>2</sup> The Office of the National Economics and Social Development Board (NESDB), Thailand and The Office of the National Economics and Social Development Council (NESDC), Thailand