MULTIMODAL TRANSPORT CORRIDORS IN SOUTH EAST ASIA: A CASE STUDY APPROACH

Thesis Submitted in Candidature for the Degree of Philosophiae Doctor of the University of Wales

by

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November 2000

DECLARATION

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ABSTRACT

The objective of this research is to assess multimodal transport corridors in South East Asia with a particular emphasis on Lao PDR, the only land-locked country in the region. The research focuses on theoretical and practical perspectives of multimodal transport competitiveness with a view to understand international freight transport practices, and the appraisal and management of multimodal transport corridors available to Lao PDR when trading internationally. This is investigated through the use of four research questions: How is international freight transport conducted in South East Asia, especially with regard to movement to and from Lao PDR. What are the factors that affect the selection of modes and routes within and around Lao PDR? Which multimodal transport corridor is the most competitive for Lao PDR international trade? Who can best manage these multimodal transport corridors?

To answer the research questions, a sample of Lao traders and logistics operators were selected. Field study was also conducted in order to understand the physical and institutional environment of freight movement within South East Asia. Data relating to the research objective was collected via a questionnaire survey and from in-depth unstructured interviews.

The findings revealed that road transport was the dominant mode of transport in Lao PDR. "Speed", "reliability" and "cost" are some of the most important factors affecting the selection of transport modes to, from and within Lao PDR. The most competitive multimodal transport corridor is shown to be a road-rail-sea combination via Port Klang in Malaysia and it is demonstrated that the efficient management of multimodal transport corridors is best done by forwarders.

This research presents a general methodology for the identification of the most competitive multimodal transport corridor while proposing a logistics decision-making model for routeing and mode selection.

ACKNOWLEDGEMENTS

I would like to express my extreme gratitude to my supervisor, Dr. A. K. C. Beresford for his constant support and "illuminating" guidance throughout the course of this study. His suggestions, criticism and encouragement form an integral part of this thesis. This research has been a constant struggle against computer technology and facilities. I was subjected to the breakdown of my laptop (twice) and the hard disk on my desktop (also twice!).

Furthermore, I would like to thank the staff members of the Logistics and Operations Management section of Cardiff Business School (ex-MASTS) for their help and assistance. Special thanks go to Mr. B.M. Gardner, Dr. P. B. Marlow, and Dr. C.S. Lalwani for their constant support.

My deep appreciation goes to the Faculty of Commerce & Accountancy, Thammasat University for providing me with the scholarship to pursue my life-long ambition of knowledge advancement even though cumbersome bureaucratic procedures enacted by an incompetent Thai Government Students' Office in London did make my life in Cardiff difficult.

I extend my sincere appreciation to Mr. Pierre-Yves Bezy of the United Nations Economic and Social Commission for Asia and the Pacific (UN-ESCAP) for offering me the opportunity to study the region presented in the thesis, and to my roommate Rawindaran VNP Nair for our constant and very constructive discussions.

I also wish to express my gratitude to all the persons I've met and interviewed, who have not been named. Their contributions have made this thesis possible. You know who you are!!!

My heartfelt gratitude goes all the members of my family who have been encouraging me to strive on, in particular, my grandmother, my parents and my in-laws. I hope that you are not disappointed with the result. A special mention goes to my late grandfather; he was my greatest source of inspiration as well as being instrumental in supporting my academic development since childhood.

Last but not least I would like to thank my wife Patcharin and my son Rujikorn ("Bart Simpson" is an angel compared to you!). Without their love, understanding and relentless support it would have been impossible for me to complete this research.

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LIST OF ABBREVIATIONS

ADB	Asian Development Bank
AETR	European Agreement Concerning the Work of Crews of Vehicle
	Engaged in International Road Transport
AFFA	ASEAN Federation of Forwarders Association
AFTA	ASEAN Free Trade Agreement
AGC	European Agreement on Main International Traffic Arteries
AGN	European Agreement on Main Inland Waterways of International
	Importance
AGR	European Agreement on Main International Railway Lines
AGT	European Agreement on Important International Combined Transport
	Lines and Related Installations
AIDA	Analysis of Interconnected Decision Areas
APC	Agreement on Minimum Requirements for the Issue and Validity of
-	Driving Permits
APEC	Asia Pacific Economic Co-operation
APL	American President Line
ASEAN	Association of South East Asian Nation
ASYCUDA	Automatic System for Customs Data
CBM	Cubic-metres
CEN	European Committee for standardisation
CFR	Cost and Freight
CFS	Container Freight Station
CHAM	Containers Hauliers' Association of Malaysia
CIF	Cost Insurance and Freight
CIP	Carriage Insurance Paid to
CMR	Convention on the Contract for International Carriage of Goods by
CIVIK	Road
COSCO	Cosco Container Line
СРТ	Carriage Paid To
CSO	Cold Storage Organisation
DAF	Delivered At Frontier
DDP	Delivered Duty Paid
DDU	Delivered Duty Unpaid
DEO	Delivered Ex-Quay
DES	Delivered Ex-Ship
D/O	Delivery Order
ECE	Economic Commission for Europe
ECMT	European Conference of Ministers of Transport
EDI	Electronic Data Interchange
ESCAP	Economic and Social Commission for Asia and the Pacific
ETA	Estimated Time of Arrival
ЕТО	Express Transport Organisation
EU	European Union
EXW	Ex-Works
FAK	Freight All Kind
FALPRO	United Nations Trade Facilitation Programme
FAS	Free Alongside Ship
FCA	Free Carriage At
FIATA	Federation Internationale des Associations de Transitaires et
	Assimilees
FMFF	Federation of Malaysian Freight Forwarder

FOB	Free On Board
GATS	General Agreement on Trade in Services
GDP	Gross Domestic Product
GMS	Greater Mekong Sub-region
GNP	Gross National Product
H/BL	House Bill of Lading
HMSO	Her Majesty's Stationary Office
ICC	International Chamber of Commerce
ICD	Inland Clearance Depot
IMF	International Monetary Fund
IMTA	International Multimodal Transport Association
INCOTERMS	International Commercial Terms
ITI	International Transit of Goods Convention
JIT	Just-In-Time
KD	Keppel Distrinark
KTM	Malayan railway
L/C	Letter of Credit
	Less-Developed Country
LFF	Lao Freight Forwarder
LIFFA	Lao International Freight Forwarders Association
LNCCI	Lao National Chamber of Commerce and Industry
	Liquid Petroleum Gas
MIFFA	Myanmar International Freight Forwarder Association
MNF	Multinational enterprise
MDA	Myanmar Port Authority
МПА	Multimodal Transport Document
МТО	Multimodal Transport Operator
	North American Free Trade Agreement
NAFIA	North American Free Frade Agreement
OFCD	Organisation for Economic Co. operation and Development
	Port Authority of Thailand
	Peoples' Democratic Republic
	Pan malaysian Lorry Owners Association
DSA	Port of Singapore Authority
ртр	Port of Tanjung Pelepas
	Pagional Container Line
	Poll on/Poll off
RORO	Roual Pailways of Cambodia
SCM	Supply Chain Management
SEM	South East Asia
SFFA	Singapore Freight Forwarder Association
SMT	Societe Mixte de Transport
SRT	State Railway of Thailand
TAR	Trans-Asia Railway project
TDRI	Thailand Development Research Institute
TEU	Twenty Foot Faujyalent Unit
тнс	Terminal Handling Charge
TIFFA	Thai International Freight Forwarders Association
TIR	Transport International Routier
TL	Transit Lao
TOM	Total Quality Management
UCP	Uniform Commercial Practices
UNCTAD	United Nations Conference on Trade and Development
	entre runons conference on trude and Development

UNIDROIT	International Institute for the Unification of Private Law
USA	United States of America
USSR	Union of Soviet Socialist Republics
VAN	Value Added Network
VICT	Vietnam International Container Terminal
VIFFAS	Vietnam International Freight Forwarders Association
WCO	World Customs Organisation
WTO	World Trade Organisation

CHAPTER 1: INTRODUCTION

1.1 RESEARCH BACKGROUND

The developing economies of South East Asia were badly hit by the regional financial and economic crisis that started in 1997. This Asian economic crisis was a major setback to the regional development progress. Fortunately, sign of a healthy return to growth is, in large part, due to the robust and increasingly competitive Asian export industries¹.

According to Mooy (1999), the development of transport and communication technologies has revolutionised production and distribution processes, and has created the "global" market. He stressed that it is within this competitive environment that shippers and consignees require efficient transport services that can get their goods at the right place, at the right time, and at the right price. Another issue that has been presented in his statement relates to the importance of strengthening regional linkages among neighbouring countries in South East Asia in order to facilitate trade and transport.

The improvement of South East Asia's transport sector can provide the foundation for further growth. However, for many countries in the region, inadequate transport infrastructure and high service cost have constrained economic development. Adequate transport and communications facilities are also considered major determinants of trade performance and of the costs and profitability of trading internationally (ESCAP, 1996a). Efficient multimodal transport corridors could play an important role in increasing the region's trade competitiveness.

¹ www.adb.org

Multimodal transport is used to describe carriage where one operator assumes liability for the carriage of goods by a route involving a number of different modes of transport, e.g. most commonly road and sea, road and rail, or road and air. Multimodal transport is generally known in the USA as "intermodal transport", and in Europe it has also often been referred to as "combined transport", although this terminology appears to have been displaced to some extent by the term "multimodal transport".

Multimodal transport corridors in South East Asia can be considered as a long chain of individual segments linking traders within the region to traders worldwide. For the majority of cargo with origins or destinations in South East Asia, only a portion of the chain is subject to direct regulation or control by governments in the region (ESCAP, 1995a).

A limited number of studies have been conducted on transport corridors in the region (Leinbach & Chia, 1989; ESCAP, 1993 & 1994a; ADB, 1998). The main purpose of these studies was to identify the main non-physical impediments as well as to promote cross-border trade facilitation. One of the major limitations of these studies was the fact that they did not assess alternative scenarios for corridor selections. The other limitations were that none of these studies explored freight cost structure, transit time and reliability of multimodal transport corridors in the region within an international supply chain context.

Some authors (Boerne, 1990; Beresford & Dubey, 1990; Levander, 1992; Christopher, 1998; Beresford, 1999a) have modelled freight cost structure and transit time of European or North American multimodal transport corridors. Very little equivalent work has been carried out in South East Asia, which is why there is a need for research to be conducted on multimodal transport corridors in South East Asia. This research, therefore, presents new data and empirical insights into the selection of modal choices and route choices along multimodal transport corridors in South East Asia while proposing a conceptual model for logistics decision-making for routeing and mode selection.

1.2 AIM OF THE RESEARCH

The main objective of this research is to assess the various multimodal transport corridors currently being utilised, or that may be utilised, by traders in South East Asia. The research will focus on shippers and consignees in Lao PDR, the only land-locked country in South East Asia, when trading internationally. The specific objectives of the study can be briefly described as follows:

- 1. To appraise transport infrastructure in South East Asia;
- 2. To understand the regulatory framework that is in place in South East Asia with regard to transport and trade facilitation;
- 3. To comprehend transport usage in Lao PDR;
- 4. To examine the factors affecting modal choice in Lao PDR;
- 5. To explore and quantify the various multimodal transport corridors that are available to shippers and consignees in Lao PDR when trading internationally;
- 6. To assess the reliability of these multimodal transport corridors;
- 7. To determine how and by whom should these multimodal transport corridors be managed;
- 8. To propose a conceptual model for logistics decision-making.

1.3 RESEARCH HYPOTHESES

The purpose of this study is to explore three main hypotheses:

1. The selection of particular transport modes or combination of transport modes for freight transport to, from and within Lao PDR is constrained by a number of factors that are related to transport infrastructure, the nature of the product being transported, the transport decision-maker, the transport service offered and the prevailing commercial environment.

2. The most frequently utilised multimodal transport corridor for Lao PDR international trade may not be the most efficient or reliable, or even the cheapest or the most competitive.

3. The management of multimodal transport corridors in the South East Asian region is best performed by freight forwarders.

1.4 DATA COLLECTION

There were many difficulties involved in the search for relevant data with regard to freight transport in South East Asia. These difficulties include out-of-date data, incomplete data sets, ambiguous data values and complete lack of data in some cases. The political situation in some of the countries involved in the study also created many barriers to data collection, as many governmental agencies were reluctant to disclose their operating procedures and practices. Governmental agencies such as Customs, port authorities, Ministries of Transport, Finance and Construction formulate and shape national as well as regional trade, transit and transport policies.

Data collected from private enterprises were also quite difficult to obtain, as many of the data required for this research are considered commercially sensitive. These private enterprises consisted of freight forwarders, transport operators, shippers (wood and garment), importers (foodstuff), etc. Access to data had to be negotiated on every level. A list of people met or interviewed for this study is provided in Appendix A.

1.5 RESEARCH METHODOLOGY

A case-study methodology was used for this research. According to Yin (1994), a case-study methodology is deem ideal for a situation where little is previously known, and the purpose of the research is to gain an understanding of the phenomenon being studied. Through this methodology the author was, thus, able to develop a better understanding of how transport mode selection was made as well their implication on multimodal transport corridors in South East Asia.

A "triangulation" research technique was formulated and applied by combining a number of research methods. The research utilised a questionnaire survey with unstructured interviews and transport modelling to examine the question of international freight transport practices to and from Lao PDR and multimodal transport corridors in South East Asia. The first stage of the research involved an empirical investigation into transport usage and the factors affecting the selection of transport mode. This was conducted through the use of questionnaire surveys. The second stage of the research involved in-depth unstructured personal interviews to collect data for the transport modelling aspect needed to explore and assess multimodal transport corridors in South East Asia.

1.6 STRUCTURE OF THE THESIS

The structure of the thesis can be separated into three parts (see Figure 1.1). The first part is the background of the research, which is presented in Chapters 2, 3 and 4. The second part, Chapter 5, concerns the research strategy and methods used in the study. The third part discusses the results of empirical findings (Chapter 6, 7 and 8) and conclusions (Chapter 9). The contents of each chapter are presented below:

• Chapter 1 begins with a general background related to the research. Then the aim of the study, the research hypotheses, data collection, research methodology and

the structure of the thesis are presented. The chapter concludes with the possible contribution of the research.

- Chapter 2 introduces the concept of multimodal transport. It begins with a definition of multimodal transport and explains transport terminology. The requirements for an efficient multimodal transport system are then examined for both the "hardware" and "software" aspects. Finally, logistics and supply chain management definitions are presented.
- Chapter 3 reviews the literature relating to transport corridors; multimodal transport competitiveness; modal choice selection, and logistics and transport modelling. The purpose of this review is to provide a perspective on previous publications and studies that have been conducted as well as to illustrate relevant research areas.
- Chapter 4 presents an understanding of the region that will be assessed in the research. Firstly, global trends in trade and logistics are explored in order to examine their numerous implications. Secondly, South East Asia is presented with a brief overview of the countries involved in the study. Thirdly, regional trade patterns and transport policies are examined in relation to cross-border and transit trade. Lastly, South East Asia's transport infrastructure is described along with its institutional framework.
- Chapter 5 proposes a framework for research methodology in transport and logistics studies, with a particular emphasis on case-study research strategy. "Triangulation" is then discussed and used as a research technique for this study. This chapter concludes with the different research methods used in the study.
- Chapter 6 presents the findings related to international freight transport practices and attitudes towards the selection of transport modes in Lao PDR. These findings are derived from an analysis of transport usage and attitudes towards transport modes in Lao PDR. Finally, external constraints to Lao PDR international freight transport are identified and discussed.

- Chapter 7 discusses the management of multimodal transport corridors in South East Asia. Freight forwarders are presented as the most capable entities to manage multimodal transport corridors within supply chains with a brief description of the freight forwarding industry in the region. A logistics decision-making model is proposed for routeing and mode selection done by regional freight forwarders.
- Chapter 8 evaluates alternative multimodal transport corridors that are available to traders in Lao PDR for export to and import from Europe and within South East Asia. A multimodal transport cost-model will illustrate the case study and helps identify the most competitive supply chain.
- Chapter 9 concludes the thesis with a summary of the research and a discussion drawn from the study's main findings. In addition, this chapter presents the limitations and applicability of the research. Finally, chapter 9 closes with suggestions for future research.



1.7 CONTRIBUTION OF THE RESEARCH

The research aims to provide an understanding of transport usage and choices in transport modes in a less-developed and land-locked country, such as Lao PDR, as well as identifying the strengths and weaknesses of multimodal transport corridors utilised by Lao traders when trading internationally. The freight forwarder is also proposed as the most capable entity for the efficient management of multimodal transport corridors with the help of a logistics decision-making routeing selection model.

It is hoped that this research will be of significance to academics, traders and policy makers in areas such as trade, transit, transport and logistics because the study will probably provide an insight into the impact of an efficiently managed multimodal transport corridor with regard to trade competitiveness. Such information can:

- Be of assistance to shippers and consignees when choosing a particular mode, or a combination of modes, of transport or a freight forwarder for export and/or import routeing;
- 2. Help forwarders and logistics operators to identify the most competitive multimodal transport corridors with the logistics decision-making model;
- 3. Show segments and links where national and regional policy makers can improve regional multimodal transport corridors. This can be done by eliminating infrastructure and institutional impediments.