2000

Relationship between trade imbalance and the competitiveness of container manufacturing industry in Vietnam

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RELATIONSHIP BETWEEN TRADE IMBALANCE AND THE COMPETITIVENESS OF CONTAINER PRODUCTION

Opportunities for developing the container manufacturing industry in Vietnam

By

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A dissertation submitted to the World Maritime University in partial fulfilment of the requirements for the award of the degree of

MASTER OF SCIENCE

in

SHIPPING MANAGEMENT

2000

DECLARATION

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflect my own personal views, and are not necessarily endorsed by the University.

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ACKNOWLEDGEMENTS

I wish to express my wholehearted appreciation and gratitude to the following persons who in one way or the other have made my study at World Maritime University a success:

To The General Director of Vietnam Sea Transport and Chartering Company (VITRANSCHART), Vo Phung Long for having the faith and confidence in me and nominating me to the Shipping Management course at the World Maritime University;

To the people behind The Carl Duisberg Gesellschaft e.V. (CDG) of Germany for their generosity in granting my fellowship for this study;

To my supervisor, Course Professor. Shuo Ma for being supportive in the preparation of this paper; and to all Professors and Lecturers who have given solid knowledge in maritime field to me;

To the staff of the WMU Library for their patience and never fading smile when assisting me in the search for books and other materials; and Teachers of English for improving my English;

To my wife Nguyen Kim Oanh, who had to manage and undergo the hardships alone for this time;

To my parents and other family members, who encourage and support me to realise my ideal;

To all my colleagues and other fellow students whose togetherness has been a source of strength all along;

To all the people who have given me support and assistance but not been mentioned here.

ABSTRACT

Title of Dissertation: **Relationship between Trade Imbalance and The Competitiveness of Container Production - Opportunities for developing the container manufacturing industry in Vietnam**

Degree: **M.Sc.**

The serious effects of trade imbalance have significantly impacted the container shipping industry, and it has forced container carriers to spend a huge amount of money for repositioning large volumes of empty containers among locations in the world. A question frequently asked is how container carriers could minimise container costs, particularly container repositioning costs?

This dissertation concentrates on the development and imbalance of trade, and the impacts of container imbalance problems on the container transport industry.

Trade imbalance, its relationship with the competitiveness of container production, forecasting demands and supply for containers is carefully considered. Especially, from the container logistics point of view, the competitive advantages of Southeast Asian countries for container manufacturing in this region have been analysed.

Finally, a brief look is taken at the competitive advantages of Vietnam in developing the container-manufacturing industry in Vietnam. The benefits of Vietnam in producing new containers as well as container carriers in minimising container costs have been presented.

The conclusion and recommendation chapter assesses the future of the concept and the anticipated advantages of Vietnam container manufacturing.

KEYWORD: Trade Development, Trade Imbalance, Competitiveness, Container Production, Logistics, Vietnam.

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LIST OF ABBREVIATIONS

ADB	Asian Development Bank
AFTA	ASEAN-Free Trade Agreement
APEC	Asia Pacific Economic Cooperation
APL	American President Lines
ASEAN	Association of South-East Asian Nations
BIMCO	Baltic and International Maritime Council
CEPT	Common Effective Preferential Tariff
CIMC	China International Marine Container
CIS	Commonwealth of Independent States
COSCO	China Ocean Shipping (Group) Company
DF	Dry freight
EB/WB	Eastbound/Westbound
ECR	Efficient Consumer response
EDI	Electronic Data Interchange
EDI	Electronic Data Interchange
ERTW	Equatorial-Round-The-World
FDI	Foreign Direct Investment
FEFC	Far East Freight Conference
GDP	Gross Domestic Product
HMD	Hyundai Mipo Dockyard Co., Ltd.
HPI	Hyundai Precision and Industry
IFC	International Finance Corporation of the World Bank
ISL	Institute of Shipping Economics and Logistics
ISO	International Standard Organization
JIT	Just-in-Time
MCI	Maersk Container Industry
MFN	Most-Favored Nation
MISC	Malaysia International Shipping Corporation Berhad

MOL	Mitsui OSK Lines
NAFTA	North America Free Trade Association
NPX	New Panamax
NYK	Neptune Orient Lines
OECF	Japan's Overseas Economic Cooperation Fund
OOCL	Orient Overseas Container Lines
P&O	Pearl and Orient Lines
QR	Quick response
RTW	Round-The-World
TEU	Twenty- foot equivalent unit
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Program
US	United States
US$	United States Dollars
USA	United States of America
VINALINES	Vietnam National Shipping Lines
VINAMARINE	Vietnam National Maritime Bureau
VINASHIN	Vietnam Shipbuilding Industry Corporation
VSC	Vietnam Steel Corporation
WB	World Bank
WTO	World Trade Organization

CHAPTER 1

INTRODUCTION

Container shipping services have been developing significantly and play a key role as a central part in the global trading network, carrying about 60 percent of the value of goods ships by sea. They provide faster, more frequent and reliable transport for almost any cargo to almost any foreign destination at a predictable charge (Stopford, 1997). On the other hand, in order to satisfy the needs of global customers, the global trends of container services like globalisation, mergers and acquisition, alliances, deregulation, increasing vessel size, supply chain management and the downward trend in freight rates have become very important in the container transportation industry today. In particular, the downward trend in freight rates also plays a very important role in enhancing the competitiveness of container shipping carriers.

The liner shipping market is highly competitive. The competition is now focused on not only the quality of the services but also the price of transport services. One of the key factors for container carriers to reduce the price of the services is then to minimise the transport service costs. The reduction of service cost can normally be done through both or either of two methods: to increase the productivity of the transport services and/or to use cheaper factors of services (Ma, 1999). Particularly

in the container transport services, the management of container costs is one of the important tasks of container carriers.

Trade imbalance has in recent years forced container carriers to spend a huge amount of money on repositioning empty containers. According to the estimation of Drewing Shipping Consultants, the total annual cost of empty container repositioning for container operators by sea, road and rail is around 10 billion dollars (Fairplay, July 1999). This has led to an increase of freight rates in container transport services by adding the empty container repositioning cost into container costs. Finding the best solutions to minimise the container costs, especially empty container repositioning costs, has become a key factor for container carriers to reduce the freight rates of container transport services, and by then improve their competitiveness.

This paper aims to present the impacts of trade imbalance on the container transport industry and analyse its relationship with the competitiveness of container production. Furthermore, from a new logistics point of view, considering and analysing the best location for container production will be discussed in detail. The main purpose of this study, therefore, is to study a solution for minimising the container logistics cost in the container transport services from the analysis of relationship between trade imbalance and the competitiveness of container production.

This paper has seven chapters. Chapter one is the introduction. Chapter two presents the international containerisation and container imbalance problem, especially the impacts of the container imbalance on the container transport industry. Chapter three analyses the competitiveness of container production and its relationship with trade imbalance. This is supported by Chapter four that shows demand forecasting and supply for containers, and particularly presents a new logistics concept in supplying containers. Chapter five analyses South East Asia- a location for container manufacturing focusing on the competitive advantages of this region and considering

container logistics costs. Further, Chapter six will analyse the opportunities for developing the container manufacturing industry in Vietnam, especially forecasting the container imbalance- export container demand, considering sources of competitive advantages and disadvantages of Vietnam in container manufacturing and benefits of the container production in Vietnam. Lastly, Chapter seven will present some conclusions. More importantly, this chapter will contain recommendations based on the analysis and conclusions made. Those recommendations are geared towards developing the container manufacturing industry in Vietnam.

This study has been carried out with materials gathered from lecture notes, seminar papers, field studies, interviews with container lines and lessors, and library research as well as personal experience. However, it was impossible to carry out an in-depth analysis of the comparative advantages of Southeast Asia countries in general and Vietnam in particular in container manufacturing without additional data and information. In particular, lack of specific statistics and records also prohibits the author to present and analyse container logistics costs.

CHAPTER 2

INTERNATIONAL CONTAINERISATION AND THE CONTAINER IMBALANCE PROBLEM

2.1 Development of Trade and International Containerisation

Trade volumes are increasing. The total volume of trade and its transport are growing faster than the world's GDP. In 1995, world output grew by 3.7 per cent, the value of trade increased by 15.4 per cent and total freight rose by 12.8 per cent (UNCTAD, 1997). In 1997, world output increased by 3 per cent and the volume of trade rose by 9.5 per cent.

Between 1990 and 1998, world seaborne trade grew at an average annual rate of 3.3 per cent, which is more than four times the rate recorded for the 1980s. The volume of world seaborne trade reached a record high of 4.95 billion tons in 1997 (UNCTAD, 1998) and hit a new record of over five billion tons (5,064 million tons) in 1998 (UNCTAD Press Release, Feb 1998). One third of this total volume in 1997 is approximately general cargo, of which about half was containerised liner cargo (825 million tons).

The containerised liner cargoes have been dramatically growing in recent years and will continue increasing more quickly in the first decade of the next century. The increase in containerised cargo volume will be concentrated mainly on South East Asia, Africa and South America (see Table 2-1).

Table 2-1: Volume forecast per region (million TEU)

	Region	1998 – 2000		2000 - 2008		2008 - 2016	
		2000 Total Volume	1999-2000 Average Annual Growth	2008 Total Volume	2000-2008 Average Annual Growth	2016 Total Volume	2008-2016 Average Annual Growth
1	Europe	55	7%	85	6%	116	4%
2	Middle East	14	9%	27	8%	40	5%
3	North East Asia	60	8%	106	7%	160	5%
4	South East Asia	38	10%	83	10%	148	7%
5	North America	30	5%	48	6%	67	4%
6	South America	17	10%	33	9%	50	5%
7	Africa	4	6%	9	10%	17	8%
	Total	218	8%	391	8%	598	5%

Source: Ocean Shipping Consultants Ltd., World Container Port Markets to 2012, 1999

The increasing significance of containerisation is a reflection of the chances that have occurred in the international organisation of manufacturing and production. A greater share of world output is now entering the global trade markets, largely as a result of the move to low cost offshore production zones in places such as South East Asia, China, South America, India, and Eastern Europe. A greater proportion of the cargo now moving internationally is of a manufactured or semi-manufactured nature.

In recent years, intra-regional trades have been expanding significantly, especially in South East Asia. The total seaborne general cargo movement in the intra-Asian liner

market, excluding that of China, is estimated to have reached 5,7 million TEU in 1997 (UNCTAD Press Release, Feb 1998).

Containerisation is a major and increasingly important sector not only of maritime activity but also of world trade, and of the entire global industrial structure. According to Robert Woods, chairman of the Far East Freight Conference (FEFC), who believes that containerisation has been an excellent catalyst for the growth in world trade (Containerisation International, March 1999, p.49).

This process has to a large degree been facilitated by the container transport system, so that containerisation has in part created its own market. The container has thus directly helped to integrate a number of countries within the mainstream of the global economy.

The increasing integration of developing regions such as South East Asia, Latin America and the Caribbean into the global economy has led to a particularly fast rise of the containerised maritime transport of their foreign trade.

Otherwise, the globalisation of economy and the increasing unit value of transported goods have led to a growing share of containerised transport. The requirements of just-in-time delivery have also led to an increased containerisation of general cargo. In volume terms, the rate of containerisation of general cargo and the proportion shipped by liners is expected to grow to 65-75 per cent by the second decade of the next century (Hoffman, 1998).

Container shipping transport is the fastest growing market in the maritime transport sector in the past decade and will continue to grow due to the following reasons:

- One of the trends towards globalisation by leading multinational companies is to continue searching for low costs. This will move the industrial focus to new locations such as South East Asia.

- The expansion of containerised shipping by developing countries will continue in the coming years.

- The establishment of trade liberalisation such as the Uruguay Round of the General Agreement on Tariffs and Trade, the North America Free Trade Association (NAFTA), and the ASEAN-Free Trade Agreement (AFTA), tariffs on industrial goods will be decreased and some regions will move toward more open trading regimes. This will continue producing a dramatic rise in container trade in some countries. For instance, South East Asia will grow rapidly, while mature economies in North America and Europe will be slower in the future.

- Trade will be increased in higher value goods and the mode of shipment will be more affected than the overall volume. This should lead to further increase in the container share of the general cargo market.

- The growth in deep-sea ship size and the subsequent increase in feeder traffic and the continuing increase in the incidence of transhipment will promote 'induced' growth in the level of container traffic. By 2005, transhipment is forecasted to represent 26.8 per cent of all container activity, which could equate to almost 82 million TEU of port handling moves, or 41 million TEU of feeder cargo movement (Peters, 2000).

2.2 Global liner shipping market, the container imbalance problem and its impacts on the container transportation industry

2.2.1 Global liner shipping market

The number of containers shipped globally increased steadily over the past years. The majority of cargo shipped by shipping lines is mainly traded among the north hemisphere industrialised regions of North America, Europe and East Asia. The number of containers shipped was from 52.7 million TEU in 1984 to 163.7 million

TEU in 1997, approximately by the average annual increase growth of 9.6 per cent (see Table 2-2).

Table 2-2: World container traffic - 1984 to 1997

Year	Container traffic (million TEU)	Percentage annual increase	Year	Container traffic (million TEU)	Percentage annual increase
1984	52.7	15.7%	**1991**	93.6	9.3%
1985	55.8	5.8%	**1992**	102.9	9.9%
1986	59.4	6.5%	**1993**	113.2	10.0%
1987	67.3	13.3%	**1994**	128.3	13.3%
1988	73.8	9.7%	**1995**	137.2	6.9%
1989	78.5	6.4%	**1996**	147.3	7.4%
1990	85.6	9.0%	**1997**	163.7	11.1%

Source: Containerisation International Yearbook (various issues, quoted in LSS, sub.10, p.8); DTRS (sub.3, p.6).

The main types of services are east-west, north - south and intra- regional trades. East - West trades account for around 45 per cent of world liner traffic, north - south trades make up almost 22 per cent and intra- regional trades the remaining 33 per cent (Hoffmann, 1998).

2.2.2 Container imbalance and its impacts on the container transport industry

In recent years, the number of empty containers shipped has increased quickly due to imbalance in cargo movements mainly between the three major trade routes (Transpacific, Transatlantic and Asia-Europe) (see Table 2-3 and Figure 2-2). This problem would continue to happen in future (see Figure 2-1).

The container imbalance problem has created great difficulties for the container transport industry. Moving empty containers has always been a costly exercise for

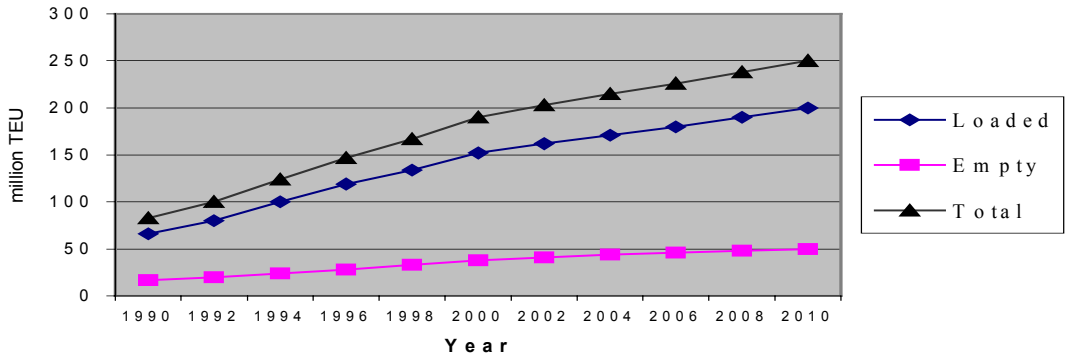
ocean carriers. These costs will finally pass on to existing customers who have no alternative means of transportation available. One firm of consultants estimates that ten billion dollars is the total annual cost of empty container repositioning for container operators - by sea, road and rail (Fairplay 1999, p.22). Trade imbalance not only causes immense cost of repositioning and container logistics, but has also had adverse effects on rate restoration efforts particularly in liner shipping.

Table 2-3: Container imbalance through cargo movements on the three major liner trade routes for 1995-1998 and forecasts for 1999-2000

Year	Container imbalance (TEU)= import-export cargo containers		
	Asia	Europe	USA
1995	-1,066,000	288,000	778,000
1996	-1,142,000	356,000	786,000
1997	-1,603,000	276,000	1,327,000
1998	-2,672,000	408,000	2,264,000
1999	-3,120,000	544,000	2,576,000
2000	-3,421,000	522,000	2,899,000

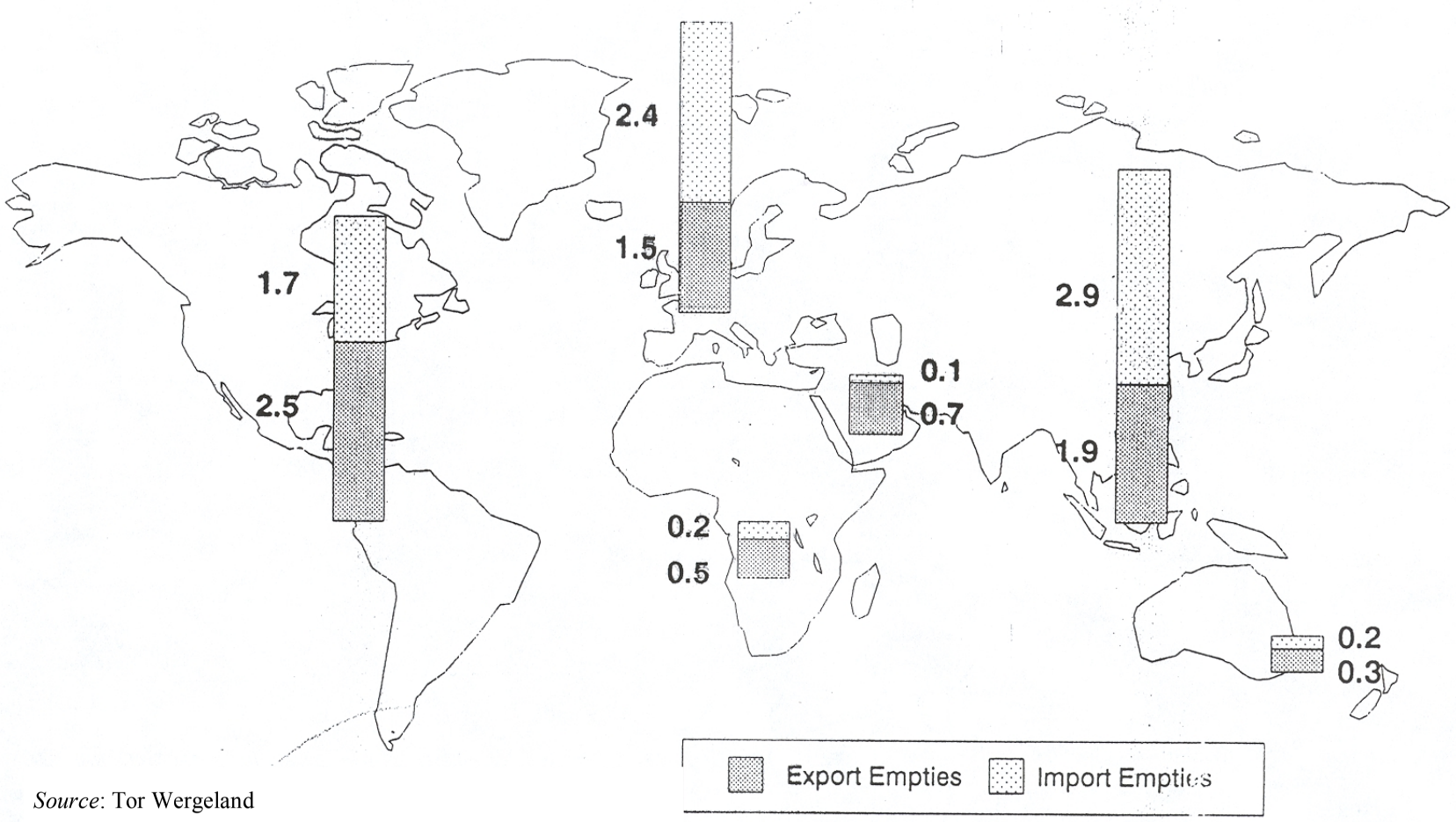
Note: European trades do not include the Mediterranean.
Source: Review of Maritime Transport 1997 & 1999.

Figure 2-1: World container movements



Note: 2000-2010 = estimates
Source: Containerisation International Yearbook data, Containerisation International, April 1999.

Figure 2-2: THE GLOBAL EMPTY CONTAINER PROBLEM
(Million TEU)



Source: Tor Wergeland

It is estimated that the current cost of repositioning empty containers around the globe now exceeds US$25 billion per year and could exceed US$50 billion by 2010. In addition, the cost of providing further land storage and wharf facilities to accommodate these empty containers could cost billions of dollars (Jarman, 1999).

Imbalance in the container trade leaves container operators with the endless management of empty boxes. This problem has been particularly exacerbated by the Asian crisis beginning in the middle of 1997, with higher outgoing cargo from Asia and simultaneously reduced inbound cargo to Asia.

Moreover, the imbalance in container trade has forced all carriers serving these trades to pay additional operating expenses as the need for repositioning empty boxes increases. For instance, the FEFC, which covers 70 per cent of the slot capacity on the trade between Europe and Asia, provided statistics showing that eastbound volumes in the first half of 1998 were 16 per cent lower than in the same period for 1997, while the westbound shipments increased by 20 per cent. In 1998, the imbalance in cargo movements between the eastbound and the westbound is around 1.9 million TEU on the transpacific trade routes and 0.4 million TEU on the transatlantic trade route. Like the Europe-Asia trade route, trade imbalance is due to its nature. The heavy cargoes in mainly 20 foot containers have moved east, but lighter cargoes, such as electrical goods, garments and footwear, which are more suited to 40 foot and 45 foot containers, have moved west.

The figures in Table 2-4 provided by the FEFC, whose members represent about 60 per cent of the trade, show that an imbalance between the east and west bound routes of more than one million TEU. This number of container volume is double the level of 1997 and a more than fivefold increase since 1994. The fact that cargoes moving on the eastbound trade are heavy cargoes stuffed in 20-ft boxes while cargoes moving on the westbound flows needed mainly 40/45ft high cube units. In the October 1997 to December 1998 period, according to Robert Woods, chairman of the FEFC, on a

round trip basis an additional expenses for repositioning empty equipment was US$200 million.

Table 2-4: The FEFC'C growing EAST/WEST imbalance (TEU)

Conference/Year	1993	1994	1995	1996	1997	1998
Asia Westbound Rate Agreement	781014	848976	1070235	1357568	1532213	1923294
Japan/Europe Freight Conference	298449	296723	304677	320050	349531	409295
WB total	1079463	1145699	1374912	1677618	1881744	2332589
EB Management Agreement	840289	952815	1001386	1340521	1381884	1323433
EB/WB difference (actual)	239174	192884	373526	337097	499860	1009156
EB/WB difference (%)	-22,20%	-16,80%	-27,20%	-22,20%	-26,60%	-43,30%

Notes: Figures relate to conference carriers only. Year-on-year growth figures have not been calculated because of differences in conference membership between the years; The FEFC controls about 60 per cent of the total trade;
Members: APL; Compagnie Maritime d'Affretement; DSR-Senator; Egyptian International Shipping Co; Egyptian Navigation Co; Hapag-Lloyd Container Line; Hyundai Merchant Marine; K Line; Maersk; MISC; Mitsui OSK Lines; National Shipping Co of Saudi Arabia; NYK Line; OOCL; P&O Nedlloyd; Sea-Land Service; Yangming.

Source: FEFC; Containerisation International, March 1999.

Since carriers will spend millions carrying empty containers back to Asia on the transpacific trade, the repositioning costs will become a negotiating point between carriers and importers. For shippers, they were forced to pay premiums to secure space on vessels during the busy peak-shipping season. On the other hand, some carriers had to charter vessels just to carry the empties back to Asia. That move cost about one million US dollars.

The figures in Table 2-5 provided by the Ministry of Trade of Vietnam show that the trade imbalance in cargo movements between export cargoes and import cargoes in Vietnam in 1997 was around 10,000 TEU. Therefore, a number of empty containers were moved to Vietnam.

Table 2-5: The container volumes of export - import cargo in Vietnam

No.	Commodity	1997 (TEU)
1	Volume of export cargo container	381,000
2	Volume of import cargo container	372,000

Source: Ministry of Trade of Vietnam, 1998.

CHAPTER 3

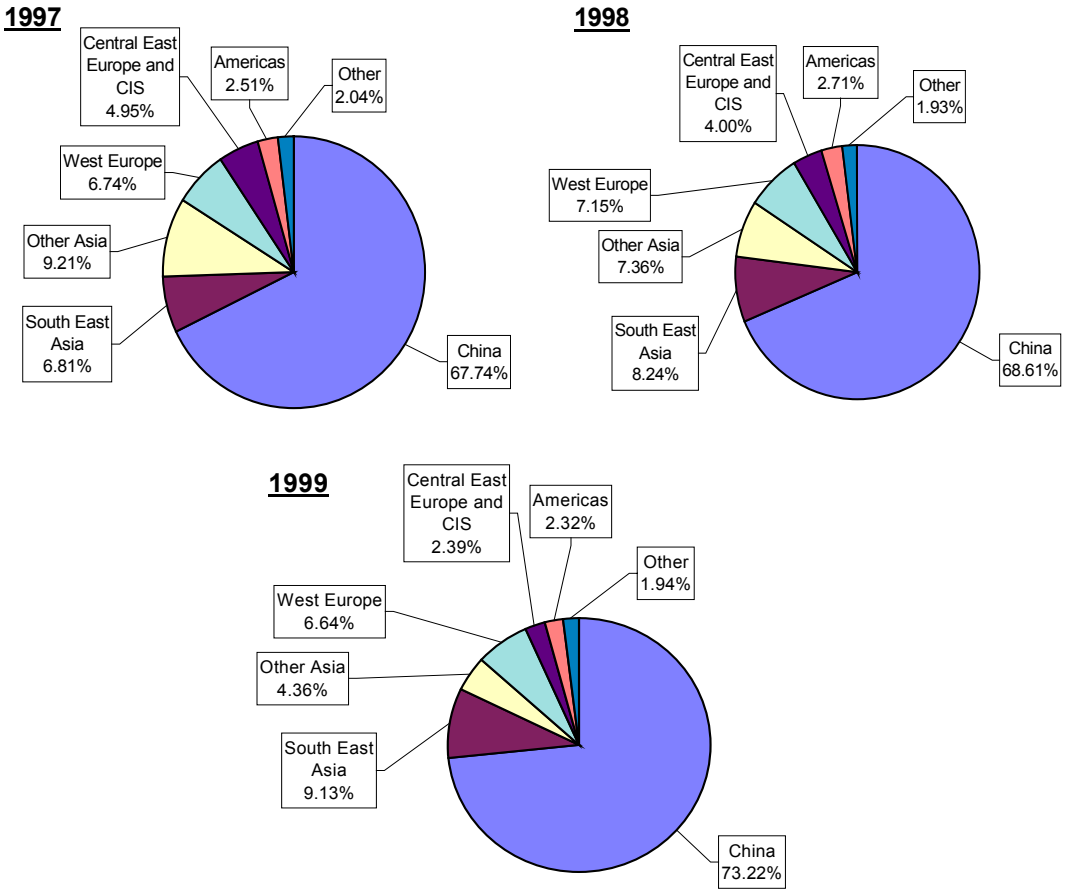
THE COMPETITIVENESS OF CONTAINER PRODUCTION AND ITS RELATIONSHIP WITH TRADE IMBALANCE

Being a labour-intensive industry with more than three billion US dollars in annual, the freight container manufacturing industry has attracted a fast-growing number of manufacturers in low-wage countries in East Asia, particularly China (Thuong, 1997). This country has replaced South Korea as the world's leading manufacturer of standard dry freight containers, repeating the history of the last decade when South Korea replaced Japan as the market leader. The significant growth of Chinese container producers has driven a few competitors in other countries out of the business and prompted other manufacturers to invest in offshore plants or focus on niche markets like reefer, tank and region-specific containers (Thuong, 1997). This chapter will analyse and consider the competitiveness of leading container-producing countries and its relationship to trade imbalance.

In 1999, although the container output volume from regions like Europe and America decreased, China and South East Asia still increased by 4.54 per cent and 8.64 per cent respectively. Container product output from China was expected to meet 73.22 per cent of global container production in 1999. This compared with a share of 68.61 per cent taken in 1998 and 67.74 per cent in 1997. A share of South East Asian

container production was also expected to increase from 6.81 per cent of global production in 1997 to 9.13 per cent in 1999, as shown in Figure 3-1.

Figure 3-1: Ratio of container output 1997-1998 by main country-region



Notes: figures include maritime and regional container types.
Source: Containerisation International Market Analysis, 1999

3.1 The European container manufacturing industry

In recent years, European container manufacturers have long lost their mainstream business to the Far East. They are continuing to switch emphasis away from mainstream dry freight boxes to more specialised, higher value production such as

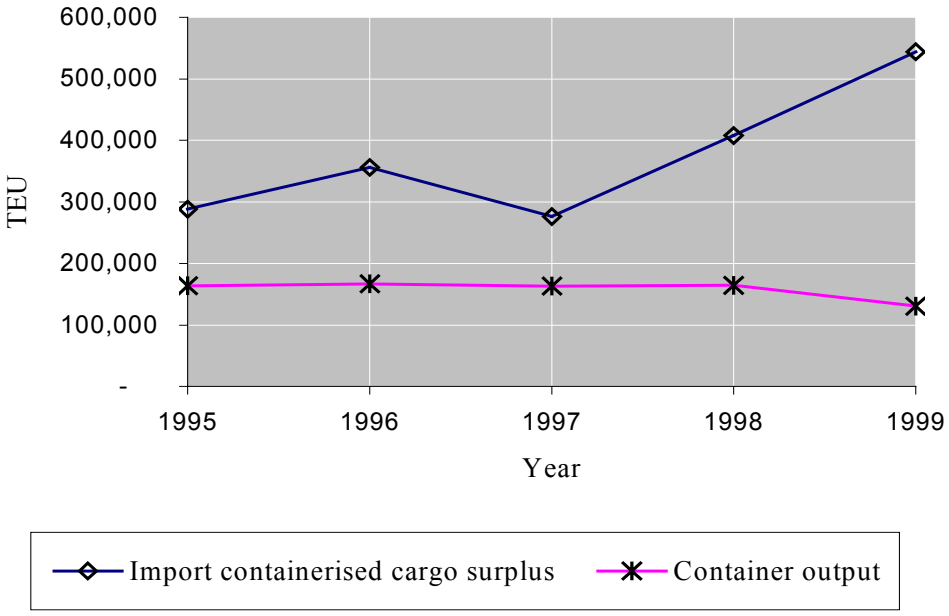
the production of steel-clad container-type swapbodies, ISO standard boxes and other special designs for the European inter-modal transport market. The vast bulk of standard dry freight container orders have migrated to Asia, and to low cost producers in China or Southeast Asia, where wages are still very low and the cost of manufacture has fallen dramatically. For example, standard 20ft production repositioned from China in the middle of 1998 was available in Europe for around US$2,100-2,200, which is well below cost for the majority of local producers (WorldCargo News, July 1998).

Moreover, the import containerised cargo surplus from trade imbalance increased dramatically over the past years, from 356,000TEU in 1996 to 408,000TEU in 1998. It is forecasted to reach 544,000TEU in 1999 and 522,000TEU in 2000 (Table 2-3 in Chapter 2). This caused a large number of empty containers in Europe and by then forced all carriers to move them to the place of container demand like Asia and have to pay additional operating expensive as the need for repositioning empty containers increases. Assuming that cost for repositioning empty containers from Europe to Asia is around US$250 - US$350 per TEU, container carriers would have to spend about US$130,500,000 - US$182,700,000 in 2000 on moving these empty boxes to Asia. That is why container operators such as shipping lines and container lessors prefer to purchase new containers from the place where the demand for containers is higher, like in Asia, instead of buying them in Europe. Furthermore, this is also one of the reasons which lead to the demand reduction of container production in Europe. The volume of container output from Europe in 1999 decreased by 20.7 per cent (Containerisation International, January 1999 and 2000).

Otherwise, the more the import containerised cargo surplus from container imbalance is, the fewer the demand of new container output is. From 1995-1999, container output from Europe decreased because the empty containers increased dramatically from container imbalance between import and export cargo movements on the two major liner trade routes (Transatlantic and Europe-Asia), as shown in Figure 3-2.

Due to the above situation, container manufacturers are building only standard boxes either in the lower cost regions of Central or Eastern Europe like Med Union Containers in Turkey, Abakanvagonmash in Russia and so on or rely on sizeable in-house production to keep them going like Maersk Container Industry (MCI).

Figure 3-2: Relationship between trade imbalance and container output from Europe 1995-1999



Notes: figures include maritime and regional container types.
Source: Containerisation International Market Analysis, 1997-1999

In 1999, the total volume of container output from Europe decreased by 20 per cent and only reached 130.5 thousand TEU, compared to 164.5 thousand TEU in 1997 and 163 thousand TEU in 1998. In particular, the container output volume from Central East Europe and CIS decreased dramatically by 14.5 per cent in 1998 and 41.5 per cent in 1999 (Containerisation International, January 1999 & 2000).

3.2 The Asian container manufacturing industry

With a share of nearly 90 per cent of global container production, Asia is regarded as the world's leading container manufacturing location, particularly China and South East Asia.

Table 3-1: Asian container production 1997-1999

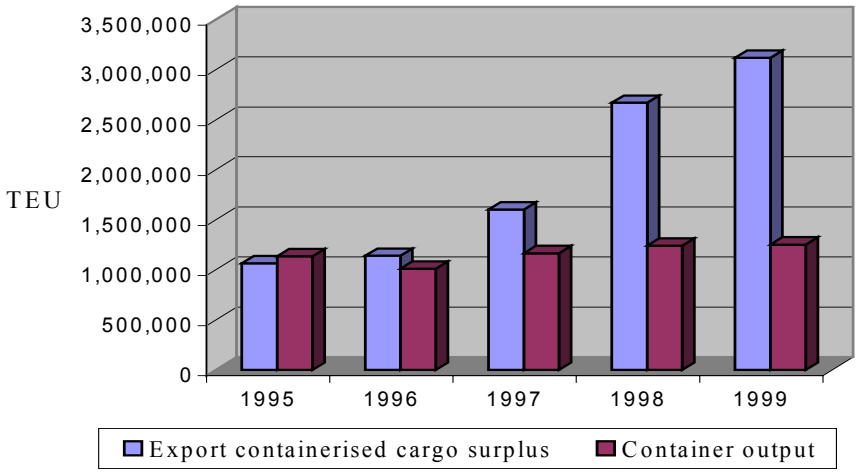
Region/country	1997	1998		1999	
	TEU	TEU	Annual growth (%)	TEU	Annual growth (%)
China	945,000	1,012,000	7.09%	1,058,000	4.55%
South East Asia	95,000	121,500	27.90%	132,000	8.64%
Other	128,500	108,500	-15.56%	63,000	-41.94%
Total	1,168,500	1,242,000	6.29%	1,253,000	0.89%

Notes: figures include maritime and regional container types.
Source: Containerisation International Market Analysis, 1999.

Container output from Asia increased by 6.29 per cent in 1998 and only 0.89 per cent in 1999. This means that it increased from 1,168,500TEU in 1997 to 1,253,000TEU in 1999 (see Table 3-1). Although the volume of container production from South Korea and Taiwan declined in 1998 and 1999, container output from China and Southeast Asia, mainly Indonesia and Thailand, still increased dramatically because of low labour cost, manufacture cost and the increase of demand for container due to container imbalance.

Over the past years, the situation of container imbalance in Asia is contrary to Europe and the USA. The export containerised cargo surplus increased rapidly, from 1,142,000TEU in 1996 to 2,672,000TEU in 1998. It is forecasted to reach 3,120,000TEU in 1999 and 3,421,000TEU in 2000 (Table 2-3 in Chapter 2). This led to the demand for new container to increase steadily (see Figure 3-3).

Figure 3-3: Relationship between trade imbalance and container output from Asia 1995-1999



Notes: figures include maritime and regional container types.
Source: Containerisation International Market Analysis, 1997-1999

3.2.1 Northern Asia

In recent years, dry freight container output from North Asia has increased dramatically, mainly from Chinese container manufacturers. Entering the business in the early 1980s, Chinese container producers spent much of that decade overcoming productivity and quality problems. The number of Chinese container producers jumped from four in 1990 to nearly 30 in 1993 (Thuong, 1997). By late 1998, their number reached 40 with nearly a million TEU in capacity; among them would be half-a-dozen builders entering the reefer business for the first time and at least 30 were presently known to be active. Of these, 25 are controlled by major groups like China International Marine Container (CIMC), Jindo Corp (of South Korea), etc (Containerisation International, January 2000).

The number of Chinese container manufacturers has increased rapidly due to the following factors.

First, China is a low cost nation and has a large labour force. Moreover, a large export cargo surplus from trade imbalance in China in recent years needs to be fuelled by large volume of empty containers, more than one million TEU (Thuong, 1997).

Second, most of the leading producers have received foreign investments and technical support through FDI inflows, mainly from South Korea, Hong Kong, Taiwan, Germany and Singapore.

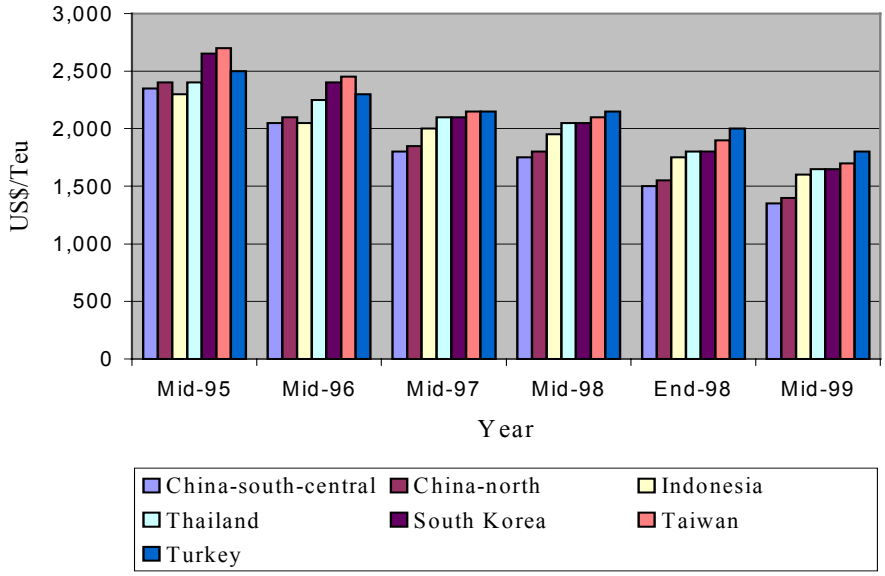
Third, Chinese container producers have been supported and linked vertically with material suppliers and /or leading buyers. Upstream, Chinese container manufacturers have utilised significant value of materials like roll steel and shared many common technologies and skills with industries such as shipyards (e.g. Guangzhou Shipyard Container Factory and Shanghai Shipyard Container Factory), metal fabrication and cargo handling equipment production. Downstream, leading shipping lines commonly hold equity shares and/or provide technical supply to container producers. Their participation gives them a secured supply of new container competitive prices and provides the producers with a steady container base. For instance, a few wholly Chinese-owned container plants are associated with China Ocean Shipping (Group) Company (COSCO-the country's national shipping lines) and Sinotrans (the leading freight forwarder), these two transportation service providers are among the largest buyers of Chinese-built containers.

Fourth, recent upgrading of mainland ports has allowed direct calls by deep sea container lines at these ports, encouraged these lines and container lessors to establish of container depots in China, and boosted containerisation of export cargoes directly from the mainland.

Fifth, the majority of container factories in China have been financed (or at least part-financed) with state-endorsed funds, usually with local or regional agencies. Instead, most factories are required to operate for a pre-set number of years, regardless of

performance, before the state-owned backer will permit production to be phased out. It is understood to be largely a question of prestige, as well as a need for the backer to recover at least some of the initial heavy investment made in the plant. As such, achieving turnover and earning foreign exchange remains the priority for some factories, ahead of purely maximising profit. This situation helps explain why Chinese container prices have been in free-fall for so long. Average prices fell by around 20 per cent throughout 1998, which compared to a drop of 15 per cent in 1996 and only 10 per cent in 1997 as shown in Figure 3-4 (Containerisation International, August 1999).

Figure 3-4: Standard dry freight container prices for selected manufacturing regions for period 1995-1999



Notes: 40ft prices cover standard 8ft 6in height (the corresponding 40ft high cube price is 5-6 per cent higher); all prices refer to ex-works delivery and largely Corten specifications
Source: Containerisation International Market Analysis, Containerisation International, August 1999

Presently, container manufacturers in China are reckoned to control more than 80 per cent of global dry freight production, while their share of world reefer output has now risen to almost 30 per cent (Containerisation International, August 1999).

On the other hand, Chinese container prices have been affected by the cost of imported raw materials like plywood, timber stock from Indonesia. For instance, the prices of Indonesian plywood has jumped from around US$420 per cubic meter late in 1998 to over US$700 by mid-1999. This has had the effect of adding more than US$100 to the cost of a 20ft container floor set, increasing it to over US$280 in 1997 (Containerisation International, August 1999).

In brief, Chinese container factories have been supported by various factors such as a near permanent surplus of capacity, low manufacturing costs, cheap finance, increased economies of scale and an acceptance of negligible profit margins or even mounting losses.

In contrast to China, South Korea and Taiwan (China) have cut back sharply their production of standard dry freight containers since the early 1990s. They were the world's largest and second largest container producing nations, respectively, in the early 1990s. Taiwan was bypassed by China in 1992 and so was South Korea in 1993 due to rising labour wages and/or currency value at home (Thuong, 1997). They find it increasingly difficult to maintain their cost competitiveness against Chinese and Southeast Asian competitors. Instead, they now only focus on reefer containers and invest in offshore plants. For example, some South Korean container producers like Hyundai Precision and Industry (HPI) and Jindo have been active in setting up offshore production of dry freight containers, with at least 20 plants in China, South East Asia, India, Mexico and others who are low cost countries.

3.2.2 South East Asia and other Asian regions

Container manufacturers in South East Asia, like their Chinese counterparts, increased in number and expanded their production capacity sharply during the 1990s. There were just five container factories still operational in South East Asia until the beginning of 1999, mainly in Indonesia, Thailand and Malaysia (Containerisation International, January 1999). The only dry freight factory left of

any size is Kumbong Heavy Industries, based near Jakarta Indonesia, which has benefited from a regional boom in the demand for export containers and boosted its output to almost 90,000TEU in 1999 (Containerisation International, January 2000).

Like China, most of the leading container producers in South East Asia have also received foreign investments and technical support, mainly from South Korea. They have been linked with material suppliers and/or leading buyers. For example, the Chuan Yuan Steel Industry, Taiwan's second largest steel producer, is also a joint venture partner in container plants in Thailand and Malaysia. Several producers (e.g. Bangkok Container Industries and Marine Container Company) feature equity participation by COSCO and Japanese business groups with shipping interests.

Being a low wage country outside East Asia, India has developed container production capacity. However, dry freight container output from this country declined rapidly from 1995-1999 due to the rapidly development of Chinese and Southeast Asian container competitors (see Table 3-1). Now there are only three container factories that are operating in India.

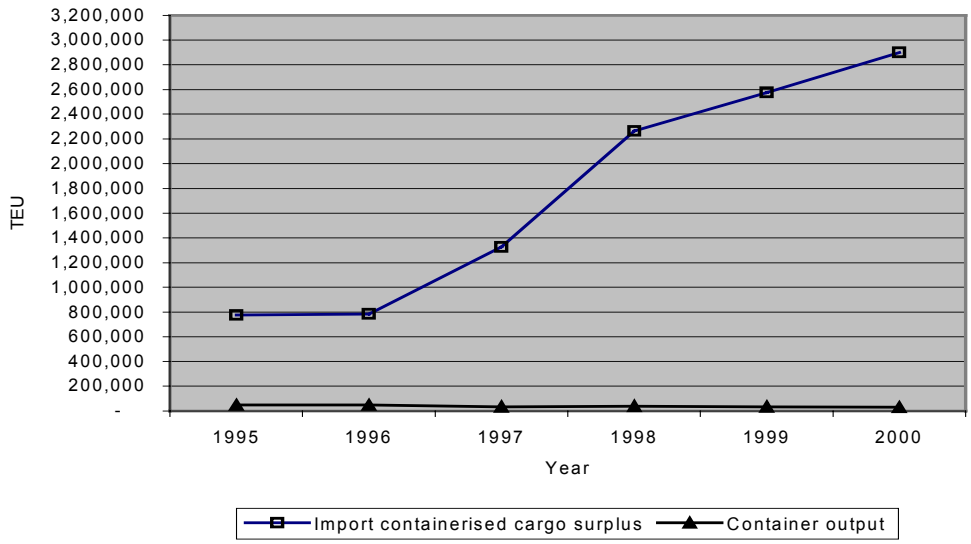
3.3 The Americas and other regional container manufacturing industry

As shown in above Figure 3-1, Americas container output in 1999 accounted for only 2.32 per cent of global container production, compared with 2.71 per cent in 1998 and 2.51 per cent in 1997. The reason can be explained by the decrease of container demand in USA.

Most of Americas container producers such as Mexican manufacturers focused mostly on the United States domestic containers where it holds a location advantage over east Asian competitors. In the mean while, the trade imbalance between imported and exported containerised cargoes in USA over the past years, on the two main liner trade routes (transpacific and transatlantic), increased rapidly from 768,000TEU in 1996 to 2,264,000TEU in 1998. Therefore, this trade imbalance

made the container demand in USA decline dramatically. It is forecasted to continue increasing in the coming years from 2,576,000TEU in 1999 and 2,899,000TEU in 2000 and by then the demand for containers is expected to decrease (see Figure 3-5).

Figure 3-5: Relationship between trade imbalance and container output from USA for 1995-1998 and forecasts for 1999 and 2000



Sources: Containerisation International Market Analysis 1997-1999.

In brief, container imbalance has significantly impacted the container demand. The more the import containerised cargo surplus from trade imbalance is, the fewer the containers demand is, and vice versa.

CHAPTER 4

FORECASTING DEMAND AND SUPPLY FOR CONTAINERS - NEW LOGISTICS CONCEPT

4.1 Forecasting demand for containers

Forecasting demand for containers is one of the necessary activities required to facilitate the flow of containers from point of production to point of consumption. The following are major factors affecting the demand for containers.

4.1.1 World containerised cargo development

The significant developments in world containerised cargo has created a demand for world container production. The volume of containerised liner cargo has been dramatically increasing in the coming years because of the significant increase of manufacturing cargo trade.

The volume of world container traffic reached 188 million TEU in 1998 and it is expected to reach 301 million TEU in 2004, 393 million TEU in 2008, 492 million TEU in 2012, and 598 million TEU in 2016 (see Table 4-1). The increase of

containerised cargo traffic would be mainly concentrated on the South East Asia, North East Asia, Europe and North America.

Table 4-1: Forecast World Container Traffic to 2016

Year	1997	1998	2000	2004	2008	2012	2016
Million TEU	176	188	218	301	393	492	598

Source: Ocean Shipping Consultants Ltd., World Container Port Markets to 2012, 1999.

The annual average ratio between total world container output and containerised cargo volume was around 0.8 to 1.1 percent over the past years (see Table 4-2). This ratio is also one of the necessary factors to estimate the annual volume of world container production.

Table 4-2: Ratio between Container production and Container traffic

Year	Container Production (thousand TEU)	Container Traffic (thousand TEU)	Ratio (%)
1990	800	87,000	0.92%
1991	920	96,000	0.96%
1992	1,130	105,000	1.08%
1993	975	115,000	0.85%
1994	1,145	129,000	0.89%
1995	1,390	145,000	0.96%
1996	1,285	158,000	0.81%
1997	1,405	175,000	0.80%
1998	1,475	188,000	0.78%

Source: Containerisation International Market Analysis and Ocean Shipping Consultants Ltd., 1999.

4.1.2 TEU capacity of the world fleet, mean ship's capacity and number of ships

The capacity of the world fleet in 1997 reached a figure of over 5 million TEU, with a total of 6,200 ships, including all types of vessels. By the end of 1998, the total

capacity of the container vessel fleet was 6 million TEU, of which cellular vessels represented 70 per cent (around 4.1 million TEU). This capacity presented an increase of 7.3 percent in the number of ships and 11.8 per cent in TEU capacity over the previous year) (see Table 4-3). According to the fleet statistics of Liner Shipping Network, by 01 March 2000 the total capacity of the world container fleet was 6,244,004 TEU with a total of 7,037 ships and in order was 801,576 TEU with a total of 274 ships.

Table 4-3: The world fleet - TEU capacity of fully cellular container ships 1995-1998 (end of year figures)

	1995	1996	1997	1998
Capacity - TEU	2,720,092	3,089,682	3,632,070	4,061,653
Number of ships	1,771	1,954	2,204	2,365
Average carrying capacity per ship	1,535	1,581	1,647	1,717

Source: Review of Maritime Transport 1999.

On the other hand, The more the mean capacity of the ships and number of ships are, the more containers are needed. The size of a container vessel has increased dramatically since the late 1960s and early 1970s (see Table 4-4). While the capacity of early container ships was less than 1,000 TEU, in 1997 the capacity of vessels greater than 4,000 TEU accounted for 15 per cent of the world container fleet. Moreover, orders for ships with capacity greater than 4,500 TEU was composed of almost 60 percent of container ship orders in that year. In future, the capacity of container ships will be greater than 6,000 TEU. These container ship types will include S-types (greater than 6,000TEU), Hyundai design (10,000TEUs), Suez Max (15,000TEUs) and Malaca Max (18,000TEUs).

According to Germanischer Lloyd, the first 8,000 TEU container ships should be operating before the new millennium. They also predicted that, by the year 2010,

several 15,000 TEU container vessels would be in operation on the biggest maritime routes.

Table 4-4: Growth in the size of ships in the world container fleet

Year	Class of type	Capacity (TEU)
1964-1967	First generation	1,000
1967-1972	Second generation	1,500
1972-1984	Third generation	3,000
1984-1995	Fourth generation	4,500
1995-present	Fifth generation (post-Panamax)	6,000

Source: Trace (1998b, p.11); Hoffman (1998, figure 1)

The increase in the size of container ships is a result of the increase in world-wide demand for liner shipping and the existence of economies of vessel size. Economies of vessel size exist when the unit costs of operating a ship decrease as the size of the vessel increases. For instance, the size of the world fleet of fully cellular containerships continued to increase with an average carrying capacity per ship growing from 1,535 TEU in 1995 to 1,717 TEU in 1998 (see Table 4-3), reflecting the general need to reduce operating costs through economies of scale. This development will continue given the number of Panamax and post-Panamax presently in order. At the end of 1998, there were 219 vessels on order providing a total additional capacity of nearly 580,000 TEU, scheduled to enter into service over the next couple of years. Of which 73 ships are the Panamax and post-Panamax size, with a total capacity of around 372,000 TEU or 33 per cent (ships) and 64 per cent (capacity) of the total order book (Review of Maritime Transport, 1999, p.15).

4.1.3 Ship service interval and container turnover time

In each market, the smaller the calling interval, the more containers are needed. Moreover, the quicker the container turnover time, the fewer containers are needed.

There are a lot of factors affecting the calling interval of ships, but two key factors, which normally influence it significantly, are the speed of the vessel and the distance between two the calling ports. Today, the average service speed of container ships is 25 knot and it seems that, at present, it is difficult to exceed a 26-knot speed without dramatically increasing running costs (essentially the fuel cost). Therefore, the calling interval is mainly based on the distance of calling ports. Fifteen years ago, most liner shipping was basis " point A to point B" transportation. Today ship, rail and truck connections are connected at port and inland multimodal terminals under a single, door to door freight bill.

In future, the long term of liner shipping is predicted to be shaped by a fourth revolution, the revolution in service pattern. With the expansion of the Panama Canal's lock, there will be an emergence of equatorial-round-the-world (ERTW) and a grid of supporting feeder services. This revolution involves a massive conversion of end-to-end, pendulum and traditional round-the-world (RTW) patterns into new equatorial RTWs will employ new Panamax (NPX), which will be able to maintain a service speed of 28 knots (similar to that of the newest ro-ros). At that time, the transit time to complete a full ERTW circle will be 45 days and between Asia and Europe using ERTW with two transfers (in Asia and the Gibraltar) would only be 20 days. It is considerably less than the 25 days of the present direct Asia/Europe services (Containerisation International, Dec 1999, pp.57-61).

Container turnover time usually depends on the market. If the market is very big, the container turnover time will be slow. The developments of the door-to-door service and multimodal transport have particularly created more demand for containers, which are being used in inland transport. The numbers of shippers who prefer to stuff containers at their factories and warehouses than at a container yard at the port have dramatically increased. In future, multimodal transport will continue

developing in Asia, South East Asia, South America and Africa. Therefore, the number of containers which are used to transport goods inland will increase.

4.1.4 Space utilisation ratio and container off service for repair

The demand for containers also depends on space utilisation ratio and container off service for repair. The higher the space utilisation ratio, the more containers are needed for service. Likewise, the more containers off service for repair are, the more containers are needed to operate the container liner service.

Otherwise, in order to operate efficiently a container liner service, carriers are interested in calculating not only the numbers of container needed for operating in service but also the numbers of containers off service for repair. Carriers do it because they have to ensure that empty containers are always available for shippers.

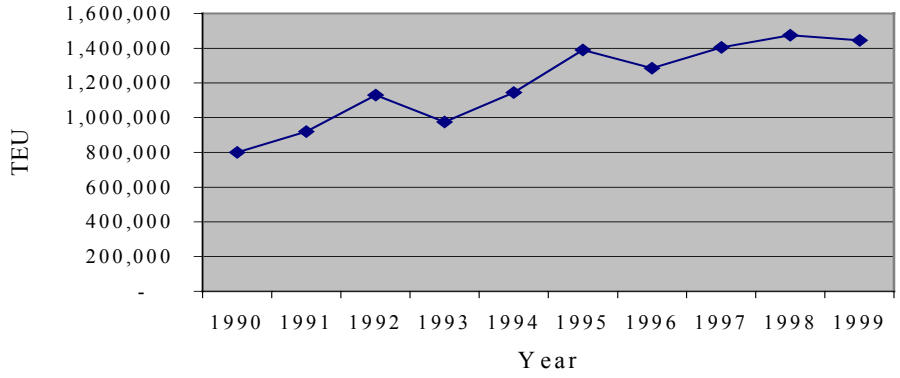
4.2 Supply of containers

By the end of 1999, world container output reached a total of 1,445 thousands of TEU, which was expected to decline by only 2 per cent on that returned in 1998 due to the Asian economic crisis and was significantly above the total reported in 1997. This was also indicated by the prospect of slower trade growth (see Figure 4-1).

The strength of container production in 1997-1998 was generated by a continuing strong growth in global container trades, which were in turn supported by a sizeable delivery of new container ships. On the other hand, in 1998 ocean carriers were continuing to receive large numbers of container ships, with the delivery backlog set to run for much of the year to come. These additional slots were expected to generate a requirement for around one million TEU of extra containers during the year.

Figure 4-1: Growth of World container output 1990-1999

Notes: totals include maritime and regional container types



Source: Containerisation International, January 1997,1998 & 2000.

More than two thirds of total annual global container production already came mainly from manufacturers in central and southern China, represented almost one million TEU (1,058,000 TEU). It compared with 132,000 TEU built in 1999 by factories in South East Asia, 63,000 TEU coming from other Asia (mainly Taiwan, South Korea and Japan), 130,500 TEU from Europe (all parts), just 33,500 TEU from the Americas and 28,000 TEU from the other regions (see Table 4-5).

At the beginning of the 2000, in order to support continuing cargo growth in the market, such as the transpacific market, and to have all new containers in service prior to the start of the market's peak shipping season, several of the world's leading shipping lines placed orders for new containers. For instance, the largest order which was placed by Seoul-based Hanjin Shipping Co and its sister entity DSR- Senator Liner was 70,750 TEU of 20ft and 40ft standard dry freight boxes. These total containers are being built by Jindo in South Korea and CIMC in Shanghai and will be completed and delivered scheduled by the end of October 2000. Furthermore, K-Line has ordered 14,800 containers (6,000 x 20ft; 5,400 x 40ft; 3,000 x 40ft high cube and 400 x 45ft containers). P&O Nedlloyd and Maersk Sealand have also

placed orders a combined total of 3,100 containers from HPI in Korea (Containerisation International, February 2000, p.30).

Table 4-5: World container output 1995-1999 by main country - region

Country-Region	1995	1996	1997	1998	1999
China	695,000	680,000	945,000	1,012,000	1,058,000
South East Asia	202,000	146,500	95,000	121,500	132,000
Other Asia	240,000	186,000	128,500	108,500	63,000
West Europe	86,500	85,000	94,000	105,500	96,000
Central East Europe and CIS	77,500	82,000	69,000	59,000	34,500
Americas	47,000	48,000	35,000	40,000	33,500
Other	37,500	35,500	28,500	28,500	28,000
Total	1,385,500	1,263,000	1,395,000	1,475,000	1,445,000

Notes: totals include maritime and regional container types; some 1999 totals are estimated.
Source: Containerisation International, January 1997,1998 & 2000.

Table 4-6: World container output 1995-1999 by main type

Main types of container	1995	1996	1997	1998	1999
DF standard and high cube	1,080,000	1,200,000	1,170,000	1,225,000	1,210,000
DF special	55,000	65,000	70,000	77,500	65,000
Integral reefer	85,000	76,000	92,000	95,500	87,000
Tank	15,000	12,000	17,000	15,500	12,000
Regional (Europe-North America)	28,000	33,000	46,000	61,500	71,000
Total	1,263,000	1,386,000	1,395,000	1,475,000	1,445,000

Notes: DF= dry freight; some 1999 totals are estimated.
Source: Containerisation International, January 1997,1998 and 2000.

Total world container output in 1999 was composed of all main types of containers such as dry freight standard and high cube, dry freight special, tank, integral reefer, regional-Europe and regional-North America containers, in which the construction of dry freight standard and high cube containers accounted for over 1.2 million TEU,

equivalent to almost 84 per cent of global container production (comprising of all types). These types in 1999 declined less than 2 per cent on the 1998 figure. The other types of containers in 1999 such as tanks, integral reefers and other dry freight specials were less than in 1998, although demand for swapbody and US domestic containers remained strong (see Table 4-6).

4.3 New logistics concepts - supply of containers

New logistics concepts such as total costs, cost trade -offs, outsourcing, just- in- time delivery, value added and globalisation have created the need for the establishment of complex international distribution chains. The ultimate goal of these is to allow the organisation to supply the right product at the right place at the right time in the right condition and most importantly for the right cost to the customers.

Total costs for an ordinary enterprise are the sum of production costs, transportation costs, warehousing costs, order processing and information costs, lot quantity costs and inventory costs (Ma, 1999). The goal of the total cost concept is to minimise the total cost of logistics, rather than focusing on each activity in isolation such as transportation cost, warehousing and storage cost, inventory cost, etc. From a total container cost logistics point of view and container cost management, container carriers and operators are not only interested in reducing costs of repositioning empty container but also total container costs. This means that all major container cost elements such capital costs, maintenance costs and empty container repositioning costs are interrelated, so a best combination should exit with which the total costs of containers are at minimum. This can be done by using a tool of integrated logistics called trade–offs method (see Figure 5-2 in chapter 5).

Cost trade-offs are a useful logistics tool in the sense that by nature most cost elements are changing constantly (Ma, 1999). For example, the price of a new 20ft dry freight container in China is US$1,500 and the cost to move this empty container from China to ASEAN is about US$250, so the total cost of this container in ASEAN

is US$1,750. At the same time, in ASEAN, the price of the same container type, which was built in Indonesia, is only US$1,700.

Logistics concerns not only materials but also actually interests in all resources needed for having the right product or service at the consumer's disposal. The resources are composed of materials, capital, people, technology know how, information and so on.

Logistics consist of two levels of planning and organising activities. The first level is where and when to get resources and products and where to send them. Therefore the problem here is the problem of location. In container management, container carriers or transport operators should know when and where they purchase or lease containers for their liner transport operation. For example, in the time of the Asian crisis, in order to solve the short of empty containers, ocean container carriers leased or bought new containers in Asia instead of purchasing them in Europe or America. The second level is how to get resources and products from the origin to the final destination. So the second problem is the problem of movement and storage.

Strategic logistics is concerned with the minimisation of total costs by looking for the most suitable locations and activity providers. This is mainly related to problems of out-sourcing and location activities.

Chapter two analysed the impacts of container imbalance problems in the maritime transport industry, particularly on the ocean carriers who had to spend a lot of money in repositioning empty containers. This is to move empty containers to the loading locations. This problem will continue to happen in the coming years and create difficult situations for container management of ocean carriers to control container cost, especially the container repositioning cost.

How to reduce the total container cost to the minimum is one of the key factors to create the competitive advantages of the container ocean carriers because container cost represents a significant part in a shipping line's total cost (Ma, 1999). Buying

cheaper new containers or making them by source out can reduce container capital cost. This means that container transport operators or container leasing companies want to find low cost locations, such as South East Asian countries, to produce new containers. On the other hand, they can purchase cheaper new containers in these regions.

One of the advantages of buying or making new containers in these regions is that they can reduce empty container repositioning costs. Instead of moving back large proportions of the empty containers to these locations, they use these new containers for loading cargo where the containers are made. This is particularly attractive when export containers over number of the import ones.

From the above logistics point of view, the finding of the most suitable locations for container manufacturing is one of the good solutions to minimise container-repositioning costs from trade imbalance problem. For example, according to The Journal of Commerce, in 1998 ocean carriers saved nearly US$200 million in repositioning costs by purchasing of new containers in Asia.

CHAPTER 5

SOUTH EAST ASIA - A LOCATION FOR CONTAINER MANUFACTURING

This chapter will present the demand for containers in South East Asia in the coming years from forecasting the development of container trade and trade imbalance in the region. From a logistics point of view, the competitive advantage of South East Asia for container manufacturing will be analysed.

5.1 Container trade development and container imbalance in South East Asia

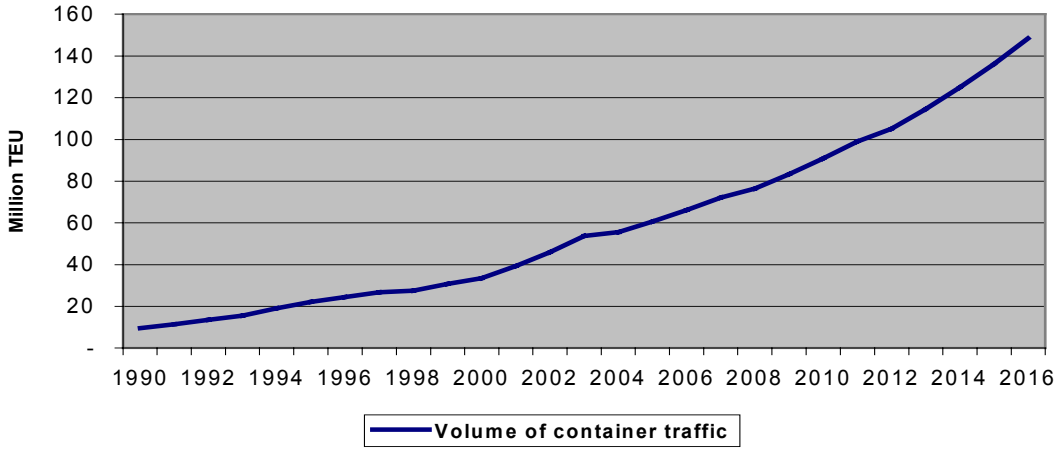
5.1.1 Container trade development

The ASEAN countries are strategically situated in a trading area that accounts for 17 per cent of the global liner market. Container traffic growth in ASEAN increased significantly to about 9-10 per cent a year over the past years and it is expected to increase rapidly to about 9-17 per cent a year after 2000 (see Figure 5-1).

In 1998 the Asian financial crisis, largely due to the changes in the relative strengths of the local currencies versus the dollar and other currencies, had an immediate and

direct effect on the container trade in South East Asia. Therefore, container traffic growth that year was only 3 per cent, or approximately 32 million TEU. Container throughput is expected to reach 148 million TEU in 2016 (Table 5-1).

Figure 5-1: Container traffic by South East Asia from 1990-1998 and forecast for 2000-2012



Source: Ocean Shipping Consultants Ltd., World Container Port Markets to 2012,1999.

Table 5-1: Forecast World Container Port Demand to 2016 (million TEU)

Region	1997	1998	2000	2004	2008	2012	2016
Europe	43	48	55	70	85	101	116
Middle East	11	12	14	20	27	33	40
North East Asia	49	51	60	82	106	132	160
South East Asia (% of Total)	**31 17,6%**	**32 17,0%**	**38 17,4%**	**61 20,3%**	**85 21,6%**	**114 23,2%**	**148 24,7%**
North America	25	27	30	38	48	58	67
South America	13	14	17	24	33	41	50
Africa	4	4	4	6	9	13	17
Total	176	188	218	301	393	492	598

Source: Ocean Shipping Consultants Ltd., World Container Port Markets to 2012,1999.

The volume of container traffic in South East Asia is expected to increase rapidly, from 17.6 per cent of total world traffic in 1997 to 24.7 per cent in 2016. By 2012, it is expected that the volume of container traffic in South East Asia (114 million TEU) would be higher than in Europe (101 million TEU) and other regions like North America (58 million TEU) and South America (41 million TEU) and so on except North East Asia (132 million TEU) (see Table 5-1).

Table 5-2: Container Traffic Forecast in ASEAN

Country	Container Traffic (000' TEU)			
	1997	2004	2010	2020
Brunei Darussalam	79	200	300	800
Cambodia	36	100	300	900
Indonesia	2,792	3,800	7,100	14,800
Malaysia	3,070	5,000	9,500	19,600
Myanmar	96	300	1,200	3,300
Philippines	2,631	4,900	8,700	15,300
Singapore	14,750	20,600	31,200	52,500
Thailand	2,181	3,700	6,200	12,300
Vietnam	672	1,700	3,600	9,400
Total	26,307	40,300	68,100	128,900

Source: ASEAN Transport Cooperation Framework Plan, July 1999.

The significant increase in container traffic in South East Asia is due to two structural factors. First, the stead development of a manufacturing base in South East Asia has helped drive the expansion in container trade. Although ASEAN is still a major producer of primary products (except Singapore), there has been a significant shift towards higher value-added manufacturing in the last two decades (see Table 5-3).

Otherwise, the commitment to an AFTA in the early 1990s also accelerated the process of globalisation. Second, the land-based transport system in South East Asia

has not developed strongly like in Europe and America, so the absence of land-based transport options that has helped to promote seaborne trade.

Table 5-3: Indicators on export performance (average growth in percentage) by country in South East Asia from 1994-1998

Country	Primary products	Natural-res.int. manuf.	Labour intens. Manuf.	Technology int. Manuf.	Human capital int.manuf.
Brunei Darussalam	-4	97	28	4	2
Cambodia	-12	175	110	12	0
Indonesia	1	-6	-6	19	9
Malaysia	0	0	5	11	-3
Myanmar	-5	-10	38	-7	-19
Philippines	0	-2	3	37	4
Singapore	-3	12	-4	6	-5
Thailand	0	-2	2	12	9
Vietnam	7	12	31	78	42

Source: International Trade Center- UNCTAD-WTO

5.1.2 Container imbalance forecasting

There is a serious imbalance between the volume of import and export container cargo in South East Asia. Over the past years, the impacts of the Asian crisis caused serious container imbalance in South East Asia. The volume of cargo exported containers from this region has been higher than that of cargo imported containers. In 1998, the container imbalance ratio in South East Asia was higher than the average imbalance ratios of 50 per cent. For instance, this ratio in Thailand, Indonesia and Malaysia was higher than the average imbalance ratios of 72 per cent, 58 per cent and 69.2 per cent respectively. This imbalance will continue happening in the coming years. The globalisation of world economy and multinational corporations will continue finding new low cost locations for production such as South East Asia, the emerged low cost market. This issue has led export activities more than import activities and trade imbalance in these regions.

5.2 Considering the competitive advantages of South East Asia in container manufacturing

A detailed analysis of competitive advantages, one of the logistics methods, helps firms to have a good achievable alternative at a minimum total cost. This analysis focuses on not only production costs but also other costs relating to logistics activities such as transportation costs, warehousing costs, inventory costs, lot quantity costs, order processing and information costs and other logistics costs. In order to consider production costs and resources for economic activities in South East Asia, the following factors will be taken into account.

5.2.1 Land factor

The land factor is one of the competitive advantages of South East Asia in the development of container manufacturing. The first advantage is that containers produced in South East Asia are aimed at supplying the increasingly demand for containers in this region due to container imbalance problem. Another advantage is that ASEAN has the investment policies for creating the advantages for foreign investors, especially the policy of land use. In addition, the distance from the location of container factory to the main port in this region like Singapore Port, the Hub Port of this region, is nearer compared to other locations such as China, Europe, or America.

On the other hand, land cost is also an important factor in the competitive advantage. The land cost in most of the South East Asian countries as such Vietnam, Indonesia, Thailand, Malaysia, and so on is cheaper than in European and America region or is equivalent to China.

5.2.2 Labour factor

The labour factor is also one of the important elements in the competitive advantage of South East Asia. One advantage is that a large population of 500 million peoples will provide both good skilled and unskilled labour forces for container manufacturing industry. Another advantage is that labour cost in this region (except Singapore) is lower than other regions such as the European or American region, and maybe equal to China. For example, the salary for one worker is about US$1.2-2.0 per day in Vietnam and US$2.97-3.70 per day in Thailand (Thailand Board of Investment), compared with $US 1.5 per day in China.

ASEAN countries are now considered the home of lowest-cost manufacturing competitors in the container manufacturing industry today. In recent years, the low labour cost in South East Asia has attracted a lot of foreign investors who have mainly concentrated the labour intensive-manufacturing product in this region such as in Vietnam, Myanmar, Indonesia, Malaysia, Cambodia, and so on.

5.2.3 Capital factor

Capital is one of the important elements for establishing the container plants in South East Asia. In comparison with container manufacturers in Europe, North America, Japan and Korea, container producers in South East Asia can not secure themselves the initial capital, but they could be only funded by states or secured by the financial international institutions like container manufacturers in China. Over the past years, the majority of plants in China received initially state funding, usually from local or regional agencies (Containerisation International, August 1999). This created the good advantages to recover at least some of the initial heavy investment made in the plants.

5.2.4 Technological factor

The technological factor is a significant factor in the development of container manufacturing in ASEAN countries. In recent years, the growth of technology-intensive manufacturing in South East Asian countries has been increasing rapidly. From 1994 –1998, the average growth of technology-intensive manufacturing reached 78 per cent in Vietnam, 37 per cent in the Philippines, 19 per cent in Indonesia, 12 per cent in Thailand and Cambodia, and 11 per cent Malaysia (see Table 5-3).

Moreover, ASEAN countries also recognise the importance of the development of information technologies: computers, software, peripherals and networks to their future success. So they are establishing the infrastructure necessary to exploit it. Singapore, for example, has made significant progress in its plan to establish a network that integrates government agencies and businesses; Malaysia has established " Multimedia corridor", and so on.

Singapore has particularly concentrated on becoming the technology centre for South East Asia, sending labour-intensive operations to low-cost other countries in this region like Malaysia, Indonesia, Vietnam, and Thailand in special mutual co-operative trade and development arrangements. This regional co-operation provides a competitive mode to attract investment and technology.

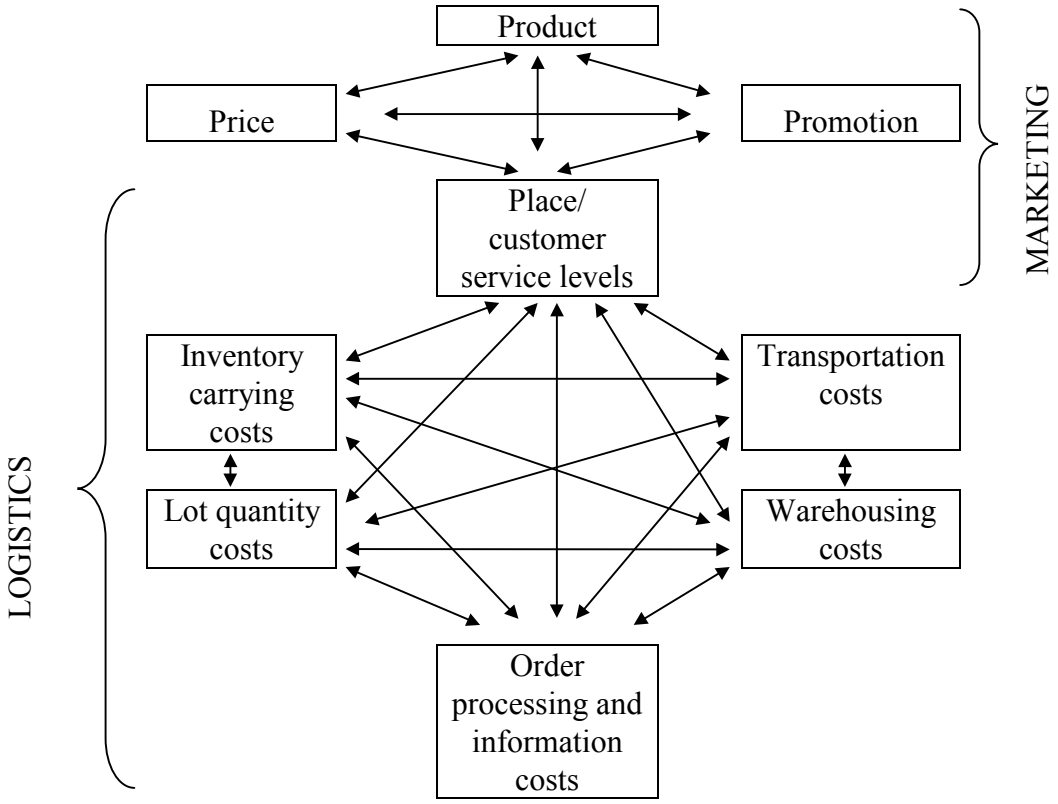
Table 5-4: Main sources of competitive advantages of container manufacturing in Southeast Asia

Factors	Competitive advantages
1. Land	Cheap cost
2. Labour	Cheap cost and large force
3. Capital	Secured by states or international financial institutions
4. Technology	Developing rapidly

5.3 Container logistics costs

Container logistics costs are the sum of production costs, transportation costs, warehousing costs, order processing and information costs, lot quantity costs and inventory costs. The goal of the total cost concept is to minimise at total container logistic cost. This can be done by using a tool of integrated logistics called the trade–offs method (see Figure 5-2).

Figure 5-2: Cost trade-offs required in marketing and logistics



Marketing objective: Allocation of resources to the marketing mix to maximise the long-run profitability of the firm.
Logistics objective: Minimise total costs given the customer service objective where Total costs = Transportation costs + Warehousing costs + Order processing and information costs + Lot quantity costs + Inventory carrying costs.

Source: Lambert, 1998.

5.3.1 Transportation costs

Transportation is one of the largest logistics costs and may account for a significant portion of the selling price of some products (Lambert, 1998). There are some major factors influencing transportation cost and price. The first factors are product-related factors that can be grouped into categories such as density, stowability, and ease or difficulty of handling and liability. Other factors are factors related to the market such as location of markets, degree of intramode and intermode competition, and so on.

One of the major advantages of container production in South East Asia is that the distance new containers must be transported from factories in ASEAN countries to the demand areas in the major ports of this region is shorter than from China, Europe or North America. Therefore, the transportation cost for moving containers produced from these factories to ports in South East Asia such as Singapore is cheaper. For instance, the cost to move a new 20ft container from China to the major ports in South East Asia (including Bangkok, Port Klang, Jakarta and Surabaya) is around US$200-300 (Containerisation International, August 1999). The repositioning cost of an empty 20ft container from Europe or North America to these ports is around US$300-500. At the same time, the cost of moving an empty 20ft container from Vietnam, Thailand or Indonesia to these ports is only around US$50-100 (P&O Nedlloyd).

Another advantage is that new containers produced in South East Asia are delivered into major ports in this region not only with cheaper transportation cost but also just-in-time delivery.

5.3.2 Warehousing costs

Warehousing is an inner part of the logistics system and plays a vital role in providing a desired level of customer service at the lowest possible total cost. The

warehousing cost of a new container is composed of all costs that relate to the storage of container during all phases of the logistics process.

One of the major advantages of new container warehousing costs in South East Asia is low, because the warehouse cost and the running of warehousing activities such as land cost, facility cost, fiscal structure cost, construction cost, labour cost, and so on are low. Another advantage is that the warehousing of new containers in the South East Asian region is to: 1) meet changing market conditions (e.g., seasonality, demand fluctuations, competition); 2) support the JIT programs of suppliers and customers; 3) support the firm's customer service policies.

5.3.3 Order Processing/ Information systems costs

Order processing and information costs are an extremely important investment to support good customer service levels and control costs (Lambert, 1998).

Computer technology and communication systems have been rapidly increasing in recent years in Southeast Asian countries, especially Singapore. This would create convenient conditions for managing and having the information required for strategic and operational planning of the logistics function. Moreover, it also creates advantages for reducing costs such as order transmittal, order entry, order processing, related internal and external related costs.

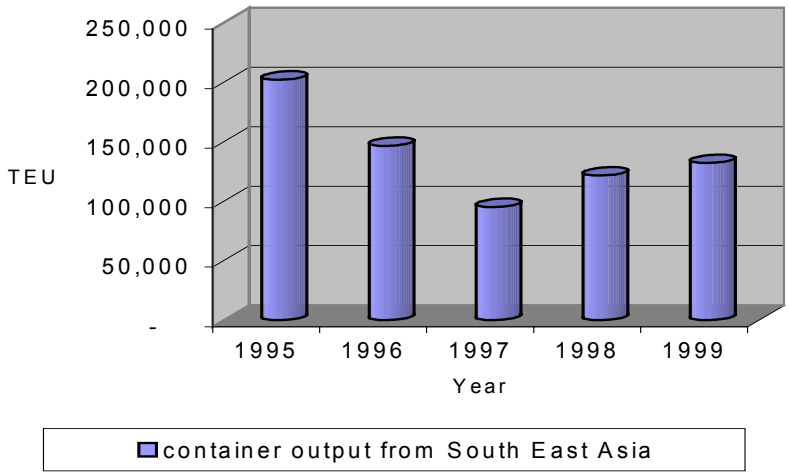
On the other hand, the use of information technology such as electronic data interchange (EDI) and satellite data transmission is also considered a source of competitive advantage. The establishment of systems such as quick response (QR), JIT, and efficient consumer response (ECR) are aimed to reduce order cycle times, speed responsiveness, and lower supply chain inventory.

5.3.4 Lot quantity costs

Lot quantity costs are purchasing or production related costs that vary with changes in order size or frequency. The major logistics lot quantity costs depend on procurements and production quantities (Lambert, 1998).

The total volume of container output from South East Asia, mainly from container factories in Indonesia, Malaysia and Thailand were 95,000TEU in 1997, 121,500TEU in 1998 and 132,000TEU in 1999 (Containerisation International, January 2000). The increasing growth of container output from South East Asia was 28.9 per cent in 1998 and 8.64 per cent in 1999 (see Figure 5-3). The annual growth of container production from container factories in the region is expected to increase by 8-10 per cent in the coming years due to the container demand from trade imbalance. This would create the competitive advantages of South East Asian region to reduce lot quantity costs by economies of scale.

Figure 5-3: Container output from Southeast Asia for 1995-1999



Notes: totals include maritime and regional container types; some 1999 totals are estimated.
Source: Containerisation International, January 1997,1998 & 1999.

5.3.5 Inventory carrying costs

Inventory carrying costs are all costs that are relevant to the holding of inventory. These costs include capital costs, warehousing costs and inventory risk costs (Ma, 1999).

South East Asia has its advantages to reduce of inventory carrying costs. One advantage is that the investment cost in infrastructure in facilities and equipment is lower than other regions, especially land cost for location of warehouse. Moreover, costs that relate to warehousing keeping are also cheap due to lower labour cost countries such as Vietnam and Indonesia. Another advantage is that AFTA has already started working for the integration of the markets of the ten ASEAN states into a single market. Tariff rates in the ASEAN will be gradually reduced over a ten to fifteen year period until it becomes 0 per cent in 2003 for some countries. This could create some advantages for making inventory service costs reduce.

In short, South East Asia has the competitive advantages of the container manufacturing industry. Its main sources of competitive advantages are not only the large demand for containers from container imbalance in South East Asia but also the low-cost location such as lower land cost and cheaper labour cost.

CHAPTER 6

OPPORTUNITIES FOR DEVELOPING THE CONTAINER MANUFACTURING INDUSTRY IN VIETNAM

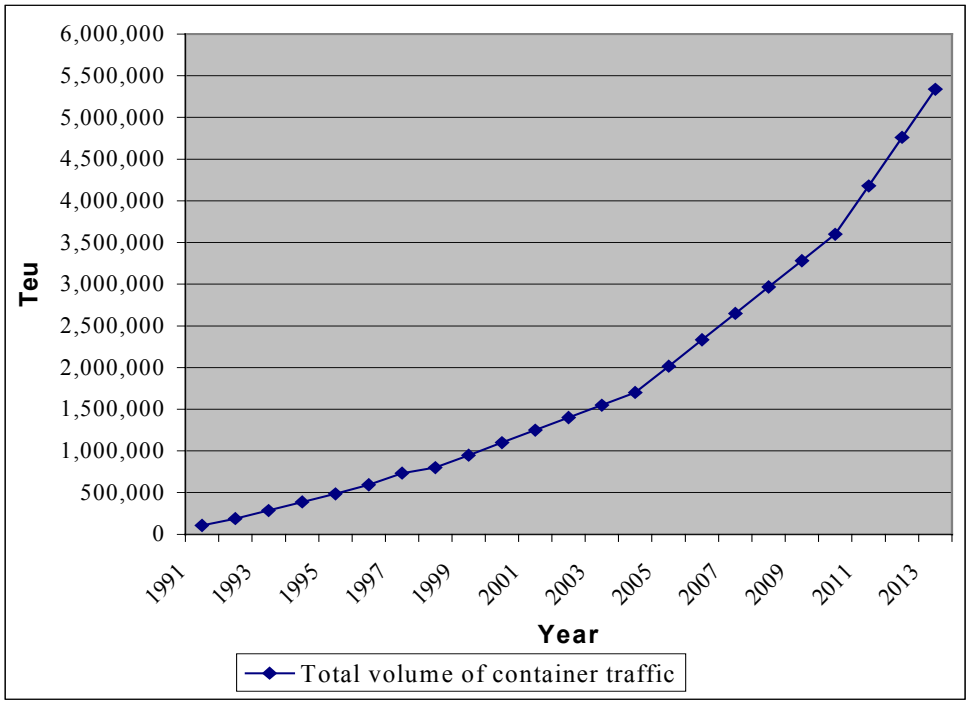
In the previous chapter, it was stated that South East Asia is considered a good location for developing container production due to its competitive advantages. Situated in the heart of South East Asia, Vietnam also has its ideal advantages for this container manufacturing industrial development. These competitive advantages derive largely from basic factors such as low wages, cheap raw materials, and special skills among the work force.

6.1 Containers trade development and container imbalance – Considering demand for export containers in Vietnam

6.1.1 Container trade development

In recent years, volumes of container trade in Vietnam have been growing rapidly and increased by 24-36 per cent per year from 1991-1997; and it is expected to continue increasing by 10-16 per cent per year for the period of 2000-2012 (Figure 6-1).

Figure 6-1: Total volume of container traffic 1991-1998 and forecasting 2000-2012 in Vietnam



Source: VINAMARINE, 1999 and ASEAN Transport Cooperation Framework Plan, July 1999.

In 1998, container traffic only increased by 9 per cent due to the Asian economic crisis, especially the changes in the relative strengths of Thailand and Indonesian currencies versus the dollar and other currencies. Total container throughput was up from 105,301TEU in 1991 to 799,665TEU in 1998 (Vietnam National Maritime Bureau (VINAMARINE), 1999). This is forecasted to increase to 1,300,000TEU in 2000, 1,700,000TEU in 2004, 3,600,000TEU in 2010 and 9,400,000TEU in 2020 (ASEAN Transport Cooperation Framework Plan, July 1999).

The significant increase of volume of containerised cargo traffic in Vietnam is due to the following structural factors.

First, the development of manufacturing products in recent years has been increasing dramatically, in particular the rapid growth of the labour intensive manufacturing and human capital intensive manufacturing products and the transfer of primary products to manufacturing products like wood. From 1994-1998, the annual growth of human capital intensive manufacturing products was 42 per cent, that of labour intensive manufacturing products was 31 per cent, that of natural-resource intensive manufacturing products was 12 per cent and that of technology intensive manufacturing products was 7 per cent (see Table 6-1).

Table 6-1: Indicators on export performance by Vietnam from 1994-1998

Group of products	Growth 94-98 (In % p.a.)	Share in exports
Primary products	7	46
Natural-res.int.manuf.	12	1
Labor intens.Manuf.	31	44
Technology int.manuf.	7	7
Human capital int.manuf.	42	2

Source: International Trade Centre- UNCTAD-WTO

Second, the shortage of land-based transport options has helped to improve sea transport and ports in Vietnam. In recent years, in response to rapidly growing national and Trans-shipment cargo volumes, Vietnam has drawn up a long-term plan to increase cargo-handling capacity at ports, specially upgrading ports and building new facilities around Hochiminh City.

Third, the significant increase of foreign investment in the manufacturing industries in Vietnam in the coming years has made containerised cargo volume increase rapidly, in particular, the volume of manufacturing products. For instance, by the year 2000, the manufacturing industries of the Hochiminh City area are expected to attract investments of between US$13 billion and US$15 billion; so cargo volume in these areas could grow 20 to 30 per cent annually.

Finally, the new Trans-Asian road project, which will be connecting Malaysia, Thailand, Vietnam, Laos, Myanmar and China, will create more transport and trading opportunities.

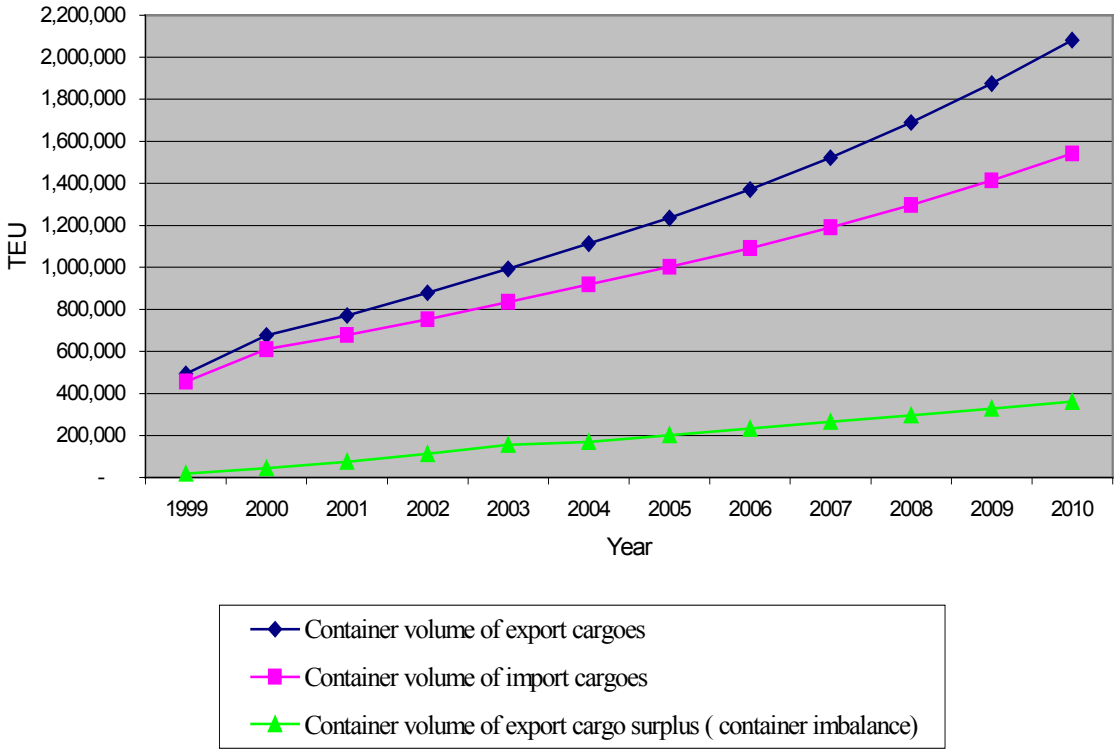
6.1.2 Container imbalance forecasting – export container demand

From 1995-1998, the annual growth of export containerised cargo volume in Vietnam increased faster than that of import containerised cargo volume by 2-5 per cent. This created a large volume of export containerised cargo surplus in Vietnam over the past years. According to the report of VINAMARINE (1999), the export cargo surplus volume in 1997 was more than 10,000TEU. It is expected that the annual growth of export containerised cargo volume would continue increasing steadily and increasing faster than that of import containerised cargo volume by 2-5 per cent in the period of 2004-2010. Thus, the container imbalance between the total volume of containerised export cargo and import cargo would be around 240,000TEU in 2004 and 360,000TEU in 2010 as shown in Figure 6-2. Export container surplus demand in Vietnam is also expected to increase by around 240,000-360,000 in this period.

Moreover, container export demand from other countries in the South East Asian region such as Thailand, Indonesia, and Malaysia in the coming years as shown in Chapter Five would be one of the advantages of container production in Vietnam. For instance, some container manufacturers in Indonesia, Thailand and Malaysia in recent years are the main suppliers for export container demand in South East Asia. Container output from these factories increased from 121,500TEU in 1998 to 132,000TEU in 1999 (Containerisation International, January 2000). In particular, Kumbong Heavy Industries, the dry freight factory that based near Jakarta boosted its output to almost 90,000TEU in 1999.

Figure 6-2: Container imbalance forecasting 1999-2010 in Vietnam

Source: VINAMARINE, 1999 and ASEAN Transport Cooperation Framework Plan, July 1999.



Furthermore, the export containerised cargo surplus in Vietnam is expected to increase steadily in the coming years because of trade imbalance that could be caused by the following main reasons. The first reason is that Vietnam's containerised export cargoes will continue increasing rapidly due to the significant development of manufacturing products and the rapid transfer of bulk cargoes to container cargoes such as rubber, coffee, and so on. Another reason is that the main containerised export cargoes, which has dramatically increased in recent years, are lighter cargoes such as textiles, garments, and shoes; and the main containerised import cargoes are heavier cargoes such as machinery and equipment.

6.2 Considering sources of competitive advantages and disadvantages of Vietnam in container manufacturing

6.2.1 Geographical condition

Situated in the heart of Southeast Asia with 3260 km of spectacular coastline and 1650 km from its northern border with China to its southernmost tip at the Eastern Sea, Vietnam offers ideal advantages for economic development in general as well as for developing container production in particular. First, Vietnam could supply the new container demand in Vietnam and South East Asia with cheaper container transport cost, compared to other regions such as China or South Korea. Moreover, empty container transport cost from Vietnam to the Hub port in the region (Singapore port) is equal to that cost from Thailand or Indonesia and is equivalent to US$50-100 per unit. Second, the projects of Vietnam's largest container port in Southern Vietnam such as Vungtau International Port company Ltd. are expected to be the future hub port for the region. Thus, this could create good opportunities for new container production from Vietnam to meet demand for new containers in other region such as Europe or the Middle East.

6.2.2 Technology

In recent years, the rapid increase of foreign investment into Vietnam has helped sustain the growing pace of economic development and the programme of industrialisation by importing technological know-how and management skills. This leads to the creation of jobs, infrastructure improvements, increases in export trade and the opening up of new markets.

Although Vietnam has not been a technology centre for South East Asia like Singapore, its technology intensive operations in recent years have significantly developed. From 1994-1998, technology intensive manufacturing products have

increased by 78 per cent per year and it is expected to continue increasing rapidly in future. Otherwise, transfer of technology and manufacturing from the developed countries and other countries like Singapore through foreign investments could create good opportunities of container manufacturing development in Vietnam. Singaporean firms, for example, have developed high-technology industrial parks in Binh Duong province, near Hochiminh City in Vietnam.

On the other hand, the infant information technology industry is rapidly expanding in Vietnam. The Vietnamese government has recently lowered import tariffs for information technology products to 5 percent from 25 percent to encourage faster growth. This is also one of the advantages for the container manufacturing industry.

Furthermore, the significant development of the steel manufacturing and shipyard industry in recent years is also another advantage for the development in container production. The Korean companies have particularly invested in the steel and shipyard in Vietnam like a joint venture between Hyundai Mipo Dockyard Co., Ltd. (HMD) of Korea and the Vietnam Shipbuilding Industry Corporation (VINASHIN). They will provide not only raw materials for container production but also the know-how and experience in the steel industry, especially in steel container production.

6.2.3 Labour force

Vietnam possesses a large, young and relatively well-educated population of 75 million. Of the labour force of 40 million, skilled labour accounts for approximately 13 per cent. Its low-cost labour base is eager to work and willing to learn. Vietnam's well educated but inexpensive work force is one of the country's primary assets. This is one of Vietnam's competitive advantages for attracting foreign investment as well as improving the competition of products by lower labour cost. In recent years, for example, the rapid growth in Foreign Direct Investment (FDI) to Vietnam has also been attributed primarily to the availability of low-cost labour.

In the 1990's, the labour costs of Vietnam were low and less than those of the Southeast Asian countries such as Thailand, Malaysia, or the Philippines (see Table 6-2). The minimum daily wage rates for unskilled workers are currently around US$3.20-3.70 in main cities or provinces and US$2.97 in other provinces in Thailand and US$2.2 a day in Indonesia. Whereas the minimum wage in Vietnam is only around US$1.35-1.50 a day for unskilled workers and around US$1.75 for skilled workers. The workers in the large cities in Vietnam such as Hochiminh City and Hanoi are paid US$1.73 a day, US$1.54 a day in smaller cities such as Haiphong, Danang, Vungtau and Cantho and US$1.35 a day in other provinces. So from the perspective of labour cost, Vietnam is probably one of the cheapest countries in South East Asia and in the world.

Table 6-2: Wage Levels of Southeast Asian countries 1996

(Average wage unless indicated otherwise)

Country	Minimum Wage for Unskilled Labour ($/day)	Unskilled Labour ($/day)	Skilled Labour ($/day)	Technician ($/month)	Engineers ($/month)	Middle Management ($/month)
Indonesia	0.70-2.85	2.00-3.00	6.10	250	380	560
Malaysia	None	7.97	13.28	578	1,395	1,992
Philippines	4.19-5.65	4.00-6.70	7.00-9.17	350-550	650-962	1,076-1,307
Thailand	5.07-6.25	5.12-6.13	6.61-7.28	282-560	584-749	700-1,221
Vietnam	0.78	1.29-1.37	2.15-2.38	100-185	195	220

Note: All data are as of mid-1996. Average wages are for workers in light manufacturing industries.
Source: World Bank, Philippines: Managing Global Integration, Volume I, November 1997, p. 9

On the other hand, traditions emphasising learning, and respect for authority and a high literacy rate (around 90 per cent) are also another advantages of labour force. Furthermore, young workers today have higher educational qualifications, a higher level of professional skill and are more adaptive to new technologies, so worker

productivity has risen rapidly. As a result, unit labour costs in the manufacturing sector have fallen in the recent years, helping Vietnam maintain its competitiveness vis a vis its regional neighbours such as Thailand, Malaysia, and Indonesia. Over 65 per cent of the total labour force are in the 16-30. Ninety per cent of the one million workers who enter the labour market each year have an elementary or more advanced education and training and education centres throughout Vietnam are improving their programmes to meet increasing demands, especially for managerial staff.

Furthermore, although the container manufacturing industry has not actually developed in Vietnam, the development of container repaired services has provided a worker team who have good knowledge and experience in container production. This is also a potential for the container manufacturing industry in Vietnam

Although Vietnam's work force is young and highly educated, the lack of available qualifications and experience is one of the biggest competitive disadvantages of Vietnam's labour force. In general, there is a lack of understanding of international business concepts and practices and a need to increase relevant technology-based training. Otherwise, Vietnam's economic backwardness has been a major obstacle in the development of its education and training systems. Only 9 to 10 per cent of the total labour force are, for example, a trained technical labour and there are only 20 to 25 university students out of every ten thousand inhabitants.

6.2.4 Capital

The finance source needed for a container manufacturing plant is one of the important factors to create the competitive advantages. Vietnam, like other developing countries, have very limited government resources. Therefore, the fund for the plant could be secured by financing from banks or other financial institutions. In spite of the limitation of finance, Vietnam could secure a substantial portion of its development funding from multilateral development banks, primarily the Asian Development Bank (ADB), the International Finance Corporation (IFC) of the World

Bank, Japan's Overseas Economic Co-operation Fund (OECF) and the United Nations Development Program (UNDP). Of these agencies, the IFC of the World Bank could provide both loan and investment for projects in a wide variety of business sectors, including construction materials, steel, infrastructure and general manufacturing.

6.2.5 Raw materials

The convenient resource of main raw materials supplied for producing new container such as hot-rolled steel, plywood and timber is one of the important factors to create the competitive advantages of container production. The raw material resource supplied must be available of high quality and at a cheaper price. In recent years, the steel industry in Vietnam has been developing and expanding significantly, particularly the development of Vietnam Steel Corporation (VSC). According to the VSC development plant of steel sector for 2010, the steel sector has also set a target of producing 2 million tonnes of raw steel and 4.5million tonnes of rolled steel in 2010. This is one of the good resources of rolled steel for container production from the country. Moreover, the increase of foreign investment in steel processing industry into Vietnam as a low cost nation is also another rolled steel resource, especially the investment from countries that are the larger steel producers such as Taiwan (China), China, and Japan.

On the other hand, Vietnam is also a timber and plywood exporting country like Indonesia. This is also one of the available and cheap resource of timber and plywood for producing container in the country instead of import from other countries.

6.2.6 Regional and Bilateral Trade Agreements

By becoming a member of the Association of South-East Asian Nations (ASEAN) and participating in the trade liberalisation program of AFTA in 1995, Vietnam committed itself to reducing tariffs to 0-5 percent by 2006. Moreover, Vietnam has begun to take steps to comply with the tariff reduction program under the Common Effective Preferential Tariff (CEPT). This issue will create good conditions for Vietnam to benefit from increased investment inflows and business opportunities, both within and outside the region.

Furthermore, the ASEAN Framework Agreement on the Facilitation of Goods in Transit in December 1998 would create convenient conditions for the transportation of goods in transit among ASEAN countries, specially the transportation of containerised cargoes.

Apart from the impact of trade liberalisation under AFTA, in November 1998 Vietnam also became a member of the Asia Pacific Economic Co-operation (APEC). APEC is a forum aimed to promote trade and investment liberalisation and economic co-operation in the Asia Pacific region by enhancing the flow of services, capital and technical know-how. In this co-operation, Vietnam can expect increased dialogue and closer co-operation with APEC members and also needs to formulate concrete plans for trade liberalisation in the future.

On the other hand, Vietnam made official application to the World Trade Organisation (WTO). In particular, by signing a major free-trade agreement with the United States on July 13, 2000, Vietnam would obtain a Most-Favoured Nation (MFN) status and be granted good opportunities for trade development. Because U.S. tariffs on Vietnamese products would reduce from the current average of about 40 percent to less than 3 percent, the volume of export cargoes to US would increase in the coming years.

6.3 Benefits derived from the container production

Container production in Vietnam has had very positive effects, particularly on the followings:

For Vietnam:

➢ Economy through increase revenue for the national government in the form of taxes, other fees and create profits for container producers. A good example is the benefits for government in the forms of taxes (VAT=5 per cent and average price per TEU = US$1,000) as shown in Table 6-3.

Table 6-3: Benefits in the form of tax from container production

Volume (TEU) per year	Tax (US$)
20,000	1,000,000
25,000	1,250,000
30,000	1,500,000
35,000	1,750,000
40,000	2,000,000

➢ employment opportunities;

➢ means of supplying one part for the development of the container transportation operators in Vietnam;

➢ and as means of expanding the development of steel container manufacturing industry in Vietnam.

For container buyers such container liners, operators and lessors:

➢ reducing new container cost by buying cheaper new container built from Vietnam;

- means of timely supply for the container demand in Vietnam;
- and reducing repositioning container costs by buying new container in Vietnam instead of large proportions of moving empty containers to Vietnam or South East Asia, specially in the container imbalance condition in Vietnam or South East Asia. For example, the container imbalance problem in Vietnam as stated above would require a large expense for removing empty containers to Vietnam. Assuming that taking an average cost of US$200 per container to cover crane handling, depots cost, inventory cost, and so on, these costs would be estimated at around US$48 million- US$70 million per year. These costs are a burden on shipowners, containership operators or container transport operators. If the container transport operators purchase new containers in Vietnam instead of moving back large proportions of the empty containers, they will reduce a large amount of container repositioning costs.

Table 6-4: Main sources of competitive advantages of container manufacturing in Vietnam

Sources	Competitive advantages
1. Container demand	Increase steadily in the coming years due to trade imbalance
2. Land	Low cost
3. Labour	Cheapest cost and large force
4. Raw materials	Cheap cost such as timber and plywood
5. Capital	Secured by states or international financial institutions
6. Technology	Developing rapidly

In short, Vietnam is now considered the potential for developing the container manufacturing industry in future because it is not only a low cost nation but also a location situated in the heart of Southeast Asia, where the container demands are expected to increase rapidly due to trade imbalance in the coming years (as

summarised in Table 6-4). In addition, buying new containers produced in Vietnam would be a good solution for container carriers to minimise repositioning costs of empty containers to Vietnam or South East Asia.

CHAPTER 7

CONCLUSION AND RECOMMENDATION

7.1 Conclusion

The container imbalance today is one of the severe problems that has put an enormous burden on container operators in the container transportation industry, particularly container shipping carriers, and forced them to spend a lot of money on repositioning empty containers. Finding the best solutions to reduce this empty container repositioning cost becomes one of the main objectives of the container shipping lines in the container management.

Although container lessors in recent years have come up with tens of thousands of solutions that help container shipping carriers save a large amount of money, container shipping carriers themselves still prefer to find a best solution to minimise container costs. The recognition of buying new containers with cheaper prices from places where the volume of cargo export surplus are very big and located near major container demand areas is considered one of the good solutions for container carriers. This solution would help them to reduce not only new container cost but also the repositioning cost of empty containers.

Moreover, the volume of cargo export surplus from Asian countries due to trade imbalances between export and import containerised cargoes, particularly from China and South East Asian countries like Vietnam, increased dramatically over the past years and is expected to continue increasing in the coming years. This will create a very large container demand in these regions; therefore, the container shipping liners will be required to have enough necessary empty containers to fuel it. According to solution suggested above, purchasing new containers in these regions will save a large amount of money for container operators like shipping lines and container leasing companies. The expensive alternative is the current one where they are moving large proportions of the empty containers.

The container manufacturing industry has changed in recent years; especially the massive shift in freight container production from developed European, Japan and Asian "mature-tiger" economies (South Korea and Taiwan) to emerging economies (China and South East Asia). This corresponds to a shift in comparative advantage among these countries. Furthermore, container manufacturing is regarded as a labour-intensive industry and requires mainly unskilled labour. Because China and South East Asian countries have a large labour force and low-wage rates, they are now well placed to become good container-producing locations.

Being a low cost nation located in the central part of South East Asia, Vietnam also has its competitive advantages over other South East Asian countries for developing container-manufacturing industry in this region, especially dry freight container production. Its main sources of competitive advantages are not only a large pool of low-wage workers and the availability of natural resources but also a part of the FDI inflows that could help it overcome product quality and labour productivity problems. These are significant factors that could make the cost of new containers lower. Otherwise, the establishment of container producing factories in Vietnam will meet the container demand due to the increase of export volume of containerised

cargo surplus from trade imbalance not only in Vietnam but also in South East Asia in the coming years.

Furthermore, not only Vietnam but also container operators like leading shipping lines and container lessors would also benefit from new containers produced in Vietnam. On the Vietnam side, they could benefit from taxes, the increase of revenue, employment opportunities, and so on. For container operators, their benefits could be from buying new containers produced in Vietnam with lower prices. In particular, they will save a large amount of money that would be spent on moving back empty containers to Vietnam and South East Asia because of trade imbalance.

7.2 Recommendation

In view of the discussions and analyses made in this paper, there are some main recommendations that are appropriate in the establishment of container manufacturing factory in Vietnam.

Recommendation shall be the followings:

- One of the comparative disadvantages of Vietnam in container manufacturing plant is a lack of experience, technical know-how and expertise in producing containers. Therefore, the necessary initiative of plant in Vietnam should be assisted by foreign investors in container manufacturing industry. This can be done by co-operation with big container manufacturers from countries like South Korea, Japan, Taiwan (China), or American and European countries, which want to invest in offshore plants in container manufacturing field into the low cost nations like Vietnam. In order to do this better, Vietnam needs to create a more convenient environment to attract foreign investors.

- Moreover, the initial capital for container plant also plays a very important role. Vietnam, like other developing countries, usually limits financial capabilities for the initiative investment. So, Vietnam should create and expand intimate relationships with international financial institutions like ADB, IMF and WB to secure the capital for container plant.

- Furthermore, a best location at which container factories will be built must be carefully examined. This location should be easily connected to transport system such as ports, rail, road, inland waterway and storage system. Otherwise, it should be next to the industrial development regions such as Hochiminh City or Dongnai province.

- Good collaborations with both domestic and foreign partners are of great importance for container production. Domestic partners could be material suppliers such as VSC for container production input and/or leading container carriers such as VINALINES for container production output. Foreign partners are global container buyers such as leading shipping lines, container lessors and operators.

- In addition, one of the necessary elements to improve the capability of container manufacturing is the training of workers, and especially, the technicians.

All in all, this study analyses the competitive advantages of container production in Vietnam. The establishment of container plant in Vietnam is considered a solution for the container imbalance problem in Southeast Asia as well as Vietnam because container carriers can minimise empty container repositioning costs by purchasing new containers from Vietnam with cheap prices instead of moving back large proportions of empty containers to Vietnam or Southeast Asia. Although the solution suggested above is based on the aspect of the new logistics concept like just-in-time and cost trade-off, it is necessary for container manufacturers in out-sourcing

strategies, container carriers in minimising container repositioning costs as well as Vietnam in developing container manufacturing industry. However, it should be further studied in depth when the project of the establishment of container plant in Vietnam is actually implemented.

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APPENDIX 1

Map of Southeast Asia

APPENDIX 2

Container Manufacturers in South East Asia

Manufacturers	ISO container types	Annual capacity (ISO units) (TEU/year)
INDONESIA:		
1. PT Asia Perintis Contindo	Dry freight (CPC).	24,000
2. PT Java Pacific Container Factory	Dry freight (CPC), Bulk, Flatrack.	18,000
3. PT Kumbong Container Industry	Dry freight, Dry freight (CPC), Dry freight (ventilated), Bulk, Silo, Open-top, Open-side, Flatrack, Platform, Insulated (non-reefer), Tank, and non-ISO container types.	48,000
MALAYSIA:		
Evergreen Heavy Industrial Corp (M) Bhd	Dry freight, Dry freight (CPC), Silo, Open-side, Flatrack.	110,000
THAILAND:		
Siam Cargo Containers Co., Ltd	Dry freight (CPC), Open-side, Flatrack.	30,000

Source: Containerisation International Yearbook 2000

APPENDIX 3

Top ranking leasing companies by fleet size (in '000 TEU)

Company	mid-1998 actual TEU	Mid-1998 Asset TEU*	mid-1999 actual TEU	mid-1999 Asset TEU*
Transamerica Leasing	1 170	1 630	1 160	1 670
GESeaCo	1 135	1 565	1 130	1 570
Textainer Group	605	540	850	760
Xtra International[1]	230	205	-	-
Interpool – CAI	690	655	830	775
Triton Container Intl	530	615	625	720
Florens Container Corp[2]	440	560	460	585
Cronos Group	360	435	355	425
Gateway Container Corp	150	135	200	180
Capital Lease	120	105	135	115
Gold Container	65	60	90	80
Carlisle Leasing	25	150	30	180
Other	420	1 205	465	1 265
Various – finance lease[3]	865	1 120	900	1 150
Grand Total	**6 805**	**8 980**	**7 230**	**9 475**
Total – operational lease	**5 570**	**7 380**	**5 950**	**7 830**

Notes: *= financial asset TEU calculation; 1= Xtra Corp placed its maritime container fleet under management with Textainer in June 1999; 2= includes containers term leased to Cosco; 3= includes containers financed separately by established transport leasing companies.

Source: Containerisation International, July 1999.

APPENDIX 4

Top ranking leasing companies and their new container purchases (in '000 TEU)

Company	1997	1998	1999*
Transamerica Leasing	50	45	50
GESeaCo[1]	45	30	40
Textainer Group	65	105	85
Xtra International[1]	25	20	-
Interpool Group	85	85	60
CAI[1]	45	70	60
Triton Container Intl	95	125	105
Florens Container Corp[2]	95	45	55
Cronos Group	30	5	5
Gateway Container Corp	100	70	90
Capital Lease	80	45	40
Gold Container	20	25	25
Other	80	105	85
Various – finance lease[3]	50	50	50
Grand Total	**865**	**825**	**750**
Total – operational lease	**755**	**735**	**650**

Notes: *= some totals are estimated; 1= GE-Genstar and Sea Containers fleets merged into GESeaCo in 1998; Interpool acquired 50% stake in CAI in 1998; Xtra Corp placed its maritime container fleet under management with Tectainer in June 1999; 2= includes containers term leased to Cosco; 3= includes containers financed separately by established transport leasing companies.

Source: Containerisation International, July 1999.

APPENDIX 5

World Fleet (Updated March 01, 2000)

Company	Rank	Total Fleet		Order Book	
		TEU	Ships	TEU	Ships
Maersk Sealand	1	544 843	222	90 612	19
P&O Nedlloyd	2	264 011	114	92 467	20
Evergreen	3	248 309	80	66 358	12
MSC	4	231 330	132	8 100	2
APL	5	181 880	62	15 160	6
Cosco	6	171 019	101	59 800	23
Hanjin	7	129 036	39	16 800	3
NYK	8	126 594	54		
Zim	9	122 802	63		
MOL	10	120 458	59	16 500	3
CMA-CGM	11	115 440	58	52 000	8
HMM	12	103 184	30		
OOCL	13	99 959	32	22 000	4
K-Line	14	99 643	43	44 800	8
YMTC	15	98 316	37	36 400	7
DSR-Senator	16	92 546	30		
H-L	17	89 076	26	33 729	7
UASC	18	72 349	44		
CSAV	19	58 738	36	18 600	6
Star Shipping	20	51 626	37	1 880	1
Other		3 222 845	5 738	226 370	145
World Fleet		**6 244 004**	**7 037**	**801 576**	**274**

Note: The above rankings are based on the fleet operated by the named line and does not aggregate any subsidiary lines. To aggregate, note the following: Evergreen: see also Uniglory and Lloyd Triestino; CMA/CGM: See CGM and ANL; CSAV: NOW CONTROLS 75% OF Libra; CP Ships: see ANZDL, Contships, Canada Maritime and Cast; Americana Ships, in which CP Ships has a 50% stake: see TMM, Lykes and Ivarans; Hamburg-Sud: see also Columbus Line, ALIANCE, South Seas Steanship and Deutsche Nah-Ost Linien; SCL: see Safmarine and CMBT (recently bought by AP Moller) DSR-Senator: Hanjin has 75% shareholding.

Source: Liner Shipping Network, 2000.