1988

Effect of freight rates on the balance of payments of Thailand

Jitsupaksinee Suksuebnuch

Follow this and additional works at: https://commons.wmu.se/all_dissertations

Recommended Citation
https://commons.wmu.se/all_dissertations/842

This Dissertation is brought to you courtesy of Maritime Commons. Open Access items may be downloaded for non-commercial, fair use academic purposes. No items may be hosted on another server or web site without express written permission from the World Maritime University. For more information, please contact library@wmu.se.
EFFECT OF FREIGHT RATES
ON THE BALANCE OF PAYMENTS OF THAILAND

by

JITSUPAKSINEE SUKSUEBNUCH
THAILAND

A paper submitted to the Faculty of the World Maritime University in partial fulfilment of the requirements for the award of a

MASTER OF SCIENCE DEGREE
in
GENERAL MARITIME ADMINISTRATION

The contents of this paper reflect my own personal views and are not necessarily endorsed by the World Maritime University or the International Maritime Organization.

Signature: 

Date: 26 October 1988

Supervised and assessed by:
Dr. H.E. Haralambides
World Maritime University

Co-assessed by:
Professor Ernst G. Frankel
M.I.T., U.S.A.
ACKNOWLEDGEMENTS

This paper owes its existence to the office of the Maritime Promotion Commission, Ministry of Communications, in Thailand and the CDG’s sponsorship by the German Government in which I had the initial opportunity to participate in a General Maritime Administration course for two years at World Maritime University.

My gratitude is presented to all the resident and visiting professors for their invaluable knowledge and academic help.

I am particularly grateful to Mr. Somchai Kongthewinsuthi; Shipping, Port and Inland Waterways Division, ESCAP, who provided an ideal environment and Miss Laddawan Boonprakob; Balance of Payments Section, Bank of Thailand, who provided information and data for this paper.

My profound gratitude goes to Dr. H.E. Haralambides who generously provided very useful advice, suggestions and comments on the study and I am indebted to Ms. Inger Sund Battista; English Language lecturer, who revised the English language.

I also wish to thank all others including WMU’s staff and my colleagues who in various ways helped me in the success of this paper, and without whom this study could not have been completed.
1.1 Problems to be studied

In the early 1950's, the social, economic and technological disparity between the industrialized countries and the developing countries were perceived to be relieved by placing little emphasis on the behavior of services in trade relations between developed and developing countries. Therefore, the ways and means of reducing the gap centered on increasing productivity, industrialization, expansion and diversification of visible exports by paying little attention on the foreign exchange deficits incurred by the developing countries in invisible transactions in shipping and insurance services. [1]

In 1964, the first session of the United Nations Conference on Trade and Development placed an item dealing with invisibles on its agenda. A number of preliminary studies on this subject had been prepared including a study by the International Monetary Fund (IMF) [2], which showed that for all developing countries in 1961, out of a total balance of payments deficit on goods and services of $5.4 billion, the deficit on freight and insurance was about $2.14 billion with freight accounting for $1.95 billion or over one third of the total deficit.

After that, the statistical data on shipping transactions collected by some developing countries also showed that the developing countries' balance of payments deficit on account of freight and insurance costs was considerably higher than it had been before many years ago. For example, according to the statistical data gathered by the
government of Brazil since 1967, Brazil’s foreign trade in 1969 generated a freight cost of $541.3 million on exports and imports. In that year, Brazilian flag vessels earned only $69.3 million in freight revenue or 13 percent of the total. Foreign vessels chartered by Brazilian shipowners accounted for $116.2 million or 21 percent of the total freight costs. Vessels of foreign flags earned the remaining $355.8 million, or 66 percent of the total. [3]

It can be seen that the great importance to the effects of shipping operations like freight costs should be attached on the balance of payments of the developing countries because of the fact that it influences on both visible trade and the services item. In addition it affects the contributions of the net receipt of national shipping, whereas the freight on imports constitutes an outflow of foreign exchange and is thus a burden to the balance of payments, the freight on exports may be considered as a contribution to a country’s exchange earnings.

Among the developing countries, Thailand is becoming increasingly important as an international shipping port and its shipping activities are considered as major industry. The international trade also plays a very important role in Thai economy. Exports and imports both in terms of volume and value are increasing, particularly exports increased about 23% in 1987 and about 90% of volume of this international trade is transported at sea.

The statistical data on freight and merchandise insurance on the balance of payments of Thailand collected by the Bank of Thailand shows that Thailand’s foreign trade in terms of foreign exchange earnings in 1986 generated a freight cost of 8882.9 million Baht in which the ocean freight cost on exports and imports accounted
for 7683.1 million Baht or about 86.5% of the total freight cost. Whereas the outflow of freight in terms of foreign exchange in that year was 4354.1 million Baht in which the ocean freight costs on exports and imports constituted 4322.1 million Baht or 99.3% of the total freight.

However, Thailand has a very small merchant fleet, registering only 450,000 gross tons in 1983. Only about 5% of the total volume of trade is now carried by national vessels. It is estimated that 90% of Thai exports are sold on f.o.b basis while the imports are bought on c.i.f basis. When the carriage of a country's national and international trade is provided by foreign flag ships, the ocean transportation is finally paid to foreign countries.

Besides, most foreign carriers of Thai exports and imports are joined together to provide services as the Shipping Conferences particularly Liner Shipping Conferences. These shipping conference always increase freight rates. Moreover, there is a tendency for freight rates to increase even more in the future.
1.2 Scope and Purpose

By considering
- the importance of ocean freight costs to the Thai economy reflected by the significance of its amount in the balance of payments, and
- the question of whether the freight rates increased by Shipping Conferences in Thailand will be beneficial to the country,

this paper is aimed to study Thailand's current account in its balance of payments which may be affected by the changing of ocean freight rates and also how it is influenced.

However, the main obstacle in the analysis in developing countries including Thailand is a lack of suitable statistics. The available shipping statistics are not adequate to the completeness of the analysis.

The useful shipping statistics for the study which are now lacking are such as:

a. freight earnings of home-flag ships including
   - earnings from transportation of home exports paid by foreign buyers
   - home imports paid by foreign suppliers
   - earnings from cross trade

b. payment to foreign-flag ships for imports when freight is paid by consignees and for exports when freight is paid by consignors

c. etc.
Therefore, the shipping data taken into account for the analysis of this study are merely the ocean freight on exports and imports gathered by the Bank of Thailand from 1974 to 1986.

Besides, it has been decided to take into account the recorded balance of payments instead of the overall balance of payments whose outflow and inflow data are not available.

The former data are obtained by the sum of data on the current account, capital account and the allocation of SDR. However, they are slightly different from the figures issued in the publications of the Bank of Thailand because of the rounding up.

1.3 Methodology

This paper will be written by a method of descriptive analysis together with the analysis of a modified mathematical model. A computer program (LOTUS 123) will be applied to facilitate the processing and presentation of data.

The analysis will be divided into six chapters as follows:

Chapter 1 which is the introduction of the study will mention the problems to be studied, objectives, coverage and limitation, method used in the analysis and source of information.

Chapter 2 will deal with the shipping situation
in Thailand particularly the role of shipping in Thai economy and some of the statistical data concerned.

Chapter 3 will relate to the definitions and the composition of the balance of payments and also the Balance of Payments' structure of IMF and Thailand.

Chapter 4 will be concerned with the relationship between freight and balance of payments and also between freight and port disbursements.

Chapter 5 will deal with the analysis of the model introduced to the study and its derived result.

Chapter 6 will be the conclusion of the study.

1.4 Benefit obtained from the study

It has been seen that freight rates plays an important role for the Thai economy regarding its effect on the balance of payments in Thailand.

Therefore, the benefit gained from the study will be:

a. by application of the mathematical model, the importance of freight rate on the balance of payments is clearly observed and realized.

b. the tool for the government especially the agencies concerned with shipping to make a suitable policy on freight rates and to implement it in a way which will be beneficial to the economy of the country.

c. a preliminary study on this subject which can be further studied by modifying and/or extending the model.
1.5 Source of information and data

The information and data expected for this study will be compiled from a secondary source which is the documents and statistical data provided by government agencies, private institutes and international organisations concerned with shipping activities, for instance,

a. Office of the Maritime Promotion Commission
b. Department of Commercial Economic, Ministry of Commerce
c. Bank of Thailand
d. Economic and Social Commission for Asia and the Pacific (ESCAP)
e. United Nations Conference on Trade and Development (UNCTAD)
f. United Nations Statistical Office
g. International Monetary Fund (IMF)

The information and data are also obtained by inquiring and interviewing the person specialized in the subject and by the reports of the meetings concerned.
References


[3] See also [1], p.29.

2.1 International Shipping in Thailand

2.1.1 Historical Background

Thai international shipping may be said to have begun 376 years ago. The Thai merchant marine went to trade with foreign countries such as China, Japan and Persia (Iran). It has been recorded that the first Thai argosy called at Nagasaki, Japan in 1612. The argosy was manned by both foreign master and crew in order to facilitate the trade.

During the first World War Thailand joined the Allies against Germany, and confiscated eleven German ships which were in Thai territorial waters. After the war the Government set up a shipping company called 'Siamese Steamship Company Ltd.' to operate those confiscated German ships which were of 1,000-5,000 dwt. This was the first time that mechanical ships flying Thai flags operated with all Thai crew internationally. The route of operation was Bangkok - Hong Kong - Japan. However, because of the lack of commercial experience and shortage of well-trained men, the company soon folded up and all the ships were sold to a Japanese shipping company.

In 1940, since the increasing need to transport cargo within the region, the Thai government realized the importance of having its own national fleet again and set up a new shipping company called 'Thai Maritime Navigation Company'.
When the company began, it bought 5 second hand ships from the U.S.A., two of which were of 5,000 dwt. and the other three were smaller. The company did not have fixed routes but operated as tramp ships going wherever there was cargo to be carried. The ships' officers and crew came mainly from the Thai Navy, but the company also hired foreign officers and crew. However, during World War II all ships belonging to the company were confiscated when calling at Allied ports; four of them were sunk and the only one remaining was returned to the company after the war.

The company restarted business with this only one ship for five years (1947-1951). The operation was not profitable and the company finally decided to sell it as scrap. The company ceased operation until 1955, when it bought 3 ships of 2,300 tons from the Republic of China. They were used to operate on the Singapore - Malaysia - Penang trade routes. The operation of these ships still did not bring any profit to the company.

After World War II, the United States become the focusing, operating, financial and decision-making center of world trade. The U.S. Merchant Marine Act of 1936, which reworked and improved subsidy programs, became a model for all later shipping legislations. Having good relationships with the U.S.A., the Thai government was influenced by the American subsidy system and later decided to take a more supportive role in shipping by providing 99.99% subsidy to the only government-owned shipping company (the Thai Maritime Navigation Company Ltd.).

The company bought 3 cargo ships and one war surplus ship from the U.S.A. by government loan. The war surplus ship was transferred to the Navy, the other two were put on route between Bangkok and neighboring
countries. However, the company continued to suffer a loss due to its high debt and interest payments and also to impediments posed by the strong shipping conferences.

Nevertheless, in 1964 the Government provided the company with two budget subsidies in order to help pay off its debt and to acquire two new ships. The two ships of 5,600 dwt. each were delivered in 1965 and were put into services on the Bangkok - Hong Kong - Japan route. The operation on this route proved to be reasonably profitable.

In 1985, the company operated only 3 ships on two routes; Bangkok - Hong Kong - Taiwan - Japan and another route plying among Southeast Asian countries. The status of the company remained unchanged as the world faced overtonnage, and the Thai shipping company still struggled to survive. [1] & [2]

In the last decade's period of recession, the government could no longer provide the subsidy and a study of the viability of the Thai Maritime Navigation Company Ltd. was carried out between March and June 1986 'to make an appropriate recommendation for corporate turn around, through improvement of productivity and management effectiveness'.

Subsequently, a letter of intent was signed with the 'Deutsche Africa Linie' (DAL; a German Shipping Company) for financial assistance and taking over of the management of TMN. Sharp criticism was voiced against this decision and it was argued that the Government should allow Thai investors instead. Pending a fundamental decision by the Government with regard to the company's future, the TMN Chairman proposed the temporary suspension of operations in order to consolidate the organization and to clear the financial mess. [3]
2.1.2 Present situation

a) Thai merchant fleet

Thailand has a very small merchant fleet, registering only about 450,000 gross tons in 1983. Most of Thai ships are conventional types which are small and old. In 1985, the Thai fleet of cargo vessels were 86 with its total capacity of 428,439 dwt. while tankers and gas carriers were 70 with its total capacity of 258,584 dwt. Of the 156 Thai flag carriers, 108 vessels were 11-20 years of age, 35 vessels were 21-30 years old, 2 vessels were over 30 years old and only 10 vessels or about 6 percent were under 10 years of age. (See Table 1)

Besides, there were only 10 vessels with a capacity of more than 10,000 dwt. (or 11 percent) for each vessel whereas the number of vessels with a capacity of less than 5,000 dwt. (or 55 percent) for each vessel was 47.[4]

At present Thailand does not have a container vessel but a few container feeders.

There were 48 vessels or about 48 percent of the total dwt. of the fleet operating on fixed routes which served routes between Thailand and ASEAN countries. The other served routes between Thailand and Japan, Europe, the U.S.A. etc. (See Table 2)

b) Shipping activities

There are now 69 Thai shipping companies, 44 of which operate conventional cargo vessels
and the others operate tankers and gas carriers. [5]

There is only one state-owned enterprise under the Ministry of Communications named 'Thai Maritime Navigation Ltd.' (TMN). Due to management and financial problems, the company is at present under temporary suspension of operations.

In 1985, there were 5 outward conferences carrying outward cargoes from Thailand:

1. Thailand/ Bay of Bengal Agreement
2. Thailand/ Europe Conference
3. Thailand/ Japan Conference
4. Thailand/ Pacific Freight Conference
5. Thailand/ U.S. Atlantic Conference

There were as many as 20 inward conferences carrying inward cargoes to Thailand either calling at Bangkok Port as direct port or base port. The important ones were Japan/ Thailand Freight Conference and Far Eastern Freight Conference (East bound).

However, most of those conference vessels did not call Bangkok Port directly. They called at Singapore and their cargoes were transshipped in feeders to Bangkok Port.

On the Thailand/ Japan route, Thai vessels carried inward cargoes amounting to around 30% of cargoes carried by conferences and outward cargoes amounting to around 40%. The situation was also somewhat similar to the Thailand/ Europe route. Although, there were no statistics showing the revenues earned by Thai ships, it was believed that they carried relatively low valued cargoes which generated low freight rates. [6]
2.2 The role of shipping in Thai economy

The national merchant marine plays a stabilizing role to a country by enabling a country to be dependent on imports of shipping services. It can be seen that developed countries, with few exceptions, are also maritime powers. Sea transport has been and still is an important factor of their economic growth.

Although the economic significance of the merchant marine is widely recognized, it is not easily quantifiable in the form of economic indices. However, there exist some indicators showing the role of shipping in the national economy including the share of the national merchant marine in the transport of international trade of a country.

2.2.1. International trade

International trade is vital to the Thai economy. Today export and import transactions together account for about half of the national income [7] and they are increasing both in terms of volume and value.

Data collected from the Customs Department and the Harbor Department in Thailand show an increase from 12 million tons in 1978 to about 20.2 million tons in 1985 (excluding exports by land transport modes, especially to Malaysia which accounted for about 700,000 tons and exports through coastal ports accounting for approximately 600,000 tons). [8]
In 1986, Thailand's overall exports rose in value by nearly 20 percent from 1985. Eight principal Thai exports which are rice, rubber, maize, tapioca products, fresh shrimp, tin, sugar and textiles rose in volume by more than 10 percent from last year whereas other exports including precious stones and jewelry, integrated circuits, frozen fish, canned seafood, toys, artificial flowers etc. grew in volume by 20.4 percent and in value by 26.9 percent. [9]

During the 70's, imports (excluding mineral oil and petroleum products) showed a strong growth of 6.7% per annum on the average. After a phase of stagnation (1980-1982), there was a steep increase to 7.3 million tons (or +29%) in 1983, 6.8 million tons in 1984 and 6.5 million tons in 1985. [10]

Although the total value of imports fell slightly in 1986 as the overall value of oil imports fell by about 43 percent, the value of non-oil imports rose by about 9 percent with raw materials and intermediate goods destined for export industries growing even faster. Overall volume rose 4.5 percent, including that of fuel oil and lubricants, along with other categories. Capital goods imports grew at a low rate for the year as a whole, however, they began to establish a clear upward trend in the last quarter of the year. [11]

Moreover, recent forecasting by the National Economic and Social Development Board (NESDB) shows an average annual growth rate (1985 - 1991) of 4.2 percent for imports and 7.5 percent for exports expressed in monetary terms. [12]
International trade and Balance of Payments

A drastically reduced trade deficit in 1986 contributed greatly to Thailand achieving its first current account surplus in 20 years.

The dramatic increase in exports, accompanied by a slight increase in imports, cut Thailand's trade deficit to just a quarter of the size in 1985.

After combining the trade balance with the services and unrequited transfers accounts, the current account surplus reached 6497.7 million Baht compared to a deficit of 41,925 million Baht in 1985.

Although capital movements were less in surplus, the overall balance of payments surplus in 1986 was more than double that in 1985's. (See Table 3)

2.2.2. International trade and Shipping in Thailand

Thailand is becoming increasingly important as an international shipping port and its shipping activities are likely to be considered as a major industry. The international trade also plays a very important role in Thai economy. About 90 percent volume of the international trade is transported at sea. (See Table 4)
However, as has been mentioned before, Thailand has a very small merchant fleet and most of the Thai ships are small and old. Therefore, Thai ships play an insignificant role in carrying either the country’s exports or imports. In 1984, only 8.5 percent of the exports were transported by Thai vessels, while merely 11.3 percent of the imports were carried by Thai ships. (See Table 5)

In addition, regarding the carriage of exports and imports by Thai vessels on some trade routes, for instance Thailand – Japan; from 1982 to 1984 Thai ships carried an average 26.27 percent of total exports and 29.12 percent of total imports (see Table 6), Thailand – Europe; the share of Thai ships in transport both exports and imports was less than 1 percent. (See Table 7) [13]

Besides, due to the disadvantage of the country’s trade agreement; f.o.b. prices for exports and c.i.f. prices for imports, foreign importers or exporters had the rights to nominate their own ships. Consequently, the transport costs or freight earnings then belonged to foreign carriers.

2.3 Statistical data concerned
Table 1.

Thai merchant fleet classified by size and age: 1985

<table>
<thead>
<tr>
<th>size</th>
<th>&lt;1,000</th>
<th>1,000-5,000</th>
<th>5,001-10,000</th>
<th>&gt;10,000</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>age</td>
<td>&lt; 5</td>
<td>5-10</td>
<td>11-20</td>
<td>21-30</td>
<td>&gt;30</td>
</tr>
<tr>
<td>No. dwt.</td>
<td>3 2,740</td>
<td>-</td>
<td>17 10,804</td>
<td>3 1,770</td>
<td>-</td>
</tr>
<tr>
<td>No. dwt.</td>
<td>- 1,006</td>
<td>2 8,695</td>
<td>3 10,941</td>
<td>61 142,657</td>
<td>20 44,986</td>
</tr>
<tr>
<td>No. dwt.</td>
<td>- 8,872</td>
<td>1 5,692</td>
<td>21 129,007</td>
<td>9 57,360</td>
<td>1 5,080</td>
</tr>
<tr>
<td>No. dwt.</td>
<td>- -</td>
<td>9 227,597</td>
<td>3 31,692</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>No. dwt.</td>
<td>6 18,431</td>
<td>4 16,633</td>
<td>108 510,065</td>
<td>35 135,808</td>
<td>2 6,086</td>
</tr>
</tbody>
</table>

Source: Harbor Department, Thai shipowners, Lloyd’s Register of Ships, Sea Transport & Economic Division, MFC.

Note: Data compiled by Research & Planning Division, MPC.
- = nil or negligible
### Table 2.

Thai vessels operated on fixed routes classified by dwt: 1985

<table>
<thead>
<tr>
<th>Route</th>
<th>No. of ships</th>
<th>dwt.</th>
<th>percentage of total dwt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thailand/Japan</td>
<td>11</td>
<td>100,443</td>
<td>21</td>
</tr>
<tr>
<td>Thailand/ASEAN</td>
<td>48</td>
<td>222,362</td>
<td>48</td>
</tr>
<tr>
<td>Thailand/Asia</td>
<td>22</td>
<td>49,437</td>
<td>11</td>
</tr>
<tr>
<td>Thailand/Europe</td>
<td>5</td>
<td>65,354</td>
<td>14</td>
</tr>
<tr>
<td>Thailand/U.S.A.</td>
<td>4</td>
<td>27,990</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>90</strong></td>
<td><strong>465,586</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

*Source: Sea Transport & Economic Division, MPC.*

*compiled by Research & Planning Division, MPC.*
<table>
<thead>
<tr>
<th>Items</th>
<th>1985</th>
<th>1986</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade balance</td>
<td>-61,672</td>
<td>-14,369</td>
</tr>
<tr>
<td>Services balance</td>
<td>15,253</td>
<td>14,953</td>
</tr>
<tr>
<td>Unrequited transfers</td>
<td>4,494</td>
<td>5,914</td>
</tr>
<tr>
<td>Current account balance</td>
<td>-41,925</td>
<td>6,498</td>
</tr>
<tr>
<td>Net Capital movement</td>
<td>51,433</td>
<td>11,354</td>
</tr>
<tr>
<td>Recorded balance</td>
<td>9,508</td>
<td>17,851</td>
</tr>
<tr>
<td>Net errors and omissions</td>
<td>2,956</td>
<td>15,727</td>
</tr>
<tr>
<td>Overall Balance of Payments</td>
<td>12,464</td>
<td>33,578</td>
</tr>
</tbody>
</table>

Source: Bank of Thailand.
Table 4.

Weight of imports and exports by mode: 1981-1985

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>Sea</td>
<td>16,972,002</td>
<td>15,735,881</td>
<td>20,031,993</td>
<td>18,908,275</td>
<td>18,091,757</td>
</tr>
<tr>
<td></td>
<td>Land</td>
<td>208,223</td>
<td>154,674</td>
<td>130,477</td>
<td>122,032</td>
<td>109,361</td>
</tr>
<tr>
<td></td>
<td>Air</td>
<td>7,793</td>
<td>7,717</td>
<td>19,483</td>
<td>27,305</td>
<td>25,726</td>
</tr>
<tr>
<td></td>
<td>Mail</td>
<td>429</td>
<td>340</td>
<td>855</td>
<td>2,714</td>
<td>724</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>17,188,447</td>
<td>15,898,812</td>
<td>20,182,808</td>
<td>19,060,326</td>
<td>18,227,568</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Mode</th>
<th>1984</th>
<th>1985</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984</td>
<td>Sea</td>
<td>16,520,959</td>
<td>21,110,595</td>
</tr>
<tr>
<td></td>
<td>Land</td>
<td>514,492</td>
<td>604,774</td>
</tr>
<tr>
<td></td>
<td>Air</td>
<td>204,119</td>
<td>146,835</td>
</tr>
<tr>
<td></td>
<td>Mail</td>
<td>47</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>17,239,617</td>
<td>21,862,226</td>
</tr>
</tbody>
</table>

Source: Department of Customs.
Table 5.

Exports and Imports transported by Thai vessels: 1977-1984

(Unit: metric tons)

<table>
<thead>
<tr>
<th>Year</th>
<th>Exports*</th>
<th>Imports*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Foreign vessels</td>
<td>Thai vessels</td>
</tr>
<tr>
<td></td>
<td>unit</td>
<td>unit</td>
</tr>
<tr>
<td>1977</td>
<td>14,578,671</td>
<td>493,378</td>
</tr>
<tr>
<td>1978</td>
<td>15,008,094</td>
<td>814,747</td>
</tr>
<tr>
<td>1979</td>
<td>16,843,654</td>
<td>1,042,999</td>
</tr>
<tr>
<td>1980</td>
<td>17,744,232</td>
<td>807,694</td>
</tr>
<tr>
<td>1981</td>
<td>15,739,524</td>
<td>1,027,965</td>
</tr>
<tr>
<td>1982</td>
<td>13,601,647</td>
<td>1,555,507</td>
</tr>
<tr>
<td>1983</td>
<td>16,887,439</td>
<td>2,120,414</td>
</tr>
<tr>
<td>1984</td>
<td>15,991,725</td>
<td>1,491,416</td>
</tr>
</tbody>
</table>

* Only cargoes loaded and unloaded at the Port of Bangkok.

Source: Department of Customs.
compiled by Research & Planning Division, MPC.
Table 6.

Transport of cargoes by Thai vessels on
Thailand — Japan routes 1982—1984

<table>
<thead>
<tr>
<th>Route</th>
<th>Nationality</th>
<th>Thai vessels</th>
<th>Foreign vessels</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Liners</td>
<td>Tramps</td>
<td>Liners</td>
</tr>
<tr>
<td>Japan/Thailand</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1982</td>
<td></td>
<td>273,723</td>
<td>158,182</td>
<td>992,643</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(19.22)</td>
<td>(11.10)</td>
<td>(69.68)</td>
</tr>
<tr>
<td>1983</td>
<td></td>
<td>456,569</td>
<td>82,136</td>
<td>1,597,569</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(21.37)</td>
<td>(3.85)</td>
<td>(74.78)</td>
</tr>
<tr>
<td>1984</td>
<td></td>
<td>475,878</td>
<td>14,864</td>
<td>1,617,234</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(22.58)</td>
<td>(0.70)</td>
<td>(76.72)</td>
</tr>
<tr>
<td>Thailand/Japan</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1982</td>
<td></td>
<td>222,784</td>
<td>102,040</td>
<td>1,281,566</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(13.87)</td>
<td>(6.35)</td>
<td>(79.78)</td>
</tr>
<tr>
<td>1983</td>
<td></td>
<td>380,168</td>
<td>20,008</td>
<td>1,102,806</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(25.29)</td>
<td>(1.33)</td>
<td>(73.38)</td>
</tr>
<tr>
<td>1984</td>
<td></td>
<td>601,700</td>
<td>3,946</td>
<td>889,401</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(40.25)</td>
<td>(0.26)</td>
<td>(59.49)</td>
</tr>
</tbody>
</table>

Source: Department of Customs.
compiled by Research & Planning, MPC.
Table 7.

Transport of cargoes by Thai vessels on Thailand - Europe route: 1982-1984

<table>
<thead>
<tr>
<th>Route</th>
<th>Nationality</th>
<th>Thai vessels</th>
<th>Foreign vessels</th>
<th>Total vessels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Liners</td>
<td>Tramps</td>
<td></td>
</tr>
<tr>
<td>Europe/Thailand</td>
<td>1982</td>
<td>20,946</td>
<td>-</td>
<td>649,827</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3.12)</td>
<td></td>
<td>(96.88)</td>
</tr>
<tr>
<td></td>
<td>1983</td>
<td>4,331</td>
<td>-</td>
<td>943,577</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.46)</td>
<td></td>
<td>(99.54)</td>
</tr>
<tr>
<td></td>
<td>1984</td>
<td>30,712</td>
<td>3,015</td>
<td>591,736</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4.19)</td>
<td>(0.48)</td>
<td>(94.61)</td>
</tr>
<tr>
<td>Thailand/Europe</td>
<td>1982</td>
<td>18,901</td>
<td>5,032</td>
<td>7,158,888</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.26)</td>
<td>(0.07)</td>
<td>(99.67)</td>
</tr>
<tr>
<td></td>
<td>1983</td>
<td>32,416</td>
<td>2,781</td>
<td>4,438,274</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.73)</td>
<td>(0.06)</td>
<td>(99.21)</td>
</tr>
<tr>
<td></td>
<td>1984</td>
<td>38,382</td>
<td>5,531</td>
<td>5,273,011</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.72)</td>
<td>(0.10)</td>
<td>(99.18)</td>
</tr>
</tbody>
</table>

Source: Department of Customs.
compiled by Research and Planning Division, MPC.
References


[5] See also [4]


CHAPTER 3

BALANCE OF PAYMENTS AND ITS COMPOSITIONS

3.1 Balance of payments' definitions

The meaning of balance of payments has been defined by many economists. Some of the interesting definitions are:

a. The balance of payments is a systematic record of all transactions between residents of one country and the rest of the world.


b. The balance of payments is merely a way of listing receipts and payments in international transactions for a country. In this sense the balance of payments is an application of double-entry book-keeping and thus it will always balance.

   (ESCAP, 1986. Implications of Currency Fluctuations in Shipping, Bangkok.)

c. Balance of payments is an account which includes a systematic recording of all the economic transactions made during a definite period of time (usually a year), between the residents of one territory and the residents of other territories.

d. The balance of payments is a statistical statement showing

  d.1 the actual transactions that have taken place in goods, services and income between a given economy and the rest of the world,
  d.2 changes of ownership and other changes in that economy’s monetary gold, Special Drawing Rights (SDR) and claims on and liabilities to the rest of the world, and
  d.3 unrequited transfers and counterpart entries that are needed to balance, in the accounting sense, any entries for these transactions and changes which are not mutually offsetting.

( Dr. H.E. Haralambides, 1987. Shipping in the National Economy; lecture notes, Malmo.)
3.2 The composition of Balance of Payments

The structure of the balance of payments is determined by the economic character of the various international transactions. In general, it is distinguished between the balance on current account and the capital balance. The former comprises the trade balance or balance of visible trade (exports and imports of goods) and the invisible balance showing exports and imports of services like transport, insurance, patents & licences, travel as well as interest, profits and dividends of foreign capital investments and unrequited transfers. The latter includes short-term and long-term investments, i.e. assets and liabilities of the private and public sector as well as the banking sector.

Normally, there is a difference between exports and imports of goods and services so that the balance on current account shows a positive or negative net account. However, the balance of payments is constructed on the basis of 'double entry system' in which every transaction recorded is to be represented by two entries that have exactly equal values. One entry is specified as a credit and comprehended as having a positive arithmetic sign, while the other is named a debit and given a negative sign. The difference between the sum of all positive entries and the sum of all negative entries (the net balance of all entries) in the statement is zero.[1]

By definition, a country's total balance of payments is always equalized. When the problems of the balance of payments are discussed, this in fact means imbalances of partial accounts e.g. deficits of the current account.
causing outflows of foreign exchange reserves and/or pressure on the exchange rate. The problem of maintaining equilibrium in a country's balance of payments is the problem of adjusting a country's balance of trade and services which is determined by factors like the level of income, prices, costs and exchange rates to the international flow of capital funds which is affected by such factors as the rates of interest at home and abroad and their expected development.

Table 1 below gives a simplified example of how a country's balance of payments can be in disequilibrium [2]

<table>
<thead>
<tr>
<th>Credits</th>
<th>Debits</th>
<th>External balances</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Exports of goods</td>
<td>5. Imports of goods</td>
<td>Balance of trade</td>
</tr>
<tr>
<td>2. Exports of services</td>
<td>6. Imports of services</td>
<td>Balance of services</td>
</tr>
<tr>
<td>3. Unrequited receipts</td>
<td>7. Unrequited payments</td>
<td>Balance of unrequited transfers</td>
</tr>
<tr>
<td>Sum 1, 2, 3</td>
<td>Sum 5, 6, 7</td>
<td>Balance of current account</td>
</tr>
<tr>
<td>Sum 1, 2, 3, 4</td>
<td>Sum 5, 6, 7, 8</td>
<td>Balance of payments</td>
</tr>
</tbody>
</table>
The left side of the table shows all the ways in which a country’s can acquire foreign currency while the right side shows how the foreign currency can be used.

Items (1) and (5) show what is called the visible trade while items (2) and (6) show the invisible trade.

Item (3) contains receipts which the residents of a country receive ‘for free’ without having to make any present or future payments in return whereas the same goes for item (7).

Items (4) and (8) express changes in stock magnitudes and refer to capital receipts and payments. When a country gets a loan from abroad or a firm issues stocks in other countries or a bank floats a loan in foreign currencies it will acquire currency and these transactions will be entered as items in (4). Similarly, item (8) shows an outflow of foreign currency.

A country can acquire foreign currency in either of two fundamental ways:
- by exporting goods and services or
- by importing capital

Therefore, exports of goods and imports of capital both have to be listed on the credit side of a country’s balance of payments.

There are of course also two basic ways in which a country can use its foreign currency:
- by importing goods and services or
- by exporting capital
There are several ways in which the balance of payments can be broken down vertically, for instance:
- the balance of trade
- the balance of services or
- the balance of unrequited transfers

If the three balances are added, a sub-total balance called the current balance will be got. None of these balances need to be in equilibrium.

If the current account shows a deficit, the country spends more abroad during the period of time than it has earned. This deficit will have to be settled by a transaction on the capital account which brings the balance of payments into equilibrium.

This can be done by, for instance by:
- borrowing abroad
- selling assets
- depleting reserves of foreign currency

Besides, to understand in what sense the balance of payments can be in disequilibrium, the nature of the capital flows in the capital account should be understood.

There are two main types of capital flow:

i. Autonomous capital movements which can be thought of being planned capital movements and are ex ante in nature. Although these capital flows have consequence on the balance of payments situation, the entities engaging in them do that without direct regard for the balance of payments consequence.

For instance, the buying of corporate shares by a non-resident constitutes such an autonomous capital inflow while a long-term loan to a foreign government
constitutes an autonomous capital outflow.

ii) Accommodating capital flows are unplanned capital flows which take place specifically to equalize the balance of payments in the book-keeping sense. They are ex post in nature and can be discovered only at the end of the period.

The accommodating capital inflows can take various forms:

- foreign firms might accept short-term claims on firms in the country
- the government may obtain loans from abroad or
- the country might have to deplete its reserves of foreign currencies in order to settle its accommodating capital inflow.[3]

If a country’s autonomous receipts are larger than its autonomous payments, there will be a surplus in the country’s balance of payments. This difference will then be settled by an accommodating outflow of capital equal to the surplus.

If a country’s autonomous inflows are smaller than its autonomous outflows, a country will have a deficit in its balance of payments. This deficit will have to be settled by an accommodating inflow of capital at the same amount which will bring the balance of payments into equilibrium.

However, if a country has a deficit in its balance of payments and this is settled by an accommodating inflow of capital, this can be viewed as a warning signal. Such a situation cannot continue for long. Sooner or later the government will have to change its economic policy.
The situation depends to a large extent on the type of policy the country already pursues. If the general economic policy is not very restrictive it may be relatively easy to close a deficit compared to the situation in a country that already has a heavily controlled economy with many restrictions and still has not avoided a deficit in its balance of payments.

Therefore, countries can be in very different position concerning the balance of payments, even though their deficits on accommodating capital inflows are the same. The reason for this may be that the general economic situation in the two countries may be very different. It is therefore not possible to discuss a country’s balance of payments situation without taking into account its general economic background.

For reasons of economic analysis the balance of payments statement is usually divided in three separate accounts:\[4\]

a) The merchandise trade account or trade balance
b) The balance of invisibles
c) The capital account

The merchandise trade and invisible accounts constitute the current account of the balance of payments. Sometimes the current account and the long term capital account are taken together and referred to as the ‘basic balance’.
a) The trade balance

The trade balance records transactions on merchandise trade between the country in question and the rest of the world.

Exports are normally valued f.o.b. (free on board) i.e. costs for transportation and insurance are not included, whereas imports are mostly valued c.i.f. (cost, insurance, freight) i.e. transportation and insurance costs are included.

b) The invisibles balance

Invisible trade consists of all non-merchandise transactions in the current account.

These transactions are disaggregated into six major categories:
- government
- travel
- interest, profits
- transport
- other services
- unrequited transfers
& dividends

Other services account includes a miscellany of transactions in services which are either inappropriate for inclusion in the other items in the balance of payments or cannot be allocated to them for statistical reasons.

Examples of such transactions are:
- commissions on exports and imports
- royalty receipts and payments
- earnings and payments in respect of
telecommunications
- postal services
- films and television
- private receipts from foreign military forces and
- international organizations' expenditures in the country

c) The capital account

The capital account records changes to stock magnitude. Imports of capital are recorded in the credit side of the capital account and exports in the debit. In other words, a reduction in the assets or an increase in liabilities is recorded in the credit side of the capital account while an increase in the country's asset or a reduction of its liabilities is recorded in the debit side.
A typical balance of payments account including several items concerned is shown in Table 2. below:

Table 2. The structure of the Balance of Payments

1. Merchandise Account
   (also called 'visible account')

2. Services Account
   (also called 'invisible account')
   - Transport
   - Tourism
   - Others
   \[(1)+(2) = \text{Current Account Balance}\]

3. Account 'External Revenues'
   - Capital Revenues
   - Receipts/payments by governments
   - Receipts/payments of business enterprises abroad
   - Others

4. Current donations

5. Capital donations

6. Capital investments and monetary gold
   a) long-term investments
   b) short-term investments
   c) monetary gold
   \[(3)+(4)+(5)+(6) = \text{Balance of investment and capital movements}\]

Source: Based on M. Bye's: Relations économiques internationales, 'Dalloz', Paris 1971, p.81
Brief explanations of the particular elements of the Balance of Payments are:

**Merchandise Account or Commercial Account**

It includes on the credit side receipts from exports and sales of non-monetary gold and on the debit side the payments for imports f.o.b. (if stated c.i.f. value of insurance and freight must be deducted), purchase of non-monetary gold.

**Services Account**

Services Account includes services produced inside the country’s territory (including ships at sea) and sold to foreign residents and vice-versa. Included in this account are the following services:

1) transport services: sea, rail, road, air transport, pipe-lines, etc.,
2) foreign tourists and travellers
3) other services: insurance, banking, film hiring, patents, trade-marks, copy-rights, etc.

**External Revenues Account**

External services are rendered by domestic residents and agencies located abroad. Included in this account are the following items:

1) receipts and charges on national capital placed abroad under the form of portfolio investments, direct investment or short-term employment,
2) receipts and payments by government, e.g. maintenance of armed forces overseas,
3) receipts and payments by business enterprises settled abroad.
Current Donations Account

'‘Donation' is any goods or rights given at a disposal of a nation by another nation, for instance donations of the United Nations Relief and Rehabilitation Administration.

'Current donations' are those which are considered, due to their volume and their value, as revenues for the donor (e.g. an immigrant's remittance to his family staying in his country of origin)

Capital Donations

There are three types of these donations:
1) voluntary donation -- If it results from a free decision by the donor (e.g. Marshall Plan, or assistance to developing countries)
2) compulsory donation -- if a donor is constrained to do so (e.g. war contributions or reparations)
3) automatic donation -- if the operation is connected with another event, e.g. an immigrant bringing with him 'capital' in chattels or in money.

Movement of Capital Assets and of monetary gold

There are three types of capital investments:
1) long-term investments if they are made for a period over one year
2) short-term investments, which are usually not considered as actual investments, e.g. movements of foreign exchange in order to balance a country's foreign trade
3) movements of monetary gold as distinct from movements of gold as merchandise (for industrial or jewellery use).[5]
3.3 IMF's Balance of Payments

The International Monetary Fund, in its efforts to unify the presentation of balance of payments statistics for analytical purposes, has suggested the various items that should be recorded in a balance of payments of its member countries.

The standard components of IMF's balance of payments are classified into the following standard groups considered relevant for analyzing the international economic relationship of the reporting countries in a uniform manner.

A. Current Account
   Merchandise: exports f.o.b.
   Merchandise: imports c.i.f.
   Trade balance
   Other goods, services, and income: credit
   Other goods, services, and income: debit
   Total goods, services, and income
   Private unrequited transfers
      Total, excl. official unrequited transfer
   Official unrequited transfers

B. Direct Investment and Other Long-Term Capital
   Direct investment
   Portfolio investment
   Other long-term capital
      Resident official sector
      Deposit money banks
      Other sectors

   Total, Groups A plus B
C. Other Short-Term Capital
   Resident official sector
   Deposit money banks
   Other sectors

D. Net Errors and Omissions
   Total, Groups A through D

E. Counterpart Items
   Monetization/demonetization of gold
   Allocation/cancellation of SDRs
   Valuation changes in reserves
   Total, Groups A through E

F. Exceptional Financing
   Total, Groups A through F

G. Liabilities Constituting Foreign Authorities' Reserves
   Total, Groups A through G

H. Total Changes in Reserves
   Monetary gold
   SDRs
   Reserves position in the Fund
   Foreign exchange assets
   Other claims
   Use of Fund credit

(See the full list of standard components of the detailed presentation in Annex 1)
The selected group, however, does not necessarily reflect the Fund's recommendations about the analytic approach that would be appropriate for countries to adopt for their own purposes. Moreover, the balances that have been drawn in the presentation may be affected by special circumstances that must be taken into account when interpreting the figures that purport to measure a given concept of imbalance. Finally, the aggregated presentation should be read in the light of other developments in the national and world economic situation that also have a bearing on the surpluses and deficits that can be compiled from the standard components.[6]
3.4 Thailand's Balance of Payments

The balance of payments statistics in Thailand are compiled by the Balance of Payments Section of the Department of Economic Research (DER) of the Bank of Thailand on the basis of the third edition of the IMF's Manual and the data are presented in the Bank's Bulletin in the third edition format. (See Annex II)

The items of the balance of payments are shown in Table 3 below:

<table>
<thead>
<tr>
<th>Table 3. Thailand's Balance of Payments' items</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Merchandise</strong></td>
</tr>
<tr>
<td>1. Exports f.o.b.</td>
</tr>
<tr>
<td>2. Imports c.i.f.</td>
</tr>
<tr>
<td>3. Non-monetary gold</td>
</tr>
<tr>
<td>4. Trade balance</td>
</tr>
<tr>
<td><strong>B. Services</strong></td>
</tr>
<tr>
<td>1. Receipts</td>
</tr>
<tr>
<td>1.1 Freight and insurance on merchandise</td>
</tr>
<tr>
<td>1.2 Other transportation</td>
</tr>
<tr>
<td>1.3 Travel</td>
</tr>
<tr>
<td>1.4 Investment income</td>
</tr>
<tr>
<td>1.5 Government, n.i.e.</td>
</tr>
<tr>
<td>Military services</td>
</tr>
<tr>
<td>Other governmental services</td>
</tr>
<tr>
<td>1.6 Other services</td>
</tr>
<tr>
<td>2. Payments</td>
</tr>
<tr>
<td>2.1 Freight and insurance on merchandise</td>
</tr>
<tr>
<td>2.2 Other transportation</td>
</tr>
</tbody>
</table>
2.3 Travel
2.4 Investment income
2.5 Government, n.i.e.
   Military services
   Other government services
2.6 Other services
3. Net services
Net goods and services
C. Unrequited transfers
   1. Private
      1.1 Inward transfers
      1.2 Outward transfers
   2. Central government
      2.1 U.S. grants
      2.2 Other foreign countries grants
      2.3 Special Yen
      2.4 Rice donated to UNICEF and foreign countries
      2.5 Miscellaneous transfers
Balance on goods, services and unrequited transfers

D. Capital movements
   (non-monetary sector)
   1. Direct investment
   2. Other private long-term
      2.1 Loans and credits to government enterprises
         Drawings
         Repayments
      2.2 Loans and credits to private enterprises
         Drawings
         Repayments
2.3 Portfolio investment
2.4 Others

3. Other private short-term
   3.1 Loans to private enterprises
   3.2 Trade credits
   3.3 Loans and credits to government enterprises
   3.4 Others

4. Local government project

5. Central government
   5.1 Loans
      Drawings
      Repayments
   5.2 Long-term assets
   5.3 Baht liabilities to IBRD, IDA and ADB
   5.4 Others
      Import credits, etc.

E. Allocation of SDRs

F. Recorded balance (A through E)

G. Net errors and omissions

H. Overall balance (F plus G)

I. Monetary movements
   1. Net IMF accounts
   2. Private institutions liabilities
   3. Private institutions assets (increase)
   4. Central institutions assets (increase)
   5. Monetary gold (increase)
   6. SDRs (increase)
   7. Central institutions liabilities

The source and coverage of these balance of payments' items are:

A. Merchandise

The data for merchandise are derived from the 'Foreign Trade Statistics of Thailand' published monthly by the Department of Customs. Since the data in that publication have a time lag of about seven to eight months, the officials of the DER obtain computer tapes of provisional data from the Customs Department, which are available with the time lag of about two months. The provisional figures are revised when the final data become available.

A.1 Exports f.o.b.

The data cover both exports and re-exports. The f.o.b. values are derived from the documents of sale and cover the actual amounts received, expressed in terms of national currency, including export duty, if any.

The following adjustments are made to the customs data by the Balance of Payments Section:

Exclude (i) Returned exports
(ii) Goods for repair or processing
(iii) Personal effects
(iv) Temporary exports
(v) Samples
(vi) Diplomatic exports
(vii) Miscellaneous exports (principally containers)

A.2 and A.3 Imports c.i.f. including non-monetary gold

The data cover all goods which enter Thailand and are cleared by customs officials, but exclude
accompanied personal effects of passengers and goods received under military aid. Imports are valued c.i.f. When the invoice value is f.o.b., the customs officials add freight and insurance at rates according to the country of exports and the means of transportation.

The following adjustments are made to the import data by the Balance of Payments Section:

Exclude (i) Returned imports
   (ii) Goods for repair or processing
   (iii) Personal effects
   (iv) Temporary imports
   (v) Samples
   (vi) Diplomatic imports

Add (vii) Parcel post
   (viii) Imports under military aid

In addition, timing adjustments are made with respect to imports of aircraft.

For reporting to the Fund's Balance of Payments Division, the Balance of Payments Section reduces the c.i.f. value of imports to an f.o.b. basis by deducting freight and insurance at the rate of 10 percent of the c.i.f. value of unadjusted imports.

B. Services-Receipts

B.1.1 Freight and insurance on merchandise

The data are derived from the exchange record and cover freight and insurance, mainly on exports, received by resident shipping and insurance companies and airlines. The data also include funds received from abroad by agents in Thailand of foreign shipping companies and airlines.
B.1.2 Other transportation

The data are derived from the exchange record and cover earnings on account of passengers' fares, charter hire, and port disbursements. The earnings on account of passenger fares represent foreign exchange receipts from passengers and may include receipts from residents.

B.1.3 Travel

The data are estimated by the Tourism Authority of Thailand (TAT) on the basis of the number of tourists and their average length of stay as obtained from the Immigration Department. To the above data, an average expenditure per day is applied, as estimated by TAT through surveys conducted every two years. The information is classified according to categories of travellers, such as businessmen, students, officials, tourists, and others.

B.1.4 Investment income

The data cover direct investment income and other investment income. The information on direct investment income and on other investment income of the private non-monetary sector is derived from the exchange record. An inflow of income is classified as direct investment income if the recipient in Thailand and the remitter abroad are affiliated enterprises. Otherwise, the income is classified as other investment income.

The income of the commercial banks is estimated by the Balance of Payments Section on the basis of the bank's holdings of foreign assets and liabilities as reported to the Bank's International Department on the 'Daily Report of Spot and Forward Exchange Transactions and Position'.

The Quarterly average for net assets or liabilities is calculated on the basis of end-of-month
balance outstanding over the preceding three months; interest is estimated by applying the prevailing London Inter Bank Offer Rate (LIBOR) to the calculated average. Since foreign liabilities of the commercial banks are always much larger than their assets, investment income of the commercial banks, as estimated by the Balance of Payments Section, is always negative and is shown in the balance of payments as a debit.

The income of the Bank of Thailand on its foreign assets is at present not available separately and therefore the figures are estimated indirectly by deducting from the changes in holdings all deposits, adding all withdrawals, and adjusting for valuation changes. The resulting figure is treated as investment income of the Bank of Thailand.

B.1.5 Government n.i.e.

The data are derived from the exchange record. The amounts mainly cover Thailand's receipts from foreign embassies and international organizations located in Thailand. The foreign exchange received is treated as their local expense, as no other details are available. Some receipts represent local expenses of U.S. military personnel in Thailand.

B.1.6 Other Services

The data are derived from the exchange record. The entries cover receipt on account of miscellaneous private services not included in other items. The entries may include remittances received from nationals working abroad on a long term basis.
Services-payments

B.2.1 and B.2.2 Freight and insurance on merchandise and other transportation

The data are derived from the exchange record and mainly cover remittances abroad by the agents of foreign shipping companies and airlines. The amounts represent receipts of these agents in Bath on income of freight, passengers fares, charter hire, etc. net of their local expenses and commission received. The payment is classified as freight when the applicant is an agent of a shipping company, whereas the amount is coded as other transportation when the applicant is an agent of the airline. The data from item B.2.2, other transportation, also include expenses abroad by resident shipping companies and airlines on account of port expenses.

B.2.3 Travel

The data are derived from the exchange record and represent the use of foreign exchange by Thai nationals for travel abroad. The data are classified according to various categories such as business, student, tourist, official, and other.

B.2.4 Investment income

The entries cover direct investment income payments as well as payments of other investment income. The information on direct investment income payments is derived from the exchange record; the data represent profits remitted by affiliates of foreign companies in Thailand to their head offices abroad. Interest payments on loans received by the private sector are also derived from the exchange record. The figure for interest on loans received by the government and by public enterprises are
obtained from the Ministry of Finance. As already indicated in item B.1.4 above, interest payments by the commercial banks are estimated by the Balance of Payments Section and are included here.

B.2.5 Government n.i.e.

The data are derived from the exchange record and represent amounts remitted to Thai diplomatic missions abroad. These remittances are treated as their local expenses, as no details are available on actual outlays. The entries also included technical assistance received by the Government from the United States under aid programs, a contra-entry for which is included in official unrequited transfers, credit.

B.2.6 Other services

The entries are derived from the exchange record and cover payments on account of miscellaneous services not included in other items. The payments are mainly for:
- Personal services (labor income)
- Management fees
- Agents' fees
- Processing fees
- Communications
- Advertising
- Subscriptions to the press, and
- Film rentals

C. Unrequited transfers

C.1 Private

C.1.1 Inward transfers

The data are derived from the exchange record
and cover remittances received on account of legacies, inheritances, migrants' transfers, family maintenance, and institutional donations. The entries also include receipts on account of income taxes, visa and consular fees, and pensions received from foreign governments.

C.1.2 Outward remittances
The data are derived from the exchange record and cover remittances abroad on account of migrants' transfers, donations to private charitable organizations, family maintenance, etc. In addition, the figures include payments of taxes and visa and consular fees to foreign governments and pensions paid by Thai Government to nonresidents.

C.2 Central Government

C.2.1 U.S. grants
The data are received from the Department of Technical and Economic Cooperation and represent grants received in the form of technical assistance, fellowships, commodities, etc.

C.2.2 - C.2.5 Other grants
The data are derived from the Customs Department and partly from the exchange record. Data on commodity aid from Colombo Plan countries, other countries, and the United Nations are received from the Customs Department, while data on cash grants are derived from the exchange record.
D. Capital movements (nonmonetary sector)

D.1 Direct investment

Direct investment enterprises are defined as enterprises in Thailand in which the foreign holding of the share capital is ten percent or more. The information is derived from the exchange record and covers only the cash flows between head offices and their affiliates. Flows of direct investment capital between branches of foreign banks in Thailand and their head offices abroad are not covered.

D.2 Other private long-term Loans

D.2.1 Loans and trade credits to government enterprises

The data on loans guaranteed by the government are received from the Ministry of Finance, while those on loans without government guarantee are derived from reports which government enterprises submit to the International Department of the Bank of Thailand.

D.2.2 Loans and credit to private enterprises

Trade credits as well as loans channelled through the banking system are derived from the various exchange control forms, while information on other loans is derived from the loan register. For loans other than trade credits and for loans which are not transacted through the banking system, the Bank of Thailand encourages borrowers to register such loans with the Banks' International Department, so that at the time of loan repayments and interest payments the debtors can obtain approval for remittances of foreign exchange. The repayments of suppliers' credit include payments of
interest as separate data are not available.

D.2.3 Portfolio investment
The data are derived from the exchange record and cover inflow of funds for the purchase of Thai shares, net of the outflow representing repatriation of funds following the sale of those shares.

D.2.4 Other private long-term capital
The data come from the exchange record and cover repayments of personal loans extended by individuals to nonresidents. The classification of these transactions as long-term is arbitrary since detailed information is not available.

D.3 Other private short-term Loans

D.3.1 Short-term trade credits
The data are derived mainly from the exchange record and relate to trade credits extended. The classification of these transactions into short-term is arbitrary since no details are available. The items also include data on trade credits received on oil imports which are furnished by oil importers.

D.3.2 - D.3.4 Other private short-term credits
The data are derived from the exchange record and cover receipts and payments of foreign exchange for credit and debit, respectively, to the Baht accounts of nonresidents.

D.4 Local government projects
The data are derived from the Ministry of Finance and cover suppliers' credits received by the
municipal authorities.

D.5 Central Government

D.5.1 Loans received by the Central Government
The data are derived from the Comptroller
General Department of the Ministry of Finance. The entries
include bonds issued abroad by the Government of Thailand.

D.5.2 Long-term assets
The data cover trade credits extended by the
Thai Government to foreign government for the purchases of
rice, and capital subscriptions to international
organizations. The data on trade credits are received from
the Ministry of Commerce, while those on subscriptions
come from the International Department of the Bank of
Thailand.

D.5.3 Bath liabilities to IBRD, IDA, and ADB
The entries cover that part of the subscriptions
to the above organizations that is paid in local currency.
The data are available in the Bank of Thailand.

D.5.4 Other Central Government capital
The entries cover changes in short-term export
credits extended by the Government. The data are derived
from information on contracts furnished by the Ministry of
Commerce.

I. Monetary movements

I.1 Net IMF accounts
The entries cover Thailand's transactions with the
IMF. The entries also cover drawings on Trust Fund Loans.
1.2 Private institutions' liabilities
The entries cover changes in the commercial banks' foreign liabilities as derived from the 'Daily Report of Spot and Forward Exchange Transactions and Position' which is submitted to the international Department by the commercial banks.

1.3 Private institutions' assets
The entries cover changes in the foreign assets of the commercial banks. The data are derived from the 'Daily Report of Spot and Forward Exchange Transactions and Position'. These holdings are said to be available to the authorities for balance of payments purposes.

1.4 Central institutions' assets
The entries cover changes in the Bank of Thailand's foreign exchange assets and exclude valuation changes.

1.5 Monetary gold
The entries cover changes in the value of monetary gold holdings. The gold is valued at the market price prevailing at the end of each year.

1.6 SDRs
The entries cover changes in the central authorities' holdings of these assets.

1.7 Central institutions' liabilities
The entries cover changes in the liabilities of the Bank of Thailand arising from swap transactions.
References

[1] See Dr. H.E. Haralambides, 'Shipping in the National Economy'; lecture notes, Malmo, 1987

[2] See ESCAP, 'Implications of Currency Fluctuations in Shipping'; p.4-7

[3] See also [1]

[4] See also [1]


CHAPTER 4

THE RELATIONSHIP BETWEEN FREIGHT AND BALANCE OF PAYMENTS

4.1 The Transport Account in the Balance of Payments

In accordance with international practices, the balance of payments is divided into a current account and a capital account. The current account is composed of merchandise trade and so-called invisible transactions which include all transactions relating, in principle, to neither goods nor capital flows. 'Invisible' comprise trade in services, income and transfers. Trade in services can be disaggregated into three categories: transport services, travel services and other private services. The first category includes the transport of goods and passengers by air, sea, road and rail as well as port services and insurances on transport. Travel services include mostly services like hotels and restaurants. Finally, 'other private services' comprise financial services (banking, insurance, brokerage etc.) as well as professional and technical services (accounting, advertising, construction and engineering, consulting and management, data processing etc.). [1]

Therefore, it can be seen that transport account is one of several items relating to services in the invisible sector of the balance of payments framework (see figure 1). The account is concerned with the earnings and operating expenses abroad, arising from the provision of transport services to foreign residents and the corresponding earnings and expenses of the foreign operators in their dealings with residents of the country.
Generally, these transactions refer to all means of transport (ocean, air, rail, road, pipelines, etc.), although for some countries for example Greece, these relevant payments and receipts correspond to ocean shipping and the transport account is often referred to as shipping account in the balance of payments.

Thus, as far as the transport account is concerned, shipping is regarded as part of the invisible exports and imports of sea transport services (see figure 2), i.e. the analysis of foreign transactions of the shipping industry is limited to the operating accounts including intermediate consumption abroad.[2]
Figure 1 The transport account in the balance of payments
Figure 2. The Role of Shipping in the Balance of Payments

Current account

Visible trade
- Exports
- Imports
Invisibles
- Credits
- Debits

Services
- Interests
- Profits
- Dividends
- Transfers

Travel
- Transport
- Insurance
- Others

Shipping
- Civil aviation
- Others

Capital account

Capital excluding reserves
- Direct investment
- Other long-term assets/liabilities
- Short-term transactions

Reserves
- Total change in holdings
- Monetization/demonetization
- Valuation changes

Errors and Omissions
As far as they are specified within the transport account, the foreign transactions of a typical sea transport account can be seen in Figure 2.1.

**Figure 2.1 The Sea Transport Account in the Balance of Payments**

<table>
<thead>
<tr>
<th>Credit</th>
<th>Debit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receipts of domestic ships</td>
<td>Payments to foreign carrier for</td>
</tr>
<tr>
<td>for freight on exports paid for by foreign buyer</td>
<td>freight on exports paid for by consignor</td>
</tr>
<tr>
<td>for freight on imports paid for by foreign supplier</td>
<td>freight on imports paid for by consignee</td>
</tr>
<tr>
<td>for freight on cross-trades</td>
<td>charter fees payments</td>
</tr>
<tr>
<td>charter fees receipts</td>
<td>passenger payments</td>
</tr>
<tr>
<td>passenger revenue</td>
<td></td>
</tr>
<tr>
<td>Port disbursements by foreign ships and crew in home ports</td>
<td>Port disbursements by domestic ships and crew in foreign ports</td>
</tr>
<tr>
<td>Receipts of home insurance companies for maritime insurance services provided to foreigners</td>
<td>Payments of marine insurance to foreign underwriters</td>
</tr>
<tr>
<td>Receipts of drydocks in the home country for maintenance repairing made by domestic and repairs to foreign ships vessels in foreign countries</td>
<td></td>
</tr>
</tbody>
</table>
According to the figure above, the credits in the shipping account consist of the earnings of the country's shipowners and operators from freight chartering, passenger revenue and expenditure of foreign ship operators in the country for bunkering, port charges, etc. Correspondingly, the debits consist of disbursements, charter payments abroad by resident shipowners and operators and payments to foreign operators for freight on imports and passenger payments.

Brief explanations of some particular items of figure 3 should be mentioned as follows: [2]

**Freight on Cross- Trades**
Receipts consist of freight earnings of national shipowners and operators from carriage of goods between third countries.

The greater the size of the national fleet in relation to the country's own transport requirements, the greater the percentage of this item's revenue on the total credit of the transport account.

**Charter Hire**
Charter receipts include charter hires accruing to the country from time-chartering of national vessels to foreign operators. Contrarily, charter payments refer to payments by domestic transport or other enterprises to foreigners for the time-charter of foreign-owned vessels.
Passenger Revenue

In the credit side of transport account, passenger fares consist of the receipts of domestic carriers for the transportation of foreign passengers to and from the country and for the transportation of foreign residents between foreign countries. Debits include the reverse transactions; fare payments of residents to foreign transportation companies.

Port Disbursements

The items in the credit side of the transport account include disbursements by foreign carriers for fuel, ships' stores and similar supplies, stevedoring, loading and unloading, port dues, agency fees, pilotage and towage, light dues and other miscellaneous port receipts, advertising, salvage earnings, mail fees, repairs and maintenance and expenditure of foreign crews in the country.

The same items will be found in reverse on the debit side under 'port disbursements', or under 'other transportation' in the IMF's classification.
4.2 Freight as the major element in balance of payments

In most maritime countries, the very important items in the transport account of balance of payments are payments for and receipts from freight.

As 'freight receipts' represent the earnings of national shipowners from carrying the country's export while 'freight payments' is the amount paid to foreign operators for carrying the country's imports. The following several situations can be considered in order to illustrate how the freight revenues and payments influence the balance of payments: [4]

(a) Exported goods are transported by a domestic carrier on a f.o.b. basis
(b) Exported goods are transported by a domestic carrier on a c.i.f. basis
(c) Exported goods are transported by a foreign carrier on a f.o.b. basis
(d) Exported goods are transported by a foreign carrier on a c.i.f. basis
(e) Imported goods are transported by a domestic carrier on a f.o.b. basis
(f) Imported goods are transported by a domestic carrier on a c.i.f. basis
(g) Imported goods are transported by a foreign carrier on a f.o.b. basis
(h) Imported goods are transported by a foreign carrier on a c.i.f. basis
(a) Exported goods are transported by a domestic carrier on a f.o.b. basis

Foreign importer
\[\downarrow\text{freight paid in foreign currency}\]
\[\downarrow\text{Domestic carrier}\]
\[\downarrow\text{Inflow of foreign exchange to the country’s balance of payments (f.o.b. price plus freight receipts)}\]

The exporter will receive the f.o.b. price from the buyer who will pay the freight due to the domestic carrier under a separate transaction. As a result, the country’s balance of payments will be credited.
(b) Exported goods are transported by a domestic carrier on a c.i.f. basis

The exporter, who has the right to nominate a ship, contracts a domestic ship and will pay the shipowner in local currency and he will receive from the buyer the c.i.f. price. This transaction will have a positive influence on the balance of payments.

In both (a) and (b) cases, the freight revenue earned will accrue to the credit side of the balance of payments since it is export of shipping services.
(c) Exported goods are transported by a foreign carrier on a f.o.b. basis

The foreign importer will have the right to nominate a ship and he will employ either his flag ship or a third flag ship. There will be no inflow of foreign exchange for freight into the exporter's balance of payments. He will receive only the f.o.b. price.
(d) Exported goods are transported by a foreign carrier on a c.i.f. basis

![Diagram](image)

The exporter contracts for shipment in a foreign ship so he will pay to a foreign carrier in foreign currency. The country’s balance of payments will be debited with this item. However, he receives the c.i.f. price from the importer. This will be reimbursed for the freight paid to a foreign carrier under the c.i.f invoice.

If the amount of the freight is the same in both cases, this transaction will be neutral for the balance of payments.

In both (c) and (d) cases, there will be no influence of the freight transactions on the balance of payments.
(e) Imported goods are transported by a domestic carrier on a f.o.b. basis

The importer has the right to nominate a ship and if he contracts a domestic ship to transport his cargo. He will pay the freight in home currency and f.o.b. price to the exporter in foreign currency. The country's balance of payments will therefore bear only the f.o.b. price paid in foreign exchange.
(f) Imported goods are transported by a domestic carrier on a c.i.f. basis

Foreign exporter

freight paid in foreign currency

Domestic carrier

Home importer

c.i.f. price paid in foreign currency

Foreign exporter

Outflow of foreign exchange
(c.i.f. price minus freight receipts)

The foreign exporter has the right to engage a ship but he employs a ship of importer. The domestic carrier will receive from a foreign exporter the amount of freight paid in foreign currency. The importer will pay the exporter the c.i.f. price. However, the outflow of foreign exchange will be reduced by the amount equal to the value of freight received in foreign currency.

In both (e) and (f) cases, the employment of a domestic ship will enable saving of foreign exchange, otherwise it is paid to foreign carriers.

The freight transactions will have no influence on the country’s balance of payments.
(g) Imported goods are transported by a foreign carrier on a f.o.b. basis.

The importer has the right to name a ship but he will employ a foreign ship. He will pay the freight in foreign currency and also the f.o.b price in foreign currency. Both transaction will be debited to the country’s balance of payments.
(h) Imported goods are transported by a foreign carrier on a c.i.f basis

The foreign exporter has the right to engage a ship and he will employ either his flag or a third flag carrier. He will pay in a currency agreed. However, he will receive the c.i.f price from which he will recover the part spent on freight.

This transaction will have a negative effect on the importer's balance of payments.

In both (g) and (h) cases, the freight payments to foreign ship will result in an outflow of foreign exchange from the importer's balance of payments.
However, as far as international comparisons are concerned, confusion on freight revenues and payments may rise from the fact that exports and imports are valued c.i.f. or f.o.b. according to the respective contracts. Therefore, the figures which appear under ‘freight’ in the transport account depends not only on the type of transaction mentioned before but also the principle applied to value imports and exports within the trade balance.

The various cases that might arise and the corresponding transport account entries can be more easily understood by figure 3 and figure 4 below: [5]
Figure 3 Principle of Valuation: Exports and Imports F.O.B.

<table>
<thead>
<tr>
<th>Actual Agreement</th>
<th>F.O.B.</th>
<th>C.I.F.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrier</td>
<td>Exp</td>
<td>Imp</td>
</tr>
<tr>
<td>Domestic</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Foreign</td>
<td>21</td>
<td>22</td>
</tr>
</tbody>
</table>

Symbols:
- c: Credit in Transport Account
- d: Debit in Transport Account
- : Not relevant to Balance of Payments

Figure 4 Principle of Valuation: Exports F.O.B., Imports C.I.F.

<table>
<thead>
<tr>
<th>Actual Agreement</th>
<th>F.O.B.</th>
<th>C.I.F.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrier</td>
<td>Exp</td>
<td>Imp</td>
</tr>
<tr>
<td>Domestic</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Foreign</td>
<td>21</td>
<td>22</td>
</tr>
</tbody>
</table>

Symbols:
- c: Credit in Transport Account
- d: Debit in Transport Account
- : Not relevant to Balance of Payments
Figure 3 represents the transport account of a country whose principle of valuation is f.o.b. for exports and imports.

a) If the country's actual trade agreements were also in f.o.b. terms for both exports and imports, the situation would be:

a.1) Square 11 and 22
Freight receipts would be the earnings of domestic carriers from carrying the country's exports while freight payments would be the payments to foreign carriers for carrying the country's imports.

a.2) Square 12 and 21
Earnings of domestic carriers from carrying country's imports and earnings of foreign carriers for carrying exports are not relevant to the balance of payments since the former is transaction between residents and the latter is transaction between non-residents.

b) If the country's actual trade agreements were in c.i.f. terms

b.1) Square 13: Freight on exports c.i.f. carried by domestic carriers
The home exporter will be compensated for the foreign buyer of his cargo for the transport cost. This constitutes an inflow of foreign exchange which is not shown by the trade balance where exports are valued f.o.b. This transaction is included in the credit side of the transport account.

This entry is merely a transfer of foreign exchange from the merchandise account to the transport account.
b.2) Square 23: Freight on exports c.i.f. shipped on a foreign carriers
The total exports figure will be decomposed in a f.o.b. component appearing in invisible exports and a freight component appearing under the 'freight' in the credit of the transport account. On the other hand the payment to foreign carriers will appear in the debit side also under 'freight'.

Therefore, two mutually offsetting figures in the transport account will leave the balance of the account intact.

b.3) Square 14: Freight on imports c.i.f. carried by a domestic carrier
This is quite similar to Square 23. From a conceptual point of view, the earnings of the home ships certainly appear in the credit side of the transport account. On the debit side, an equal amount appears under 'freight' due to the f.o.b. valuation of imports.

b.4) Square 24: Freight on imports c.i.f. carried by a foreign carrier
The foreign exporter pays the freight to a foreign carrier. At first sight, this transaction between foreigners should not appear in the balance of payments of the importer's country. But due to the valuation principle, the c.i.f. value of imports is decomposed in an 'imports f.o.b.' component and a 'freight' one, appearing in the debit of the transport account.

This is another transfer of foreign exchange from the merchandise account to the transport account.
Some important remarks observed from figure 3 are:

i) Square 12, 21 are of no relevance to the balance of payments.

ii) Square 14, 23 constitute mutually offsetting entries.

iii) The credit side of transport account (Square 11, 13) is associated with the country's export trade, while the debit side (Square 22, 24) is associated with the country's imports.

iv) As far as the actual foreign exchange earnings of the national ships are concerned, the only relevant squares are 11 and 14 (exports f.o.b. and imports c.i.f.), while squares 13 and 23 are entries of statistical necessity.

v) As for the country's actual foreign exchange payments for freight transportation, the only relevant squares are 22 and 24 (imports f.o.b. and c.i.f. on foreign carriers).

Figure 4 represents the transport account of a country whose principle of valuation is f.o.b. for exports and c.i.f. imports.

a) If the country's actual trade agreements were in f.o.b. terms for exports and imports, the situation would be

a.1) Square 11: Freight on exports f.o.b. shipped on a domestic carrier

    The foreign buyer pays the freight to the domestic carrier.
a.2) Square 12: Freight on imports f.o.b. carried by a domestic carrier

At first sight, this entry should not enter in the balance of payments as a transaction between residents. Due to the c.i.f. valuation of imports, this freight has to be included in the merchandise account. Thus, the inclusion of these payments as both credits and debits is a statistical necessity.

a.3) Square 21: Freight on exports f.o.b. shipped on a foreign carrier

This transaction is not relevant to the balance of payments as being a transaction between foreign residents.

a.4) Square 22: Freight on imports f.o.b carried by a foreign carrier

Freight is paid directly to the foreign carrier by the home importer but this freight is included in merchandise imports.

b) If the country's actual trade agreements were in c.i.f. terms,

b.1) Square 13: Freight on exports c.i.f. shipped on a domestic carrier

This case is quite similar with the corresponding of figure 3 (Square 13). Although freight is paid by the exporter to the domestic carrier in national currency, the exporter is compensated for the transport cost by the foreign buyer of his cargo through the c.i.f.
price of exports. This constitutes a foreign exchange inflow that does not appear in the balance of payments when exports are valued f.o.b. Thus, its inclusion in the credit side of the transport account is a matter of statistical necessity. The exports c.i.f are decomposed in an ‘export f.o.b.’ component and a ‘freight receipts’.

b.2) Square 14: Freight on imports c.i.f. carried by domestic carrier

The foreign exporter pays the freight to the domestic carrier and these freight earnings are a direct credit in the transport account.

b.3) Square 23: Freight on imports f.o.b. carried by a foreign carrier

This is a double entry appearing both in the credit and debit side of the transport account.

Freight is paid directly to the foreign carrier by the home exporter and it appears in the debit side of the transport account. The exporter is compensated through the c.i.f. price of the exports by the foreign buyer. Due to the f.o.b. valuation of exports, this compensation for the transport cost must appear in the credit side of the transport account.

b.4) Square 24: Freight on imports c.i.f. carried by a foreign carrier

Freight is paid indirectly by the home importer through the c.i.f. price and this freight is included in merchandise imports because of the valuation principle followed.
From figure 4, a few final remarks should be made:

i) From the first row of figure 4, all earnings of domestic carriers from the services of the country's external trade (exports and imports) are included as credits in the transport account, irrespective of the f.o.b. or c.i.f. nature of the trade agreements.

ii) Only the entries 11, 14 represent the actual foreign exchange earnings of national shipowners in the national currency and should not enter in the balance of payments at first sight, their inclusion is necessitated by reasons of balance of payments statistical consistency due to this followed valuation principle. Nevertheless, these earnings are not void of economic significance for balance of payments purposes, they can be thought of as representing the opportunity cost in foreign exchange which would have been incurred in case the national fleet had not existed.

iii) As far as payments of foreign exchange for freight transportation are concerned, the only debit entry in the second row of figure 4 is that in Square 23.

iv) All other payments to foreign carrier for the carriage of the country's import (Square 22 and Square 24) do not appear in the transport account but are included in merchandise imports.
Comparison between the two principles of valuation on freight receipts and freight payments

1) Freight: Credit side

From both figures, the credit side of freight consists of the sum of all entries of the first row plus the credit of Square 23.

Square 11, 13 and 23 are of the same nature and are directly comparable.

In Square 12, when the valuation principle of imports is c.i.f. (figure 4), the earnings of domestic carriers for carrying the country's f.o.b imports are included in the credit of freight.

In Square 14, at first the earnings of the national ships are of the same nature and are direct credits under freight. However, if the principle of valuation of imports is f.o.b., this payment appears in the debit of freight in the transport account (figure 3) whereas if it is c.i.f this debit disappears from the transport account and hides itself under merchandise imports (figure 4).

2) Freight: Debit side

In country's who value their imports c.i.f. (figure 4) the only freight payment that appear in the transport account is that made to foreign carriers for carrying the country's c.i.f. exports (Square 23). All other payments are included in merchandise imports.

Thus, the only possible comparison of freight payments in the two cases relates to this item only.
From the various situations that appear under 'freight' in the transport account of countries that followed different valuation principles of their imports, it can be seen that the transport accounts are incomparable and the utmost care should be taken when such comparisons are attempted. Furthermore, greater care should be taken when transport accounts comparisons are attempted between countries who posses a national shipping industry (where figure 3 or 4 would be applicable) with countries that either do not posses one or if they do, the ships comprising it are regarded as foreign. [6]
4.3 Freight and Port Disbursement

The nature of the relationship between freight earnings/payments and the corresponding port disbursements is as the country’s payment to foreign carriers for the transport of its external trade increase, the port costs of these carries in the country must also rise since these charges are directly related to the increased activity of the carriers in the country and vice versa.

Therefore, port expenditures constitute a partially balancing element, minimizing large fluctuations in the balance of the transport account because revenues from the carriage of goods are offset by port charges and other related costs.

The following remarks could be made on the inverse relationship of freight and port disbursements:

a) When the problem of investing in shipping like the substitution of national ships for the foreign ones previously used in carrying the country’s external trade is considered, this will have an effect not only on freight receipts and payments but also on port disbursements home and abroad.

b) Port disbursements of foreign carriers in national ports must be regarded as the export contents of the country’s import of shipping services which should be subtracted from freight payments. Conversely port disbursements of national ships in foreign ports must be considered as the import contents of the country’s export of shipping services which should be subtracted from freight earnings.
References


[3] See also [2]


[5] See also [2]

[6] See also [2]
5.1 Presentation of the Model

The Model of this study is modified from the mathematical and/or statistical Model proposed in Item 4.b. of the provisional agenda 'Developments in Shipping, Ports and Inland Waterways; Level and Structure of Liner Freight Charges in the ESCAP Region, 1974-1981' in the sixth session of Committee on Shipping, and Transport & Communications, 7-13. December 1982, Bangkok, Thailand.

The prototype Model was suggested for the purpose of analysis of the relation between freight charges and freight rates and also the role played by various surcharges. It was based on the employment of Index Numbers showing the changes in a variable or group of related variables with respect to time.

The modified Model is aimed to analyse the relationship between balance of payments and ocean freight rates as this is measured by the index of the net effect of the freight rates on the balance of payments which is:

$$EBP = \frac{\text{RCAi index} \times Mi + 1 + Nb}{1 + Mb + Nb}$$
whereas

RCAi index refers to index of the remainder of the current account.

Mi refers to rate of ocean freight or the amount of ocean freight compared to the amount of the remainder of the current account during the given year.

Nb refers to rate of capital account or the amount of capital account compared to the amount of the remainder of the current account during the base year.

Mb refers to rate of ocean freight or the amount of ocean freight compared to the amount of the remainder of the current account during the base year.

(see the derivation of the index in Annex III)
5.1.1 Data used in the Model

a) Freight data

The collection of freight data for the balance of payments in Thailand was undertaken by the Balance of Payments Section of the Department of Economic Research (DER) of the Bank of Thailand. The main data including freight and insurance on merchandise were derived from the exchange record whose method of data processing is as follows:

i) Under the existing exchange control regulations, the authorized dealers (i.e. commercial banks authorized by the Bank of Thailand to deal in foreign exchange) require that persons purchasing or selling foreign exchange have to fill in prescribed exchange control forms stating the purpose of the purchase or sale.

ii) The authorized dealers send the forms to the International Department of the Bank of Thailand for scrutiny.

iii) The International Department, in turn, sends the forms to the Bank's Data Processing Center for coding and tabulating the transactions.

iv) The Balance of Payments Section receives copies of the tabulation for use in compiling the balance of payments' statistics.
The receipts on freight and insurance on merchandise derived from the exchange record cover the data mainly on exports received by resident shipping and insurance companies and airlines. The data include funds received from abroad by agents in Thailand of foreign shipping companies and airlines.

The data on earnings on account of passengers fares, charter hire and port disbursements are included in 'other transportation'.

The payments on freight and insurance merchandise cover remittances abroad by the agents of foreign shipping companies and airlines. The amounts represent receipts of these agents in Baht on account of freight, passengers fees, charter hire, etc. and also the net of their local expenses and commission received. The payment is classified as freight when the applicant is an agent of a shipping company whereas the amount is coded as other transportation when the applicant is an agent of an airline.

The expenses abroad by resident shipping companies and airlines on account of ports are also included in 'other transportation'.

The freight data used in this Model are ocean freight on exports and imports derived from 'Breakdown for Services (excluding Travel) in Thailand's Balance of Payments: 1974-1986' (See Table 1.)
However, due to the Principle of Valuation in Thailand which is f.o.b. for exports and c.i.f. for imports, freight payments are also included in the merchandise account. For the correctness of using the freight payments on imports, such freight payments should be deducted and added to the debit side (or outflow of foreign exchange) of the ocean freight on imports from 'Services' Account in Table 1.

The freight will be deducted at the rate of 10 percent of the c.i.f. value of unadjusted imports which is equal to the rate used for reducing the c.i.f. value of imports to an f.o.b. basis by the Balance of Payments Section, Bank of Thailand for reporting to the IMF's Balance of Payments Division.1 (See Table 2 & 3)

b) Others

The other data used in the Model which are the remainder of the current account, the capital account and the total balance of payments. The netflow of foreign exchange of the current account and the capital account can be obtained from 'Balance of Payments' published in the 'Quarterly Bulletin' regularly issued by the Bank of Thailand (See Table A. in Annex II) but the inflow and outflow of foreign exchange of these accounts can only be derived from the official records compiled for internal use by the Balance of Payments Section, B.O.T. (See Table 4 & 5)

The recorded balance of payments which is the sum of data on the current account, the capital account and the allocation of SDR is applied in the Model instead of the overall balance since inflow and outflow data of the latter are not available. (See Table 6)
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Freight and merchandise</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freight</td>
<td>1453.7</td>
<td>1005.0</td>
<td>1229.3</td>
<td>1093.9</td>
<td>1730.1</td>
<td>1720.8</td>
</tr>
<tr>
<td>Ocean freight</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>on exports</td>
<td>1268.0</td>
<td>971.4</td>
<td>1050.5</td>
<td>799.7</td>
<td>1438.1</td>
<td>1558.5</td>
</tr>
<tr>
<td>on imports</td>
<td>13.2</td>
<td>16.1</td>
<td>0.4</td>
<td>10.1</td>
<td>1.0</td>
<td>3.9</td>
</tr>
<tr>
<td>on transit trade</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air freight</td>
<td>27.0</td>
<td>2.0</td>
<td>50.5</td>
<td>1.8</td>
<td>96.7</td>
<td>3.8</td>
</tr>
<tr>
<td>on exports</td>
<td>27.0</td>
<td>0.9</td>
<td>50.5</td>
<td>0.9</td>
<td>96.7</td>
<td>2.8</td>
</tr>
<tr>
<td>on imports</td>
<td>0.9</td>
<td>16.1</td>
<td>0.4</td>
<td>10.1</td>
<td>1.0</td>
<td>0.4</td>
</tr>
<tr>
<td>on transit trade</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other freight</td>
<td>41.5</td>
<td>0.4</td>
<td>15.7</td>
<td>27.6</td>
<td>45.0</td>
<td>50.1</td>
</tr>
<tr>
<td>on exports</td>
<td>30.2</td>
<td>0.3</td>
<td>15.3</td>
<td>27.5</td>
<td>45.0</td>
<td>50.1</td>
</tr>
<tr>
<td>on imports</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Insurance</td>
<td>117.2</td>
<td>31.2</td>
<td>112.6</td>
<td>20.5</td>
<td>112.6</td>
<td>26.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transportation</td>
<td>1200.1</td>
<td>749.0</td>
<td>1269.0</td>
<td>643.5</td>
<td>1131.3</td>
<td>544.5</td>
</tr>
<tr>
<td>Passenger fares</td>
<td>672.7</td>
<td>508.4</td>
<td>590.8</td>
<td>361.3</td>
<td>381.2</td>
<td>289.4</td>
</tr>
<tr>
<td>Ocean vessels</td>
<td>672.7</td>
<td>508.3</td>
<td>590.8</td>
<td>361.3</td>
<td>379.1</td>
<td>289.4</td>
</tr>
<tr>
<td>Air crafts</td>
<td>672.7</td>
<td>508.3</td>
<td>590.8</td>
<td>361.3</td>
<td>379.1</td>
<td>289.4</td>
</tr>
<tr>
<td>Charter hires</td>
<td>0.2</td>
<td>56.1</td>
<td>2.0</td>
<td>54.6</td>
<td>86.4</td>
<td>41.0</td>
</tr>
<tr>
<td>Ocean vessels</td>
<td>0.2</td>
<td>40.7</td>
<td>2.0</td>
<td>54.6</td>
<td>86.4</td>
<td>41.0</td>
</tr>
<tr>
<td>Air crafts</td>
<td>0.2</td>
<td>40.7</td>
<td>2.0</td>
<td>54.6</td>
<td>86.4</td>
<td>41.0</td>
</tr>
<tr>
<td>Others</td>
<td>15.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Port disbursement</td>
<td>438.1</td>
<td>144.1</td>
<td>572.8</td>
<td>234.8</td>
<td>642.1</td>
<td>154.3</td>
</tr>
<tr>
<td>Ocean vessels</td>
<td>437.1</td>
<td>16.8</td>
<td>405.9</td>
<td>23.3</td>
<td>609.1</td>
<td>18.1</td>
</tr>
<tr>
<td>Air crafts</td>
<td>1.0</td>
<td>127.3</td>
<td>166.9</td>
<td>211.5</td>
<td>33.0</td>
<td>136.2</td>
</tr>
<tr>
<td>Others</td>
<td>1.0</td>
<td>127.3</td>
<td>166.9</td>
<td>211.5</td>
<td>33.0</td>
<td>136.2</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>89.1</td>
<td>40.4</td>
<td>105.4</td>
<td>45.4</td>
<td>108.0</td>
<td>46.2</td>
</tr>
</tbody>
</table>

* The credit entry includes mainly freight on exports received by domestic and foreign shipping companies in Thailand. In the case of foreign shipping company remittances of amount received, less their local expenses, to the head offices abroad will appear as a debit entry. The debit entry excludes freight and insurance on imports, since these are already included in the imports which are recorded on the c.i.f. basis.

Source: Balance of Payments Section, Department of Economic Research Bank of Thailand.
<table>
<thead>
<tr>
<th>Year</th>
<th>Debit</th>
<th>Credit</th>
<th>Debit</th>
<th>Credit</th>
<th>Debit</th>
<th>Credit</th>
<th>Debit</th>
<th>Credit</th>
<th>Debit</th>
<th>Credit</th>
<th>Debit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>2618.8</td>
<td>4791.1</td>
<td>3159.6</td>
<td>5047.4</td>
<td>3496.4</td>
<td>5961.4</td>
<td>2881.1</td>
<td>7059.9</td>
<td>3690.3</td>
<td>9237.6</td>
<td>4370.8</td>
</tr>
<tr>
<td>1981</td>
<td>2524.5</td>
<td>4547.6</td>
<td>3021.7</td>
<td>4845.2</td>
<td>3353.5</td>
<td>5766.4</td>
<td>2739.2</td>
<td>6810.2</td>
<td>3576.1</td>
<td>8972.3</td>
<td>4270.6</td>
</tr>
<tr>
<td>1982</td>
<td>2474.9</td>
<td>3926.5</td>
<td>3066.2</td>
<td>4129.0</td>
<td>3335.9</td>
<td>5079.3</td>
<td>2711.2</td>
<td>6072.7</td>
<td>3529.1</td>
<td>7911.2</td>
<td>4234.7</td>
</tr>
<tr>
<td>1983</td>
<td>2258.2</td>
<td>3926.2</td>
<td>2902.5</td>
<td>4129.0</td>
<td>3279.5</td>
<td>5079.3</td>
<td>2610.4</td>
<td>6072.7</td>
<td>3434.8</td>
<td>7988.7</td>
<td>4202.8</td>
</tr>
<tr>
<td>1984</td>
<td>0.5</td>
<td>216.3</td>
<td>0.2</td>
<td>103.7</td>
<td>5.4</td>
<td>100.8</td>
<td>94.3</td>
<td>2.5</td>
<td>31.9</td>
<td>0.1</td>
<td>5.8</td>
</tr>
<tr>
<td>1985</td>
<td>0.5</td>
<td>216.3</td>
<td>0.2</td>
<td>103.7</td>
<td>5.4</td>
<td>100.8</td>
<td>94.3</td>
<td>2.5</td>
<td>31.9</td>
<td>0.1</td>
<td>5.8</td>
</tr>
<tr>
<td>1986</td>
<td>120.1</td>
<td>26.0</td>
<td>69.9</td>
<td>0.2</td>
<td>129.3</td>
<td>2.5</td>
<td>148.8</td>
<td>5.7</td>
<td>179.9</td>
<td>2.9</td>
<td>283.7</td>
</tr>
<tr>
<td>1987</td>
<td>0.6</td>
<td>94.3</td>
<td>0.4</td>
<td>10.0</td>
<td>1.0</td>
<td>1.7</td>
<td>1.0</td>
<td>1.9</td>
<td>0.7</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>1988</td>
<td>2070.7</td>
<td>2121.7</td>
<td>2182.9</td>
<td>2393.5</td>
<td>2282.3</td>
<td>2394.7</td>
<td>3060.6</td>
<td>4018.7</td>
<td>2746.9</td>
<td>3579.5</td>
<td>3531.8</td>
</tr>
<tr>
<td>1989</td>
<td>1370.8</td>
<td>816.2</td>
<td>1371.8</td>
<td>1301.5</td>
<td>1614.2</td>
<td>607.7</td>
<td>2252.8</td>
<td>814.2</td>
<td>2153.4</td>
<td>814.8</td>
<td>2136.5</td>
</tr>
<tr>
<td>1990</td>
<td>1369.4</td>
<td>815.6</td>
<td>1371.8</td>
<td>1301.5</td>
<td>1614.2</td>
<td>607.7</td>
<td>2252.8</td>
<td>812.5</td>
<td>2153.4</td>
<td>814.7</td>
<td>2136.5</td>
</tr>
<tr>
<td>1991</td>
<td>0.1</td>
<td>816.2</td>
<td>1371.8</td>
<td>1301.5</td>
<td>1614.2</td>
<td>607.7</td>
<td>2252.8</td>
<td>812.5</td>
<td>2153.4</td>
<td>814.7</td>
<td>2136.5</td>
</tr>
<tr>
<td>1992</td>
<td>18.0</td>
<td>312.4</td>
<td>9.7</td>
<td>200.8</td>
<td>9.2</td>
<td>91.0</td>
<td>8.0</td>
<td>25.8</td>
<td>10.1</td>
<td>41.3</td>
<td>121.4</td>
</tr>
<tr>
<td>1993</td>
<td>0.5</td>
<td>0.2</td>
<td>0.9</td>
<td>0.2</td>
<td>2.6</td>
<td>0.2</td>
<td>2.6</td>
<td>3.2</td>
<td>5.8</td>
<td>17.2</td>
<td>675.8</td>
</tr>
</tbody>
</table>

(Unit: Millions of Baht)
Table 2  Ocean freight on Imports of Balance of Payments: 1974-1986

(Unit: Millions of Baht)

<table>
<thead>
<tr>
<th>Year</th>
<th>Imports</th>
<th>Non-freight (c.i.f)</th>
<th>Deducted freight</th>
<th>Total freight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>monetary on gold</td>
<td>on</td>
<td>on</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td></td>
<td>(5)</td>
<td>(6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1974</td>
<td>13.2</td>
<td>63304.6</td>
<td>6330.5</td>
<td>6343.7</td>
</tr>
<tr>
<td>1975</td>
<td>16.1</td>
<td>64525.7</td>
<td>6452.6</td>
<td>6468.7</td>
</tr>
<tr>
<td>1976</td>
<td>10.1</td>
<td>71446.1</td>
<td>7144.6</td>
<td>7154.7</td>
</tr>
<tr>
<td>1977</td>
<td>16.2</td>
<td>96004.8</td>
<td>9606.2</td>
<td>9622.4</td>
</tr>
<tr>
<td>1978</td>
<td>91.3</td>
<td>109956.1</td>
<td>834.7</td>
<td>11079.1</td>
</tr>
<tr>
<td>1979</td>
<td>88.6</td>
<td>153463.5</td>
<td>153934.3</td>
<td>15482.0</td>
</tr>
<tr>
<td>1980</td>
<td>216.3</td>
<td>190025.3</td>
<td>190025.3</td>
<td>19218.8</td>
</tr>
<tr>
<td>1981</td>
<td>103.7</td>
<td>216000.1</td>
<td>216000.1</td>
<td>21703.7</td>
</tr>
<tr>
<td>1982</td>
<td>56.4</td>
<td>193319.6</td>
<td>20.5</td>
<td>193340.1</td>
</tr>
<tr>
<td>1983</td>
<td>100.8</td>
<td>234278.5</td>
<td>34.7</td>
<td>234313.2</td>
</tr>
<tr>
<td>1984</td>
<td>94.3</td>
<td>242283.6</td>
<td>32.2</td>
<td>242315.8</td>
</tr>
<tr>
<td>1985</td>
<td>31.9</td>
<td>253333.7</td>
<td>40.8</td>
<td>253374.5</td>
</tr>
<tr>
<td>1986</td>
<td>5.8</td>
<td>245690.3</td>
<td>159.8</td>
<td>245850.1</td>
</tr>
</tbody>
</table>

* Ocean freight is deducted at the rate of 10% of the c.i.f. value of unadjusted imports.

Source: Bank of Thailand
Table 3 Ocean freight of Thailand's Balance of Payments
classified by Inflow of foreign exchange (Credit)
and Outflow of foreign exchange (Debit): 1974-1986

(Unit: Millions of Baht)

<table>
<thead>
<tr>
<th>Year</th>
<th>Exports Credit</th>
<th>Exports Debit</th>
<th>Imports Credit</th>
<th>Imports Debit*</th>
<th>Total Credit</th>
<th>Total Debit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974</td>
<td>1286.0</td>
<td>958.2</td>
<td>6343.7</td>
<td></td>
<td>1286.0</td>
<td>7301.9</td>
</tr>
<tr>
<td>1975</td>
<td>1050.5</td>
<td>783.6</td>
<td>6468.7</td>
<td>1050.5</td>
<td>7252.3</td>
<td></td>
</tr>
<tr>
<td>1976</td>
<td>1366.7</td>
<td>1053.7</td>
<td>0.4</td>
<td>7154.7</td>
<td>1367.1</td>
<td>8208.4</td>
</tr>
<tr>
<td>1977</td>
<td>1437.1</td>
<td>1239.6</td>
<td>1.0</td>
<td>9622.4</td>
<td>1438.1</td>
<td>10862.0</td>
</tr>
<tr>
<td>1978</td>
<td>1775.4</td>
<td>1569.8</td>
<td>3.9</td>
<td>11170.4</td>
<td>1779.3</td>
<td>12740.2</td>
</tr>
<tr>
<td>1979</td>
<td>2132.4</td>
<td>1897.1</td>
<td>3.2</td>
<td>15482.0</td>
<td>2135.6</td>
<td>17379.1</td>
</tr>
<tr>
<td>1980</td>
<td>3161.8</td>
<td>2258.2</td>
<td>0.5</td>
<td>19218.8</td>
<td>3162.3</td>
<td>21477.0</td>
</tr>
<tr>
<td>1981</td>
<td>3926.2</td>
<td>2902.5</td>
<td>0.2</td>
<td>21703.7</td>
<td>3926.4</td>
<td>24606.2</td>
</tr>
<tr>
<td>1982</td>
<td>4129.0</td>
<td>3279.5</td>
<td>19390.4</td>
<td>4129.0</td>
<td>22669.9</td>
<td></td>
</tr>
<tr>
<td>1983</td>
<td>5079.3</td>
<td>2610.4</td>
<td>23532.1</td>
<td>5079.3</td>
<td>26142.5</td>
<td></td>
</tr>
<tr>
<td>1984</td>
<td>6072.7</td>
<td>3434.8</td>
<td>24325.9</td>
<td>6072.7</td>
<td>27760.7</td>
<td></td>
</tr>
<tr>
<td>1985</td>
<td>7888.7</td>
<td>4202.8</td>
<td>2.5</td>
<td>25369.4</td>
<td>7891.2</td>
<td>29572.2</td>
</tr>
<tr>
<td>1986</td>
<td>7683.0</td>
<td>4316.3</td>
<td>0.1</td>
<td>24590.8</td>
<td>7683.1</td>
<td>28907.1</td>
</tr>
</tbody>
</table>

* Data are derived from Table 2.

Source: Bank of Thailand
## Table 4: Remainder of Current Account of Thailand's Balance of Payments: 1974-1986

(Unit: Millions of Baht)

<table>
<thead>
<tr>
<th>Year</th>
<th>Merchandise Credit</th>
<th>Merchandise Debit</th>
<th>Services Credit</th>
<th>Services Debit</th>
<th>Unrequited transfer Credit</th>
<th>Unrequited transfer Debit</th>
<th>Total Credit</th>
<th>Total Debit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974</td>
<td>49002.4</td>
<td>56974.1</td>
<td>14366.2</td>
<td>7075.3</td>
<td>5069.0</td>
<td>152.0</td>
<td>68437.6</td>
<td>64201.4</td>
</tr>
<tr>
<td>1975</td>
<td>44364.5</td>
<td>58073.1</td>
<td>115501.1</td>
<td>9607.2</td>
<td>1821.0</td>
<td>189.0</td>
<td>61686.6</td>
<td>67869.3</td>
</tr>
<tr>
<td>1976</td>
<td>60381.2</td>
<td>64301.5</td>
<td>12628.6</td>
<td>11297.1</td>
<td>695.0</td>
<td>230.0</td>
<td>73682.8</td>
<td>75828.6</td>
</tr>
<tr>
<td>1977</td>
<td>70462.8</td>
<td>86455.4</td>
<td>13334.6</td>
<td>11126.9</td>
<td>1034.0</td>
<td>232.0</td>
<td>84831.4</td>
<td>97814.3</td>
</tr>
<tr>
<td>1978</td>
<td>82250.8</td>
<td>99711.7</td>
<td>20348.5</td>
<td>16275.0</td>
<td>1060.0</td>
<td>244.0</td>
<td>103659.3</td>
<td>116230.7</td>
</tr>
<tr>
<td>1979</td>
<td>106881.2</td>
<td>138540.9</td>
<td>27231.2</td>
<td>24028.6</td>
<td>1478.0</td>
<td>254.0</td>
<td>135590.4</td>
<td>162823.5</td>
</tr>
<tr>
<td>1980</td>
<td>132040.5</td>
<td>171022.8</td>
<td>40367.0</td>
<td>30125.7</td>
<td>4826.0</td>
<td>395.0</td>
<td>177233.5</td>
<td>201543.5</td>
</tr>
<tr>
<td>1981</td>
<td>150218.2</td>
<td>194400.1</td>
<td>47472.8</td>
<td>42454.1</td>
<td>4006.0</td>
<td>315.0</td>
<td>201697.0</td>
<td>237169.2</td>
</tr>
<tr>
<td>1982</td>
<td>157203.4</td>
<td>174006.1</td>
<td>55140.0</td>
<td>47194.5</td>
<td>4559.0</td>
<td>355.0</td>
<td>216902.4</td>
<td>221555.6</td>
</tr>
<tr>
<td>1983</td>
<td>145076.1</td>
<td>210881.9</td>
<td>62057.3</td>
<td>47951.4</td>
<td>6821.0</td>
<td>444.0</td>
<td>213954.4</td>
<td>259277.3</td>
</tr>
<tr>
<td>1984</td>
<td>173520.0</td>
<td>218084.2</td>
<td>66668.9</td>
<td>54107.4</td>
<td>4589.0</td>
<td>461.0</td>
<td>244777.9</td>
<td>272652.6</td>
</tr>
<tr>
<td>1985</td>
<td>191703.0</td>
<td>228037.1</td>
<td>77990.9</td>
<td>66424.2</td>
<td>5187.0</td>
<td>693.0</td>
<td>274880.9</td>
<td>295154.3</td>
</tr>
<tr>
<td>1986</td>
<td>231481.4</td>
<td>221265.1</td>
<td>79981.5</td>
<td>68395.4</td>
<td>6594.0</td>
<td>681.0</td>
<td>218056.9</td>
<td>290341.5</td>
</tr>
</tbody>
</table>

* Excluding 10% of the c.i.f. value of unadjusted imports deducted as ocean freight

** Excluding ocean freight

Source: Bank of Thailand
<table>
<thead>
<tr>
<th>Year</th>
<th>Private Capital Credit</th>
<th>Private Capital Debit</th>
<th>Public Capital of SDR Credit</th>
<th>Public Capital of SDR Debit</th>
<th>Capital Movements Total Credit</th>
<th>Capital Movements Total Debit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974</td>
<td>21,429.0</td>
<td>13,628.0</td>
<td>1,986.0</td>
<td>732.0</td>
<td>23,415.0</td>
<td>14,360.0</td>
</tr>
<tr>
<td>1975</td>
<td>22,460.0</td>
<td>16,764.0</td>
<td>2,986.0</td>
<td>928.0</td>
<td>25,446.0</td>
<td>17,692.0</td>
</tr>
<tr>
<td>1976</td>
<td>25,815.0</td>
<td>20,754.0</td>
<td>5,153.0</td>
<td>950.0</td>
<td>30,968.0</td>
<td>21,704.0</td>
</tr>
<tr>
<td>1977</td>
<td>31,752.0</td>
<td>23,391.0</td>
<td>7,396.0</td>
<td>1,790.0</td>
<td>39,148.0</td>
<td>25,181.0</td>
</tr>
<tr>
<td>1978</td>
<td>41,081.0</td>
<td>37,486.0</td>
<td>13,392.0</td>
<td>2,129.0</td>
<td>54,473.0</td>
<td>39,615.0</td>
</tr>
<tr>
<td>1979</td>
<td>59,067.0</td>
<td>45,992.0</td>
<td>24,219.0</td>
<td>3,528.0</td>
<td>83,779.6</td>
<td>49,520.0</td>
</tr>
<tr>
<td>1980</td>
<td>99,401.0</td>
<td>73,877.0</td>
<td>28,956.0</td>
<td>3,743.0</td>
<td>128,863.4</td>
<td>77,620.0</td>
</tr>
<tr>
<td>1981</td>
<td>116,815.0</td>
<td>95,455.0</td>
<td>41,420.0</td>
<td>7,350.0</td>
<td>158,723.0</td>
<td>102,805.0</td>
</tr>
<tr>
<td>1982</td>
<td>124,327.0</td>
<td>107,056.0</td>
<td>36,606.0</td>
<td>15,532.0</td>
<td>160,933.0</td>
<td>122,588.0</td>
</tr>
<tr>
<td>1983</td>
<td>123,171.0</td>
<td>104,904.0</td>
<td>34,189.0</td>
<td>17,775.0</td>
<td>157,360.0</td>
<td>122,679.0</td>
</tr>
<tr>
<td>1984</td>
<td>160,386.0</td>
<td>118,234.0</td>
<td>39,504.0</td>
<td>23,291.0</td>
<td>199,890.0</td>
<td>141,525.0</td>
</tr>
<tr>
<td>1985</td>
<td>139,191.0</td>
<td>119,568.0</td>
<td>69,166.0</td>
<td>37,356.0</td>
<td>208,357.0</td>
<td>156,924.0</td>
</tr>
<tr>
<td>1986</td>
<td>112,683.0</td>
<td>100,137.0</td>
<td>37,129.0</td>
<td>38,322.0</td>
<td>149,812.0</td>
<td>138,459.0</td>
</tr>
</tbody>
</table>

Source: Bank of Thailand
Table 6 Recorded Balance of Payments of Thailand: 1974-1986

(Unit: Millions of Baht)

<table>
<thead>
<tr>
<th>Ocean freight*</th>
<th>Remainder of Capital Account**</th>
<th>Capital Account***</th>
<th>Total (Recorded Balance)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit Debit</td>
<td>Credit Debit</td>
<td>Credit Debit</td>
<td>Credit Debit</td>
</tr>
<tr>
<td>1286.0 7301.9</td>
<td>68437.6 64201.4</td>
<td>23,415.0 14,360.0</td>
<td>93138.6 85863.3</td>
</tr>
<tr>
<td>1050.5 5322.3</td>
<td>61658.6 67869.3</td>
<td>25,446.0 17,692.0</td>
<td>88183.1 92813.6</td>
</tr>
<tr>
<td>1367.1 8208.4</td>
<td>73682.8 75828.6</td>
<td>30,969.0 21,704.0</td>
<td>106017.9 105741.0</td>
</tr>
<tr>
<td>1438.1 10862.0</td>
<td>84831.4 97814.3</td>
<td>39,148.0 25,181.0</td>
<td>125417.5 133657.3</td>
</tr>
<tr>
<td>1779.3 12740.2</td>
<td>103659.3 116230.7</td>
<td>54,474.0 39,615.0</td>
<td>159911.6 168555.9</td>
</tr>
<tr>
<td>2135.6 17379.1</td>
<td>135590.4 162823.5</td>
<td>83,779.6 49,520.0</td>
<td>221505.6 229722.6</td>
</tr>
<tr>
<td>3162.3 21477.0</td>
<td>177233.5 201543.5</td>
<td>128,863.4 77,620.0</td>
<td>309259.2 300640.5</td>
</tr>
<tr>
<td>3926.4 24606.2</td>
<td>201697.0 237169.2</td>
<td>158,723.0 102,805.0</td>
<td>364346.4 364580.4</td>
</tr>
<tr>
<td>4129.0 22669.9</td>
<td>216902.4 221555.6</td>
<td>160,933.0 122,588.0</td>
<td>381964.4 366813.5</td>
</tr>
<tr>
<td>5079.3 26142.5</td>
<td>213954.4 259277.3</td>
<td>157,360.0 122,679.0</td>
<td>376393.7 406098.8</td>
</tr>
<tr>
<td>6072.7 27760.7</td>
<td>244777.9 272652.6</td>
<td>199,891.0 141,525.0</td>
<td>450740.6 441938.3</td>
</tr>
<tr>
<td>7891.2 29572.2</td>
<td>274880.9 295154.3</td>
<td>208,357.0 156,924.0</td>
<td>491129.1 481650.5</td>
</tr>
<tr>
<td>7683.1 28907.1</td>
<td>318056.9 290341.5</td>
<td>149,812.0 138,459.0</td>
<td>475552.0 457707.6</td>
</tr>
</tbody>
</table>

Data obtained from Table 3
** Data obtained from Table 4
*** Data obtained from Table 5

Source: Bank of Thailand
CONTAINERISATION IN BANGLADESH

BY

GHULAM RABBANI
BANGLADESH

A paper submitted to the Faculty of the World Maritime University in partial satisfaction of the requirements for the award of a

MASTER OF SCIENCE DEGREE

in

GENERAL MARITIME ADMINISTRATION

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

Signature:  
Date: 26 October 1988

Supervised and assessed by:

Doctor Hercules Haralambides
World Maritime University

Co-Assessed by:

Professor Albert Westerlink
Director, Merchant Marine Academy, Belgium
CONTAINERISATION
IN
BANGLADESH

GHULAM RABBANI
ABSTRACT OF
CONTAINERISATION IN BANGLADESH

The paper studies the feasibility of the development of containerisation in Bangladesh under the existing socio-economic conditions. The subject is very topical for developing countries.

It is in the strong interest of Bangladesh that she should keep pace by adapting herself to the new technology of containerisation. The effects of not joining the technological progress could be detrimental for the national economy as well as for the port and shipping industry.

The paper attempts to study the development of a complete system of containerisation in Bangladesh with emphasis on the internal distribution system.

The paper also attempts to give a fair idea of what Bangladesh has in terms of infrastructure, equipment and institutional framework presently and what would be required for the development of a complete system of containerisation.

Most of the containerisable cargo originates or is destined for the Dhaka area. There are only very limited prospects for containerisation outside the Dhaka-Chittagong corridor.
The paper also attempts to identify the need for a Rail based internal distribution system with an ICD at Dhaka as a minimum requirement for workability. The design and operational layout of the ICD is outside the scope of this paper.

A phased development plan seems to be appropriate—here and such a plan has been proposed. Estimates of capital and operating costs of the Rail based container service and the ICD are also given.

It is stressed in the paper that it is indispensable for Bangladesh to extend, modernise and optimise her port facilities and operational capabilities for container traffic. Harmonisation of different plans for containerisation has to be made.
PREFACE

As part of the curriculum, students at the World Maritime University (WMU) are expected to undertake a study project and produce a thesis on a maritime field in partial fulfilment of the requirements for obtaining the Masters degree.

The subject chosen for the thesis is "Containerisation in Bangladesh". My interest on the subject was developed during the course of studies in the first year at the WMU and visits to the ports of Bremen and Bremer Haven during the field trip to Germany in October 1987 and the port of Halifax during "On the Job Training" in Canada in March '88.

None of the students from Bangladesh at the WMU has undertaken a study project for his thesis on containerisation so far. Besides, some reference material on this subject is readily available. I being from the Navy had little knowledge of commercial shipping before coming to the WMU. The subject chosen has given me a good exposure to many aspects of commercial shipping. The subject is also very topical for developing countries.

This thesis project is intended for those readers, who while possessing a general knowledge about shipping, wish to know more, particularly about prospects and feasibility of containerised shipping, in Bangladesh.
This thesis project includes a number of quotations and many references, but the main source for this study has been the "Rail Container Transport Study - Bangladesh, Draft Final Report - Prepared for Asian Development Bank acting as executive agency for UNDP - September '87" (RCTS) and "Transport of Containers in Bangladesh - Feasibility Study and Detailed Engineering - Phase I Draft Report -Prepared for the World Bank on behalf of the UNDP - December '85". The statistical data, maps and figures used in this study project are mostly from RCTS.

This being said I am now faced with the task of thanking the organisations and individuals, without whose help, guidance and understanding this study project would have been difficult to complete.

I shall name: Dr H L Beth, visiting professor at the WMU who helped me formulate the outline and framework and gave me valuable advice for my thesis project; Dr H Haralambides, lecturer at the WMU, my supervisor; and not forgetting to mention the visiting professors and the resident staff of the WMU and the WMU librarian Mr Richard Poisson who helped me by providing valuable material and guidance during the preparation of my thesis project; Kazi Mahbubul Huq, Director, Bangladesh Consultants Limited, who was very kind to allow me to make copies of the above named project reports for myself after having failed to obtain them from the Bangladesh Ministry of Ports Shipping and IWT; Mr Omar Hadi, Chief of Planning and Mr Anwar Hossain, Deputy Chief of Planning at the Ministry of Ports Shipping and IWT both of whom briefed me
on shipping and containerisation in Bangladesh and supplied me with some material and identified for me other sources for collecting data and material; Mr Yar Ahmed, Traffic Officer, Incharge of the Interim ICD at Kamalapur Dhaka who gave me a briefing and showed me around the facility this January.

In the end I wish to mention my wife, Mohua, who has shown a great deal of patience and understanding during her stay with me in Malmo and during the preparation of the thesis project when on many occasions she was deprived of my company when I was burning the midnight oil writing my thesis or typing it on the Word Processor at the WMU. She gave me a lot of encouragement and never complained. She has a lot of contribution in the completion of this thesis project.
### LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Development of Container Handling at Selected South Asian Ports</td>
<td>15</td>
</tr>
<tr>
<td>3.1</td>
<td>Bangladesh Imports FY80-1 to FY85-6</td>
<td>21</td>
</tr>
<tr>
<td>3.2</td>
<td>Bangladesh Exports FY80-1 to FY85-6</td>
<td>22</td>
</tr>
<tr>
<td>3.3</td>
<td>Main Trading Partners - Bangladesh External Trade by Region FY85-6</td>
<td>23</td>
</tr>
<tr>
<td>3.4</td>
<td>Bangladesh Non-Bulk Import and Export Tonnages</td>
<td>28</td>
</tr>
<tr>
<td>3.5</td>
<td>Forecast Container Penetration of Bangladesh Non-Bulk Imports and Exports</td>
<td>38</td>
</tr>
<tr>
<td>3.6</td>
<td>Forecast Container Tonnage for Bangladesh Imports and Exports</td>
<td>38</td>
</tr>
<tr>
<td>3.7</td>
<td>Chittagong-Forecast of Container Imports and Export</td>
<td>41</td>
</tr>
<tr>
<td>3.8</td>
<td>Advantages and Disadvantage of Rail, Road and Inland Waterway Transport</td>
<td>42</td>
</tr>
<tr>
<td>4.1</td>
<td>Estimated Size of Operational Cargo Fleet '85 (BITWA &amp; Private)</td>
<td>63</td>
</tr>
<tr>
<td>6.1</td>
<td>Objectives for an Integrated Information System</td>
<td>86</td>
</tr>
<tr>
<td>6.2</td>
<td>Options for Management</td>
<td>90</td>
</tr>
<tr>
<td>6.3</td>
<td>Ship Profile in Developing Country Trades</td>
<td>118</td>
</tr>
<tr>
<td>7.1</td>
<td>Summary of Capital Expenditure</td>
<td>126</td>
</tr>
<tr>
<td>7.2</td>
<td>Annual Rent for ICD Land</td>
<td>126</td>
</tr>
<tr>
<td>7.3</td>
<td>Summary of Equipment Financial Operating costs</td>
<td>127</td>
</tr>
</tbody>
</table>
7.4 Summary of Equipment Operating Cost
Components ........................................ 127
7.5 Summary of ICD Staff Staff Costs .......... 130
7.6 Summary of Railway Operating Profile ...... 130
7.7 Summary of Railway Operating Costs ...... 132
7.8 Cost of Rolling Stock Depreciation .......... 132
LIST OF FIGURES

2.1 Map of Bangladesh ........................................ 6
3.1 Import-Export Cargo Movement To and From Chittagong Port ........................................ 24
3.2 Rail Transit Routes - India-Bangladesh-Nepal ........................................ 29
3.3 Forecast Growth-Containerised Tonnage Through Chittagong and Mongla Ports ............. 39
3.4 Potential Container Transport Network ........................................ 43
4.1 Map of Karnaphuli River and Approach ........................................ 48
4.2 Chittagong Port General View ........................................ 49
4.3 Chittagong-Dhaka Road Map ........................................ 56
4.4 Dhaka to Mongla Road & IWT Routes ........................................ 57
4.5 Types of Cargo Carrying Vessels ........................................ 62
6.1 Integrated Container Terminal System ........................................ 89
6.2 Container Cargo Transport Links To Dhaka/Narayanganj Through Chittagong ............. 102
6.3 Container Cargo Transport Links To Dhaka/Narayanganj Through Chalna .................. 103
6.4 Possible ICD sites in Dhaka Area ........................................ 108
6.5 National Rail Container Network - Likely and Possible Rail Flows ...................... 112
7.1 Development Time Table ........................................ 138
### Glossary

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADB</td>
<td>Asian Development Bank</td>
</tr>
<tr>
<td>BG</td>
<td>Broad Guage</td>
</tr>
<tr>
<td>BIWTA</td>
<td>Bangladesh Inland Water Transport Authority</td>
</tr>
<tr>
<td>BIWTC</td>
<td>Bangladesh Inland Water Transport Corporation</td>
</tr>
<tr>
<td>BNCC</td>
<td>Bangladesh National Container Company</td>
</tr>
<tr>
<td>BSC</td>
<td>Bangladesh Shipping Corporation</td>
</tr>
<tr>
<td>B/L</td>
<td>Bill of Lading</td>
</tr>
<tr>
<td>BR</td>
<td>Bangladesh Railways</td>
</tr>
<tr>
<td>CCC</td>
<td>Customs Cooperation Council</td>
</tr>
<tr>
<td>CFS</td>
<td>Container Freight Station</td>
</tr>
<tr>
<td>C&amp;F</td>
<td>Cost and Freight</td>
</tr>
<tr>
<td>CIF</td>
<td>Cost Insurance and Freight</td>
</tr>
<tr>
<td>CPA</td>
<td>Chittagong Port Authority</td>
</tr>
<tr>
<td>CTD</td>
<td>Combined Transport Document</td>
</tr>
<tr>
<td>CTO</td>
<td>Combined Transport Operator</td>
</tr>
<tr>
<td>FCL</td>
<td>Full Container Load</td>
</tr>
<tr>
<td>FCT</td>
<td>Two Axle Container Wagon</td>
</tr>
<tr>
<td>FLT</td>
<td>Front Lift Truck</td>
</tr>
<tr>
<td>FOB</td>
<td>Free on Board</td>
</tr>
<tr>
<td>FY</td>
<td>Financial Year</td>
</tr>
<tr>
<td>GOB</td>
<td>Government of Bangladesh</td>
</tr>
<tr>
<td>Ha</td>
<td>Hectares</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>ICD</td>
<td>Inland Clearance Depot</td>
</tr>
<tr>
<td>IWT</td>
<td>Inland Water Transport</td>
</tr>
<tr>
<td>Km/h</td>
<td>Kilometres per hour</td>
</tr>
<tr>
<td>l</td>
<td>length</td>
</tr>
<tr>
<td>LCL</td>
<td>Less than Container Load</td>
</tr>
<tr>
<td>m</td>
<td>million</td>
</tr>
<tr>
<td>MG</td>
<td>Metre Guage</td>
</tr>
<tr>
<td>MPB</td>
<td>Multi Purpose Berth</td>
</tr>
<tr>
<td>NTD</td>
<td>National Transport Document</td>
</tr>
<tr>
<td>NVOCC</td>
<td>Non-Vessel Owning Common Carrier</td>
</tr>
<tr>
<td>pa</td>
<td>per annum</td>
</tr>
<tr>
<td>PMA</td>
<td>Port of Mongla Authority</td>
</tr>
<tr>
<td>RCTS</td>
<td>Rail Container Transport Study, Bangladesh '87</td>
</tr>
<tr>
<td>REEFER</td>
<td>Refrigerated Container</td>
</tr>
<tr>
<td>RHD</td>
<td>Roads and Highway Department</td>
</tr>
<tr>
<td>Ro-Ro</td>
<td>Roll on Roll off</td>
</tr>
<tr>
<td>RTG</td>
<td>Rubber Tyred Gantry</td>
</tr>
<tr>
<td>TEUs</td>
<td>Twenty foot Equivalent Units</td>
</tr>
<tr>
<td>Tk</td>
<td>Taka (Bangladesh Currency) $=Tk 33</td>
</tr>
<tr>
<td>UN</td>
<td>United Nations</td>
</tr>
<tr>
<td>UNDP</td>
<td>United Nations Development Fund</td>
</tr>
<tr>
<td>UNCTAD</td>
<td>United Nations Conference on Trade and Development</td>
</tr>
<tr>
<td>%</td>
<td>percent</td>
</tr>
</tbody>
</table>

$1$
CONTAINERISATION IN BANGLADESH

TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>ABSTRACT</th>
<th>ii</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREFACE</td>
<td>iv</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>vii</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>ix</td>
</tr>
<tr>
<td>GLOSSARY</td>
<td>x</td>
</tr>
<tr>
<td>I  INTRODUCTION</td>
<td>1</td>
</tr>
</tbody>
</table>

II THE DEVELOPMENT OF BANGLADESH UPTO NOW

<table>
<thead>
<tr>
<th>History</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socio Economic Background</td>
<td>5</td>
</tr>
<tr>
<td>The People</td>
<td>5</td>
</tr>
<tr>
<td>The Economy</td>
<td>8</td>
</tr>
<tr>
<td>Poverty and Power</td>
<td>12</td>
</tr>
<tr>
<td>Brief Review of Containerisation in Bangladesh</td>
<td>14</td>
</tr>
</tbody>
</table>

III STRUCTURAL DEVELOPMENT OF DEMAND

| Commodity Structure-Foreign Trade        | 20   |
| Imports                                  | 20   |
| Exports                                  | 20   |
| Main Trading Partners                    | 25   |
| Future Growth of Imports and Exports     | 25   |
| Imports                                  | 25   |
| Exports                                  | 26   |
| Prospects of Transit Trade               | 27   |
| Nepal                                    | 27   |

xii
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advantages</td>
<td>74</td>
</tr>
<tr>
<td>Problems in Adapting Container Services</td>
<td>77</td>
</tr>
<tr>
<td>The Importance and Need for The Introduction of Containerisation in Bangladesh</td>
<td>81</td>
</tr>
<tr>
<td><strong>VI  PROJECT FORMULATION FOR CONTAINERISATION</strong></td>
<td>85</td>
</tr>
<tr>
<td>Desired Changes in Institutional Procedures and Documentation</td>
<td>85</td>
</tr>
<tr>
<td>Use of Computers</td>
<td>85</td>
</tr>
<tr>
<td>Institutional Framework</td>
<td>88</td>
</tr>
<tr>
<td>Present State and Changes Required</td>
<td>92</td>
</tr>
<tr>
<td>Customs</td>
<td>93</td>
</tr>
<tr>
<td>Documentation</td>
<td>95</td>
</tr>
<tr>
<td>Port Authority</td>
<td>96</td>
</tr>
<tr>
<td>Customs</td>
<td>96</td>
</tr>
<tr>
<td>Railway</td>
<td>97</td>
</tr>
<tr>
<td>ICD Operator</td>
<td>97</td>
</tr>
<tr>
<td>Through Transport</td>
<td></td>
</tr>
<tr>
<td>Documentation</td>
<td>98</td>
</tr>
<tr>
<td>Steps Required to be Taken</td>
<td>99</td>
</tr>
<tr>
<td>Desired Infrastructural and Equipment Changes</td>
<td>100</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>104</td>
</tr>
<tr>
<td>Vehicles</td>
<td>105</td>
</tr>
<tr>
<td>Terminals</td>
<td>105</td>
</tr>
<tr>
<td>ICD at Dhaka</td>
<td>106</td>
</tr>
<tr>
<td>Site Selection</td>
<td>109</td>
</tr>
<tr>
<td>Handling Equipment</td>
<td>110</td>
</tr>
</tbody>
</table>
CONTAINERISATION IN BANGLADESH

CHAPTER I

INTRODUCTION

It is in the strong interest of the developing countries that they should keep pace by adapting themselves to the new technology of Containerisation. This is the modern trend in transportation and developing countries have little choice; they have to adapt their facilities to the modern transport technologies. There are a lot of reasons for developing countries, to describe the container system as being highly attractive. It is the belief of many shipping economists that the effects of not joining the technological progress, mainly, will be negative; i.e., in general, for the national economy, as well as for the port and shipping industry.

General cargo vessels dominated the ports of the developing countries during the last decades but these countries, including Bangladesh, are facing the necessity to cope with the requirements of specialised vessels now, in particular, the container vessels.

Although the trend of containerisation does not take into account the special considerations in developing countries, as possible unemployment, low wages etc., these countries, and Bangladesh is no exception, have to prepare themselves for handling this specialised traffic in their ports.
No country interested in taking part in world traffic and trade, can accept the situation that it be excluded from the liner traffic with container vessels, because of missing up-to-date port facilities. For this reason, it is indispensable for Bangladesh and other developing countries, to extend, modernise and optimise their port facilities and operational capabilities for container traffic. This is already reflected in Bangladesh's current development programme. (1)

According to the Containerisation International Yearbook '85, container traffic worldwide exceeded 55 million TEUs in 1985. 75% of this traffic is handled by ports in developed countries but container traffic is now growing quickly in most developing countries.

Containerisation in Bangladesh is still in its infancy. Harmonisation of different plans for containerisation has to be made. There are many examples that show that containerisation in its infant stage has produced a lot of confusion. Congesting an unadapted port with containers, instead of enjoying the benefits, will make the ports suffer from a decrease in productivity. Containerisation results in its benefits only when completeness of the system is achieved.

Scope. This paper attempts to study the development of a complete system of containerisation in Bangladesh. To get an idea of the setting in which containerisation is to be developed the second chapter deals with the history and socio-economic condition of Bangladesh and a review of the present position of containerisation in Bangladesh.
The third chapter looks at the imports and exports of Bangladesh and her trading partners to determine the extent of demand for containerisation. It also examines the possibility of transit trade. Container traffic forecasts for the next fifteen years are provided and the modal choice is also discussed in this chapter.

The fourth chapter evaluates the facilities which exist to handle the imports and exports and handling capability for containers - i.e. the supply aspect.

In the fifth chapter a general evaluation of containerisation is done - taking into account the basic considerations, its advantages and problems etc., relating them to Bangladesh. The need for the introduction of containerisation in Bangladesh is also discussed.

The sixth chapter outlines the changes desired for containerisation and then goes on to list out a minimum requirement for workability.

In the seventh chapter a phased development plan is given and its financial and economic aspects are discussed.

The eighth is the concluding chapter, where the summary and conclusions of the paper are given. Some proposals/recommendations are also made.

AIM

The aim of this paper is to study the feasibility of the development of containerisation in Bangladesh under the existing socio-economic conditions.
REFERENCE TO CHAPTER I

CHAPTER II

THE DEVELOPMENT OF BANGLADESH UPTO NOW

History

It is believed that an Austro-Asian race first inhabited the Indian subcontinent in an unknown prehistoric age. Then came the Dravidians, Aryans and Mongolians. Archeological excavations show signs of powerful dynasties who ruled the land till the Muslims conquered in the 11th century and established their rule. After more than 7 centuries of Muslim rule, in the mid 18th century, came the British who took over from the Muslims. In 1947 the British left and the country became a part of Pakistan, the home of Muslims in the Indian Sub-Continent. West Pakistan came to dominate the new nation's government and economy and the Bengalis of East Pakistan felt that they had got a new colonial master who exploited them, a feeling which through conflicts and a nine month war led to independence in December 1971.

A map of Bangladesh is at Figure 2.1.

Socio Economic Background

The People. In 1987 the total estimated population of Bangladesh was 105 million who are fairly evenly distributed over an area of 144000 sq km. The most important urban centres are, Dhaka, Chittagong and Khulna with populations of 4m, 2m, and 1m respectively. Every year the population grows by more than two and a half million people, and by the year 2000 or shortly thereafter it will exceed 150m people at a growth rate of 2.6% per year. This
Source: Meet Bangladesh, 83
FIG NO 2.1
rate of growth is not exceptional in the Third World, but when it occurs in the world's most densely populated large country, it is disturbing. Four out of 5 people live in rural areas, and more than half of them do not own any land.

The 85% Bangladeshis who live in rural areas are mainly engaged in agriculture, which is often practiced at or near to subsistence levels. At a national level agriculture is the largest component of GDP, contributing about 50% of total national income.

Less than 25% of the population (one of four persons) can read and five of six women are illiterate. On the other hand there are millions of young people in secondary schools, over 40000 in 6 universities in Bangladesh and a significant but unknown number abroad. The health situation is poor, infant mortality is high by international standards, 125 per 1000, and only 2 out of 3 newborn children will live long enough to take care of their old parents. This is one major reason why parents want many sons, and explain why every woman on the average will have more than 6 children. Family planning will have some effect on the birth rate, which may still exceed 40 per 1000 people, but a significant fall in fertility will hardly take place until conditions improve, more women are educated and social and economic conditions are better.

Strong traditions influence the role of women in society and active life. They don't work in the fields or in transport and only very marginally in trade in contrast to Africa. However, women play a crucial role in the economic and social life. Most of them are not counted as
members of the "labour force", Statistics hardly include any women in agriculture, but in the subsistence economy the work of women in the homestead is an indispensable part of the economic system.

About 60% of the labour force has its major occupation in agriculture as land owning farmers, tenant, (share croppers) and farm workers. Other major areas of occupation are services, trade and catering, manufacturing, construction and transport. More than 16 million people work in agriculture, less than 1 million in modern manufacturing and about 0.7 million in government service. (3)

The Economy. In spite of high population density, Bangladesh has enough land to feed a larger population much better than now and still have a surplus of farm products for export. This will only be possible if land is fully utilised, modern farm technology applied widely, and control of water extended as much as technically possible. Bangladesh is not as poor in natural resources as is generally assumed. However, it is poor in mineral resources, even though natural gas is a valuable asset of which more may be found, and possibly oil as well.

Bangladesh population has very low levels of per capita income. In 1987 GDP per head was less than Tk 5000 (US $ 160), one of the lowest in the world. Despite the annual GDP growth of 4 to 5% between 1982 and 1986 the impact of high population increases has been to reduce per capita GDP growth to below 2%. The poorest three quarters of the rural house holds use 75% of their consumption expenditure on rice only!
One of the reasons for this poverty is the low productivity. Net output per farmer in the Scandinavian countries is 15 to 20 times as high as for farmers in Bangladesh, and the difference in manufacturing is even higher. This can be remedied by the use of modern technology, but to equip 30 million working Bangladeshis with up-to-date machinery and equipment would cost so large a sum that it would take many decades of savings in Bangladesh and of foreign aid to pay for it, and equally important, a massive and sustained training and education effort to enable people to use modern technologies efficiently. The illiterate or semi literate Bangladeshi has shown an impressive ability to employ modern tools and equipment, or agricultural inputs like fertilisers and seeds of high yielding varieties. But the educated elite, of course with few exceptions, has shown little managerial talent and practical sense, and much modern machinery and equipment is unused and being destroyed due to organisational weaknesses, as well as a weak sense of importance of maintenance.

Bangladesh has still some way to go to reach self-sufficiency in foodgrains, it has to import. In manufacturing there has been slow advance, this is due to a relative stagnation of the important jute and cotton textile industries, while ambitious plans to expand production of engineering goods have not been fulfilled. Growth sectors have been nitrogenous fertiliser production, pharmaceutical products and in recent years ready made garments for export. Domestic commercial energy supplies have risen sharply. Electricity generation capacity and transmission and distribution networks have been expanded rapidly and so have natural gas production and distribution. Output of government services, higher quality hous-
Sing and construction have also risen rapidly.

Bangladesh's balance of payments remains precarious. In money terms exports have risen more slowly than imports, of which foreign aid pay for about half. Traditional exports have risen slowly, particularly of jute and jute goods, which still account for half of all commodity exports. Two new non-traditional exports, frozen food - mostly shrimps and ready made garments represent almost all the growth of such new exports. Migrants remittances from workers in Middle East had risen sharply but have declined after 1983-84 from three quarters of commodity exports to little more than half in the later years. They however remain an important source of foreign exchange.

The central government financial situation remains weak. Most of the Annual Development Programme (ADP) i.e. government financed investment and other development expenditure is still financed by foreign aid. On the average there is about one years lag in disbursements of commodity aid. As exports from Bangladesh will not grow fast enough to meet the country's increasing import demand, more foreign aid disbursements will be needed and this is why the Government of Bangladesh, supported by the World Bank, asks for more commodity aid, which also adds taka revenue to the Government budget.

The consultants, in the RCTS, are of the opinion that it will be very difficult and perhaps impossible to meet the overall growth target laid down in the Third Five Year Plan (1985-90) which is 5.4% per year. For this target to be achieved agriculture must grow at 4% and industry at no less than 10%. For industry to grow at such a
rate, for instance, a necessary condition would be that market outlets for Bangladesh garment exports are allowed to grow by more than 50% per year, which is not really possible now with quota restrictions by American and European countries. Under normal conditions, the economy of Bangladesh should continue to grow, but the balance of payments situation will remain critical.

The Third Five Year Plan targets are not ambitious per se, but unfortunately, under present circumstances they seem to be unrealistic. If Bangladesh is to utilise fully its own resources—fertile land and the people—economic growth must be high and sustained. Simultaneous growth in agriculture and manufacturing is needed together with heavy investments in transport and energy infrastructure, but the level of growth and investments will depend much more on domestic mobilisation of human resources than on the inflow of foreign aid.

From independence until mid '86, Bangladesh received US$19.5 billion in aid commitments of which US$10 billion were in project aid. Much of the project aid goes into expansion and improvement of infrastructure, viz irrigation, flood control and drainage, storage capacity, transport and natural gas and electricity. (3)

The major impact of aid has been to keep the economy going and to permit a slow but a fairly steady growth of GDP per head. Food aid has prevented famine and has created employment for poorer people and has therefore had certain favourable effects on the living condition of the poor. Commodity aid has helped to maintain economic activities and thus also employment in the modern sectors, which is at the same time creating handsome profits in
business activities. Aid flows have also increased the wealth and influence of the already mighty, and this may have created more hardship for many poor.

**Poverty and Power.** Poverty in Bangladesh is both rural and urban - but the rural situation is most disturbing. Millions of households have very little or no land and they depend on seasonal farmwork and non agricultural activities for survival. Most of these people suffer from nutritional deficiencies. There is of course enough land eventually to produce sufficient food for an even larger population, but not enough land to provide farm employment for the majority of the people. Rural works programme financed through Food For Work and other sources give millions of landless and sub marginal farmers some income during part of the year. Vulnerable Group Feeding programmes also assist deprived people.

The rural elite is powerful rather than rich. The patron-client relationship situation is still strong, and the clients cling to it as an ultimate security in times of distress. The larger farmers rent out land to their clients, and invest their surplus in other activities, and in education of their children, who thereby may find job in the government bureaucracy and thus reinforce the families power position.

It is common knowledge in Bangladesh that the wealthy part of the business community exercise far more power nationally than do the rural landlords and larger farmers. Import trade, including aid financed imports is a major source of easily earned money. Wealthy businessmen use their influence to make the authorities accept aid for construction projects and for machinery, and equipment.
which leads to profits in the construction industry and in import trade. Such incomes are also a source of corruption which few people will deny, is widespread in Bangladesh, petty corruption, as well as large deals.

There are quite a number of well to do families in Bangladesh who own, comfortable large houses in pleasant surroundings, cars and a variety of consumer durables, and who can afford travel abroad for medical and other reasons and to educate their children in USA and European countries. Some of their incomes are based on exploitation of share croppers and factory or construction workers but much originates in trade. Yet even a drastic income redistribution would hardly improve the lot of the poor very much. However, if foreign aid ceased, much of the sources of high incomes would evaporate as well.

Power and material comfort rest with the higher ranks of the bureaucracy and the armed forces as well. Both groups hold power because of their positions and when there is no legitimate political power, military and civil service officers rule the field. Very low pay scales make them dependent on the business community, however, unless they, as often is the case have substantial — perfectly legal mostly, side incomes from ownership of land, real estate and businesses or from professional services.

Politics is also business — politicians admit to spending small fortunes to be elected as local or national government officials. Their electorates expect that the elected representatives will provide services and benefits to them and accept that these benefits have to be paid for, but will not accept excessive greed in the long run. In this social system there can be little hope that demo-
cracy in the short run will pave the way for the poor taking control of the government machinery.

Since independence Bangladesh has only in short periods lived under a pluralistic system of democratic government and by now most of the time under military rule. Except periodic excesses, and inspite of such limitations as press censorship, special military courts etc, serious offences against civil rights of the Bengali people have not been frequent.

After the history and socio economic condition of Bangladesh against which to view the study we shall now review the present position of containerisation in Bangladesh.

**Brief Review of Containerisation**

Maritime containerisation has grown rapidly in Bangladesh reaching a total of approximately 50000 TEUs in FY1985-86 after a relatively slow start in the FY1980-81. In Asia it started in the 70s.

The majority of import containers move through Chittagong port, but Mongla port handles a substantial volume of export containers, mostly jute. Chittagong currently handles 84% of Bangladesh’s containerised tonnage. Chittagong alone handled 50133 TEUs in 1986-87.

The number of containers handled by various South Asian ports between 1982 and 1987 are shown in Table 2.1. The table shows that although Bangladesh still handles relatively few containers, recent growth has been very
### TABLE 2.1

**DEVELOPMENT OF CONTAINER HANDLING AT SELECTED SOUTH ASIAN PORTS IN THOUSAND TEUS**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pakistan (Karachi)</td>
<td>124.2</td>
<td>140.4</td>
<td>160.0</td>
<td>244.1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sri Lanka (Colombo)</td>
<td>103.2</td>
<td>128.5</td>
<td>181.5</td>
<td>215.9</td>
<td>243.9(c)</td>
<td>-</td>
</tr>
<tr>
<td>India (Total) (b)</td>
<td>215.8</td>
<td>234.5</td>
<td>320.2</td>
<td>297.8</td>
<td>389.6</td>
<td>-</td>
</tr>
<tr>
<td>Bombay</td>
<td>130.7</td>
<td>141.3</td>
<td>202.0</td>
<td>175.1</td>
<td>203.7</td>
<td>220.0(c)</td>
</tr>
<tr>
<td>Calcutta/Haldia</td>
<td>33.4</td>
<td>32.6</td>
<td>46.6</td>
<td>38.9</td>
<td>53.8</td>
<td>67.0(c)</td>
</tr>
<tr>
<td>Cochin</td>
<td>32.0</td>
<td>31.3</td>
<td>35.4</td>
<td>37.3</td>
<td>44.5(c)</td>
<td>-</td>
</tr>
<tr>
<td>Madras</td>
<td>18.6</td>
<td>28.1</td>
<td>35.0</td>
<td>45.2</td>
<td>83.9</td>
<td>100.0</td>
</tr>
<tr>
<td>Tuticorin</td>
<td>0.7</td>
<td>1.1</td>
<td>1.0</td>
<td>1.2</td>
<td>3.2</td>
<td>4.5(c)</td>
</tr>
<tr>
<td>Visakhapatnam</td>
<td>0.4</td>
<td>0.4</td>
<td>0.2</td>
<td>0.1</td>
<td>0.5</td>
<td>0.7(c)</td>
</tr>
<tr>
<td>Bangladesh (Total)</td>
<td>5.9</td>
<td>13.3</td>
<td>20.7</td>
<td>30.4</td>
<td>50.3</td>
<td>67.1(c)</td>
</tr>
<tr>
<td>Chittagong</td>
<td>5.1</td>
<td>10.7</td>
<td>15.5</td>
<td>25.0</td>
<td>39.1</td>
<td>50.7(c)</td>
</tr>
<tr>
<td>Mongla</td>
<td>0.8</td>
<td>2.6</td>
<td>5.2</td>
<td>5.4</td>
<td>11.2</td>
<td>16.4(c)</td>
</tr>
<tr>
<td>Burma</td>
<td>1.5</td>
<td>1.0</td>
<td>0.9</td>
<td>1.0</td>
<td>1.1</td>
<td>-</td>
</tr>
<tr>
<td>Thailand (Bangkok)</td>
<td>259.4</td>
<td>304.5</td>
<td>341.0</td>
<td>400.4</td>
<td>450.0</td>
<td>-</td>
</tr>
<tr>
<td>Malaysia (Total)</td>
<td>221.1</td>
<td>280.1</td>
<td>343.6</td>
<td>355.6</td>
<td>367.5</td>
<td>-</td>
</tr>
<tr>
<td>Penang</td>
<td>64.9</td>
<td>86.6</td>
<td>98.3</td>
<td>104.1</td>
<td>120.0(c)</td>
<td>-</td>
</tr>
<tr>
<td>Port Kelang</td>
<td>157.2</td>
<td>193.5</td>
<td>240.7</td>
<td>244.9</td>
<td>232.5(c)</td>
<td>-</td>
</tr>
<tr>
<td>Johor</td>
<td>-</td>
<td>-</td>
<td>4.6</td>
<td>6.6</td>
<td>15.0</td>
<td>-</td>
</tr>
<tr>
<td>Singapore (Total)</td>
<td>1116.3</td>
<td>1274.3</td>
<td>1552.2</td>
<td>1698.8</td>
<td>2000.0(c)</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>2048.5</td>
<td>2376.5</td>
<td>2920.1</td>
<td>3244.8</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

(+16%) (+32%) (+11%)

(a) Fiscal year ended 30 June. (b) Fiscal year ended 31 March. (c) Estimate

Source: Containerisation International Yearbooks 1985 & 1987 except Bangladesh (from CPA & PCA).
fast. Chittagong and Mongla together are handling a similar volume to Calcutta and Haldia.

Container penetration, i.e., the percentage of the available containerisable tonnage actually transported in containers, in Chittagong and Mongla ports both in terms of imports and exports, has increased steadily since containerisation was introduced. According to the consultants' estimates in RCTS, the overall FY1986-87 figures for Bangladesh are probably about 23-24% for imports, 8-9% for exports and 18-19% overall.

About 20% of non-bulk imports through Chittagong are containerised compared with more than 40% of exports. The overall figure for Mongla is lower at around 10%. It seems that the potential for increasing container penetration is greater at Mongla but the existing import tonnages are small, so higher container penetration would not substantially alter Mongla's overall level of containerisation. On the other hand, one of Mongla's leading export commodities: raw jute is still proving to be more economically shipped in break bulk.

Most containers are stuffed or stripped in port areas in the open for institutional and technical reasons. Bangladesh Railway has introduced an interim Internal Clearance Depot (ICD) last year (1987) at Dhaka, with supporting rail services, and customs have been available there to undertake clearance. At present traffic levels are low but are expected to grow quickly up to the available capacity.

Import and export cargo to and from Chittagong port is moved by the three surface modes: rail, road and
inland water transport (IWT) to and from Dhaka.

In Chittagong port, containers are currently handled at conventional berths. Light conventional cranes are provided on most berths but discharge and loading of containers are carried out by ships' gear. The port is congested with a large number of stored containers, mostly empties. There exists a small facility for loading containers to rail.

A new multi-purpose berth (MPB) with 450 m quay (two wharves) is being constructed to be used primarily for containers. Construction of the quay itself with rails for quay side cranes has been completed but the supporting container storage areas and Container Freight Station without which the quay cannot operate, are yet to be built. The project is expected to be completed by 1991. The berth is being funded by the World Bank and the capacity has been assessed at 90000 TEUs p.a. However, it is likely that some of the port container throughput will continue to arrive at other berths on general purpose vessels even after this new berth is in operation.

The rail route to Dhaka is meter gauge (MG) throughout, as is the whole rail system in East Bangladesh. The road between Chittagong and Dhaka is approximately 60 km shorter in length than the railway but currently requires two ferry crossings over the Meghna and Gumti rivers. It is being steadily upgraded but is not yet suitable for the heaviest container vehicles. Most vehicles used are only of 5 to 8 tonnes capacity. IWT services are also available, but access to Chittagong requires crossing the edge of the Bay of Bengal, for which more substantial sea-going vessels are needed than those required for internal
Mongla port lies to the west of Chittagong across the Jamuna and Ganges delta. It was developed from Chalna anchorage in 1974. A new road has been constructed from Khulna, but a ferry crossing of the Rupsa river is required. The nearest rail facility is at Khulna, on the western broad gauge (BG) system. The most widely used inland transport mode at Mongla is IWT, for which river craft may be used.

Container handling started on board the vessels at Mongla port since August 1980. However, sea-going vessels started to take berth alongside the permanent port jetties from July 1983 for handling containers to cope with the ever-increasing container traffic. While 462 TEUs were stuffed on board the vessels during 1984-85, the number decreased to 221 TEUs during 1985-86. On the other hand, while 4417 TEUs were handled at the jetties in 1984-85 the number increased to 10937 TEUs during 1985-86.

The development of container shipping in the Bay of Bengal has already been achieved through the introduction of feeder routes to the mainhaul liner services. The principal ports from which Bangladesh’s containers are transhipped from the feeder routes to the mainhaul lines serving ports elsewhere in the world are Singapore, Colombo and Madras.
REFERENCES TO CHAPTER II

(2) *Meet Bangladesh*, Second Edition '83 and *This is Bangladesh '85*, published by Department of Films and Publication, Ministry of Information, Bangladesh.

(3) *Bangladesh Country Study and Norweigian Aid Review - '86*, The Chr Michelsen Institute.


(6) *The Chittagong Port Authority - Yearbook - June'87*

(7) *Mongla Port Authority - Yearbook - '85-86*.
CHAPTER III

STRUCTURAL DEVELOPMENT OF DEMAND

Commodity Structure - Foreign Trade

Imports. Most of Bangladesh’s imports are bulk commodities with food grain, cement, fertilisers, petrol and oil accounting for around 75% of the total tonnage. Non bulk imports amounted to 1.4 m tons in FY 85-86 of which over 90% used Chittagong port. The non bulk import items are diverse, they are: foodstuffs, garments, raw materials, chemicals, machinery and equipment, metals and other industrial materials.

Bangladesh takes almost 50% of its imports from South East Asia and the Far East. Since 1980 the value of imports in Taka has been around 14.5% of GDP, and 95-98% of them arrived by sea. Table 3.1 shows Bangladesh’s imports by value from FY 80-81 to FY 85-86.

Exports. Bangladesh exports are jute, (which amounts for 85% by volume of exports and 60% by value) jute goods, tea, leather, frozen goods, garments and others which include handicrafts. The vast majority of Bangladesh exports are carried out by sea, although the proportion has been declining in the last two to three years as garments, leather goods and frozen foods have increasingly been carried by air freight. The Taka value of exports remains reasonably stable as a proportion of GDP from FY 76-77 to FY 85-86 at around 5 to 6%. Table 3.2 shows Bangladesh exports by value from FY 80-81 to
<table>
<thead>
<tr>
<th>FY</th>
<th>80-81</th>
<th>81-82</th>
<th>82-83</th>
<th>83-84</th>
<th>84-85</th>
<th>85-86</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value in million</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taka (1)</td>
<td>37288</td>
<td>38729</td>
<td>45265</td>
<td>50874</td>
<td>68263</td>
<td>53414 (a)</td>
</tr>
<tr>
<td>Annual growth Rate %</td>
<td>22</td>
<td>4</td>
<td>17</td>
<td>12</td>
<td>34</td>
<td>-22</td>
</tr>
<tr>
<td>Value in million</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US $ (2)</td>
<td>2293</td>
<td>1930</td>
<td>1902</td>
<td>2040</td>
<td>2629</td>
<td>1787</td>
</tr>
<tr>
<td>Imports as % age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of GDP (by value) (1)</td>
<td>16</td>
<td>14.6</td>
<td>15.7</td>
<td>14.5</td>
<td>16.3</td>
<td>11.1</td>
</tr>
<tr>
<td>% age by sea (by value) (1)</td>
<td>95</td>
<td>96</td>
<td>97</td>
<td>97</td>
<td>96</td>
<td>92</td>
</tr>
<tr>
<td>Bulk (ooo tonnes) (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chittagong</td>
<td>3838</td>
<td>4018</td>
<td>4087</td>
<td>4580</td>
<td>5520</td>
<td>4390</td>
</tr>
<tr>
<td>Mongla</td>
<td>845</td>
<td>868</td>
<td>1060</td>
<td>1026</td>
<td>2005</td>
<td>1453</td>
</tr>
<tr>
<td>Total</td>
<td>4683</td>
<td>4886</td>
<td>5147</td>
<td>5606</td>
<td>7525</td>
<td>5843</td>
</tr>
<tr>
<td>Bulk annual growth rate %</td>
<td>-39</td>
<td>4</td>
<td>5</td>
<td>9</td>
<td>34</td>
<td>-22</td>
</tr>
<tr>
<td>Non Bulk (000 tonnes) (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chittagong</td>
<td>1177</td>
<td>1129</td>
<td>947</td>
<td>1100</td>
<td>1309</td>
<td>1424</td>
</tr>
<tr>
<td>Mongla</td>
<td>39</td>
<td>51</td>
<td>38</td>
<td>62</td>
<td>80</td>
<td>108</td>
</tr>
<tr>
<td>Total</td>
<td>1216</td>
<td>1180</td>
<td>985</td>
<td>1162</td>
<td>1389</td>
<td>1532</td>
</tr>
<tr>
<td>Non Bulk annual growth rate %</td>
<td>55</td>
<td>-3</td>
<td>-17</td>
<td>18</td>
<td>20</td>
<td>10</td>
</tr>
</tbody>
</table>

(a) Estimated by factoring July 85 - May 86

Source: (1) Statistical Yearbook and monthly statistical bulletins .
(2) Calculated from the import figures using exchange rates from Bangladesh Bank Annual Report 1985-86 .
(3) Chittagong Port Authority and Port of Mongla Authority .
**TABLE 3.2**  
**BANGLADESH EXPORTS FY 80-81 TO 85-86**  
(Extract from Rail Container Transport Study -Bangladesh '87)

<table>
<thead>
<tr>
<th>FY</th>
<th>80-81</th>
<th>81-82</th>
<th>82-83</th>
<th>83-84</th>
<th>84-85</th>
<th>85-86</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value in million Taka (1)</td>
<td>11484</td>
<td>12387</td>
<td>18016</td>
<td>20136</td>
<td>26225</td>
<td>27190 (a)</td>
</tr>
<tr>
<td>Annual growth rate %</td>
<td>4</td>
<td>8</td>
<td>45</td>
<td>12</td>
<td>30</td>
<td>4</td>
</tr>
<tr>
<td>Value in US$ (2)</td>
<td>706</td>
<td>617</td>
<td>757</td>
<td>807</td>
<td>1010</td>
<td>910</td>
</tr>
<tr>
<td>Export as % of GDP at current market prices (3)</td>
<td>4.9</td>
<td>4.7</td>
<td>6.2</td>
<td>5.8</td>
<td>6.3</td>
<td>5.6</td>
</tr>
<tr>
<td>% by sea (by value)</td>
<td>98</td>
<td>97</td>
<td>97</td>
<td>97</td>
<td>94</td>
<td>90</td>
</tr>
</tbody>
</table>

(1) Bulk (000 tonnes)(4)

<table>
<thead>
<tr>
<th></th>
<th>Chittagong</th>
<th>Mongla</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>282</td>
<td>35</td>
<td>317</td>
</tr>
<tr>
<td></td>
<td>181</td>
<td>51</td>
<td>181</td>
</tr>
<tr>
<td></td>
<td>134</td>
<td>22</td>
<td>185</td>
</tr>
<tr>
<td></td>
<td>97</td>
<td>-</td>
<td>119</td>
</tr>
<tr>
<td></td>
<td>45</td>
<td>-</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>37</td>
<td>-</td>
<td>37</td>
</tr>
</tbody>
</table>

(4) Chittagong Port Authority and Port of Mongla Authority.

(a) Estimated by factoring July 85 - May 86 by 1.08

Source: (1) Statistical Yearbook and monthly Statistical Bulletins.  
(2) Calculated from the Taka export figures using exchange rates from Bangladesh Bank Annual Report 1985-86.  
(3) Calculated from Statistical Yearbook.  
(4) Chittagong Port Authority and Port of Mongla Authority.
### TABLE 3.3

**MAIN TRADING PARTNERS**

**BANGLADESH EXTERNAL TRADE BY REGION FY85-86 IN MILLION TAKA (a)**

<table>
<thead>
<tr>
<th>Region</th>
<th>Imports</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Value</td>
<td>%</td>
<td>Value</td>
<td>%</td>
</tr>
<tr>
<td>Western Europe</td>
<td>9.2</td>
<td>17</td>
<td>5.8</td>
<td>21</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>2.4</td>
<td>4</td>
<td>1.4</td>
<td>5</td>
</tr>
<tr>
<td>Africa</td>
<td>0.1</td>
<td>-</td>
<td>1.7</td>
<td>6</td>
</tr>
<tr>
<td>Middle East</td>
<td>1.9</td>
<td>4</td>
<td>4.8</td>
<td>18</td>
</tr>
<tr>
<td>South East Asia and Far East</td>
<td>26.4</td>
<td>49</td>
<td>3.9</td>
<td>14</td>
</tr>
<tr>
<td>China</td>
<td>2.4</td>
<td>5</td>
<td>0.8</td>
<td>3</td>
</tr>
<tr>
<td>Australia</td>
<td>0.9</td>
<td>2</td>
<td>0.5</td>
<td>2</td>
</tr>
<tr>
<td>America</td>
<td>5.2</td>
<td>10</td>
<td>6.7</td>
<td>25</td>
</tr>
<tr>
<td>Pakistan</td>
<td>1.8</td>
<td>3</td>
<td>1.5</td>
<td>6</td>
</tr>
<tr>
<td>India</td>
<td>3.1</td>
<td>6</td>
<td>0.1</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>53.4</td>
<td>100</td>
<td>27.2</td>
<td>100</td>
</tr>
</tbody>
</table>

(a) Estimated by factoring July 85 - May 86 by 1.08

IMPORT - EXPORT CARGO MOVEMENT TO AND FROM CHITTAGONG PORT

BANGLADESH

Dinajpur, Rangpur, Rajshahi, Bogra, Khulna, Jessore, Faridpur, Barisal, Noakhali

TO REST OF THE WORLD

Source: CPA Yearbook '87

FIG 3.1
FY 85-86. A map of Bangladesh showing import-export cargo movement to and from Chittagong port is at Figure 3.1.

**Main Trading Partners**

The sources and destinations of Bangladesh imports and exports by value are shown in the table 3.3. Import from South East Asia and the Far East have been increasing rapidly and in FY 85-86 accounted for almost 50% of Bangladesh imports whereas in FY 75-76 the American continent was the principal source of this import trade, contributing nearly 40%.

The United States and Western Europe are the major destinations for Bangladesh exports as shown in Table 3.3 followed by the Middle East. The USA has become the most important as the principal destination for garments. Western Europe imports a more even share of garments, leather, tea, jute goods and frozen foods. The Middle East is an important destination for jute.

**Future Growth of Imports and Exports**

**Imports.** Import growth in Bangladesh can only be forecast realistically on the basis of past trends, together with predictions for (macro-economic) variables such as population, GDP, investment productivity, resources and balance and terms of trade.

As we have seen earlier, growth of both bulk and non-bulk imports has outstripped export growth in recent years and is currently increasing at 5% to 20% per year. With the forecast of continuing high rate of population growth, the anticipated need to import food grains to
satisfy basic needs for at least the next 5 to 10 years, and the requirement for substantial investment in infrastructure and services, it is likely that import tonnages will continue to increase at rates similar to those over the past decade. There may be some change in the composition of imports as, for example, food grain imports are projected to decrease, but reduction in the items are likely to be substantiated by increase in others.

For the purpose of this study the figures proposed by the consultants in the Rail Container Transport Study Bangladesh ’87 will be used for the future growth of imports. Their estimates are purposefully conservative. They are:

- FY 86-87 to FY 91-92 - 6% per annum
- FY 91-92 to FY 96-97 - 5% per annum
- FY 96-97 to FY 01-04 - 4% per annum

There is however a strong argument for higher future projections, based on the fact that these growth rates represent a reduction from rates observed in the immediate past.

Exports. In general terms it is very difficult to foresee a significant increase in export tonnage, particularly through Chittagong and Mongla because of the paramount importance of jute and jute products and the poor prospects of this market. It is likely that the unit value of exports will increase as jute is replaced by higher value, jute goods, finished leather products are exported rather than hides and skins and other relatively high value exports introduced. However the increase in the exported volume of these relatively high
value items would have to be very dramatic to affect the total tonnage of exports substantially. The introduction of these higher unit value exports is in turn likely to result in further expansion of air freight, again taking trade away from the ports. Therefore it is difficult to foresee exports through Chittagong and Mongla increasing significantly beyond the level of about one million tonnes per year.

For exports also we shall use the figures for the overall growth rate for non bulk tonnage proposed by the consultants in the Rail Container Transport Study Bangladesh '87, that is averaging no more than 2%.

A forecast of non bulk import and export tonnages is given in Table 3.4.

Prospects of Transit Trade

There are prospects of using Bangladesh ports as transit ports, specially Mongla for the cargo of Nepal, Bhutan and other neighbouring countries.

Some transit traffic, mostly bulk goods, has used Bangladesh ports in the past but currently there is no transit traffic to Nepal, India or Bhutan that could be identified.

We shall now discuss the prospects of transit trade with Nepal, India and Bhutan separately. A map showing the Rail Transit Routes is at Figure 3.2.

Nepal. Nepal's import and export position has many similarities to that of Bangladesh. Imports sub-
<table>
<thead>
<tr>
<th>Commodity</th>
<th>FY 85-86</th>
<th>86-87</th>
<th>92-93</th>
<th>97-98</th>
<th>02-03</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Imports (Total)</strong></td>
<td>1532</td>
<td>1639</td>
<td>2303</td>
<td>2912</td>
<td>3543</td>
</tr>
<tr>
<td></td>
<td>(6)</td>
<td>(5)</td>
<td>(4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Exports</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raw Jute</td>
<td>417</td>
<td>400</td>
<td>373</td>
<td>328</td>
<td>251</td>
</tr>
<tr>
<td></td>
<td>(-1)</td>
<td>(-2)</td>
<td>(-5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jute Goods</td>
<td>470</td>
<td>470</td>
<td>499</td>
<td>519</td>
<td>519</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(1)</td>
<td>(0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tea</td>
<td>25</td>
<td>30</td>
<td>35</td>
<td>45</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>(2)</td>
<td>(5)</td>
<td>(5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garments</td>
<td>36</td>
<td>45</td>
<td>102</td>
<td>159</td>
<td>228</td>
</tr>
<tr>
<td></td>
<td>(15)</td>
<td>(10)</td>
<td>(8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leather</td>
<td>18</td>
<td>18</td>
<td>18</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>(0)</td>
<td>(0)</td>
<td>(0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frozen Foods</td>
<td>20</td>
<td>24</td>
<td>47</td>
<td>74</td>
<td>106</td>
</tr>
<tr>
<td></td>
<td>(12)</td>
<td>(10)</td>
<td>(8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>81</td>
<td>85</td>
<td>125</td>
<td>189</td>
<td>292</td>
</tr>
<tr>
<td></td>
<td>(6)</td>
<td>(8)</td>
<td>(10)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1067</td>
<td>1072</td>
<td>1199</td>
<td>1332</td>
<td>1470</td>
</tr>
<tr>
<td></td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Consultants analysis and estimation in Rail Container Transport Study Bangladesh '87.
stantially exceed exports both in value and volume and predominant exports are jute and jute products, hides and skins. Majority of Nepal's seaborne trade is carried through Calcutta/Haldia.

In order to facilitate the transit traffic, the Nepalese and Indian governments entered into a Transit Agreement first signed in 1971, with modifications negotiated annually mainly to cover changes in routings and custom procedures by changing circumstances.

The nearest and most obvious port to handle Nepalese maritime traffic is Calcutta and this was the port specified in the treaty. Later on however the treaty was amended and an agreement was signed in 1978 between India and Bangladesh to allow part of the traffic to be carried through Bangladesh.

The agreement was originally welcomed because
a. It gave some freedom of choice to Nepal
b. Once loaded onto the Metre Guage in Chittagong no further transhipment is required between the port and Nepalese territory.
c. Chittagong port charges are much lower than in Calcutta and Chittagong is generally perceived to be a more efficient port.

The traffic rapidly rose to 67,200 tonnes in 1980, the volume subsequently diminished until currently no Nepalese traffic is being carried. In fact the arrangement has never been a success, mostly due to the unacceptable long transit times. (It took nearly two years
for less than 50 % of the cargo landed in Chittagong in 1979 and 80 to reach Nepal. (9)

Because the transit time was commercially unacceptably long, the traders reverted to importing exclusively through Calcutta. The Chittagong arrangement was a failure. The main problems with the transit agreement were:

a. Longer transit times due to lack of coordination between Indian and Bangladesh railways, shortage of wagons and motive power and procedural and customs delays.

b. Higher rail transit costs, because of the greater distance to Chittagong.

c. Inconveniences such as the Nepalese having to pay transit and port charges in Bangladesh in foreign currency and needing visas to visit Bangladesh, and

d. The disadvantages of not having the network of agents, warehouses and business associates available at Chittagong port, which has been established at Calcutta.

Following is a summary of the findings of the consultants on Nepalese transit in the "Rail Container Transport Study -Bangladesh -87."

There is a strong political desire within Nepal for alternative routes to be made available through Bangladesh for third country transit traffic. However, there are commercial, economic and practical disadvantages in
such an arrangement as compared with existing routes through Calcutta. This particularly applies to Chittagong which is further away from Nepalese border points than Calcutta. Also between Chittagong and Nepal it is necessary to cross the Jamuna river and the Bangladesh / Indian border, both points of lengthy delay.

There is a generally held view amongst those concerned in Nepal that conditions in Calcutta port are improving. It is also felt that truck transport is much more efficient than by rail.

In the present circumstances the commercial sector in Nepal has, in theory, a choice between using rail via Chittagong and truck (or rail) through Calcutta. In practice, the advantages of Calcutta are overwhelming and Chittagong is not seen as a viable alternative to Calcutta. There is little prospect of this situation changing in the future.

More consideration is currently being given to the prospects for using Mongla as an alternative transit port for Nepal and a committee has been established to promote this possibility on behalf of Bangladesh. The Port of Mongla Authority and some private traders have been lobbying the Bangladesh government to obtain the Indian government’s approval for rail transit traffic to cross the border at Rohanpur and for Benapole to be opened to road transport traffic.

The rail distance from Mongla to Jogbani (Nepal/India border) is 588 kms, compared with 963 kms from Chittagong. However, the former necessitates transhipment from Broad Guage to metre guage at Parbatipur.
Rail through Mongla may not be regarded as an attractive alternative to truck via Calcutta. Road transport from Mongla would be more attractive but may be more politically sensitive. Inland water transport has some advantages over both road and rail.

If the rail route via Chittagong has any potential for carrying Nepalese transit traffic, it is for bulk rather than non-bulk or containerisable traffic. This is for all the usual reasons favouring rail transport of bulk cargoes, such as the large size of consignments and the relative insensitivity to transit time.

Rail movement of transit traffic in containers would require the provisions of dedicated resources and use of unit trains. These would only be provided if there were a commitment to ensure movement of adequate volumes of containers regularly. Bulk traffic on the other hand would make use of conventional services.

**Bangladesh Nepal Bilateral Traffic.** Bangladesh exports fertiliser and some bitumen, but little else to Nepal while Nepal's exports to Bangladesh have come down to almost zero. Bangladesh exports amounted to only about US$ 5 million in 85-86. There were no imports from Nepal in 1985-86.

The fertiliser exported to Nepal is mainly urea from Ghorashal and Triple Super Phospate (TSP) from Chittagong. This traffic is expected to increase in future but prospects for other bilateral trade are very limited. There is little containerised traffic potential.
India. Two ICDs are proposed to be set up in FY 88-9 in North Eastern India at New Jalpaiguri and Gauhati. A temporary ICD is already in operation in Gauhati.

Annual containerisable tonnage forecasts for these two ICDs in thousand TEUs are:

<table>
<thead>
<tr>
<th></th>
<th>Import</th>
<th>Export</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Loaded</td>
<td>Empty</td>
<td>Loaded</td>
</tr>
<tr>
<td>Gauhati</td>
<td>1.8</td>
<td>8.45</td>
<td>10.25</td>
</tr>
<tr>
<td>New Jalpaiguri</td>
<td>-</td>
<td>1.9</td>
<td>1.9</td>
</tr>
</tbody>
</table>

Source: Transmark/RITES

The movement potential to and from Gauhati is considerable, the average daily TEUs forecasts requiring one train per day. From July to December the requirements would be about 70% above the average annual demand.

From the figures above it can be seen that demand is almost entirely in the export direction, this means importing substantial numbers of empty containers. It has previously been assumed that these could be moved from Calcutta.

The potential attraction of carrying this traffic through Bangladesh is not just the volume but also the directional pattern. Chittagong currently exports considerable numbers of empty containers and this will increase. A Dhaka ICD would also have a considerable imbalance in favour of imports, even after allowing for some empties being sent for loading elsewhere in the
country ( Srimongal ). There would be advantages in despatching the surplus empty containers from Dhaka for stuffing at Guwahati rather than returning them empty to Chittagong.

The economics of moving containers to and from Guwahati through Chittagong port therefore appears attractive. The situation for New Jalpaiguri is less so.

The distance to Mongla is little shorter than that to Calcutta, traffic levels are lower and the BG border crossing would have to be reopened to allow rail movement into Bangladesh. A benefit might be that enough empties would be generated from imports into North Bengal to feed New Jalpaiguri without the need to bring empty containers from Calcutta, but this is unlikely.

**Bhutan.** Bangladesh and Bhutan signed a bilateral trade agreement in 1980 but no significant movement of goods has subsequently taken place. At present there is little indication or interest in potential container traffic between these two countries.

**Container Traffic Forecasts**

The total volume of containers through the ports, estimated by the consultants in the Rail Container Transport Study Bangladesh ’87 is given in the following paragraphs.

Container traffic is forecast to grow from 56000 TEUs pa to 154000, 252000 and 360000 TEUs pa by FY92-3, FY97-8, FY02-3 respectively. Between 30 and 50% of
export TEUs are expected to be loaded boxes. The imbalance between imports and exports is expected to widen slightly as container penetration of imports reaches the same level as exports. Dhaka is expected to account for between 50 and 55% of imports and exports in the future.

It is assumed that:

a. The extent of containerisation into and out of Bangladesh would be dictated by other countries.

b. Aggregate port throughputs would be predominantly determined by the performance of the Bangladesh economy.

c. The distribution of traffic between ports would be determined by many factors other than inland transport costs.

d. The locational distribution of importers and exporters within Bangladesh would not respond readily to changes in transport costs because of many other factors (locations of raw materials, agents, banks, etc) involved in any decision to relocate.

In FY86-7 container penetration of non bulk imports was estimated at 18-19%. Tonnage per loaded TEU is continuing to fall, largely as a result of increasing proportions of 40 foot boxes. From a peak of 13.8 tons the average weight per TEU is now 11.4 tons. The imbalance between imports and exports and between ports results in substantial handling and storage of empty containers. Container dwell times, i.e., the time a container stays in a port (or ICD) is currently estimated at between 20 to 25 days for imports.
On analysis of the import and export container traffic which included delivery addresses, modal split, port dwell times, use of agents, transport costs, onward distribution requirements and other relevant information, it was established by the consultants that almost 70% of import containers examined contained goods for Dhaka. Of these 75% were for delivery in Metropolitan Dhaka. The pattern is likely to remain the same. Jute will continue to dominate exports but growth is likely to come mostly from garments and frozen food.

From the forecasts by commodity in Table 3.4 it can be seen that the rate of containerisation of raw jute, jute goods and "other" are critical to the forecasts of containerised tonnages.

At Table 3.5 is the forecast of container penetration of Bangladesh non bulk imports and exports, i.e., the percentage of the available containerisable tonnage actually transported in containers.

The forecast of container tonnage for Bangladesh imports and exports are given in Table 3.6. This has been arrived at by multiplying the non bulk tonnages in Table 3.4 by the market penetration in Table 3.5.

**Port Throughputs**

- **Allocation.** Chittagong share of containerised imports is assumed to decrease gradually and is forecast as: 97% for FY86-7, 94% for FY92-3, 89% for FY97-8 and 84% for FY02-3, and for exports
### TABLE 3.5
FORECAST CONTAINER PENETRATION OF BANGLADESH
NON BULK IMPORTS AND EXPORTS (PERCENT)

<table>
<thead>
<tr>
<th>Commodity</th>
<th>FY 86-7</th>
<th>92-3</th>
<th>97-8</th>
<th>02-3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Imports (Total)</strong></td>
<td>19</td>
<td>38</td>
<td>50</td>
<td>60</td>
</tr>
<tr>
<td><strong>Exports</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raw Jute</td>
<td>5</td>
<td>17</td>
<td>28</td>
<td>43</td>
</tr>
<tr>
<td>Jute Goods</td>
<td>18</td>
<td>43</td>
<td>58</td>
<td>73</td>
</tr>
<tr>
<td>Tea</td>
<td>60</td>
<td>72</td>
<td>82</td>
<td>92</td>
</tr>
<tr>
<td>Leather</td>
<td>85</td>
<td>91</td>
<td>96</td>
<td>100</td>
</tr>
<tr>
<td>Frozen Foods</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Garments</td>
<td>95</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Other</td>
<td>30</td>
<td>42</td>
<td>47</td>
<td>56</td>
</tr>
<tr>
<td><strong>Total Exports</strong></td>
<td>21</td>
<td>43</td>
<td>58</td>
<td>72</td>
</tr>
</tbody>
</table>

### TABLE 3.6
FORECAST CONTAINER TONNAGE FOR BANGLADESH
IMPORTS AND EXPORTS (000 TONNES)

<table>
<thead>
<tr>
<th>Commodity</th>
<th>FY 86-7</th>
<th>92-3</th>
<th>97-8</th>
<th>02-3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Imports (Total)</strong></td>
<td>311</td>
<td>875</td>
<td>1456</td>
<td>2126</td>
</tr>
<tr>
<td><strong>Exports</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raw Jute</td>
<td>20</td>
<td>63</td>
<td>92</td>
<td>108</td>
</tr>
<tr>
<td>Jute Goods</td>
<td>85</td>
<td>215</td>
<td>301</td>
<td>379</td>
</tr>
<tr>
<td>Tea</td>
<td>18</td>
<td>25</td>
<td>37</td>
<td>52</td>
</tr>
<tr>
<td>Leather</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>Frozen Foods</td>
<td>24</td>
<td>47</td>
<td>74</td>
<td>106</td>
</tr>
<tr>
<td>Garments</td>
<td>43</td>
<td>102</td>
<td>159</td>
<td>228</td>
</tr>
<tr>
<td>Other</td>
<td>26</td>
<td>52</td>
<td>93</td>
<td>164</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>230</td>
<td>520</td>
<td>774</td>
<td>1055</td>
</tr>
</tbody>
</table>

Source: Consultants analysis and estimates in RCTS.
CHITTAGONG PORT

Containerised Tonnage

<table>
<thead>
<tr>
<th>Year</th>
<th>Imports</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY81-2</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>FY86-7</td>
<td>0.3</td>
<td>0.4</td>
</tr>
<tr>
<td>FY91-2</td>
<td>0.6</td>
<td>0.7</td>
</tr>
<tr>
<td>FY96-7</td>
<td>1.2</td>
<td>1.3</td>
</tr>
<tr>
<td>FY01-2</td>
<td>1.5</td>
<td>1.6</td>
</tr>
</tbody>
</table>

MONGLA PORT

Containerised Tonnage

<table>
<thead>
<tr>
<th>Year</th>
<th>Imports</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY81-2</td>
<td>450</td>
<td>450</td>
</tr>
<tr>
<td>FY86-7</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>FY91-2</td>
<td>350</td>
<td>350</td>
</tr>
<tr>
<td>FY96-7</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>FY01-2</td>
<td>250</td>
<td>250</td>
</tr>
</tbody>
</table>

Source: RCTS

FIG NO 3.3
for FY86-7 to FY02-3 -2% for raw jute, 28% for jute goods and 93% for tea, leather, frozen foods, garments and other goods. The resulting forecast growth of containerised import and export tonnage through the two ports is shown in Figure 3.3. The increasing percentage share of imports through Chittagong and Mongla is clearly shown.

b. **Tonnages Per Loaded TEU.** In forecasting future changes in container tonnages use has been made of the recent trends; an increase in the proportion of 40ft containers from 39% of import TEU and 50% of export TEU in FY86-7 to 56% and 60% respectively in FY02-3. There is an associated reduction in the average tonnage per TEU, because of the smaller average tonnage per TEU for 40ft compared with 20ft containers, from 12.4 tonnes for imports and 9.9 tonnes for exports in FY86-7 to 10.9 tonnes and 9.9 tonnes respectively in FY02-3 proportion of 40ft containers is likely to continue increasing worldwide. This is assumed to apply to Bangladesh also.

c. **FCL and LCL.** It is assumed that the FCL/LCL proportions for imports would also be applicable to exports for both the ports. In future the FCL proportion would increase, consistent with worldwide trends. The share of FCL is assumed to rise from 66% in FY86-7 to 75% in FY02-3.

Estimated port throughputs for Chittagong in terms of TEU are summarised in Table 3.7.
# TABLE 3.7
CHITTAGONG - FORECAST OF CONTAINER IMPORTS AND EXPORT (TEU '000s)

<table>
<thead>
<tr>
<th>Commodity</th>
<th>FY 86-7</th>
<th>92-3</th>
<th>97-8</th>
<th>02-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imports</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FCL</td>
<td>16</td>
<td>49</td>
<td>85</td>
<td>123</td>
</tr>
<tr>
<td>LCL</td>
<td>8</td>
<td>20</td>
<td>28</td>
<td>41</td>
</tr>
<tr>
<td>Total Loaded TEU</td>
<td>24</td>
<td>69</td>
<td>113</td>
<td>164</td>
</tr>
<tr>
<td>Empties</td>
<td>4</td>
<td>8</td>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>Total Import TEU</td>
<td>28</td>
<td>77</td>
<td>126</td>
<td>180</td>
</tr>
<tr>
<td>Exports</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FCL</td>
<td>9</td>
<td>21</td>
<td>35</td>
<td>50</td>
</tr>
<tr>
<td>LCL</td>
<td>5</td>
<td>9</td>
<td>11</td>
<td>17</td>
</tr>
<tr>
<td>Total Loaded TEU</td>
<td>14</td>
<td>30</td>
<td>46</td>
<td>67</td>
</tr>
<tr>
<td>Empties</td>
<td>14</td>
<td>47</td>
<td>80</td>
<td>113</td>
</tr>
<tr>
<td>Total Export TEU</td>
<td>28</td>
<td>77</td>
<td>126</td>
<td>180</td>
</tr>
</tbody>
</table>

Source: Consultants analysis and estimates in RCTS.
Advantages and disadvantages of rail, road and inland waterway transport

<table>
<thead>
<tr>
<th>Rail</th>
<th>Road Advantages</th>
<th>Inland Waterways</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Comparatively low energy per ton/km</td>
<td>- Relatively small initial capital investment</td>
<td>- Transport of large volume of (bulk) cargo at low cost</td>
</tr>
<tr>
<td>- Convenient transport of low value consignments (bulk materials, heavy volumes)</td>
<td>- Flexibility of capacity and services and of scheduling departures/arrivals</td>
<td>- Low energy consumption per unit</td>
</tr>
<tr>
<td>- Low cost per unit carried on long distance</td>
<td>- On short distances: speed of service and low cost per unit carried</td>
<td>- Very high safety</td>
</tr>
<tr>
<td>- Permanent service all over the year</td>
<td>- Low terminal costs</td>
<td></td>
</tr>
<tr>
<td>- Very high level of safety</td>
<td>- Door-to-door services</td>
<td></td>
</tr>
<tr>
<td>- Possibility of programming transport processes</td>
<td>- High reliability, security and availability</td>
<td></td>
</tr>
</tbody>
</table>

Disadvantages

- Big initial capital investment
- Capacity inflexibility
- Slow transport facilities on short distances
- Expensive terminal facilities
- High cost of transshipments
- Low door-to-door capability
- Limited capacity for moving heavy volumes of bulk materials
- High cost for very long hauls
- Interruptions due to vehicle breakdowns or weather conditions
- Low energy efficiency
- Negative image (slow and unreliable)
- Restricted to seaport transport (concentration of large number of containers necessary)
- Minimum of containers required to run a regular service
- Very low door-to-door capability

Table : 3.8

Source: Keppel R, Port Management Textbook-Containerisation
POTENTIAL CONTAINER TRANSPORT NETWORK

Source: Transport of Containers in Bangladesh, 85

FIG NO 3.4
Rail, Road or IWT?

The key determinants of a choice between the three modes for inland transport of containers are the costs of transportation and the quality of service. A comparison of the advantages and disadvantages of rail, road and inland waterway is given in Table 3.8.

Major factors affecting competitive transport costs and service quality are the pace of improvements to the roads between Dhaka and the two ports and replacement of ferry services by bridges and any investment in container handling facilities for IWT. Very important is the growth in availability of larger 3 and 4 axle trucks, capable of carrying containers.

Transport routes to be considered are those which could have a direct role to play in transportation of containerisable freight between Dhaka and the ports of Chittagong and Mongla. These cover rail, road and IWT. Each route suffers from constraints which need to be alleviated.

Till in the recent past virtually all containerisable traffic was carried by road. Between Dhaka and Chittagong - IWT currently lacks container carrying capacity, therefore there is no competition with road or rail.

Nearly all containers are unstuffed at Chittagong and transported inland by road in break bulk form. The proportion carried by rail is low and for IWT appears to be negligible. The main reasons identified for choosing road were speed and reliability.
Traffic volumes and route distances greatly influence rail competitiveness. Also important are the relative levels of efficiency of the various modes. Road is generally quicker than other modes for freight, except air, and rail quicker than water. On the other hand the lowest cost per ton/km or unit of capacity is generally achieved by water followed by rail and road. However rail and water usually require investment in terminal facilities and sometimes collection or delivery of goods by road.

The consultants in the ROTS have identified adequate traffic to support rail container services in the Chittagong - Dhaka sector with an ICD at Dhaka.

If rail is to enter the container traffic market this will have to be by offering an attractive alternative to road, particularly in terms of quality of service.

According to the main conclusions arising from the assessment of through costs by the consultants in the RCTS:

a. Rail may be reasonably competitive compared with road for LCL on the basis of direct transport costs.

b. Rail may be less competitive than road for FCL. It will take some years for road to offer a fully comparable FCL service to a large share of traffic.

c. Since rail would offer the only regular service for through transport of loaded 40' containers -
calculations on a per TEU basis may understate the overall competitiveness compared with road.

A potential transport network for Bangladesh is shown at Figure 3.4. (13)

REFERENCES TO CHAPTER III

(8) Rail Container Transport Study - Bangladesh.

(9) As cited in (8) above.

(10) As cited in (8) above.

(11) As cited in (8) above.


CHAPTER IV

STRUCTURAL DEVELOPMENT OF SUPPLY

Existing Port Facilities

Port of Chittagong. The main port situated on the right bank of Karnaphuli river comprises 13 general cargo berths, mostly backed by warehouses, along the river with another 4 berths further west beyond the two multipurpose berths, now being constructed. Beyond these last 4 berths bulk discharge facilities exist for bulk traffic. These follow the river and road leading to Chittagong airport. A map showing the Karnaphuli river and its approach is at Figure 4.1 and a general view of the Port of Chittagong is at Figure 4.2.

Depth at jetty berths ranges from 7.01m to 9.14m and depth at moorings ranges from 6.24m to 9.19m and above. The width of the navigational channel (5.49m contour) varies from place to place. A minimum of 250m channel width is maintained. For manoeuvring in the Karnaphuli river the length (LOA) carrying dry cargo and tankers with oil is restricted to 186m (610ft). The datum depth of the Outer Bar is 5m approximately.

Chittagong is connected by MG railway and road, currently involving two ferry crossings with Dhaka. Water craft or barges to and from Dhaka cross the edge of the Bay of Bengal to reach Chittagong.

Rail access is available to all berths and backup storage areas. There are in all three accesses and two
THE CHITTAGONG PORT AUTHORITY

CHITTAGONG TOWN

KARNAFULI RIVER & APPROACH

Source: CPA Yearbook, 87

FIG No 4.1
CHITTAGONG PORT GENERAL VIEW

Source: RCTS
marshalling yards. One of the rail accesses, with a connection to the rail marshalling yard, runs behind the site of the MPB and serves berths 14 to 17 and the bulk facilities. This line will eventually serve the rail terminal at the MPB also.

**Cargo and Container Handling Facilities.** General cargo containers and some bulk traffic mostly bagged grain or cement are handled at general cargo berths 1-13 in the main port area. Light conventional cranes are provided on most berths but discharge and loading of containers are carried out by ships gear.

Purpose built road tugs and trailers are used to convey containers to and from the quays and storage areas. Large areas of the port have been given over to container storage causing congestion. Containers are stored loaded, awaiting customs, and empty, waiting for outshipment. Some of the storage areas are well surfaced and orderly and others are improvised. Most FCL and LCL containers are stripped or stuffed in the open, also customs examination takes place in the open.

Container yards and storage facilities available are as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Sq m</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Area of existing, Interim Container yard</td>
<td>67215</td>
</tr>
<tr>
<td>* General cargo dumps being used for container handling</td>
<td>11373</td>
</tr>
<tr>
<td>* Space being used for storing empty containers</td>
<td>20000</td>
</tr>
<tr>
<td>* General cargo dumps temporarily used for container stuffing and stripping and storage</td>
<td>17600</td>
</tr>
<tr>
<td>* Yards under construction</td>
<td>14000</td>
</tr>
</tbody>
</table>

In addition, more space was to be brought under the
Interim Container Yard during 87-88.

Plugging facilities for 30 refer containers have been made available for public use in the Interim Container Yard.

An open type hanger adjacent to the container freight station ie "N" shed, facing the yard with 32ft height, 90ft length and 45ft breadth is also available for all weather stuffing and stripping of containers round the clock.

"M" shed and "N" shed with 8084.10sqm area each have been converted into CFS. (Source: CPA Yearbook '87)

Various port sheds at the west of the port area close to berths 12 and 13 are used for import LCL and export FCL traffic. Import FCL are usually unloaded direct to road truck, after customs clearance. Present arrangements are obviously slow, expensive and cause damage and loss of goods.

The port does have a fleet of modern Valmet front loaders for container handling. (Source: RCTS)

CPA has already received 2 Forklifts (FLTs) of 42 tonnes capacity, 8 FLTs of 25 tonnes capacity, 3 FLTs of 16 tonnes capacity, 12 terminal tractors, 4 trailers of 40ft length and 12 trailers of 20ft length, 6 Roll Trailers for stuffing and stripping, 10 Pallet trucks, Goose neck 2 nos and Parking Stands 2 nos under the Finnish Grant. In addition 1 no 42 tonne FLT and 4 nos 40ft long terminal trailers were expected to be received by the end of '87. (Source: CPA Yearbook '87).
**Multipurpose Berth.** The scope of the multipurpose berth project engulfs the construction of 2 wharves of 450m in length which have been completed and are designed to carry gantry cranes and heavy container handling equipment. The backup facilities which are yet to be completed will include development of about 450 acres of land into paved storage area, Container Freight Station (CFS), office building, garage and workshops, customs fencing, services and utilities etc. The project is expected to be completed by 1991 and would enable to handle a total throughput of more than 90000 TEUs per year. At the same time the berths can be used for other cargo too. However, it is likely that some of the port container throughput will continue to arrive at other berths, on general purpose vessels, even after this new berth is in operation.

**Rail Facilities.** Bangladesh Railway operates the port rail system with its own locomotives. Convention al wagons are loaded on or around the various berths and warehouses. They are distributed from a number of small sorting yards.

Containers are loaded and discharged to and from rail wagons at a small yard close to the main port entrance. Generally front loaders are used but a rail mounted gantry crane exists and is expected to be refurbished for container handling.
Mongla Port

The port is situated at the confluence of the river Pussur 80kms up from the Bay and Mongla Nullah and occupies a strategic position in the topography of Bangladesh. The entire western part consisting of most of the districts of Bangladesh in its hinterland.

The one and only bar at the entrance of Pussur River has a minimum datum depth of 17ft. This is a limiting factor affecting the draft of ships entering and leaving Mongla Port.

There are 5 newly constructed berthing jetties of 600ft each with 28ft depth of water at the jetty front. Besides there are 12 swinging mooring buoys where the vessels are made fast with their own cables, 19 more ships can be safely anchored within 4 miles working range. The depths vary between 45-19ft at datum.

There are 4 transit sheds of 52800sqft and 7500 tons capacity each (3 completed) and 2 warehouses of 105600sqft and 15000 tons capacity each. Besides there is open stack yard for containers. Construction of other ancillary facilities is in progress.

For container handling there are two prime movers, two 40ft trailers, Eight 20ft trailers, one 25 ton forklift and one 30.5 ton forklift.

Cargo that cannot be handled in the berths is discharged or loaded overside between ships and barges at the Mongla Anchorage. A high quality road now exists to Khulna but a congested ferry across the Rupsa river must
be used to get to the port. The nearest suitable rail facilities are at Khulna, across the Rupsa river.

With the completion of Khulna-Mongla highway, the port has been connected with the rest of the country by the land route. Ro Ro ferry has been provided at the Rupsa river Ferry crossing.

Existing Internal Transport Facilities

Roads and Road Transport The development of roads in Bangladesh had been rather slow until the beginning of 2nd Five Year Plan in mid 1980. Since then, increased emphasis has been given to the development of roads.

The road transport sector plays a most important role in the overall growth of economy in Bangladesh. It contributes about 4% of the country's GDP. Road transport presently carries about 63% of freight and 40% of passenger traffic.

Road Network There are at present 10914kms of roads under the control of the Roads and Highways Department. Of these 2820kms are national highways and they are all paved (was only 1375kms in 1980). National highways are mostly single carriageway two lane roads generally having a pavement width between 5.5m to 6.7m. Alignment of the roads is very poor at many locations. The roads pass through a number of small towns and villages, and activities such as weekly markets, encroach on the highways causing obstructions to the smooth movement of traffic. Some of the national highways are plan-
ned to be reconstructed with foreign assistance. These projects were expected to be taken up by the end of '87.

As the country is riverine, bridges and culverts feature prominently on the road network. At present there are 2389 bridges having a total length of 69900m and 7439 culverts having a length of 3110m. Many of the older bridges and culverts are inadequate to support the existing and projected vehicle loads and form the weakest link in the road network. Besides, a number of major rivers in the country have not been bridged so far and have to be crossed in ferries which not only slows down the traffic but also places restriction on the type of vehicles.

Since 1980 the programme of rehabilitation of old bridges and construction of new bridges to replace the ferries has received considerable impetus. 12 major bridges having a length of 1891m have already been completed and 17 more with a length 4765m are under construction with substantial foreign assistance.

Even with the construction of the above bridges, there still exist as many as 33 ferry crossings. Twelve of these which are on important trunk roads such as Dhaka-Chittagong, Khulna-Mongla, Dhaka-Mawa and Dhaka-Sylhet are being planned for replacement with bridges in the near future.

The axle load effects of road vehicles carrying containers are likely to be significantly greater than the average loads of current commercial vehicle traffic in Bangladesh. The impact of containerisation on the road system would be - increase in pavement maintenance.
LEGEND:
ROAD 6.7 m WIDE
ROAD PARTLY 6.7 m
AND PARTLY 5.5 m WIDE

SCALE
10 5 0 10 20 30 40 50 km

Source: RCTS

Fig. No. 4.3
and upgrading of the roads and the design of new facilities to handle container traffic.

Most important routes relevant to this study are the Dhaka-Chittagong highway, Dhaka-Sylhet road, direct road from Dhaka to Mongla port. Projects are in hand to improve these routes. However, the consultants' view is that it is unlikely that the full length of road from Chittagong to Dhaka will have been upgraded to a sufficient standard for the efficient transport of containers by road much before the year 2000. The Dhaka-Chittagong highway route and characteristics by route section are shown in Figure 4.3. The Dhaka to Mongla road and IWT routes are shown in Figure 4.4.

It has been recommended by the consultants in RCTS that roads, which will be used by trucks/trailers loaded with containers, should in the interest of safety be widened to at least 7.3m (24ft) wherever possible, this being the common international standard.

**Vehicles.** In the Asian Development Bank (ADB) Road Sector Development Studies, the consultants, Kamp-sax, estimated the Bangladesh motor vehicle fleet in 1986, including motorcycles at 153000. The truck fleet was estimated at 16500 vehicles. The consultants and the Roads and Highways Department estimated that the truck fleet would be 19000-20000 in 1990 and 25000-26000 in 1995.

In addition to the motorised vehicle fleet there are enormous numbers of non-motorised conveyances. Cycle-rickshaws, in particular, although predominantly found
in urban areas. These add considerably to the difficulties of motorised transport on the national road network.

Trucks are two axle having a typical loading capacity of six to seven and a half tons. Three axle rigid vehicles are occasionally seen but articulated vehicles are virtually nonexistent, apparently due to the constraint of ferry crossings.

The axle loads will vary both with the type of vehicles and the loads in the containers. Following 4 types of typical vehicles are considered:

a. Two axle rigid lorry - Currently being used to carry containers in Bangladesh. These are not designed to carry containers and are unsuitable for this purpose. Such vehicles would continue to be used for sometime though.

b. Three axle rigid lorry - Not common in Bangladesh but are the most frequently used type of heavy commercial non articulated truck elsewhere.

c. Four axle articulated tractor trailer - These are the type of vehicle most commonly used for carrying containers and some are already in use by shipping lines in Chittagong.

d. Five axle articulated tractor trailer - These can carry heavier loads with less axle weight than the 4 axle type. It is presumed that they may eventually form a proportion of the container carrying fleet.
Opinions differ as to how soon larger trucks will be introduced but it is clear that their introduction will continue to be restricted by the regulations in the Vehicle Ordinance, the geometry of roads and the size of ferries. The ADB Road Sector Development Studies, Final Report concluded that the average size would not increase noticeably within the next ten years.

The public sector Bangladesh Road Transport Corporation (BRTC) plays only a minor role in truck transport in Bangladesh. In May '86 it had a total fleet of 256 and is estimated that BRTC takes about 5.6% of traffic in the principal routes in Bangladesh.

**Inland Water Transport**

**Waterways.** The principal waterways—administered by Bangladesh Inland Waterways Transport Authority (BIWTA)—used for transportation are the natural routes formed by the river systems and are classified as regular or seasonal depending on the water discharge. For this study, regular routes having controlled depths of at least 3.7m (12ft) described as Class A or those exceeding 1.8m (6ft) are Class B, are of prime importance.

For transportation of containers the following routes are of most relevance:

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>Class</th>
<th>Distance kms/miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Chittagong</td>
<td>Dhaka</td>
<td>A</td>
<td>307 / 191</td>
</tr>
<tr>
<td>b. Chittagong</td>
<td>Khulna</td>
<td>A</td>
<td>417 / 259</td>
</tr>
<tr>
<td>c. Mongla</td>
<td>Dhaka</td>
<td>A</td>
<td>338 / 210</td>
</tr>
<tr>
<td>d. Mongla</td>
<td>Dhaka</td>
<td>A&amp;B</td>
<td>303 / 188</td>
</tr>
</tbody>
</table>
Since the controlled depths used for classification purposes are minimum figures, vessels of deeper draft than implied by the controlled depth figures can be used for much of the year.

**Vessels.** There are two distinct types of vessels used in the domestic waters of Bangladesh. They are "bay crossing" meaning seagoing and certified to make the short crossing of part of Bay of Bengal from Chittagong into the lower Meghna river, and "inland". Generally operating costs of inland vessels are lower than those capable of bay crossing. Country boats are also a very important means of inland water transport. Estimated size of the operational cargo fleet is in Table 4.1. The cargo carrying units have an external appearance generally as indicated in Figure 4.5.

According to the consultants, the most favourable vessel for bay crossing should be the coaster of 600 tons dwt or more, with preferably a sizable hold and breadth in excess of 10.5m which should give a minimum capacity of 24TEUs with hold stowage and one high on top of the hatches.

A bay crossing barge of the two hold configuration of 45m length could provide an alternative to the coaster but with a reduced capacity. For inland waterways, the flat of approximately 70m length will provide a 48TEU capacity. No other vessel has been favourably viewed.

The existing vessels potentially suitable for con-
TYPES OF CARGO CARRYING VESSELS

Source: Transport of Containers in Bangladesh, 85
Containers are as follows:

Chittagong route - 11 Coasters (7 Public + 4 Private Sector), Two of 44TEUs and others of 24TEUs.
16 Bay crossing barges (Public Sector). 20TEUs, already in service.

Mongla route - 8 Self propelled barges and 8 Flats, already in service.

<table>
<thead>
<tr>
<th>TABLE 4.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESTIMATED SIZE OF OPERATIONAL CARGO FLEET '85</td>
</tr>
<tr>
<td>(BIWTC &amp; PRIVATE)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Bay Crossing</th>
<th>Inland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coaster</td>
<td>96</td>
<td>-</td>
</tr>
<tr>
<td>Cargo Vessel</td>
<td>-</td>
<td>564</td>
</tr>
<tr>
<td>Tug</td>
<td>6</td>
<td>168</td>
</tr>
<tr>
<td>Flat</td>
<td>6</td>
<td>91</td>
</tr>
<tr>
<td>Barge</td>
<td>51</td>
<td>685</td>
</tr>
<tr>
<td>Tanker</td>
<td>29</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>188</td>
<td>1516</td>
</tr>
</tbody>
</table>

Ports and Traffic. The most important inland port for containers are Chittagong, Mongla, Narayanganj and Baghabari. Collectively Dhaka, Narayanganj and other IWT ports in Dhaka area presently handle 80-90% of the traffic volume handled by Chittagong IWT port, mostly to and from Chittagong.

Railways. Bangladesh Railways is a state owned and state managed organisation. The railway is split...
into two administrative zones. East and West, with their headquarters at Chittagong and Rajshahi respectively.

The West zone comprises both BG and MG tracks, whilst the East zone is entirely MG east of the Jamuna river including the Chittagong-Dhaka route.

The rail distance between Chittagong and Dhaka is 321km. This is longer than the road distance because the rail route goes further north than the road in order to bridge the Meghna and other rivers. Because of the flat country there are relatively few gradients.

A single track line continues north from Akhaura Junction towards Sylhet. If it proves technically and economically feasible to move tea in containers from the Sylhet area, most probably from Srimangal, this line would be used.

Nepal transit traffic to and from Chittagong if any would be routed over the MG throughout. The route would be Chittagong-Akhaura-Ferry at Bahadurabad via Parbatipur to the Indian border at Biral.

The rail ferry is currently experiencing much difficulty owing to siltation, causing delays and congestion to cross Jamuna traffic. In the longer term a MG track may be provided on the projected Jamuna bridge.

Maximum permissible speed on MG main lines is 72Kph. Locomotives with a maximum axle load of 11.94mtons are permitted on main lines. The Chittagong-Dhaka section has 3 double line stretches amounting to 122km out of
The Chittagong-Dhaka line has bridges varying from 1/2m to 900m of various types, major ones are of steel girder type.

The effects of monsoon and storm are very severe on Bangladesh railways. During heavy rains between June and September, various bridges under the track and embankments are under pressure and sometimes results in bridge washouts or embankment breaches. BR have equipped themselves to counter these problems.

Improvement projects in the current five year plan (85-90) include rehabilitation of passenger and freight rolling stock and upgrading of the BG main route, west of the Jamuna. Other major projects include the upgrading of the Sylhet-Akhaura, Bhairab Bazar-Dewanganj Bazar and Bonpara-Dinajpur lines. All are relevant to container service development, the first for export tea and the later two for Nepal transit and other cross Jamuna traffic.

For the initial container services planned to operate from Chittagong port to the pilot Kamalapur ICD in Dhaka, rolling stock has been provided by conversion of existing wagons. These are of two types: covered CJ 4 wheel wagons and BFR rail truck boggies. 47 four wheel wagons and 13 boggie vehicles have been allocated for conversion. The boggie wagons are potentially capable of carrying 40ft containers. The 4 wheel wagons can carry 20ft containers - lightly loaded i.e. less than 21.3 tonnes gross.
There are over 9000 CJ covered 4 wheel wagons available to BR, a number considerably in excess of the current or the envisaged future requirements. BR has 77 BFR flat rail truck bogies having a length over hard stock of 13.1m and 87 a length of 11m. Only the former are long enough to carry 40ft containers. Not many of these could be spared for conversion as these are required for departmental use.

As an alternative, considerable number of other types of bogie wagons exist, from tank wagons through to more modern BC bogie covered wagon. As a result of the substantial reduction in freight traffic of recent years, it is likely that the productivity of these wagons has fallen and a number could probably be identified as surplus to immediate requirements and available for conversion. Unfortunately, none of these wagons are long enough to carry 40ft containers.

The BR has a total fleet of 290 locomotives, 150 in the East zone and 140 in the West. The container service will look to BR to provide with reliable, well maintained locomotives from adjacent depots at appropriate times to operate the advertised train schedules. Dedicated locomotives would be desirable.

**Interim ICD at Dhaka.** A major development required to operate rail container services on the Dhaka Chittagong route is an Inland Clearance Depot (ICD) in the Dhaka area. A start has been made by conversion of some existing facilities at Kamalapur Railway station to provide an interim ICD. In conjunction with a small fleet of converted freight wagons, this pilot operation
is providing facilities required to enable the container service to be run up to Dhaka. It started in April ‘87.

Provided the ICD is operated efficiently and the associated rail services run according to plan, shippers will become acquainted with the benefits of throughout movement of containers and traffic can be expected to increase steadily.

The capacity of the interim ICD facility is likely to be quickly reached (may be by 1989-90) and there will be a requirement for a larger purpose designed depot. The interim ICD capacity is 4100 import TEU and 4100 export TEU annually. Customs inspection facility is available at the ICD.

Two trains a week now (up to 88-89). Three trains a week is expected to run from FY89-90 to FY90-91. Train sizes would increase progressively throughout the period.
REFERENCES TO CHAPTER IV

(14) The Chittagong Port Authority Yearbook June’87.


(16) As cited in (15) above.

(17) As cited in (14) above.

(18) Mongla Port Authority – Yearbook – ’85-86.

(19) As cited in (15) above.

(20) As cited in (15) above.


(22) As cited in (15) above.
CHAPTER V

EVALUATION OF CONTAINERISATION

"Containerisation of developing country trades is proceeding apace; by 1990 it is unlikely that any purely break-bulk liner services will remain".

(Containerisation in the Eighties by M G Graham & D O Huges, '85)

Introduction

More than a decade ago, at the time the International Multimodal Transport Convention was being proposed in Geneva, doubts and fears were being expressed in developing countries about the problems of providing container services for them and the "threat" posed by the multimodal transport operators (MTOs). Containerisation was seen by developing countries as a sophisticated, expensive invention of the industrial trading countries deceived into accepting without thought for their needs, controlled by multinational operators many thousands of miles away and requiring expensive investments in ports and inland transport facilities which the developing countries could not afford.

Today, many problems remain, but much of the emotion has evaporated. This is partly because time has dispelled the worst fears and given an opportunity for the benefits of container services to be seen first hand. The Western operators have also been able to point out several basic considerations about the adoption of con-
Container services in developing country trades, which have largely been accepted in the Third World.

These basic considerations listed in "Containerisation in the Eighties" by M G Graham & D O Huges are briefly discussed below.

Basic Considerations For Adoption Of Container Services In Developing Country Trades

a. There are the sheer advantages of being able to put the goods in container, advantages for which developing country goods are suited as others. Developing country ports have been particularly prone to congestion, delay, loss and pilferage. Containers have improved that, reduced the losses and improved the outturn. Some types of developing country produce, like tropical fruits, gain particularly from the fine temperature control possible with insulated containers. Ventilated containers can be used when necessary. Simpler packaging has been possible with many products particularly semi-bulk and bagged cargo. Certain dirty cargoes like hides, skins and bones, unpopular with western dockers at destination can be satisfactorily handled in lined containers.

b. The imbalances in developing country liner trade have proved less severe and less of a disadvantage than feared. Western operators have been able to point out that no container trades are perfectly balanced and that containerisation does not make developing country liner trade imbalances any worse, indeed in some cases it can make them better.
by means of triangulation. There is no denying the fact that empty containers do have to be moved, but this is one of the costs of container services paid for by productivity improvements elsewhere in the service. Also cross subsidisation of lower value cargoes, like developing country produce exports, by the higher value manufactures, is not disturbed by containerisation. Some of the bulk cargoes were traditionally carried with liner cargo e.g., logs from West Africa, moving along with bagged coffee. The coffee is container compatible, the logs are not. The result is that efficient bulkers have been developed to specialise in the log trade, thus lowering costs and also providing space for containers, vehicles and so on in the inland run to West Africa which competes with the container services and presses downwards on rates. The conbulker may take some of this traffic. The optimum balance between type of service depends on cases. The main point is that there is a competitive situation and no inherent disadvantage to the developing countries.

The traders in industrial countries took the advantages of containerisation for granted once these countries had geared themselves up to the use of containers. They were calling for their use to carry the liner goods they imported from developing countries. The exporters of produce and other developing country cargoes who geared up to use containers would have a quality or convenience edge over the others. Those that did not, risked being left behind. With the passage of time there is less conventional handling capability left in deve-
loped countries and it becomes virtually necessary that trade is served by containers.

d. Not everything has to be done at once—it is not all or nothing. Operators have emphasised the gradual approach. Progress can be made and benefits achieved gradually in two senses. Not all trades have to be containerised at once. The most important, or those involving least problems, can be dealt with first—for Bangladesh it could be garments, frozen food, etc to start with. Neither do all parts of the through transport chain have to be geared at once, particularly the inland leg.

In many developing countries, because inland communications are poor and Bangladesh is such a case, a great deal of industrial activity takes place in the vicinity of the ports. These key areas can benefit directly from door to door container traffic. In many developing countries, much of the produce comes from the hinterland and traditionally moves to the port area in cargo lots suitable for shipping into break-bulk vessels. Containers in such cases could be packed in the port area, as is being done in Chittagong port now, and the advantages of containerisation in terms of port and ship productivity and in terms of the requirements of the other end of the trade can still be met. Inland transport communications to key areas can be improved over time as money is available and the whole process of access of containers to the hinterland can thus be stepped out over a period of time. This would apply to Bangladesh too.
The majority of those providing through transport services (MTOs) are the ship owners who have been present in liner trades for many years and who, together with their shipping agents, are well known commercial entities in the developing countries with whom they trade. Where non vessel owning operator (NVO) carriers offer services, they are again mostly known forwarding companies or groups of them, familiar with the needs, laws and customs of the countries in which they operate.

Finally there is the point that containerisation has developed in a way responsive to cooperative ventures. The European and Japanese ship owners have evolved consortium fleets. In some cases they have invested jointly in terminals. The shipping agencies have taken on the organisation of landside operators at the other end of the trades, a method being extended to developing countries. The opportunity thus exists for joint container service ventures between developed and developing countries. Asian and European lines have become members of the African Container Express (ACE) group in the Far East trade. Though number of such ventures has been limited, but there is reason to hope that more such joint arrangements will be made eventually.

With the passing of time, perceptions in developing countries of the considerations described above have eased their worst fears. This paves the way for progress. There are, however, still some particular problems which need to be tackled if container services in developing country trades are to be successful.
Before these particular problems are discussed, we shall first expand a little more on the advantages of container services.

The Advantages of Container Services

a. More Reliable Performance. Container services have achieved high reliability. One of the reasons for this is that container services usually achieve a high degree of port rationalization and this leads to more even predictable schedules which the traders value above all. Provided a service is predictable, traders can make plans and keep them. The other reason is that there is the smoothness and efficiency in handling cargo on and off container ships and across container berths; this has greatly reduced port congestion and delay. Container services have shown a better ability to perform partly for intrinsic reasons and partly because priority berthing has been given to them in many countries. The real solution lies in the provision of new facilities.

b. Faster Transit. In container services, goods spend little time sitting about for a variety of reasons; therefore faster door to door transit times can be achieved. Container ships need not travel faster than break bulk liners, though they often do. Greater in-movement speed would be cost increasing, whereas reduction of static time is cost reducing. This reduction is achieved first because the interface between sea and land is more efficient and secondly because container services usually make fewer port calls.
Faster transit times reduce the disadvantage of distances from the market. It follows that because there are less goods tied up in transit at an "average moment" and so less capital is tied up. The resultant saving in interest is shared between traders at either end of the trade, according to the terms of the contract.

The combination of greater reliability and faster transit produces another real saving, in that stocks are able to be replenished more quickly and with greater certainty. The reservoir of stock an importer needs to hold can thus be safely reduced by considerable amounts and again there is a saving in working capital to be made.

c. Protection of Cargo. Containers afford greater protection of cargo in the following ways:

* The physical protection of the cargo from damage by crushing, scuffing etc is much greater. Yet this can be achieved by use of lighter packs.

* Money is saved; on materials, by freeing labour, hitherto engaged in making up elaborate packs, for other tasks, and also on freight hitherto paid on crates, cases, etc.

* The opportunities for pilferage are greatly reduced. As cargo is no longer in the system in loose form, the incidence of loss is greatly reduced.
* The number of occasions on which the cargo is handled is usually reduced. This in turn reduces the opportunities for damage, delay, mis-sorting and pilferage.

d. **Insurance.** Container operators in international trade state that the marked improvements in quality of service through the protection of cargo in containers and their proper routeing had a marked effect upon the container operators cargo claims; both claims and payments against claims have been markedly reduced. The proportion of total cargo insurance borne by the container operators is greater than the proportion traditionally borne by liner operators. Most claims begin by being a claim against the carrier and the number of claims so presented has decreased greatly since the advent of the container services, so much so that dramatic reductions in operators' overheads related to insurance have been possible.

Improved insurance performance is important to traders in three ways: First, their own insurance costs are lower. Secondly, if the operators insurance costs are reduced, the pressure on increasing freight rates is eased. Thirdly, and most importantly, insurance seldom if ever recoups the goodwill of customers lost to a trader through failure to deliver - regardless of whose fault it is; if the number of claims is reduced, then goodwill is better protected.
e. **General Average.** Break-bulk cargoes, particularly of certain types of produce, are more susceptible to fire risk than cargo in containers. In such cases general average is normally applied. This particular hazard is virtually absent from container ships. Navigational hazards are, of course not entirely eliminated and general average is then applied, but there has been a marked decrease in their number. (24)

**Problems in Adapting Container Services**

The main problems encountered in adapting container services to developing country needs are: availability of skilled management, provision of capital and a surplus of labour, often unskilled. All these problems apply to Bangladesh also. We shall discuss each one of them separately.

**Management.** Containerisation is a management intensive operation. Good calibre management is required to direct the flow of containers and the documentation pertaining to them. It is obvious that managers need to be trained in container control and in the computer software needed for essential tracking systems and production of commercial documentation.

Western companies have developed their shipping agencies to perform these tasks in developing countries; they have had the training of staff in their own hands, supplemented by secondments. For the developing countries to build up an adequate central experience and expertise of their own—the joint venture is obviously one way to bridge the gap; secondment of staff is ano-
ther, but the developing countries are very conscious of the proportion of foreign nationals to national staff. They do not want to see commercial control of their industries and revenues slip out of their own hands. The UN and other bodies, including Western operators, also provide staff training schemes in container service management. Good training is essential, but it is important that supervision is not removed too soon.

**Provision of Capital.** Provision of capital is always a problem in developing countries. Container service is capital intensive—due to the scale economies of large ships and specialist berths and with new areas of investment in containers and computers. Behind it all there is the pressure for money to be spent in infrastructure developments.

The high productivity of container services may actually reduce capital needs. It has been calculated that one container ship and accompanying containers would cost less than the four to six smaller, less complicated break-bulk vessels which would be required to do the same work without containerisation. The one container berth and back up terminal facilities would certainly cost less to build than the seven to nine conventional berths which would otherwise be needed, especially if conversion of existing berths is involved. In the seventies, without realising these facts a lot of capital was wasted which were spent in obsolete schemes in the third world.

Developing countries can now take advantage of the development of containership technology and fleets. They, including Bangladesh could buy second hand ships or charter them. Charter rates and second hand prices are rela-
tively low and where capital is spent on purchase, ship mortgage finance is available on favourable terms. Containers could also be leased rather than purchased. Though operating with owned containers is likely to be cheaper than with leased containers, provided their use could be guaranteed.

New developments may be financed by private investment, aid fund or recourse to international loans such as those provided by the World Bank. Joint ventures are a suitable way of attracting foreign private capital and in a way which does not take up local capital. Funds would be available for ventures like the provision of terminal facilities or packing depots and repair shops. The World Bank and other agencies have publicly stated that they regard port infrastructure investment as a suitable use for their loan funds. The multipurpose berth project in Chittagong is being funded by the World Bank.

**Foreign Exchange.** Foreign Exchange is a related problem and a crucial question for developing countries. First, selling cif (or delivered) on a multimodal tariff does afford an opportunity to earn foreign exchange, but it must be remembered that one country selling freight paid means another buying freight paid. As with conventional shipping services the terms of trading are entirely a matter between buyer and seller. The MTO takes instructions on the terms of trading and in no way dictates them. Some developing countries—and they are not alone—seek to capture freight on their imports by a process of fob buying and steering import cargo to their own national lines, who then benefit from the transaction and minimise the exposure to foreign exchange outlay. However, such action may provoke retaliation.
The stronger the national lines of the developing countries become commercially, the more able are they to earn foreign exchange without recourse to methods which are bound to cause some conflict. This is part of the 40/40/20 topic of the UN Liner Code.

Doubts have been expressed concerning payment for inland transport services of containers namely that payment might be required to foreign based MTOs in foreign currency, even where costs arise in local currency. In practice, it is normal for inland legs to continue to be paid for separately in local currency. This avoids a foreign exchange drain. If an operator did not earn local currency to pay for inland transport operations, then he would have to buy it and the national accounts would show an inflow for this purpose. On the whole the chances of unconvertible local currency reserves or unremittable profit from local operations building up in this way are not great, because container services involve a number of unremunerated or under remunerated activities like local imbalanced movements and container repair costs and thus require some cross-subsidy from seafreight.

Seafreight earned by a foreign line is usually remittable, which is usually in dollars and where paid locally in local currency is convertible on being remitted abroad.

Labour. In developing countries there is abundant supply of cheap labour. There is a dilemma in these countries' economies in that the adoption of techniques which increase productivity is necessary to increase living standards, but often brings short to medium term difficulties in adopting to change. Containerisation is
a high productivity operation. It brings advantages in efficiency and utilisation of capital. Even in the short run, containerisation creates new jobs as well as reducing some of the traditional ones in the ships hold and on the quay. There may be an immediate pressure on the amount of port labour required, leading to counter demands for no reduction in the labour force, which in turn reduces the gain in real productivity.

Where containers are packed and unpacked in or near the port, like in Bangladesh, there is employment in packing depots directly related to port work and there will be some work for maintenance and repair of containers and equipment.

Container berths are usually worked intensively to gain maximum use of capital equipment, thus requiring an increase in the number of shifts to cover the working week.

In the longer term, the efficient through transport of exports and imports assists the promotion of economic development and helps to create work in the other sectors of the economy. Some such benefits may begin to show quite quickly. (25) & (26)

The Importance And Need for The Introduction of Containerisation in Bangladesh

On analysis of the basic considerations, the advantages and the problems discussed above, we find that by adapting to containerisation Bangladesh definitely would be a gainer.
It is seen from Table 2.1 that Bangladesh still handles relatively few containers, recent growth is however been fast. The trend world over now is towards containerisation. Bangladesh should not lag behind.

If Bangladesh do not gear up to use containers, she would be risking being left behind. As has been discussed earlier not everything has to be done at once, it should be done taking the gradual approach.

The containerisable exports of Bangladesh are: raw jute and jute goods - 73%, tea - 5%, hides and skins - 4%, frozen foods - 7%, garments - 8% and handicrafts -1%, others - 2%.

The containerisable imports are: food and drink - 20%, garments and materials - 16%, chemicals and pharmaceuticals 18%, machinery and spare parts - 15%, metals and other industrial raw materials - 22%, personal effects and other supplies - 9%.

Container traffic is expected to grow rapidly. At Chittagong, reaching 138000 TEUs p a by FY92-3 and 234000 TEUs p a by FY97-8, over half of which is expected to originate or be destined for the Dhaka area. Only very limited prospects exist for containerisation outside the Chittagong - Dhaka corridor. (Consultants estimates in: RCTS)

On the routes between Bangladesh and the industrialised countries, there is considerable potential for expanding containerisation and this is likely to ensure substantial growth in Bangladesh container traffic in the
foreseeable future. On the other hand, much of Bangladesh's trade is on routes presently not containerised, such as to China, Pakistan, and Eastern Europe. Therefore, overall high levels of containerisation cannot be achieved unless container services are provided to these countries. Containerisation is likely to spread to such services, but penetration in the foreseeable future is likely to be slow. Bangladesh therefore can afford to go slow.

A survey suggested that most importers and exporters of Bangladesh are well aware of the advantages of containerisation. A system of inland container transport is attractive to them. They consider such a development to be an essential requirement for the expansion of trade and commerce in Bangladesh. They see reductions of pilferage and damage as the principal benefits of an inland transport system together with speed of service and the opportunity for personal supervision of cargo clearance. (RCTS).

For such a service to operate successfully customs procedures, back-up facilities and proper equipment are needed to be available. Once such a system is established it has to be reliable. In other words, efficient, commercially oriented and operation of ICD and road, rail or inland waterway service are essential for any project to be competitive or viable. Parallel changes in customs and commercial procedures must be achieved, removing institutional obstacles to door to door container movement.
REFERENCES TO CHAPTER V


(25) As cited in (23) above.

(26) As cited in (24) above.

CHAPTER VI

PROJECT FORMULATION FOR CONTAINERISATION

Desired Changes in Institutional Procedures and Documentation

Use of Computers. In the early days of containerisation it was commonly said that - "What is the good of speeding up the flow of goods if the paperwork cannot keep up". (Containerisation in the Eighties by M G Graham and D O Huges, '85).

Part of this issue has been a facilitation matter.

For containerisation the fundamental operational changes required are an adequate and up-to-date documentation and information system which meets the internal demands of effective arrangements and external demands of the forwarders and shipping lines. Such documentation system can either be designed as a manual system or as a computer system. The decision of choice depends mainly on the quantity of containers to be handled per year and the extent to which the general objectives of a container terminal should be fulfilled. Therefore a system must be used by terminals which can relate each particular container to the information required for efficient yard marshalling and proper sequential loading or discharge. Such a system is fundamentally one of data acquisition, storage, processing requirements, tailored to suit the special requirement of the container terminal operations. The objectives for an integrated information system is in
OBJECTIVES FOR AN INTEGRATED INFORMATION SYSTEM

COST OBJECTIVES
- to minimize costs for personnel
- to minimize documentation
- to minimize collection of data
- to realize an economic computer system

DOCUMENTATION OBJECTIVES
- to collect once and immediately data at point of origin
- to minimize use of documents
- to standardize documents
- to guarantee immediate information about container data

DISPOSITION OBJECTIVES
- to rationalize the operational preplanning

CONTROL OBJECTIVES
- to reduce manual control procedures

FLEXIBILITY OBJECTIVES
- to design the system in general already for future extensions

TABLE: 6.1

Source: Fiedler G, Port Management Textbook-Containerisation
Table 6.1.

The result of an analysis is that the realisation of the objectives, combined with a turnover figure of more than 100,000 containers p.a. requires a computer system which should be designed as an on-line system. Computer systems based on punching cards suffer from time lags between data collection and availability of data (in reports) for the various departments. (Documentation - Information Systems by G. Fielder in Port Management Textbook - Containerisation, '85). Since Chittagong port is expected to handle more than 100,000 containers p.a. by FY91-2, it would be a wise decision to introduce a computer for container handling there.

An implementation of a computer system has to be performed carefully as it normally implies fundamental changes of existing organisational and operational procedures. Therefore such a computer should be implemented in stages in order to avoid an overcharge of the personnel concerned.

Experiences show that it is of real advantage to implement a computer system as a first step, which is able to handle the minimum requirements without negligence of the interregational aspects of the:

* Service Department - advice from agents, forwarders.
* Yard Control Office - disposition of containers, shuffling of containers, completion of data (location etc).
* Reception Department - dock receipts, delivery orders, check of advice, etc.
* Ships Operation - operational preplanning, manifests/stowage plans, etc.
* Control office - manifests/stowage plans, etc.
* Gate - inspection of containers, weight seal, etc.
* Administrative Control - reports, statistics, data transfer to Port Authority.
* Agents/Forwarders, Management, Customs, etc.

Nevertheless such a "minimum system" must already be designed for future extensions and further rationalisation of administrative procedures which will be realised by computer in a subsequent stage. An integrated container terminal system is illustrated in Figure 6.1. (28)

Institutional Framework

The management operation and ownership of the overall container service and ICD needs much thought and attention. There are a number of options which are listed in Table 6.2. These include various permutations of public sector bodies, including BR and CPA, private sector and joint ventures between public and private sectors. The criteria by which the options are to be evaluated are:

a. To maximise the benefits of containerisation, reduce delay, damage, lower insurance, etc for users, increase trade.

b. To ensure the benefits of door to door containerisation are widely and equitably distributed across the economy.
INTEGRATED CONTAINER TERMINAL SYSTEM (ICTS)

SERVICE DEPARTMENT
- Advises from agents
- Advises from forwarders

RECEPTION DEPARTMENT
- Dock receipts
- Delivery orders
- Check of advices
- Preparation of E.I.R.
- Definition of sequence-no.

YARD CONTROL OFFICE
- Disposition of containers
- Yard control
- Shuffling of containers
- Completion of data (location etc.)

SHIP'S OPERATION CONTROL OFF.
- Operational pre-planning
- Manifests/stowage plans
- Preparation of hatchlists, etc.

ADMINISTRATION CT
- Reports
- Statistics
- Data transfer to P.-Auth.

Agents/Forwards
- 

MANAGEMENT
- 

CUSTOMS
- 

Source: Fiedler G, Port Management Textbook—Containerisation FIG NO 6.1
**TABLE 6.2**

**OPTIONS FOR MANAGEMENT**

<table>
<thead>
<tr>
<th>Options</th>
<th>ICD Overall Service Ownership Management</th>
<th>Rail Service Provision &amp; Operation</th>
<th>ICD Management Distribution &amp; Operation From ICD</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Integrated</td>
<td>Management</td>
<td>BR</td>
<td>a. Public</td>
<td>Public</td>
</tr>
<tr>
<td></td>
<td>management</td>
<td></td>
<td>b. Contract</td>
<td>sector</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>with private</td>
<td>may incl</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>c. Private</td>
<td>ude BP,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>c. Facilities</td>
<td>CPA,BS,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>leased to private sector</td>
<td>etc</td>
</tr>
<tr>
<td>B Integrated</td>
<td>Private management</td>
<td>BR</td>
<td>Private</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Private</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Local companies only</td>
<td></td>
</tr>
<tr>
<td>C Integrated</td>
<td>Jt venture management</td>
<td>BR</td>
<td>a. Jt venture</td>
<td>Levels</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>b. Contract</td>
<td>of parti</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>with operator</td>
<td>plication</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>c. Lease with</td>
<td>may be</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>operator</td>
<td>varied</td>
</tr>
<tr>
<td>D Separate</td>
<td>None management</td>
<td>BR</td>
<td>a. Private</td>
<td>Each</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>b. Jt Venture</td>
<td>activity</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>is managed</td>
<td>indepen-</td>
</tr>
</tbody>
</table>

**Source:** RCTS
c. To promote efficient operations through effective management, competition or other means.

d. To permit unrestricted use of the ICD on a non-discriminatory basis to users.

The criteria concerned should relate to national requirements, rather than those of any individual organisation.

There are no hard and fast rules about what type of organisation owns, manages or operates an ICD. The following are examples of ICD operators:

- Port Authority, Shipping Lines, Railway Authority
- Freight Forwarding Company, Road Haulage Company, Joint Company formed by consortium of interests.

In India, the ICDs are all operated by the Railways, mainly because the inland transportation is more railway oriented than in most countries.

The consultants in RCTS recommend that a public limited company be set up to manage the overall service and ICD. It could be called the Bangladesh Container Company (BNCC). Its owners would be BR, CPA and the private sector having a third share each. The company itself should be set up as a joint stock company able to operate in an enterpreneurial and businesslike manner.

The consultants believe that BNCC should undertake all operations associated with ICD but should not seek to establish itself as a freight forwarder, customs clearance agent or Non-Vessel Owning Common Carrier (NVOCC).
Its dominant position may allow it an unfair advantage over competitors. There may also be commercial advantages in avoiding direct competition with potential users, some of whom will be engaged in these activities. (29)

Present State and Changes Required

The institutional procedures and documentation at present are not designed to facilitate door to door container movement. The reasons that most containers are stuffed or stripped in port areas is as much a result of inappropriate procedures and documentation as of lack of suitable inland transport equipment and infrastructure.

The customs have agreed to undertake container clearance at the interim ICD. Opportunity now exists to progressively improve institutional procedures and practice in advance of provision of a permanent ICD at Dhaka. This process has now begun but difficulties should not be underestimated.

The most important areas where significant changes are required are as follows:

* terms of trade,
* simplification of trade procedures,
* exchange control regulations,
* customs,
* adoption of Custom Cooperation Council conventions
* rail contract of carriage and insurance.

These involve a whole range of public bodies - Ministry of Commerce, National Board of Revenue, Bangladesh Bank, Sadharan Bima Corporation, BR and CPA.
There is a general willingness of most bodies to change in their activities, they recognise that containerisation is important.

In Bangladesh the relative importance to the economy, of customs duties and trade restrictions is very much greater than in developed and many other developing countries. Some 60% of national revenue is raised through customs duties and this, with import prohibitions is a major instrument of national economic policy (RCTS).

A well developed freight forwarding industry does not exist in Bangladesh which is a must for door to door container transport. There is only one firm that might be considered a real freight forwarder. There are many C&F agents but few have shown much interest in developing wider transport expertise beyond traditional customs brokering and haulage contracting. Steps are needed to promote a larger and more active forwarding activity.

**Customs**

Currently containerised cargo is generally treated by customs and other organisations concerned as ordinary break-bulk cargo. Almost all containers are stripped or stuffed inside port areas. Inland distribution is arranged and carried out as a domestic operation.

Customs clearance was provided at the ICD established at Dhaka in 1987.

Customs require a bond or deposit to be paid on all
containers leaving port areas. This and the need to re-load goods after inspection further discourage inland movement of containers.

Containerisation initially imposes more pressure on the customs department. It clearly presents more opportunities for smuggling and greater vigilance is necessary until equivalent improvements have been made in the control procedures.

The broadening and diversity of the clearance frontiers also requires more control and the setting up of additional procedures to monitor transit documents, which may require additional staff. Customs have to conduct close and frequent reviews of their procedures and documents (which have not been revised for many years) becoming increasingly unsuitable and develop random inspection techniques which can be statistically designed to achieve predicted levels of detection for given throughputs.

The Customs department in Bangladesh, as elsewhere is frequently criticised for being unfair, inconsistent and obstructive. Much of this may well be true but the criticism might be less harsh if it were realised that unusual responsibilities and difficulties the department faces. For example the tariffs and restrictions are not only very complicated, they are also frequently changed. New lists are issued every year and a number of changes made during the year by Gazette Notice. Customs have the revenue raising responsibility of 60% of government revenue through customs duties, etc.

It is not surprising that customs officers have
difficulty in keeping up with the mass of detailed legislation. It is in fact self defeating in its objectives.

The relevance to container transport is that the difficulties of clearing any but the most straightforward consignments - machinery and spare parts for example - greatly increase the container dwell times and the amounts that have to be invested in providing additional storage capacity.

**Documentation**

According to recent surveys in the USA, the current average documentation cost per deepsea shipment is about US$ 400. A typical split of this amount in US$ would be:

- a. Shipper 180
- b. Forwarder 70
- c. Carrier 50
- d. Bank 50
- e. Insurance company 20
- f. Government (e.g. customs, Statistical services etc) 30

Source: Containerisation International - February '86.

Unit labour costs in Bangladesh are obviously much less than in the USA. On the other hand procedures are more cumbersome, more documents are involved and their processing is slower and less efficient, so that processing costs may well be of the same order.

In any event it is clear that substantial costs are incurred in documentary processes and significant savings
can be realised if the documents and procedures can be more efficient.

The consultants in RCTS do not consider that there are very many documentary changes that are essential for inland container transport. The systems are there and they work. What is needed are changes in procedures and attitudes.

Improving documents is easy. It consists first of regularising their size and secondly their format. Documents can and should be reviewed and amended as often as necessary to keep them simple and suitable for their purpose.

**Port Authority.** The consultants also consider that the documentary control system for container movements in Chittagong port is very good and there is no need to change it. Exactly the same documents and procedures can be used in the ICD. When new stocks are required they should be reviewed for format improvement and possible simplification.

**Customs.** Like the Port Authority, the Customs already have well established procedures for importing and clearing goods, including containers, and no documentary changes are actually essential. However, the introduction of an import transit document and equivalent reexport control document has been recommended. The consultants also recommend that the customs should consider implementing more of their control procedures by independent documents. The general principle in Bangladesh is to collect a number of procedural documents together in a large dossier which has its advantages of the documents.
less likely to get lost and they give a complete history of the procedures. This may however not be favourable from a security point of view.

Railway. The principle documents required by the railway for the operation are:

b. Interchange Agreement — with the principal carrier.
c. Container Interchange Receipts — recording the transfer of containers between carriers.
d. Train Manifest — loading records compiled either from Container Interchange Receipts or the Customs Transit Forms moving with the containers for controlling receipt at the delivery end.

ICD Operator. Documents for the ICD operation fall into two categories. The first comprises the documents that are external to the operator itself but which will pass to or through the ICD office and which the operator will need to be aware of. These include ship arrival notification, shipping manifests, bills of lading, import entries, consignment notes, etc., and are not generated or actioned by the ICD although they may be annotated for receipt or "claused" for discrepancies.

The requirements for the ICD's own documentary system have to be analysed to rationalise and simplify them. Some of the documents are: Removal Tally, Container Card, Seal Slip, Delivery Document, Out of Charge Note, Cargo Traffic Permit, Containers Traffic Permit, Removal Note, Request for Additional Service, Export Cargo Shipping Instructions, etc., Customs Out-pass, Container Load List, etc.
Through Transport Documentation

The ICD offers the opportunity to effect export shipments under through transport documentation. This means that an exporter should be able to deliver his goods to the ICD and be issued with a document of receipt which he can immediately negotiate, i.e., cash at the bank where a letter of credit (L/C) had been arranged by the buyer of the goods. There are two basic types of such negotiable documents:

a. Through Transport Document - Contract of carriage involving more than one carrier. The carrier who issues the document acts as a Principal for the carriage which he is performing but as an Agent for all other carriage.

b. Combined Transport Document - issued by a carrier who contracts as a Principal to effect the whole of the carriage for all the required modes and stages in his own name. Thus he accepts responsibility for the whole trip, although he may sub-contract parts or all of the transport to others.

The problem with the Dhaka ICD arises with export documentation. Imports can be consigned through to Dhaka on the strength of documentation from the origin end, but it is not clear now who would issue the negotiable document for exports consigned from Dhaka.

Through transport documentation would not be particularly attractive to the exporter and neither the Rail-
way nor the ICD operator are likely to have the commercial strength to issue Combined Transport Document, at least in the initial stages.

The most likely solution appears to be that shipping lines represented by their agents would issue the Combined Transport Document, having sub-contracted to the Railway for the inland leg to Chittagong. They may choose to engage the ICD operator as their agent actually to conduct this business. Later on, freight forwarders would probably become sufficiently well established to issue their own combined transport document.

None of these arrangements can, however, be forced on the organisations concerned. They will evolve from whatever the respective parties decide to do based on their own commercial judgements.

**Steps Required To Be Taken**

With the interim ICD at Kamalapur now operational it would be reasonable to expect that many of the institutional problems will have been solved by FY92-3, when Phase 1 of ICD is operative. Some organisational and other problems still need to be solved.

Special steps are required to be taken by the various ministries, BR, Chittagong port and customs to resolve outstanding issues in the following areas:

a. Decisions must be taken on the setting up of a management company, BNCC, covering organisational and financial structures.
b. Government sanction for changes in institutional procedures and their introduction.

c. Definition of responsibilities and function of the ICD management and other departments.

d. Tariffs and working procedures.

e. Printing of instruction manuals for the guidance of staff, guidance brochures for clients, working documents and stationary.

Desired Infrastructural and Equipment Changes

To gain the full economic benefits of containerisation it is necessary to offer adequate port facilities for handling and storage of boxes on the one hand, and efficient use of inland transport systems on the other. The later aspect calls for high density, regular and uninterrupted traffic flows between ports and inland terminals in order to reap the special advantages from the cost structures of railways or inland waterways. Local collection and delivery by road vehicles makes complete door to door services possible.

There is a need for continuing improvement in the national road system and an increasing fleet of road vehicles suitable for carrying containers. Various terminals for handling containers would have to be developed with associated equipment.

Overall upgrading of transport routes is required, specially the Dhaka-Chittagong and Dhaka-Mongla. Trans-
Portabian improvements which are required to be made are assumed as follows:

* National highway improvements and bridge construction according to a realistic implementation schedule.
* A Jamuna bridge at Sirajganj with a single track MG rail connection to be opened in FY92.
* A gradual introduction of larger trucks than the present 5-8 tonnes, after FY92, including container carrying vehicles.

IWT services are available between Mongla and Dhaka (309 km) or Narayanganj (293 km), with journey duration of roughly 70 hours. Whilst this carries substantial traffic, usage is concentrated amongst bulk commodities and jute. There are currently no facilities for container handling. It is assumed that some modest investment will be made there too. Other developments desired are:

* An ICD at Dhaka and associated rail service is required to be introduced by FY92-3 to handle maritime container for greater Dhaka area.

* Development of the ports independently to handle containers in the absence of a more integrated national ports policy. But the introduction of an integrated national ports policy would be beneficial.

* A rail connection to Mongla is required to be constructed.

* The Hardinge rail bridge is required to be decked.

101
CONTAINER CARGO TRANSPORT LINKS TO DHAKA / NARAYANGANJ THROUGH CHITTAGONG

Source: Transport of Containers in Bangladesh 85
WITH ICD

INDIVIDUAL PREMISES

DHAKA/NARAYANGANJ

TRANSHIPMENT PORT

JETTY

WITHOUT ICD

INDIVIDUAL PREMISES

DHAKA/NARAYANGANJ

IWT TERMINAL

CHALNA

CFS

TRANSHIPMENT PORT

ORIGIN/DESTINATION PORT

CONTAINER CARGO TRANSPORT LINKS TO
DHAKA / NARAYANGANJ THROUGH CHALNA

KEY

Ocean ship

Internal port movement (containers)

Internal port movement (loose cargo)

Rail (containers)

Rail (loose cargo)

Road (containers)

Road (loose cargo)

IWT (containers)

IWT (loose cargo)

Transhipment point

Part of Chalna container port

Source: Transport of Containers in Bangladesh 85

FIG. NO. 6.3
over to allow use by road traffic.

Container cargo transport links to Dhaka/Naryanganj through Chittagong and through Chalna/Mongla with and without an ICD are at Figures 6.2 and 6.3.

**Roads and Bridges**

It has been discussed earlier that a number of major rivers in the country have not been bridged so far and have to be crossed on ferries, which not only slows down the traffic, but also places a restriction on the type of vehicles. Ferries which are on important trunk roads such as Dhaka-Chittagong (Gumti), Khulna-Mongla (Rupsa), Dhaka-Mawa and Dhaka-Sylhet, which have been planned for replacement with bridges in the near future must be implemented.

Poor surfaced roads need to be improved. Road rehabilitation projects must be undertaken. The full length of the road from Chittagong to Dhaka must be upgraded to a sufficient standard for the efficient transport of containers. The Dhaka and Mongla port routes (via Aricha, Daulatdia, Faridpur, Jhennidah, Jessore and Khulna) and more direct route through Mawa must also be upgraded. For safety reasons the roads which will be used by trucks/trailers loaded with containers must be widened to the common international standard of at least 7.3m (24’).

Alignment of the roads is poor at many locations even on the main trunk roads such as the Dhaka and Chittagong road. The alignment needs to be corrected.
The roads pass through a number of small towns and villages. Bypass roads need to be constructed. Steps should be taken to ensure that activities such as weekly markets which encroach on the highways causing obstructions to the smooth movement of traffic do not do so.

**Vehicles**

Articulated vehicles are presently non-existent, apparently due to the constraint of ferry crossings. These need to be introduced. It is expected that 3 axle trucks and 20 feet tractor trailers will eventually be introduced.

**Terminals**

Various terminals that might be required are:

**Short Term:**
* Chittagong Port — To handle national and transit containers through the port.
* Dhaka ICD — To handle maritime containers for greater Dhaka area.
* Srimangal ICD — Srimangal is the centre of Bangladesh tea production. 95% of overall tea production arises in the Srimangal and Sylhet areas. Tea production is expected to rise from 44000 tonnes in FY86-7 to 72000 tonnes in FY02-3 - 70% of which is exported. A small ICD at Srimangal is desired.

**Long Term:**
* Khulna — To handle maritime containers to
and from Mongla port.
* Parbatipur - To handle maritime containers to and from Chittagong and Mongla for North West region and to exchange Nepal traffic for Mongla between MG and BG.

For a marine container service terminal in a developing country the aim should be maximum flexibility at reasonable cost. Location is important. Many of the traditional liner ports are in river estuaries which form a prime means transport in the country, as is in Bangladesh.

When investment in a main facility is being made, there is a need to look ahead to future requirements. There is a case for saying that berth length and depth of quay and access should be sufficient to handle vessels of around 1800 TEUs with a length of about 215m and draft 11m. This size has established itself as the handy sized container ship. (Containerisation in the Eighties by M G Graham and D O Huges, '85)

Bangladesh should look to the time when vessels up to this size can be accommodated. This may mean moving down river to a new site. The Maunsell '85 study had identified such a site at the mouth of the Karnafuli river.

**ICD at Dhaka**

The most important and essential development required for a rail container service is a purpose built Inland Clearance Depot (ICD) in the Dhaka area. A useful start has already been made by the provision of an
interim ICD at Kamalapur station. The following facilities are required at the ICD at Dhaka:

a. An administrative building for ICD management, documentation and terminal control staff and to provide office accommodation for representatives of shipping lines or agents.

b. A railhead area where containers can be transferred to and from trains.

c. Full container storage area, to accommodate all LCL and FCL traffic without physical segregation. Random access must be available for any particular container.

d. Empty container storage to accommodate all empty containers, which should be stored in blocks segregated by owner and type.

e. CFS for packing and unpacking LCL cargo and for customs examination of packages.

f. FCL customs inspection and unloading area.

g. Workshop for site machinery and railway wagon maintenance.

h. Container repair area.

j. Trailer parking area.

k. An external vehicle holding area.
POSSIBLE ICD SITES IN DHAKA AREA

Source: RCTS
A gate house to control access to and from the site.

Site Selection. In determining the choice of a site for a rail connected ICD, the principal factors involved are:

* Availability of land which should be in excess of 10 hectares.
* Present ownership of land—acquisition costs and planning problems.
* The ability of local road system to cope with increased levels of road traffic and to provide good access to industrial areas and customers premises.
* Accessability to inland water transportation.

Possible ICD sites at Dhaka area is shown in Figure 6.4.

Kamalapur is the preferred choice—the land is already in railway ownership, therefore land acquisition costs and planning problems are reduced. Land available is 18.09 hectares. Extensive road improvements are planned in the area. (These must be carried out). So the Kamalapur area meets the first three criteria but not the fourth. The ICD could serve IWT by operating road trucks in bond between the ICD and an appropriate jetty—probably at Pagla.

That Kamalapur has already been selected as the location for the pilot ICD is an added attraction in developing the full ICD on the same site.
Handling Equipment. After evaluation of various types of container and cargo handling equipment and having regard to the characteristics of the site, the levels of traffic forecasts and the phases of development, it is recommended that the handling equipment should be such as to provide relatively high density container storage, so reducing the land area required to the minimum. Wheel loads should also be considered—high wheel loads results in the need to provide very heavy duty paving. Segregation of loaded and empty container storage allows use of light machines for handling empties, which are relatively inexpensive and require lighter paving.

For the rail terminal, electric rail mounted cranes are recommended, one initially and two by FY02-3. A mobile crane will also be required to provide for emergencies. For loaded container storage, straddle carriers are recommended as they allow high density stacking, (a front loader is used now). Medium capacity front lift trucks are considered most suitable for empties, which can be block stacked up to four high, saving space.

Rail

New methods of train movement which are quite different from the traditional methods of railway freight operation will be required with the establishment of a modern rail container service between a port and an ICD. The new services are required to provide regular, fast and punctual trains between port and ICD, providing the customers with reliable services to a published time table while achieving high productivity of railway assets.
Wagons must be specifically designed for carriage of containers and dedicated to these traffic. The wagons must be formed into fixed formation trains which will not vary on a daily basis, but only over longer periods of time in response to long-term traffic fluctuation. When several sets of rolling stock are in use at any one time, these sets should be identical in composition, and hence interchangeable.

The trains should ideally run directly between the port berth, railhead, and the ICD, with no intermediate shunting, marshalling, or train examination. This would minimise pilferage of both the payload contents and the rolling stock components so common in Bangladesh.

High availability of well-maintained, fully braked wagons must be assured. This could be possible with the container organisation undertaking its own wagon maintenance within the ICD complex.

Trains should be planned to operate around 300 days per annum (6 days per week) which should allow for maintenance of container handling vehicles and equipment.

Rail facilities, for container trains, to be provided as part of the MPB development, comprise a two siding rail terminal with sidings of 250m, to be spanned by electric cranes. It will be necessary to split full length container trains between sidings on arrival as the sidings are of insufficient length. This limitation will impose certain constraints on the time-tabling of container trains and local train movement in Chittagong. The size and shape of the site, as presently planned, does not allow extension of the sidings.
The rail facilities planned for the MPB would not be adequate for the number of containers forecast to be handled. Ultimately rail facilities for containers might be provided behind berth 14 as part of a later stage development.

The likely and possible flow of containers by rail are shown at Figure 6.5.

**Wagons.** Two options exist: Firstly, convert as many readily available four wheel bogie wagons possible and construct new wagons. (Train speeds would be restricted to 56 km/h). This is the minimum cost option, but requires allocation of scarce resources at Pahartali railway works.

Secondly, purchase a fleet of new purpose built wagons which may or may not be compatible with the rest of the fleet. This course of action offers the potential for higher train speed and therefore greater rolling stock productivity.

By FY01-2, the following wagon fleet would be required:

- 132 Four wheeler wagons - 20' containers, weights below 18.5 tonnes.
- 24 bogie wagons - 20' containers, weights "short bogies" above 18.5 tonnes.
- 96 bogie wagons - 40' containers, "Long bogies".

We may reasonably assume the following sources of
these wagons:

132 - Converted CJ wagons.
24  - Converted Tank / BC / BCF wagons.
20  - Converted BFR wagons.
76  - New wagons, preferably purchased new or
     built at Pahartali.

The system could operate satisfactorily using
wagons converted to an approved standard and this would
be cheaper in capital terms than the option of purchasing
new wagons. The later off course is the superior techni-
cal option and is the option to go for if finances are
available.

In general, the container service will look to BR
to provide it with reliable well maintained locomotives
from adjacent depots at appropriate times to operate the
advertised train schedules.

**Strategy.** It is considered that current and
planned improvements in the national road system under -
the urgency of upgrading rail freight services. Contain-
er services and unit trains for bulk commodities should
receive priority in the allocation of line and other
resources. (39)

**Chittagong**

The capacity of rail facilities needs to be adeq-
uate to accommodate the traffic volumes forecast using a
pattern of rail services compatible with ICD requi-
rements.
Maximum daily throughput for Chittagong would be constrained by train capacity and container mix. Average container per day forecast per day are 50, 110, and 174 for FY92-3, FY97-8, and FY02-3 respectively. The train services therefore required would be 1, 2, and 3 daily for these years and annual throughput of 19600 TEUs, 44000 TEUs, and 72000 TEUs respectively.

Port rail facilities are part of a chain that must provide an integrated service, backed by modern communication system and transmission of documents.

Ability of the port area as a whole to absorb the number of loaded and empty containers requiring to be stored have to be considered. There would be requirements for equipment and hard standing for container storage. To reduce the number of containers in the port following would be required:

a. For loaded containers:
   * improved customs procedures.
   * rapidly rising storage tariffs after reasonable initial period and auction or disposal of goods after say 30 days, to discourage traders from excessive dwell times for imports.

b. Empties:
   The storage of empties is influenced by:
   storage tariff levels, storage capacity, storage policy of leasing companies, tariff levels, and storage availability at neighbouring ports, availability of capacity or shipping services, container demand in the
region, need for repair, etc.

Action should follow a survey of boxes by status, owner, type, etc to determine trends and influences. Action can then be directed at those responsible in such a way as to achieve the desired result.

Even after the MPB is in use some of the containers will still be handled in the conventional berths. Container traffic remaining in the conventional port will be influenced by the MPB, after allowing for the reduction in average dwell times resulting from use of the ICO, and the volume of the containers remaining in conventional vessels.

To allow movement of containers between the proposed MPB rail head and the conventional port CPA has proposed to provide a bridge across the Maheshkhal canal between berths 13 and MPB. This should be implemented.

Ultimately, rail facilities for containers might be provided behind berth 14 as part of a later stage development.

The CPA plan to provide electric rail mounted cranes for loading/unloading container trains, one initially and another when required (FY 02-3).

It appears likely that the storage capacity of the MPB will be saturated shortly after commissioning in FY91-2 and that even allowing for substantial overspill into the conventional port area an overall deficit in container storage at the port will emerge around FY95-6. One solution could be simply to extend storage into fur-
ther outlying areas of the port, but this would definitely lead to a fairly sharp fall off in efficiency and increase in equipment requirements. Congestion and dwell times would increase. Overall organisation at the port would come under strain, with impacts upon berthing and ship turnarounds.

Under these circumstances, the most likely requirement will be the development of a second MPB. The financial cost of a second MPB has been estimated at Tk 1925 million at 87-8 prices (US$ 58.33 million approximately) (Maunsell '80 study and RCTS estimates).

In the much longer term, consideration should be given for the provision of deep water berths at Patenga, beyond the airport, on the right bank of the Karnaphuli river, close to its mouth.

Ships

Ships operating in the Indian Sub Continent and East Africa is shown in Table 6.3. Combo vessels are prominent on these and other developing country trades. The break-bulk cargo carried slows down load and discharge times and is also a limiting factor in the size of the Combo vessels, they have a low productivity level. Ships of this size do not benefit from the economies of scale. Combos attract developing countries for several reasons: they allow a limited number of containers to be handled and provide a back-stop for break-bulk operating if container control goes away; they come in relatively small units and therefore do not require investment in large lumps; they are flexible as to types of cargoes carried. In practice these advantages are more apparent than real.
The geared cellular vessel is very flexible as to the types of cargo it can handle and has a much greater handling productivity level. It does not have to be large, but at sizes above 1000 TEUs have achieved significant economies of scale. This advantage will be maximised if concentrations of cargo can be achieved by service rationalisation.

It is usually better to go for geared cellular vessels and not for Combos (Containerisation in the Eighties by M G Graham and D O Huges '85). Bangladesh should opt for the geared cellular type when acquiring ships for its fleet.

Table 6.3
Ship Profile in Selected Developing Country Trades

<table>
<thead>
<tr>
<th></th>
<th>Indian Subcontinent</th>
<th>East Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ships</td>
<td>TEUs</td>
<td>Ships</td>
</tr>
<tr>
<td>-----------------</td>
<td>---------------------</td>
<td></td>
</tr>
<tr>
<td>Full Container</td>
<td>10 8000</td>
<td>4 4900</td>
</tr>
<tr>
<td>Bulk Container</td>
<td>6 6500</td>
<td>3 3800</td>
</tr>
<tr>
<td>Ro Ro</td>
<td>2 2800</td>
<td>-</td>
</tr>
<tr>
<td>Semi Container (Combo)</td>
<td>21 6600</td>
<td>12 4850</td>
</tr>
<tr>
<td>Converted Cellular</td>
<td>3 2900</td>
<td>1 920</td>
</tr>
</tbody>
</table>

Source: Containerisation in the Eighties by M G Graham and D O Huges '85.

Ports in Bangladesh will probably be served only by feeder vessels from major container ports of Singapore Madras and Colombo because of a less favourable geogra-
phical location. While the big fully cellular container ships only serve a few main ports. Small feeder vessels operate between these ports and a certain range of ports at some distance moving comparatively small amounts of containerised cargo.

Bangladesh's container trade is now almost entirely by feeder services - COBRA, SCI, etc.

Feeder vessels could be small container ships having only little draft. They would be the right choice for services operating into or out of small or not so big ports like Mongla and Chittagong without deep water channels and berths.

Bangladesh therefore should go for feeder vessels which can carry up to 300 TEUs having a length varying between 80 to 120 metres. Ports in Denmark, Norway, Sweden and Finland are regularly served by such feeder vessels, operating mainly from Bremerhaven and Hamburg. (Container Vessels and Fleet Type by J. Neubert in Port Management Textbook - Containerisation).

Training

A large programme of training will be required, as this will be the first time, that a fully developed system of container rail transport and ICD will be operational in Bangladesh.

Senior management appointments should be made as soon as the organisation to manage the rail container transport and ICD is agreed. Senior managers and engineers may require some overseas training. Training will
also be necessary for ICD and rail supervisory, operations, maintenance, security and office staff. Exhaustive training programmes have to be arranged for the staff as follows:

a. Working procedures.
b. Container train operation.
c. Operation and maintenance of container handling equipment.
d. Operations within the ICD.
e. Handling of emergencies such as accidents, pilferages, etc.
f. Procedures for dangerous and hazardous goods, etc.

Minimum Requirements for Workability

It is not possible to fulfil and bring about all the changes desired immediately due to financial and other constraints. The changes will have to be brought about in stages as finance and resources are made available. The changes have to be prioritised and the development carried out in phases.

The consultants in the BIWTA study, Transport of Containers in Bangladesh - Feasibility Study and Detailed Engineering, '85, had recommended that initially, rail and IWT transport should be provided from Chittagong and IWT from Mongla. They expected that later road transport would take an increasing share, provided that the bridge upgrading programme continues. They had recommended the ICD to be at Pagla and its design should be flexible so that it could in later phases accommodate different modal proportions of transport if the demand trends change or
experience shows that one particular method is to be preferred.

The consultants in the RCT Study, Bangladesh, '87 have recommended that a rail based inland container distribution system be established in the Dhaka – Chittagong corridor.

Both the consultant groups have shown preference for rail based inland distribution.

Because of the reasons discussed in the earlier chapters the rail based internal distribution system is the preferred choice for the internal distribution of containers in Bangladesh. A start has already been made with the introduction of the interim ICD at Dhaka in '87.

For the rail based inland container distribution system the minimum requirement for workability are:

* provision and completion of a permanent ICD in Dhaka in Kamalapur.

* provision of unit trains services for containers between Chittagong port and Dhaka.

* completion of the MPB project with the rail terminal as soon as possible.

* Initiation of institutional measures (regulations, procedures and documentation) for efficient operation of container services.

In the RCTS designs and operational layouts have
been developed for the rail container service and Dhaka ICD at Kamalapur. It is proposed that the project be implemented as recommended by the consultants.

The phased development plan and the estimates of capital and operating costs as calculated by the consultants are summarised in the next chapter.

Other developments should not be neglected and must be carried out at an even pace by the Roads and Highways Department, BIWTA, BSC, Port Authorities, and other related departments.

REFERENCES TO CHAPTER VI


(30) (31) (32) (33) As cited in (29) above.


(35) (36) (37) (38) (39) As cited in (29) above.

122
CHAPTER VII

DEVELOPMENT PLAN

AND

COSTS OF RAIL CONTAINER SERVICE AND THE ICD

Development Plan

The proposed rail container project is composed mainly of the ICD and the railway service. These should provide the following:

a. Rail container services between railheads at Dhaka ICD and Chittagong Port.

b. Handling, storage and customs clearance of containerised goods at Dhaka ICD.

c. Collection and delivery of containers and containerised goods between Dhaka ICD and customs premises.

Following has been assumed:

a. CPA would carry out the movement of containers between the port railhead, stack and quayside at Chittagong.

b. BR would operate and maintain the railway infrastructure between Dhaka and Chittagong. (the railway track, signalling and telecommunications, etc).
c. Private road hauliers would undertake local
distribution of containers and containerisable
goods between Dhaka ICD and customers premises.

To keep the capital and operating costs of the pro-
ject within affordable limits the development has been
planned to be carried out in three phases, with capacity
beginning at fairly modest levels in Phase I and then gra-
dually being expanded in Phases II and III to accommodate
rising throughputs. The phased investment programme is
as follows:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Years</th>
<th>Main Components</th>
<th>Capital Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>FY90-1 to</td>
<td>Initial development of the ICD and rail container</td>
<td>Tk 366m</td>
</tr>
<tr>
<td></td>
<td>FY92-3</td>
<td>service</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>FY97-8</td>
<td>Purchase of additional handling equipment, plus</td>
<td>TK 109m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>modest site extension works</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>FY02-3</td>
<td>Purchase of additional handling equipment</td>
<td>TK 151m</td>
</tr>
</tbody>
</table>

Total - Tk 626m

**Capital Costs**

Total capital costs over the three phases of the project are estimated at Tk 626 million, of which Tk 366 million would be for Phase I, Tk 109 million for Phase II, and Tk 151 million for Phase III. In the first phase
there would be need for major civil works for site development, along with advance ordering of certain of larger container handling equipment. The overall capital costs for each phase are summarised in Table 7.1.

An analysis of the capital expenditure shows that the majority of the project expenditure would be for development of site and facilities at Kamalapur and procurement of container handling equipment. The necessity of providing re-inforced pavements for container yards and specialised equipment, for container transfer on/off trains and within the ICD (cranes, straddle carriers and fork lifts) means that major expenditures in these categories are unavoidable.

Project capital costs would not cover the direct acquisition of land in Dhaka, railway rolling stock or equipment and facilities at Chittagong. Following has been assumed:

a. Land would be rented at Kamalapur site because of very high land acquisition costs.

b. Railway locomotives and rolling stock would be provided for by BR on the basis of an annual charge for depreciation and interest.

c. No allowance is made for related capital outlays within Chittagong Port (for improving container movement inland of Chittagong). It is expected that one of the benefits of the project would be to alleviate congestion in the port and over the longer run this might enable net reductions in capital outlays at the port.
### TABLE 7.1
**SUMMARY OF CAPITAL EXPENDITURE**

<table>
<thead>
<tr>
<th></th>
<th>PH I</th>
<th>PH II</th>
<th>PH III</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FY 90-91</td>
<td>FY92-93</td>
<td>Total</td>
<td>FY97-98</td>
</tr>
<tr>
<td>Civil Works</td>
<td>42</td>
<td>125</td>
<td>167</td>
<td>58</td>
</tr>
<tr>
<td>Container Handling</td>
<td>40</td>
<td>119</td>
<td>159</td>
<td>51</td>
</tr>
<tr>
<td>Railway workshops</td>
<td>3</td>
<td>9</td>
<td>12</td>
<td>-</td>
</tr>
<tr>
<td>Preliminary Expenses</td>
<td>5</td>
<td>15</td>
<td>20</td>
<td>-</td>
</tr>
<tr>
<td>Working Capital</td>
<td>-</td>
<td>8</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>90</td>
<td>276</td>
<td>366</td>
<td>109</td>
</tr>
</tbody>
</table>

Source: Consultants estimates in RCTS.

### TABLE 7.2
**ANNUAL RENT**

<table>
<thead>
<tr>
<th></th>
<th>Phase I</th>
<th>Phase II</th>
<th>Phase III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land area ha</td>
<td>12.8</td>
<td>17.4</td>
<td>18.09</td>
</tr>
<tr>
<td>Rental per annum</td>
<td>7280</td>
<td>9905</td>
<td>10304</td>
</tr>
<tr>
<td>(1 ha = 2.471 acres or 35582 ft²)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Consultants estimates in RCTS.
### TABLE 7.3
**SUMMARY OF EQUIPMENT FINANCIAL OPERATING COSTS (TK '000)**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>FY92-3</th>
<th>FY97-8</th>
<th>FY02-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail Transfer Crane</td>
<td>1 887</td>
<td>1 892</td>
<td>2 1779</td>
</tr>
<tr>
<td>Straddle Carriers</td>
<td>2 4335</td>
<td>2 4902</td>
<td>3 7352</td>
</tr>
<tr>
<td>Tractors</td>
<td>6 1984</td>
<td>8 2725</td>
<td>11 3785</td>
</tr>
<tr>
<td>Trailers 20 ft</td>
<td>12 308</td>
<td>22 565</td>
<td>30 771</td>
</tr>
<tr>
<td>Trailers 40 ft</td>
<td>15 514</td>
<td>24 822</td>
<td>37 1267</td>
</tr>
<tr>
<td>Forklifts 2.5T</td>
<td>15 2110</td>
<td>35 4834</td>
<td>42 5847</td>
</tr>
<tr>
<td>Forklifts 5T</td>
<td>5 1956</td>
<td>10 3912</td>
<td>14 5704</td>
</tr>
<tr>
<td>Front Loaders</td>
<td>2 502</td>
<td>3 835</td>
<td>2 958</td>
</tr>
<tr>
<td>Mobile Cranes</td>
<td>1 1780</td>
<td>1 1780</td>
<td>1 1780</td>
</tr>
<tr>
<td>Workshop</td>
<td>1 2055</td>
<td>1 2055</td>
<td>1 2055</td>
</tr>
<tr>
<td>Computer System</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>17422</td>
<td>24955</td>
<td>33041</td>
</tr>
</tbody>
</table>

Source: Consultants estimates in RCTS.

### TABLE 7.4
**SUMMARY OF EQUIPMENT OPERATING COST COMPONENTS (%)**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>FY92-3</th>
<th>FY97-8</th>
<th>FY02-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance</td>
<td>81</td>
<td>75</td>
<td>74</td>
</tr>
<tr>
<td>Fuel</td>
<td>11</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>Lubrication</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Power</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Liquid gas</td>
<td>3</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Consultants estimates in RCTS.
ICD Operating Costs

**Land Rent.** BR allows rental of its land for the purpose of commercial use.

Considering the prevailing rate of Tk 16 per sq ft per annum, the annual rental of land for each of the years of Phases I, II and III has been estimated in Table 7.2. Phase I requires a site area of approximately 13 ha equivalent to a annual rental of Tk 7 million. In Phase II site area would rise to 17 ha approximately with rental cost of slightly less than Tk 10 million. Phase III site area would be 18 ha approximately, costing roughly Tk 10 million.

**Equipment Operating Costs.** Equipment operating costs have been estimated for each equipment item. Components of operating costs include, as appropriate, costs of maintenance, fuel, lubricating oil, power and liquid gas. Annual maintenance costs have been calculated as a percentage of capital costs, while costs of other items have been based on estimates of unit input requirements. Future diesel oil costs have been assumed to be Tk 9.45 per litre. The total annual equipment operating costs are summarised in Table 7.3.

Within the overall annual equipment costs the largest component is maintenance, which amounts to between 75 to 80% of operating costs. This demonstrates the critical importance which would need to be attached to maintenance in order to ensure efficient services without requiring to have a large provision for backup equipment. The components of equipment operating costs are summarised in Table 7.4.
The growth in fuel allocations reflect the relatively higher proportions of mobile equipment, such as forklifts, tractors and trailers, as traffic throughputs rise at the ICD.

**ICD Staff Costs**. Summaries of staffing and costs by main staff section are set out in Table 7.5. The salary levels allowed are slightly higher than those of BR, keeping the remuneration sufficiently attractive for dedicated and skilled personnel. This reflects the requirements and costs of operating the ICD on a commercial basis, more comparable with the Bangladesh private sector.

**ICD Administrative Costs**. To cover all ICD administrative costs including office running and day to day maintenance expenses, marketing and promotion expenses etc., a modest provision amounting to 30% of ICD staffing cost has been assumed. This amounts to Tk 4 million in FY92-3, Tk 7 million in FY97-8, and Tk 9 million in FY02-3 on the basis of the staffing costs in Table 7.5.

**Civil Works Maintenance**. For proper up-keep and maintenance of all civil engineering items, annual maintenance costs have been estimated on the basis of a percentage of capital costs, with allowances for individual components ranging from 1% to 10%. The overall average maintenance allowance with respect to the total capital costs is roughly 0.6%. On this basis the annual civil works maintenance costs would be just under Tk 1 million in Phase I and slightly more than in Phase II and III.
### TABLE 7.5
**SUMMARY OF ICD STAFF COSTS**

<table>
<thead>
<tr>
<th>Staff Section</th>
<th>FY92-3</th>
<th>FY97-8</th>
<th>FY02-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management</td>
<td>Staff No</td>
<td>Cost</td>
<td>Staff No</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>750</td>
<td>6</td>
</tr>
<tr>
<td>Clerical</td>
<td>20</td>
<td>1200</td>
<td>42</td>
</tr>
<tr>
<td>Cargo Operations</td>
<td>108</td>
<td>5260</td>
<td>206</td>
</tr>
<tr>
<td>Train Handling</td>
<td>4</td>
<td>180</td>
<td>6</td>
</tr>
<tr>
<td>Maintenance</td>
<td>45</td>
<td>2150</td>
<td>88</td>
</tr>
<tr>
<td>Security/Gen Svcs</td>
<td>61</td>
<td>2585</td>
<td>103</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>244</td>
<td>12125</td>
<td>451</td>
</tr>
</tbody>
</table>

*Source: Consultants estimates in RCTS.*

### TABLE 7.6
**SUMMARY OF RAILWAY OPERATING PROFILE**

<table>
<thead>
<tr>
<th></th>
<th>FY92-3</th>
<th>FY97-8</th>
<th>FY02-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trains per Week</td>
<td>6</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>Crews</td>
<td>10</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Annual Km ‘000</td>
<td>198</td>
<td>396</td>
<td>594</td>
</tr>
<tr>
<td>Train Set Nos</td>
<td>2</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Locomotive allocation</td>
<td>2.5</td>
<td>5</td>
<td>7.5</td>
</tr>
<tr>
<td>Short Bogies</td>
<td>10</td>
<td>19</td>
<td>24</td>
</tr>
<tr>
<td>Converted Long Bogies</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>New Long Bogies</td>
<td>9</td>
<td>52</td>
<td>76</td>
</tr>
<tr>
<td>Four Wheel Wagons</td>
<td>55</td>
<td>110</td>
<td>132</td>
</tr>
</tbody>
</table>

*Source: Consultants estimates in RCTS.*
Railway Operating Costs

Railway costs are based on providing a dedicated rail container service between Dhaka ICD and Chittagong Port without stops at intermediate points. Since this service would differ from those of existing BR services, BR average cost and performance data was not used. Separate estimates of operating costs were made by the consultants. Table 7.6 summarises the main aspects of rail operation for costing purposes.

A summary of railway operating costs are provided in Table 7.7 for the selected years. Total railway operating costs rose from Tk 35 million in FY92-3 to Tk 77 million in FY97-8 to Tk 110 million in FY02-3.

Annual railway costs are composed of capital charges on rolling stock, and variable operating costs of running container services. Rolling stock is generally procured through foreign donor assistance, and then on lent to BR by GOB. Capital charges have been based on the existing method by which GOB calculates its required levels of return for rolling stock secured on behalf of BR.

Depreciation. Depreciation is on straight line basis taking into account the cost of the scrap value (total acquisition costs minus scrap value) and expected life of the rolling stock. The rolling stock depreciation is shown at Table 7.8.

Interest. The interest rate is 6.5% p a of the capital acquisition costs.
### TABLE 7.7
**SUMMARY OF ANNUAL RAILWAY OPERATING COSTS (TK MILLION)**

<table>
<thead>
<tr>
<th>Item</th>
<th>FY92-3</th>
<th>FY97-8</th>
<th>FY02-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depreciation</td>
<td>6.8</td>
<td>16.1</td>
<td>22.7</td>
</tr>
<tr>
<td>Interest</td>
<td>7.8</td>
<td>18.8</td>
<td>27.0</td>
</tr>
<tr>
<td>Maintenance</td>
<td>5.7</td>
<td>12.0</td>
<td>17.4</td>
</tr>
<tr>
<td>Crew</td>
<td>0.8</td>
<td>1.6</td>
<td>2.0</td>
</tr>
<tr>
<td>Fuel</td>
<td>7.5</td>
<td>15.0</td>
<td>22.5</td>
</tr>
<tr>
<td>Train Examination</td>
<td>0.4</td>
<td>0.8</td>
<td>1</td>
</tr>
<tr>
<td>Insurance Provision</td>
<td>2.7</td>
<td>6.4</td>
<td>9.2</td>
</tr>
<tr>
<td>Overheads</td>
<td>2.9</td>
<td>5.9</td>
<td>8.6</td>
</tr>
<tr>
<td><strong>Total (rounded)</strong></td>
<td>35</td>
<td>77</td>
<td>110</td>
</tr>
</tbody>
</table>

*Source: Consultants estimates in RCTS.*

### TABLE 7.8
**COST OF ROLLING STOCK DEPRECIATION TK IN '000S**

<table>
<thead>
<tr>
<th>Unit</th>
<th>Econ-Scrap</th>
<th>Net Econ-Expected Depreciation</th>
<th>Life (Yrs)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locomotive</td>
<td>33000</td>
<td>3300</td>
<td>29700</td>
<td>20</td>
</tr>
<tr>
<td>Four Wheelers</td>
<td>202</td>
<td>20</td>
<td>182</td>
<td>10</td>
</tr>
<tr>
<td>Short Bogies</td>
<td>326</td>
<td>33</td>
<td>293</td>
<td>10</td>
</tr>
<tr>
<td>Long Bogies (cnvtd)</td>
<td>326</td>
<td>33</td>
<td>293</td>
<td>10</td>
</tr>
<tr>
<td>Long Bogies (new)</td>
<td>825</td>
<td>82</td>
<td>743</td>
<td>20</td>
</tr>
</tbody>
</table>

*Source: Consultants estimates in RCTS.*
**Maintenance**. Unit maintenance costs have been based on the consultants' estimates of annual labour plus spare parts requirements for each rolling stock types. The maintenance costs per unit per annum are:

- Locomotive: Tk 1894m
- Converted 4 wheel wagons: Tk 8m
- Converted short/long bogies: Tk 21m
- New long bogies: Tk 16m

( with duty, sales tax, etc on spares )

**Crew**. Train crew costs are based on annual costs per crew of Tk 80000 and an average of 5 crews per train for 56 Km/hr on 8 hr shift basis. Thus the annual expenditure per train set stands at Tk 400000.

**Fuel**. Fuel costs assume a future price of diesel fuel of Tk 9.45 US$ 20 (based on a projected future oil price of US$ 20 per barrel). Locomotive fuel consumption is estimated to be 4 litres/Km, the average fuel cost would be Tk 37.80 per Km.

**Insurance**. Insurance cost has been assumed to be a provision of 2% of the total capital cost of annual train sets in operation.

**Overhead**. To cover BR infrastructure costs and other overhead costs to be availed by the proposed container service, a contribution of 20% of direct cost has been assumed. This would be in addition to full capital charges provision in the form of depreciation and interest costs.
Development Programme

Effective implementation of the project for an efficient system for container transport by rail is important for BR and the economy of Bangladesh. Careful planning and execution of the project deserves high priority.

The main components of the project are:
* Preparatory action by BR.
* Construction of the ICD including equipment provision.
* Organisation and institutional procedures.
* Container train operation.
* Training.

Preparatory action which should be taken up by BR, as soon as the project is approved in principle and a source of funding is identified are: clearance of site, arrangement for supply of about 6700 tonnes of scrap for heavy duty pavements and 60 lb/yard rails and other track materials at the site of ICD.

The various items of construction in Phase I involve:

a. 31673 sqm of heavy duty pavement. This will require 13000 cum of cement concrete and cutting/fixing of 67000 tonnes of scrap rails. The work should be completed in about 350 working days.

b. 732.14 sqm bitumen carpet pavement. This should also be finished in 350 working days.

c. RCC beams and track for rail transfer gantry.

134
crane, 450m long, involving pre casting and driving of RCC piles and plinth beams.

d. Customs wall and drainage system involving 5000 cum of brick masonry and mass cement concrete.

e. CFS shed, workshops, and other sheds involve fabrication and erection of 350 tonnes of MS sections and 100 tonnes of scrap rail.

f. Administrative building having a floor area of 1500 sqm, including partitioning, furnishing, etc.

g. Railway sidings involve laying of about 3000m of 60 lb/yard track and 12 points crossing.

Completion of various items of work will require 200 to 400 working days. Allowing for loss of man days due to monsoons, holidays, festivals, etc, the works can be completed within a realistic target period of two years. An additional time of 12 months should be allowed for appointment of consultants and preparation of drawings, design, tender schedules and progressive award of contracts.

To ensure completion of the works in scheduled time, it would be necessary to split it up into a number of contracts.

To allow civil engineering design construction to take place, operating and system design requirements must be established for the ICD in greater detail. Operational planning staff need to work alongside the engineering team so that operating requirements are fully met.
The requirements for container trains, organization, institutional procedures and training have already been discussed earlier.

The activities of staff recruitment, training, marketing and promotion, administration and documents would obviously be integrated with and supported by the interim ICD operators.

These diverse activities could best be coordinated within the government administration. It is suggested that the existing National Containerisation Committee be charged with the task of coordinating and monitoring the ICD project in all its aspects. This may be done by requesting regular reports from concerned organisations and holding joint liaison meetings every three months to review the progress and decide on the targets for the next three months.

Technical Assistance

The funding agreement should make adequate provision for technical assistance in a number of areas, such as:

a. Detailed design and drawings for the construction of ICD, including tender documents.

b. Specification tender documents and procurement and commissioning of container handling equipment.

c. Operation and maintenance of containers, handling equipment.
d. Preparation of instruction manuals for staff and guidance manuals for clients.

e. Professional advice on commercial practices, simplification of trade procedures, Freight forwarding, customs procedures, documentation, marketing and financial management.

f. Container train operation for a limited period, say 9 to 12 months.

g. Designing of training programmes and undertaking training.

A development time table in bar chart form is set out in Figure 7.1.

**Project Feasibility**

The project has a financial Internal Rate of Return (IRR) of 15% and an economic IRR of 13% as calculated by the RCTS consultants. Financial and economic Net Present Values (NPV) are Tk 7 million and negative TK 15 million respectively over the life of the project. Such levels of return are considered broadly consistent with present criteria for project acceptability in Bangladesh.

The project is sensitive to changes in key variables, which in particular demonstrates the initial importance of institutional measures to overcome sources of delay and inefficiency.
| Sl No | Project Month Number | 12 | 9 | 6 | 3 | 0 | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 | 33 | 36 | 92 | 25821242730 |
| 1     | Preparatory action by BR |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 2     | Civil Engineering Works |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 2.1   | Appointment of Consultants |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 2.2   | Design, Tenders |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 2.3   | Appointment of Contractors |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 2.4   | Contracts for Civil Works |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 2.5   | Execution of Civil Works |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 3     | Machinery & Equipment |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 3.1   | Specification & Tender |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 3.2   | Contracts for Item 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 3.3   | Supply & Commissioning of 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 4     | Container Wagons |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 4.1   | Specifications & Tenders for Parts/New Rolling Stock |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 4.2   | Contracts for 4.1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 4.3   | Supply/Manufacture Wagons |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 5     | Training |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

Kamalapur ICD Phase-I
Broad Timetable for Execution of Project

Source: RCTS
REFERENCES TO CHAPTER VII

Rail Container Transport Study - Bangladesh

Transport of Containers in Bangladesh - Feasibility Study and Detailed Engineering - Phase I
Draft Report - Prepared for the World Bank on Behalf of the UNDP - September '85
CHAPTER VIII

CONCLUSIONS AND PROPOSALS

Conclusions

The principal conclusions are as follows:

* Serious problems of retarded agricultural and industrial development, family planning and the effective development of resources still attend the Bangladeshi economy. Simultaneous growth in agriculture and manufacturing is needed, together with heavy investments in transport and energy infrastructure. Economic growth must be high and sustained.

* With few exceptions, the educational elite has shown little managerial talent and practical sense, and a lot of modern machinery and equipment remain unused and get destroyed due to organisational weaknesses, as well as a weak sense of importance of maintenance.

* Bangladesh’s balance of payments remain precarious. In monetary terms, exports have risen more slowly than imports, of which foreign aid pay for about half. Most of the Annual Development Programme is government financed investment and other development expenditure is still financed by foreign aid.

* Maritime containerisation has grown rapidly in Bangladesh reaching a total of approximately 50000 TEUs in FY85-6 after a relatively slow start in ’80.
* Majority of import containers move through Chittagong port, but Mongla port handles a substantial volume of export containers—mostly jute. Chittagong alone currently handles 84% of Bangladesh's containerised tonnage, 50133 TEUs in FY86-7.

* There is a lack of infrastructure for distribution of seaborne containers in Bangladesh which is causing damage and delay to cargo and adds to port congestion and extra costs to importers and exporters. This is denying them the full benefits of containerisation. If this state is not remedied, the effectiveness of the new MPB being constructed in Chittagong will be reduced. Completion of the MPB project must be expedited.

* The containerised traffic is forecast to grow rapidly at Chittagong and Mongla ports, as further cargo is containerised. 154000 TEUs pa and 252000 TEUs pa and 360000 TEUs pa are forecast to be handled at Chittagong port by the years FY92-3, FY97-8 and FY02-3 respectively. Of these some 55% of the container traffic originates from or is destined for the Dhaka region.

* It is indispensable for Bangladesh to extend, modernise, and optimise her port and other infrastructural facilities and operational capabilities for container traffic.

* Only very limited prospects exist for containerisation outside the Chittagong-Dhaka corridor.

* In short to medium term there are no prospects of Indian or Nepalese transit traffic through Bangladesh.
There are only long term prospects of transit trade with Nepal and there is a strong political desire within Nepal for this. More consideration is currently being given to the prospects for using Mongla as an alternative transit port for Nepal.

* In the short to medium term, there are prospects for provision of a small ICD at Srimongal for export tea traffic

* A rail container service and associated ICD in Dhaka is expected to attract over 50% of the various categories of container traffic. A rail based container service enjoys certain inherent advantages, but the rail service operation must be reliable and efficient.

* The most suitable site for an ICD at Dhaka is at Kamalapur, where over 18 Ha of BR owned land beside the main passenger station is available. There is no other suitable site for the purpose at Dhaka at which both rail and IWT facilities can be provided at reasonable cost.

* The ICD could be constructed at the Kamalapur site which would be capable of modular expansion, in phases, to a capacity of approximately 78000 TEUs pa.

* Capacity is likely to be available for container trains between Chittagong-Dhaka subject to some constraints on timing. A unit train service can be provided between Chittagong and Dhaka commencing with 2 trains weekly for the interim ICD and rising to 3 trains in each direction by FY02-3.

* If the project is to be viable and compete effecti-
vally with other modes, then efficient commercially orient-
ted management and operation of the ICD and rail service
are a must.

* Parallel changes are required in institutional regu-
lations, procedures and documentation which are obstacles
to door to door container movement. These changes will
have to be extensive to allow the rail container services
to operate the way it has been proposed. These involve
many public bodies including customs. These changes can
be brought about progressively in advance of the full pro-
ject implementation.

* Benefits arising from the project include not only
in transport cost savings but also other substantial indi-
rect benefits. These are reduction in inventory costs and
foreign interest payments associated with imports and
exports and reduced handling requirements at Chittagong
port because of the reduced port dwell times for contai-
ners using the ICD.

* The introduction of a computer system at Chittagong
port is essential for efficient handling of containers.

* Investment in the ICD and associated rail services
is estimated as follows:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td>Taka 276 million</td>
</tr>
<tr>
<td>Phase 2</td>
<td>Taka 109 million</td>
</tr>
<tr>
<td>Phase 3</td>
<td>Taka 151 million</td>
</tr>
</tbody>
</table>
Proposals/Recommendations

It is proposed / recommended that :

* The rail based inland container distribution system with a permanent ICD in Dhaka and scheduled rail service be introduced in the Chittagong-Dhaka corridor as has been recommended by the consultants in the RCTS.

* Early approval be given to the proposed development programme so as to ensure the early clearance of the ICD site.

* After necessary approval and arrangement of funds, early steps be taken for arranging the necessary engineering design and technical assistance for rail and ICD operational planning, management, organisational and institutional development.

* The service and facilities be designed to be as flexible as possible because of the dynamic nature of the container business. This would require:

  - Flexible train service planning to accommodate long and short term fluctuations in port throughputs.
  
  - Flexible terminal and equipment provision through modular expansion of Dhaka ICD and other terminals, in line with traffic growth.
  
  - Flexible tariff structure and marketing approach to accommodate changing competitive relationships with road transport. Changes in customs procedures.
and commercial practice will influence the market position of a rail based system.

* The existing National Containerisation Committee be charged with the task of monitoring and coordinating with the various planning and executing authorities at the national level including the ICD project.
BIBLIOGRAPHY

Following is a list of books, reports and publications which have been studied for the preparation of this thesis project. Numbered references have been made to some of them and listed after each chapter.

Baudelaire J G, Port Administration and Management, The International Association of Ports and Harbours, '86.

Beth H L, Port Management Textbook-Containerisation, Institute of Shipping Economics and Logistics, Bremen '85.


Multimodal Transport And Containerisation - Guidelines on the Introduction of Containerisation and Multimodal Transport and the Modernisation and Improvement of the Infrastructure of Developing Countries, by UNCTAD, '84, UN publication Sales No E83 II D 14.


Bangladesh Country Study and Norwegian Aid Review-'86, The Chr Michelsen Institute.

This is Bangladesh, 1985, Department of Films and Publication, Ministry of Information, Bangladesh.

Chittagong Port Development Project, Volume I, Report for the Chittagong Port Authority by Maunsell Consultants, Australia, '80.


Transport of Containers in Bangladesh - Feasibility Study and Detailed Engineering - Phase I Draft Report, Prepared for the World Bank on Behalf of the UNDP - December '85 (For Bangladesh Inland Water Transport Authority) by Rendel Palmer and Tritton - Consulting Engineers, London and Bangladesh Consultants Ltd.


Containerisation International Yearbook - '85, '86 & '87, National Magazine Ltd.
Chittagong Port Authority Yearbook - June '87.

Mongla Port Authority Yearbook - '85-86.


Bangladesh Export Statistics '85-'86. Export Promotion Bureau, Bangladesh.

WMU Lecture notes - Professor A Westerlink, Dr. Rolf W. Stuchtey, Professor E K Mengels and others.