# A PILOT STUDY ON THE ATTRACTIVENESS OF CONTAINER TERMINAL OPERATORS

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## Introduction

There is no independent third party international container terminal operator from Taiwan until the setup of the Taiwan International Ports Corporation Ltd. (TIPC) in 2012. However, many Taiwan ocean container carriers (such as Evergreen Marine Corp.(EMC) and Yang Ming Marine Transport Corp.(YML)) do own their terminal operating subsidiary companies (Taipei Port Container Terminal Corporation of EMC Group and Kao Ming Container Terminal Corp (KMCT) of YML).

After the corporatisation of port operation, Taiwan has set up the TIPC in 2012. After the setup of TIPC, the port administration/regulation is supervised by the Maritime and Port Bureau (MPB) of the Ministry of Transportation and Communication. The port operation is in managed by the TIPC. According to the TIPC incorporation law promulgated on 2012/Nov./09 in Taiwan, Article 8 of the TIPC incorporation law stated that *"The lands used by the TIPC in the port area can be awarded by the government to the TIPC. In return, the TIPC should give part of its company shares to the government. Or the MPB can simply lease the land in the port area to the TIPC. Through the above two alternatives, the TIPC can develop and operate the lands in the port area to generate revenue. However, public facilities and any facilities requested to be installed by the government in the port area should be provided free of charge to the TIPC by the government".* Put simply, the land ownership and the land management in the international port areas in Taiwan are belonged to MPB and TIPC respectively when the corporatisation of Taiwan international ports is launched in 2012.

As a newly born state-owned third party container terminal operator, the TIPC is working hard to find its way for future growth. The signature of Economic Cooperation Framework Agreement (ECFA) between Mainland China and Taiwan in 2010 and the planning to sign Free Trade Agreement of the Service Industry between the two major economics across the Taiwan Strait in 2013 have pressured the Taiwanese container terminal operators to evaluate their current competitiveness with the other major port operators around the world.

## Port Operation Business Models Review

According to the types of ownership, there are six business models in the container terminal operating industry (see Figure 1).

- ✓ Third Party Independent Port Operators (3PPOs model) (e.g. ICTSI of Philippine) – Establishing a port operating company to generate profit from its operation. The 3-P port operators can firstly search for a potential buyer to sell parts of their terminals and even to sell out the companies. Philippine's ICTSI (International Container Terminal Service) sold most of its container terminals in the South America to Hong Kong's HPH when the market during the Asian Financial Crisis and bought another container terminal in the Brazil when the market is low again (Nguyen, 2011). P&O Port is a subsidiary of the P&O Steam Navigation, and the former is sold to the Dubai World Port Holding Corp. in 2006. Dubai Ports World soon resold the P&O Port's American operation to American International Group's asset management division, Global Investment Group in 2006 (King & Hitt, 2006). Terminals are run as profit centres (Drewry, 2010).
- ✓ Ocean Container Carriers' Operators (OCCO model)– MSC, OOCL, and Evergreen Marine Corp. use this business model to handle their container cargoes. Port operating activities are managed by a department or a subsidiary company of the ocean carriers. OOCL was once ranked as the

top 10 port operator in 2006, but was soon out of the top 10 list after it sold out its port operation business in New York and Vancouver to Teachers' Pension Fund in 2007. Mediterranean Shipping Corp. also announced to look for buyers to buy 49% of stakes (at the price on around $2 billion USD) in its port operation business in 2011. Terminals are often run as cost centres (Drewry, 2010).

- ✓ Non-core subsidiary of a mega carrier (transportation company) (NCD model)- CSX World Transportation (CSXWT) and Sea-Land Service, Inc. are both parts of the CSX group in 1999. The core business of the CSX group is the railway business. Thus CSX group sold the Sea-Land Service, Inc. to Maersk Lines in 1999 and sold the CSXWT to Dubai Ports International (DPI) in 2004 for 1.15 billion USD.
- ✓ A core department of a mega logistics service provider (CD model) – the port operating department of Hamburger Hafen und Logistik AG (HHLA) in Germany.
- ✓ An independent member of an ocean shipping group (IMOSG model)– e.g. Maersk Lines/APMT, Hanjin Shipping/HPC, COSCO/COSCO-Pacific.
- ✓ An independent port operator that take port operation as its core business (IPP model) – e.g PSA, EUROGATE and Dubai Ports International (DPI) (Le Rossignol, 2007).

Another type of taxonomy of global terminal operators is suggested by Drewry (2000), Global/international stevedores (where Terminal operation is prime focus of their business), Global carriers (Container shipping is prime focus of business), and Global hybrids (e.g. APM Terminals, NYK Line (Ceres), COSCO (COSCO Pacific), CMA CGM (Terminal Link), APL/NOL (APL Terminals)).

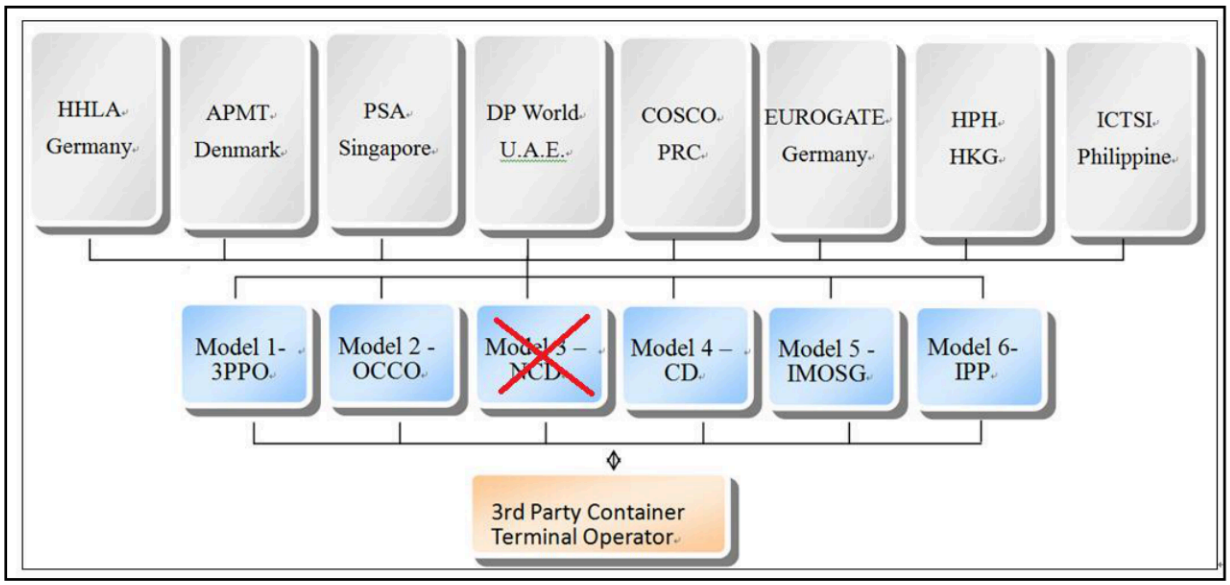


Figure 1 Large Third Party Container Terminal Operators

Note: (1) 3PPO: Third Party Independent Port Operators (2) OCCO: Ocean Container Carriers' Operators (3)NCD: Non-core subsidiary of a mega carrier (4) CD: core department of a mega logistics service provider (5)IMOSG: independent member of an ocean shipping group (6)IPP: independent port operator that take port operation as its core business.

**Literatures Review on Attractiveness Attributes**

Caschili and Medda (2013) study the port attractiveness index in Africa and define it as 'The capacity of a port to compete in regional and international markets and attract freight traffic'. However, there isn't any research investigate the attractiveness of a container terminal operator to its users with a quantitative methods. This research reviews literatures concerning port competition, port co-opetition, port competitiveness, port selection, and regulation on terminal operators to summarize five major criteria and seventeen subcriteria related with the terminal operators' attractiveness. These subcriteria were classified into five groups after a discussion with two shipping executives who have more than twenty years of working experience in major ocean container carriers. The five groups of subcriteria

are named as fee charged, services, hardware, software, and operator's networking. Each of the first two groups has four subcriteria and each of the latter three groups has only three subcriteria. Eight of the nine literatures are found in academic database. Eight of the nine researches indicated fee charged is important in their researches and five of the nine researches revealed connectivity of terminals is also a very important factor influencing terminal operators' competitiveness and attractiveness (see Table 1).

**Research Framework:** After the literature review, a hierarchical research structure with five major criteria and seventeen sub-criteria is established as the Figure 2.

Table 1 Criteria/Sub-criteria influencing the attractiveness of port operators

| Criteria | Sub-criteria | Criteria/Sub-criteria reviewed in Literatures | Chang et al. (2008) | Gardiner et al. (2007) | Notteboom (2004) | Notteboom (2007) | Pardali & Michalopoulos (2008) | Saeed & Larsen (2010) | Tongzon (2009) | Yap & Lam (2004) | Yeo et al. (2008) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Fee Charged | Storage Cost | Storage fee | ✓ | | | ✓ | | ✓ | ✓ | ✓ | ✓ |
| | Berthing Fee | Berthing fee | ✓ | | | ✓ | | ✓ | ✓ | ✓ | ✓ |
| | Cargo Handling Fee | Cargo handling fee, low labour cost | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Miscellaneous Fee | Pilot charge, tug boat fee, tonnage due, inland transport charge, port construction fee | ✓ | | | ✓ | | ✓ | ✓ | ✓ | ✓ |
| Services | Reliability | Reliable, reputation, accident rate, financial stability | ✓ | | | ✓ | | | ✓ | ✓ | ✓ |
| | Friendly Response | Advertisement, port marketing, communicative, understanding of customers, simplified tariff | ✓ | | | | ✓ | | ✓ | ✓ | |
| | Flexibility | Priority service, flexibility, technical support | | | ✓ | | | | ✓ | ✓ | ✓ |
| | Efficiency | Port operation efficiency | | ✓ | | | | | ✓ | ✓ | |
| Hardware | Equipment | Cargo handling equipment | | | | ✓ | | | | ✓ | |
| | Infrastructure | Access to the hinterland via highway and railway | | | | ✓ | | | | ✓ | |
| | Superstructure | Warehouse and office buildings capacity in a terminal | | | | ✓ | | | | ✓ | |
| Software | Information system | Cargo tracking, EDI ability | | | | | ✓ | | | ✓ | |
| | Labour quality | Experienced employees, high quality labours | | | | | | | | ✓ | ✓ |
| | Management quality | Manager with in-depth shipping knowledge | | | | | | | | ✓ | |
| Operator's Networking | Numbers of terminals operated | Total numbers of terminals owned globally (economics of density) | | ✓ | | | | | | | |
| | Relation with LSPs | Numbers of cooperated LSPs (e.g. ocean freight forwarders), customs efficiency | ✓ | ✓ | ✓ | | | | | | ✓ |
| | Connectivity of its terminals | Frequency of ships served, numbers of ports connected, location of the terminal, close to major navigation routes & hinterland | ✓ | ✓ | ✓ | ✓ | | | ✓ | | |

Source: compiled by this research

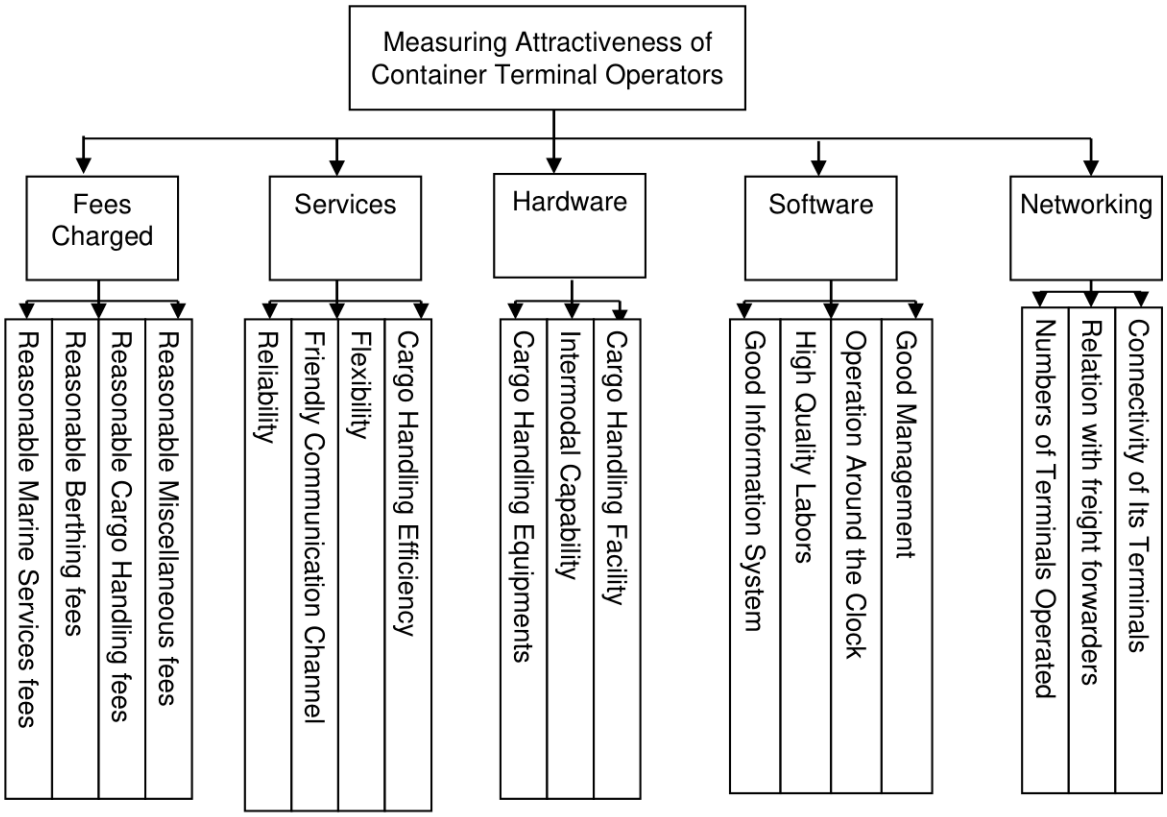


Figure 2 Hierarchical Research Structure

**Research Design**

Questionnaires were then distributed to the executives who work for ocean container carriers and studied EMBA programme in a leading maritime university in Taiwan. These carriers have their headquarters, branch offices, or agents in Taiwan. Twenty copies of questionnaires were distributed to these shipping executives and thirteen copies of them are successfully returned and valid for further analysis. Respondents' demographic data are shown in the table 2.

Table 2 Demographics Data of Respondents

| Job Title | Number of respondents | Seniority | Number of respondents | Departments | Number of respondents |
|---|---|---|---|---|---|
| Senior Manager | 2 | Above 10 Years | 8 | OP | 5 |
| Middle Manager | 8 | 5~10 Years | 3 | Sales | 4 |
| Junior Manager | 3 | 3~5 Years | 2 | Planning | 4 |

Source: This research

**Research Findings**

In terms of influencing the attractiveness of container terminal operators, the order of importance of these five major criteria are fees charged (0.420), operators' networking (0.185), services(0.153), softwares (0.148), and hardwares(0.094). No surprising, in a highly competitive market after the deregulation of shipping industry, well-equipped software and hardware with low user's fees are the necessary condition to attract carriers using a terminal operator's service. On the other hand, operators' networking attribute is reported important to influence carriers' port choice behavior by several previous literatures. The degree of importance of subcriteria influencing the attractiveness of container terminal operators are cargo handling fee (0.175), berthing fee (0.161), connectivity of its terminals (0.084), numbers of terminals operated(0.063), and equipments(0.059) (see Figure 3).

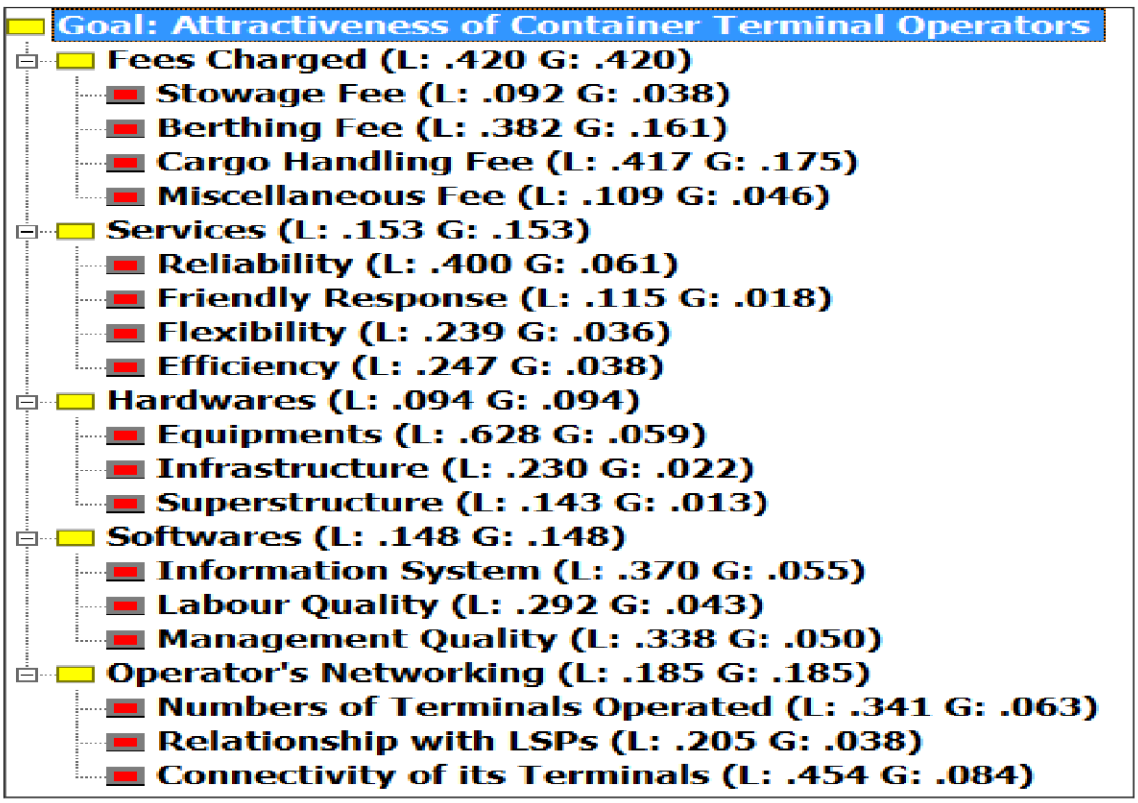


Figure 3 Degree of Importance of Service Attributes influencing Port Operators' Attractiveness

Using IPA (Importance-Performance Analysis) matrix and fuzzy semantic wordings technique, three attributes are found in the 'Concentrate Here Quadrant' which implies the importance of these attributes (i.e. berthing fee, connectivity, and the number of terminals operated) are perceived to have the above-average degree of importance and most terminal operators' performance on these attributes are perceived to be below the average. Terminal operators can focus using their limited resources to improve their performance on these three attributes to further enhance their attractiveness to their users (see Figure 4).

**Conclusions and Suggestions**

A port is a collection of many terminals and each terminal competes with each other and competes with terminals in the other ports as well. Thus a study on the improvement of a port's competivity and attractiveness cannot be operationalized without a quantitative research on the attractiveness index of its terminal operators. Some large container terminal operators have managed as many as 205 berths in 50 ports (e.g. HPH). It obtains the cost advantage resulting from economies of scales. The wide geographic service coverage (e.g. HPH serves in 25 different countries) also make large terminal operators achieve high degree of attractiveness resulting from its dense service networking (i.e. economies of density). Future extension of this research is already on its way, the authors have collected the respondents' evaluation on five major global container terminal operators' performance with these seventeen sub-criteria of attractiveness. An Importance-Performance analysis on these seventeen attractiveness sub-criteria can be used to pinpoint out the attractiveness determinants from the seventeen subcriteria for these reviewed container terminal operators. Finally the port operators can invest their limited resources on these service determinants to effectively improve their attractiveness to ocean carriers.

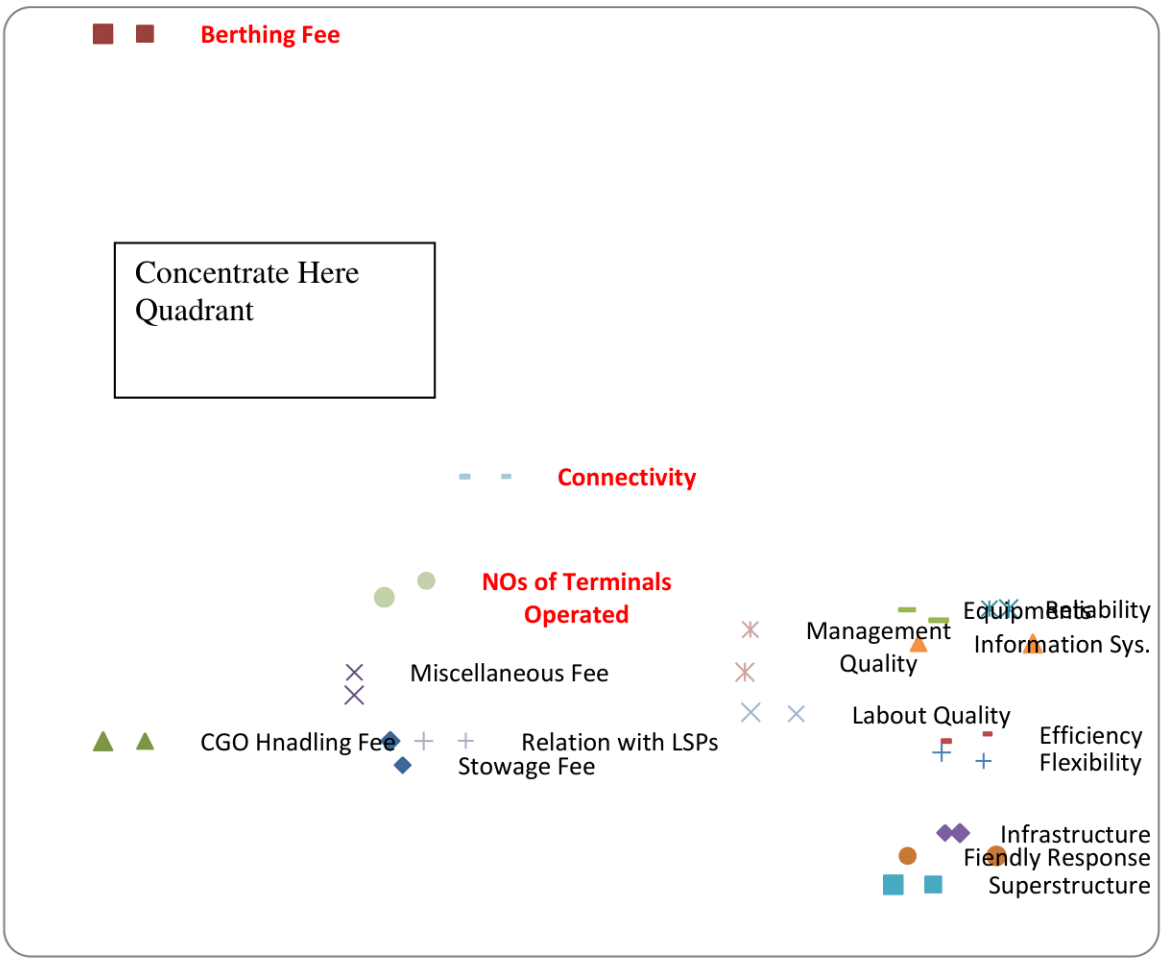


Figure 4 Importance and performance Matrix

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