

CHAPTER 14

Emerging global networks in the container terminal operating industry



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Abstract

This paper deals with the emerging corporate geography in the container terminal industry with issues related to the similarities or differences among terminal locations, the processes leading to the expansion of these holdings and the interactions they maintain as nodes within the global freight distribution system. It will be demonstrated that terminal operators show varying degrees of involvement in the main cargo handling markets around the world. We also unravel the corporate geography of the investment strategies of global terminal operators such as HPH, PSA, DP World and APM Terminals, but also operators that are more regionally focused, such as Ports America, Eurogate, SSA Marine and ICTSI.

1 | Introduction

Multinational enterprises (MNEs), as key drivers of globalization, have adopted flexible multi-firm organization structures on a wide variety of markets. Many of the world's largest MNEs are regionally based in terms of breadth and depth of market coverage with most of their sales situated within their home leg of the 'triad', namely in North America, the European Union or Asia (Rugman and Verbeke 2003). Additional risks of an economic, cultural, administrative or geographic nature hinder transnational companies from venturing into other regions outside the domestic markets (Ghemawat 2001).

The relative importance of transnational companies varies considerably across industries. Maritime shipping has traditionally been one of the most multinational activities. While there is some regional orientation, many maritime shipping companies have established true global liner service networks (Frémont 2007). A similar internationalization process took place in the port operation industry. From a dominantly regional structure, sometimes focused on a single port, several port terminal operators have established a multinational portfolio. This trend points to an emerging corporate geography in the container terminal sector with issues related to the similarities or differences among

terminal locations, the processes leading to the expansion of these holdings and the interactions they maintain as nodes within the global freight distribution system (Laulajainen and Stafford 1995).

In light of the corporate geography perspective, this paper deals with the geographical characteristics of the investment strategies of global terminal operators in the container industry. In line with the definition of global port operators in Bichou and Bell (2007), global terminals operators are defined as companies involved in international port terminal operations with a view of establishing globe-spanning network services. Several scholars have described the increasing complexity in terms of the actors involved in the terminal operating industry, the competition between these actors (e.g. Parola and Musso 2007) and the potentially diverging objectives and entry strategies of each of these actors. The observed complexity is linked to the heterogeneity in strategic paths among terminal operators as exemplified by the work of Olivier (2005) and differences in local market entry conditions (see e.g. De Langen and Pallis 2005). It will be demonstrated that global container terminal operators show varying degrees of involvement in the main cargo handling markets around the world.

The paper focuses on how global terminal networks emerged and to what extent the global terminal operators are really global. The first section presents a typology of global terminal operators and discusses recent development in throughput volumes of the leading actors in the container terminal industry. In a second section, the objectives and the entry and expansion strategies of the groups of global terminal operators are analyzed. In parts three and four the spatial/geographical aspects related to the expansion strategies of global terminal operators are discussed, with a particular focus on factors affecting regional differences and the global portfolio of the actors involved. The last section examines the logistics strategies of global terminal operators.

2 | Typology and market positions of global terminal operators

A strict categorization of terminal operating companies is difficult to establish. Bichou and Bell (2007) propose a classification of global port operators based on four types of market players: (a) terminal-operating shippers (TOS) mainly active in non-containerized cargo operations; (b) terminal-operating shipping lines (TOSL) with terminals operated on a dedicated or a common-user basis; (c) terminal-operating port authorities (TOPA) and (d) terminal-operating companies (TOC). Olivier (2005) and Olivier et al. (2007) make a distinction between two types of transnational corporations in the terminal industry: international terminal operators (ITOs) whose core expertise is linked to terminal operations and ocean carriers whose core expertise is not in ports but vertically-related maritime shipping activities. Along the same lines, Slack and Frémont (2005) use the terms transnational terminal operating companies (TTOs) and international shipping lines. Parola and Musso (2007) define three groups: pure stevedores who manage terminals as profit centers, integrated carriers who manage terminals mainly as costs centers and a group of hybrid terminal operators consisting of shipping lines involved in the stevedoring business and handling both own cargo and third-party traffic to make profit. Combining

the above insights transnational terminal operating companies are grouped in three categories:

- *Stevedores*. Port terminal operators that expanded into new markets to replicate their expertise in terminal operations and to diversify their revenue geographically. Port of Singapore Authority (PSA) is the largest global terminal operator coming from a stevedore background.
- *Maritime shipping companies* invested in port terminal facilities to help support their core maritime shipping business. In many cases hybrid structures are formed with separate business units or sister companies active in liner shipping or terminal operations. The terminal facilities can be operated on a single-user dedicated base or alternatively also be open to third shipping lines. APM Terminals, a sister company of Maersk Line, is the largest global terminal operator coming from a maritime shipping background.
- *Financial holdings* includes various financial interests ranging from investment banks, retirement funds to sovereign wealth funds attracted by the port terminal sector as an asset class and for revenue generation potential. The majority has an indirect management approach; acquiring an asset stake and leaving the existing operator take care of the operations. Others will manage directly the terminal assets through a parent company.

Table 1 and Figure 1 provide an overview of the top ten global terminal operators classified by volume and by hectares of terminals they control. As well as looking at total TEU handled by each global operator, Table 1 also provides global terminal operator throughput by the equity TEU measure, whereby throughput is adjusted to reflect the share of individual terminal operating companies held by the global operators. This indicator is the most relevant for analysis of profitability and entry strategy, beyond pure throughput. The top ten terminal operators control an increasing share of the world's total container handlings: 64.6% in terms of total throughput handled in 2009 compared to 41.5% in 2001. The sample of terminal operators classified by Figure 1 accounts for 397 terminals worldwide totaling close to 20,000 hectares (200 square kilometers). Terminal control is allocated to the firm that has the largest equity stake. The results of Figure 1 should thus be treated with caution as various terminals have various levels of equity stakes.

Hong Kong based Hutchison Port Holdings (HPH), whilst remaining the overall market leader in total volume, number of terminals and hectares terms, holds the second place on an equity TEU basis, due to the sale of a 20% share in the company to Singapore-based PSA Corporation in 2006. APM Terminals, part of the Danish AP Moller group, takes second position in total TEU terms whilst DP World is in fourth place. Chinese Cosco Pacific has claimed fifth position in the equity TEU table. OOCL makes the top 10 in 2006 but having sold its Vancouver and New York terminals to Ontario Teachers' Pension Fund (assets operated by Global Container Terminals), is no longer present in the top ten. No new global container terminal operators of any size emerged in recent years. However, there are a number of highly active smaller players in the market, building international portfolios. These include Shanghai International Port Group (SIPG), Macquarie, ICTSI, KGL and RREEF. China Merchants Holdings is not listed by Drewry. The Chinese group recently launched its internationalization through deals in Vietnam (May 2010) and Sri Lanka (Sept

2010). It is a sizeable player with 43.9 million TEU in 2009, and would rank fifth in the Drewry league.

Table 1. Throughput of the top-10 global container terminal operators for selected years

Throughput of the top 10 global container terminal operators (*)

2001			2006			2009		
Operator	m teu	share	Operator	m teu	share	Operator	m teu	share
HPH	29.3	11.8%	HPH	60.9	13.9%	HPH	64.2	13.6%
PSA	19.5	7.9%	APMT	52.0	11.9%	APMT	56.9	12.0%
APMT	13.5	5.5%	PSA	47.4	10.7%	PSA	55.3	11.7%
P&O Ports	10.0	4.0%	DP World	41.6	9.4%	DP World	45.2	9.5%
Eurogate	8.6	3.5%	Cosco Pacific	22.0	5.0%	Cosco Pacific	32.5	6.9%
DPA	4.7	1.9%	Eurogate	11.7	2.7%	MSC	16.4	3.5%
Evergreen	4.5	1.8%	Evergreen	9.4	2.1%	Eurogate	11.7	2.5%
Cosco Pacific	4.4	1.8%	SSA Marine	8.9	2.0%	Evergreen	8.6	1.8%
Hanjin	4.2	1.7%	MSC	7.6	1.7%	SSA Marine	7.7	1.6%
SSA Marine	4.0	1.6%	HHLA	6.6	1.5%	CMA-CGM	7.0	1.5%
Top 10	102.7	41.5%	Top 10	268.1	60.9%	Top 10	305.5	64.6%

Top 10 global container terminal operators' equity based throughput

2006			2009		
Operator	m teu	share	Operator	m teu	share
PSA	41.2	9.3%	PSA	45.0	9.5%
APMT	32.4	7.3%	HPH	32.2	6.8%
HPH	30.8	7.0%	DP World	31.5	6.7%
DP World	26.2	5.9%	APMT	31.1	6.6%
Evergreen	8.1	1.8%	Cosco Pacific	10.9	2.3%
Cosco Pacific	7.9	1.8%	MSC	8.2	1.7%
Eurogate	6.6	1.5%	Evergreen	7.2	1.5%
HHLA	6.0	1.4%	SSA Marine	6.3	1.3%
OOCL	4.8	1.1%	Eurogate	6.1	1.3%
APL	4.6	1.0%	CMA-CGM	4.6	1.0%
Top 10	168.6	38.2%	Top 10	183.1	38.7%

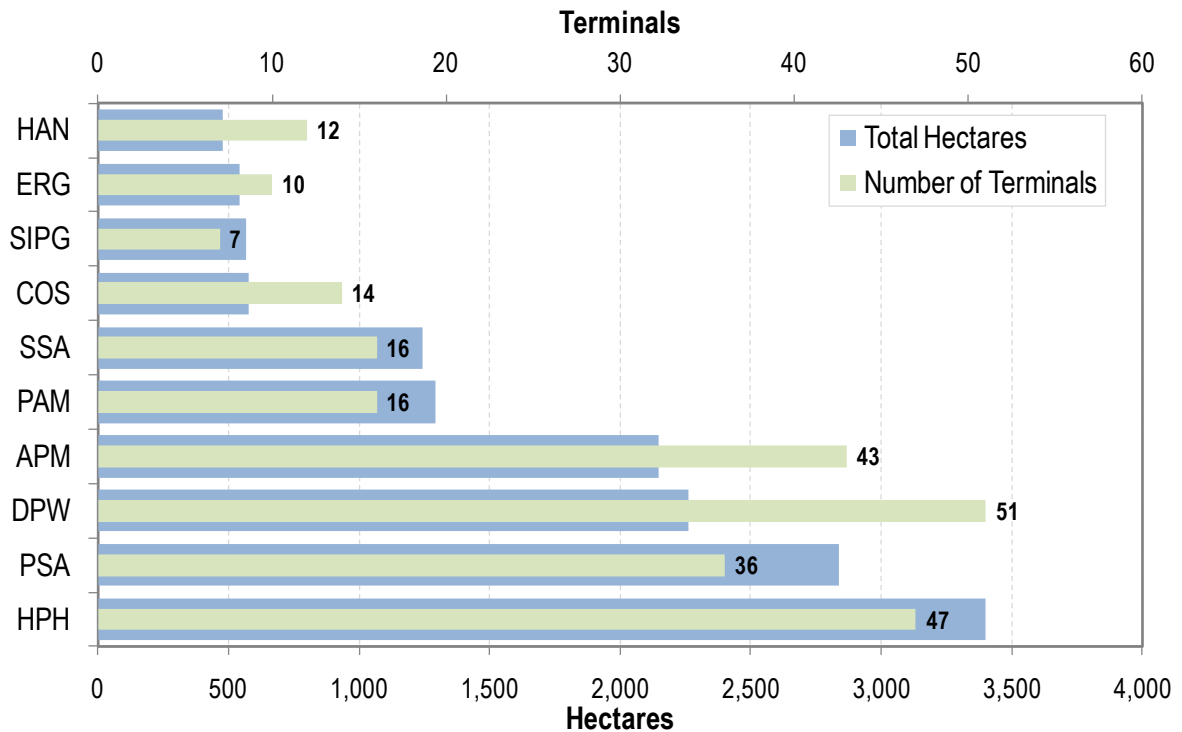
(*) Figures include all terminals in which 10% plus shareholdings were held. Figures do not include operations at common-user terminals

Source: based on data from Drewry Shipping Consultants (2006, 2010)

The year 2008 was a turning point for the container terminal operators as the final quarter saw unprecedented volume declines due to an emerging world economic and financial crisis. The contraction in global container port throughput in 2009 amounted to approximately 12%. In the recent financial/economic crisis terminal operators have done better than shipping lines. Also, early entrants like PSA and HPH have performed better than late entrants who have had to pay premiums to be in the game (e.g. DP World). The changed economic situation means that terminal operators have adopted a more cautious assessment of future prospects. While there is a lack of transparency about global operator plans as it remains a highly competitive business, press releases make

clear that quite a number of capacity expansion projects are being shelved, deferred or cancelled as a result of the economic crisis.

Figure 1. Number of Terminals and Total Hectares Controlled by the Ten Largest Port Holdings, 2009



Note: HAN = Hanjin, ERG = Evergreen, SIPG = Shanghai International Port Group, COS = Cosco Pacific, SSA = SSA Marine, PAM = Ports America, APM = APM Terminals, DPW = DP World, PSA = PSA International, HPH = Hutchison Port Holdings

3 | Entry and expansion strategies in the terminal operator industry

3.1 Introduction

The history and dynamics behind the internationalization strategies of global terminal operators have been widely addressed in academic literature. Peters (2001) argues that international ventures were first established by terminal operators searching for investment opportunities abroad. Peters and later also De Souza et al. (2003) describe three consecutive waves in the internationalization of the container terminal industry. The first wave included companies HPH, P&O Ports and SSA who expanded their operations on a geographical scale thereby benefiting from the port privatization schemes in many regions across the world. As soon as the strategies of the pioneers proved to be successful, a second wave of companies started seeking expansion internationally (e.g. PSA, CSX World Terminals and Eurogate). A third wave of terminal operators emerged when major container carriers entered the terminal industry in an effort to support their core business. Olivier et al. (2007) contest the proposed chronology as the terminal entry of ocean carriers dates back to the container terminal investment decisions of steamship companies such as Sealand and American President Line (APL) in the 1960s and 1970s in a time when most port facilities were still state-

controlled. While carrier investments in terminals are indeed not a recent phenomenon, it will be demonstrated that the scale of carrier involvement has reached more international heights in the last decade.

Expansion strategies of the three types of global terminal operators lean on horizontal or vertical integration processes (Notteboom and Winkelmans 2001) or diversification strategies, depending on the type of operator (Table 2). The objectives and incentives of the three categories of global terminal operators differ. APM Terminals and Cosco Pacific are hard to position. These companies were formed to become independent terminal operators from their sister carrier. From a firm-level standpoint they are stevedores since their core expertise is terminal operations. From a conglomerate standpoint, however, one could argue they are part of a group of companies that primarily serve ocean shipping interest and have as a major customer their sister carrier.

Table 2. Types of Global Port Operators

Stevedores	Maritime Companies	Shipping	Financial Holdings
Horizontal integration	Vertical integration		Portfolio diversification
Port operations is the core business; Investment in container terminals for expansion and diversification.	Maritime shipping is the main business; Investment in container terminals as a support function.		Financial assets management is the main business; Investment in container terminals for valuation and revenue generation.
Expansion through direct investment.	Expansion through direct investment or through parent companies.		Expansion through acquisitions, mergers and reorganization of assets.
PSA (Public), HHLA (Public), Eurogate (Private), HPH (Private), ICTSI (Private), SSA (Private).	MSC (Private), APL (Private), Hanjin (Private), Evergreen (Private).		DPW (Sovereign Wealth Fund), Ports America (AIG; Fund), RREEF (Deutsche Bank; Fund), Macquarie Infrastructure (Fund), Morgan Stanley Infrastructure (Fund), SSA Marine (Goldman Sachs).

3.2 Horizontal integration

The conventional actors that considered port operations as their core business, stevedores, have expanded into new locations. This involves mergers and acquisitions of existing terminals or the construction or expansion of new terminal facilities. Pursuing a strategy based on *organic growth* is generally the most obvious strategy available to container terminal operators.

When looking at the history of internationalization, the year 2001 stands out as the year of hostile take-overs with three landmark deals: HPH-ECT, PSA-HNN and HPH buying ICTSI's International Business Division. The years 2005 to 2007 saw an extraordinary level of *merger and acquisition* activity in the terminal operator industry against a backdrop of increasing container terminal capacity shortages. A front-runner in the latest consolidation wave was DP World, through the acquisition of the terminal portfolios of CSX World Terminals (2005) and P&O Ports (2006). These two acquisitions have given DP World a significant presence on the container handling scene in China, Hong Kong, South (East) Asia, Australia, the Americas and Europe (Drewry Shipping Consultants 2006). Apart from DP World's acquisitions, another major deal was PSA's acquisition of a 20% stake in Hutchison Port Holding's global terminal portfolio, following its earlier purchase of strategic shareholdings in a number of other Hong Kong operations in 2005.

In addition, quite a number of terminal operators have taken shareholdings or increased their existing stakes in individual terminal businesses. Traditional stevedoring companies opted for horizontal integration in part to counterbalance the consolidation trend in liner shipping. Horizontal integration in liner shipping through strategic alliances and mergers and acquisitions has indeed enhanced consolidation at the demand side. The top 20 carriers controlled 26% of the world slot capacity in 1980, 42% in 1992 and more than 60% in 2008. The traditional stevedores are thus confronted with larger and fewer shipping lines demanding better service at a lower cost (Notteboom 2002). Terminal operators face the constant risk of losing important clients, not because of deficiencies in port infrastructure or terminal operations, but because customers can reorganize their service networks or can engage in new partnerships with other carriers (Slack et al. 1996).

3.3 Vertical integration

The horizontal integration process was concomitant with vertical integration strategies pursued by several maritime shipping companies that have invested in terminal operations. Coming from a new background and attracted by the growth prospects of the industry several financial holdings also became increasingly involved in terminal operations (or at least in the ownership part).

The involvement of a shipping line in terminals can be grouped in four categories (Parola and Musso 2007 and Soppé et al. 2009):

- Special contractual berthing or volume agreements between a third-party stevedore and the shipping line (e.g. virtual dedication);
- Minority shareholding of the shipping line in a terminal (typically below 20%);
- Joint ventures between the shipping line and a third-party stevedore often linked to the dedicated use of the terminal by the shipping line;
- A dedicated terminal with at least a 51% shareholding by the shipping line or its terminal operating sister. Musso et al. (2001), Slack and Frémont (2005), Brennan (2002) and Cariou (2003) provide a more in-depth analysis on the issue of dedicated terminals.

For maritime companies, terminals typically serve other more operational targets on top of pure financial objectives. By entering the terminal operator business, shipping lines or

their parent companies gain control of terminal capacity deployment allowing them to better deal with problems of vessel schedule integrity (Notteboom 2006 and Vernimmen et al. 2007). Hence, the operator will prioritize the handling of vessels in terms of berthing and crane density in view of an efficient synchronization of liner services (e.g. hub-feeder operations) and high schedule reliability. In particular MSC and CMA CGM, the world's second and third largest container shipping lines, have been very active in this field, with in Europe alone involvements in 15 and 10 container terminals respectively. Other shipping lines with a strong presence in the terminal operator industry include Evergreen, COSCO (directly or via sister company Cosco Pacific), Hanjin, APL, NYK, K-Line, Yang Ming and Hyundai.

A number of liner terminals offer stevedoring services to third carriers as well, thereby creating some hybrid form between pure dedicated facilities and independently operated multi-user facilities. For instance, Maersk Line's parent company, AP Moller, operates a large number of container terminals through its subsidiary APM Terminals.

3.4 Differentiation

Parallel to horizontal and vertical integration, the terminal operation sector was penetrated by an array of large equity firms and financial holdings. The goal of this process is unrelated to rationalization or efficiency improvement within the terminal sector per se, but represents a stake taken in the perceived profitability of the sector and the resulting diversification in the financial portfolio. Financial holdings' prime objective is to generate a return on investment. Terminals are often seen as assets that generate economic rent and which are tradable through buying and selling operations (liquidity). Therefore, large equity firms, such as mutual and sovereign wealth funds, became interested in owning a stake in various terminal assets, notably port terminals, because of several value propositions:

- *Intrinsic value.* As physical assets, terminals have an intrinsic value mostly related to real estate, infrastructure and equipment. Since terminals tend to occupy highly accessible locations that cannot be effectively substituted, this scarcity implies high valuations. Traffic growth linked with globalization made terminal assets even more valuable, so the intrinsic value of terminals is also directly related to the traffic they handle. The higher the traffic, the more valuable is the land that supports terminal operations. In such a context, it was expected that terminal assets would steadily increase in value.
- *Operational value.* Terminals provide a source of income, linked with the rent they generate, which in turn is directly proportional to the traffic handled. This insures a constant revenue stream as freight traffic tends to have a limited, or at least an easily predictable seasonality. Future traffic growth expectations result in income growth expectations.
- *Risk mitigation value.* Transport terminals are quite standard in their infrastructure, equipment and operations implying that their business model can effectively be replicated in a variety of markets. This enables private equity firms to diversify their portfolios in different segments of the transportation industry (ports, airports, rail) while at the same time undertaking a geographical diversification. Terminal assets

located in different regional markets help mitigate risks, particularly the risks related to traffic demand fluctuations and the pricing and capacity strategies of rivals and on alternative routes. A global portfolio might also help to reduce the financial and political risks associated of being active in only one market.

3.5 Privatization and capital costs as drivers of consolidation and market entry

The observed horizontal consolidation trend in the terminal operating industry as well as the entry of shipping lines and financial holdings has been instigated by a number of institutional, financial and operational considerations.

First of all, this trend is facilitated by the privatization of port activities through concession/lease agreements, BOT (Build Operate and Transfer) and other investment arrangements between port authorities or government bodies and private terminal operators (Notteboom 2007; De Souza et al. 2003). Landlord port authorities lease the land to private port operators on the basis of long-term concession agreements, in the range of 25 to 40 years. Port authorities have developed specific bidding procedures to grant concessions to the best possible candidates. The move towards transparent and open concession procedures resulted in local terminal operators no longer able to rely on shelter-based strategies for their survival. At the same time it facilitated through acquisition the local market entry of global players with deep pockets and specific know how (Pallis et al. 2008).

Table 3. Major Port Terminal Acquisitions since 2005

Date	Transaction	Price paid for transaction compared to EBITDA
2005	DP World takes over CSX World Terminals	14 times
Early 2006	PSA acquires a 20% stake in HPH	17 times
Mid 2006	DP World acquires P&O Ports	19 times
Mid 2006	Goldman Sachs Consortium acquires ABP	14.5 times
End 2006	AIG acquires P&O Ports North America	24 times
Early 2007	Ontario Teachers' Pension Fund acquires OOIL Terminals	23.5 times
Mid 2007	RREEF acquires Maher Terminals	25 times
July 2007	Goldman Sachs acquires a majority share in Carrix, the parent company of SSA Marine	Not disclosed

Note: EBITDA = Earnings Before Interest, Taxes, Depreciation and Amortization

Source: Compiled from the acquiring firms' press releases.

Secondly, there is the increased proportion of fixed costs among total terminal operating costs, caused by ever higher initial capital expenditure on cranes, information technology and deepwater ports. The nature of the container handling business – notably its high fixed costs and lack of service differentiation (except in terms of location) – in theory creates significant opportunities to improve service through co-operation. However, forms of operational co-operation in the market do not come easily and most of the time

they end up in mergers or acquisitions (Notteboom 2002; Musso et al. 2001; Slack and Frémont 2005). An increasing number of financial institutions such as banks, hedge funds, private equity groups and investors entered the terminal business in the period between 2000 and 2007 (Babcock and Brown, Macquarie Infrastructure and American International Group to name a few), which resulted in higher valuations. Global terminal operators and investor groups have paid record prices for port assets (Table 3).

3.6 Limits to consolidation

Evidence underlines that the consolidation process that has rapidly taken place in recent years may have reached limits. From one side, most of the global terminal assets are already part of the portfolio of global terminal operators and from the other diminishing returns are likely to play in view of growing competition and questionable future growth opportunities. Given the fact that there are no large companies or terminal assets left to acquire nowadays, it can be expected that the top four players (PSA, APM Terminals, HPH and DP World) will maintain their lead over the other operators for quite a number of years to come. Spurred by the sudden excess supply of port capacity, as well as lower profitability levels enjoyed by terminal operators, M&A activity in the container handling sector is likely to slow down significantly in the years to come.

Further consolidation may also be restricted by institutional factors, particularly the policies of national and supranational competition authorities who closely monitor the risks of having dominant actors in regional container markets. For example, in Europe, extensive EU competition law provisions guide mergers and acquisitions where corporate reorganizations are to be welcomed to the extent that they are in line with the requirements of dynamic competition and capable of increasing the competitiveness of European industry, improving the conditions of growth and raising the standard of living in the Community. EU competition law has already affected HPH's expansion within North Europe (i.e. when HPH took over ECT in Rotterdam) and it is likely that any future moves by PSA or DP World will also be carefully scrutinized by regulatory authorities.

Of key interest in any M&A activity will be the valuation of port and terminal assets. In the peak period of demand growth and interest in acquiring terminals during 2005-2007, port companies were being valued (and paid for) at EBITDA multiples in excess of 20 times (see Table 3). With the crash in demand and the credit crunch, this exceptional situation has ended, at least for the time being. Anecdotal evidence suggests that multiples of around 8-12 times EBITDA are the new benchmark, but there has yet to be any major M&A deal going through to verify these new levels in the market.

4 | The spatial expansion of terminal operators

4.1 Building competitive advantage

The spatial dimension of terminal business has been remarkable, more in particular the expansion of terminal portfolio activities on an ever larger geographical scale, from local to regional and global. Port terminal operations have similarities with retailing as both are market servicing activities where accessibility is fundamental. While for retailing a market area represents a customer base, a hinterland is what defines a similar relationship for a seaport terminal. Each terminal facility is mostly independent from the others with competition taking place over the fundamental issues of price, reliability and quality of service. Each terminal operator possesses a range of physical and intangible assets and capabilities.

The objective is to get access to a port and secure a customer base, which in many ports around the world requires a concession agreement with the local port authority where a port operator negotiates the terms of a long-term leasing agreement (Notteboom, 2007; Theys et al. 2010). An alternative strategy consists in entering a port via the merger with or acquisition of an incumbent firm. Terminal operators wishing to operate in a foreign port services market would have to possess some competencies that would offset the advantages held by incumbent firms. These are to be found in the area of firm size and the realization of economies of scale and scope, market power and marketing skills, technological expertise or access to cheaper sources of finance. Musso et al. (2001) identify the ability of firms to broaden their scale and scope through horizontal expansion as the most important driver of the internationalization of terminal operators.

The competitiveness of a terminal operator is related to the array of resources for its business and strategy (Collis and Montgomery 1995). The management's ability to consolidate the company's capabilities and skills into competencies that empowers the operating company to adapt quickly to changing opportunities is the real source of competitive advantage (Prahalad and Hamel 1990). It can be argued that a global terminal operator's core competence should (a) provide potential access to a wide variety of port service markets (b) make a significant contribution to terminal users' benefits and (c) be difficult for competing ports to imitate. If a core competence is based on a complexity of technologies and skills it will be difficult for competing terminal operators to imitate and it will therefore have a higher probability of generating a competitive advantage. For example, the fully automated container terminals operated by ECT of the HPH group in the port of Rotterdam is the result of a technological process that is difficult to imitate but the technology itself can rather easily be transferred to other ports. A competitive advantage purely based on technological competencies is less durable. As equipment is getting increasingly standardized (e.g. Shanghai-based ZPMC, the world's largest gantry crane producer, supplies around 60% of the world's demand for quay cranes) and can be replicated, competitiveness is more than often a matter of operational efficiency, quality of hinterland access and process innovation. Olivier et al. (2007) have argued that IT and managerial know-how are increasingly differentiating and defining the competitive advantage of global terminal operators. IT (software as opposed to hardware) has been

the source of much of the strategic partnerships and alliances the operators have engaged to leverage international opportunities.

Global terminal operators, particularly stevedores and financial holdings, run terminals as profit centers. Greater efficiency is gained and cost savings are realized by implementing common systems across the terminal network. Global terminal operators often have central purchasing departments at their headquarters involved in making large contracts with the suppliers of terminal equipment such as gantry cranes or terminal tractors. The pooling of orders for various terminals reduces the unit purchasing price of cranes and yard equipment. Similar arrangements are made for the purchase and maintenance of terminal planning software, which in some cases is developed in-house (e.g. the terminal and ship planning software house Cosmos has recently been integrated in the PSA group). The output of research and development units stationed at various locations across the world is typically shared among the terminals of the whole network through knowledge sharing configurations based on IT-platforms and intensive workshops. Also, the creation of extensive networks makes it possible to spread investment risks.

4.2 From single locations to a global network

It is only through growth strategies that global operators have progressed from being single location / regional players into the global market. The organizational forms adopted by terminal operators to internationalize their business and create partnerships with other firms are strongly entwined with local institutional setting. Olivier (2005) refers in this context to the role of 'place-specificity' and 'territorial embeddedness' linked to the home market in understanding expansion strategies. In line with the 'home market factor' identified by Olivier et al. (2007), the home ports typically remain very important in the network of these operators as illustrated in Table 4.

Table 4. The role of home ports in the total worldwide container throughput of a selection of global terminal operators

Operator	Home port	2002		2007		2009	
		'000 TEU	share	'000 TEU	share	'000 TEU	share
HHLA	Hamburg	3494	87.5%	6698	91.4%	4700	94.5%
DP World	Dubai	4194	79.2%	10663	24.6%	10970	24.1%
ICTSI	Manilla	1043	80.3%	1372	43.1%	1396	38.4%
PSA	Singapore	16800	64.0%	27100	47.5%	25140	44.4%
Eurogate	Bremerhaven	2984	31.3%	4875	35.1%	4536	36.4%
HPH	Hong Kong	10459	28.5%	12322	18.6%	11206	17.4%
SSA Marine	Seattle	711	16.0%	1070	13.8%	705	7.4%

Source: based on data from Drewry Shipping Consultants (2005, 2010)

In developing a global expansion strategy, HPH, PSA, APM Terminals and DP World try to sustain competitive advantage by building barriers to prevent competitors entering their domains or against them succeeding if they do. These barriers are partly based on the building of strongholds in selected ports around the world and on advanced know how on

the construction and management of container terminals. When discussing the US airline industry, Goetz and Sutton (1997) used the term ‘fortress hubs’ to indicate strongholds where, apart from the dominant carrier, no other carrier has been able to establish their operations. Terminal growth involves replicating a business model and providing capital for infrastructure improvements. The scale of operations has created substantial surplus capital that allow them to withstand an intensive competitive war and that enable them to financially outperform rival companies in case of bidding procedures for new terminal operations. The surplus capital is used to move resources wherever they are necessary either to preserve their own interests or tackle competition. Fixed costs in the container handling business are comparatively high relative to operating costs, and economies of scale are fairly high. Global players seem to be best placed to meet the high capital requirements to cover initial investments in a terminal of a reasonable scale.

For example, PSA first built a stronghold at its home base Singapore before taking the step towards global scale and coverage. The critical mass and its focused strategy at Singapore enabled PSA to develop exceptional competencies in terminal handling as additional real estate for port development is extremely difficult to come by within the city-state. Once the company established itself as an international benchmark, the company’s ambitions went global through a mixed strategy of organic growth (new terminals) and acquisitions (e.g. HesseNoordNatie in 2001) backed up by a sound financial status. This development was accelerated by increased competition at its Singapore terminals, not at the least from newcomer Tanjung Pelepas in Malaysia (APM, 1999), and with it less opportunities for internal growth.

Not all operators started their international expansion from the respective home markets. Olivier et al. (2007) uses the case of Hanjin to demonstrate that institutional impediments for investments in the home market can make operators decide to start the international expansion of their terminal network out of foreign ports.

4.3 Regional differences

The differences across regions in terms of the internationalization of container terminal operations has been discussed extensively in academic literature (Airriess 2001; Notteboom 2002; Slack and Frémont 2005; Olivier 2005; Bichou and Bell 2007; Olivier 2010). A number of factors have been identified that enhance or restrict regional expansion in different markets.

First of all, there are the *supply and demand characteristics of the regional market*. Global investors base their investment strategy on exhaustive analyses of profitability, operational efficiency, growth potential and the level of indigenous cargo. Port regions with poor prospects in terms of throughput growth gain less interest from potential investors, certainly when inter-port or intra-port competition is high. Transshipment terminals present a riskier investment (higher vulnerability) since the volumes are more footloose and much more subject to pricing strategies of rival transshipment hubs than in the case of gateway cargo (Rodrigue and Notteboom 2010). Regions with a high concentration in port volumes in a few ports or with terminal capacity constraints are much more prone to the direct involvement of shipping lines as these actors are urged to

secure capacity. Slack and Frémont (2005) identified this factor as a major reason for the early adoption of dedicated terminals in the US. The ability to take firm control of the supply chain is also a key issue as it leads to a functional integration between transportation and distribution. Shipping lines might be more eager to enter a regional terminal market if the chances of successfully extending their value creation toward the hinterland and the entire supply chain is higher. A 'closed' regional cargo market controlled by local interests (e.g. incumbent logistics players or forwarding agents) which seek to maximize rent extraction on cargo passing through the region, can deter potential terminal investors.

The second factor relates to the *degree of private operator participation in the regional container market*. Not all regions around the world show the same timeline in opening up local container markets to private operators. For example, South America and Eastern Europe have started to walk the path of port privatization one or more decades later than many port regions in Europe and North America. Even within the same region large differences might exist at the level of port governance and institutional arrangements. For instance, Slack and Frémont (2005) demonstrate that the late arrival of international terminal operators in France was the combined result of the peculiar status of container crane drivers in French ports (prior to the recent port reform), the captive nature of much of the French cargo and the shelter strategies of local terminal operators. Olivier et al. (2007) rightly state that the supply of investment opportunities is not endless and is constrained by institutional factors facing the investors to enter in foreign markets. Differences in local institutional factors and the degree of openness of the local terminal market might imply that the advance of global terminals operators is very visible in one market and is lagging behind in another. This also implies that part of the observed internationalization in the terminal industry cannot be explained by the deliberate strategies of the actors involved, but are simply a result of terminal operators seizing new, sometimes unexpected, opportunities to enter a local market. Jacobs and Notteboom (2010) argue that the outcome of investment strategies of terminal operators are in large part confined by the 'locational windows of opportunity' in specific ports or regions and the 'critical junctures' in concessioning procedures; only the terminal operator who is granted the terminal can enter. This can lead to a 'jewel in the crown' phenomenon where an operator is willing to purchase an entire portfolio and bear extra risk to acquire a particular facility. For example, HPH bought ICTSI's facilities in 2001 as it considered its Mexican operations (Ensenada in particular) as a mean to tap into North American markets.

A third factor that might lead to regional differences in the internationalization of port terminal operations is the *potential increase in the valuation of the terminal asset*. This factor is strongly related to the demand and supply profile in the region as terminal assets are typically valued higher when located in markets with a high growth potential and high terminal capacity utilization.

Global terminal operators are increasingly hedging the risks by setting up dedicated terminal joint ventures in cooperation with shipping lines. Another way of enhanced cooperation in the container terminal industry consist of offering long term contracts to shipping lines with gain sharing clauses as it was the case for PNCT (AIG) and MSC in the

Port of New York. Soppé et al. (2009) discuss the increased cooperation between terminal operators and shipping lines in setting up terminals. While the empirical evidence in the paper points to more cooperation, there are no real global partnerships between carriers and terminal operators, mainly because the largest carriers prefer taking advantage of diversification of their suppliers' portfolio at the global level rather than a close cooperation with a limited number of major pure terminal operators.

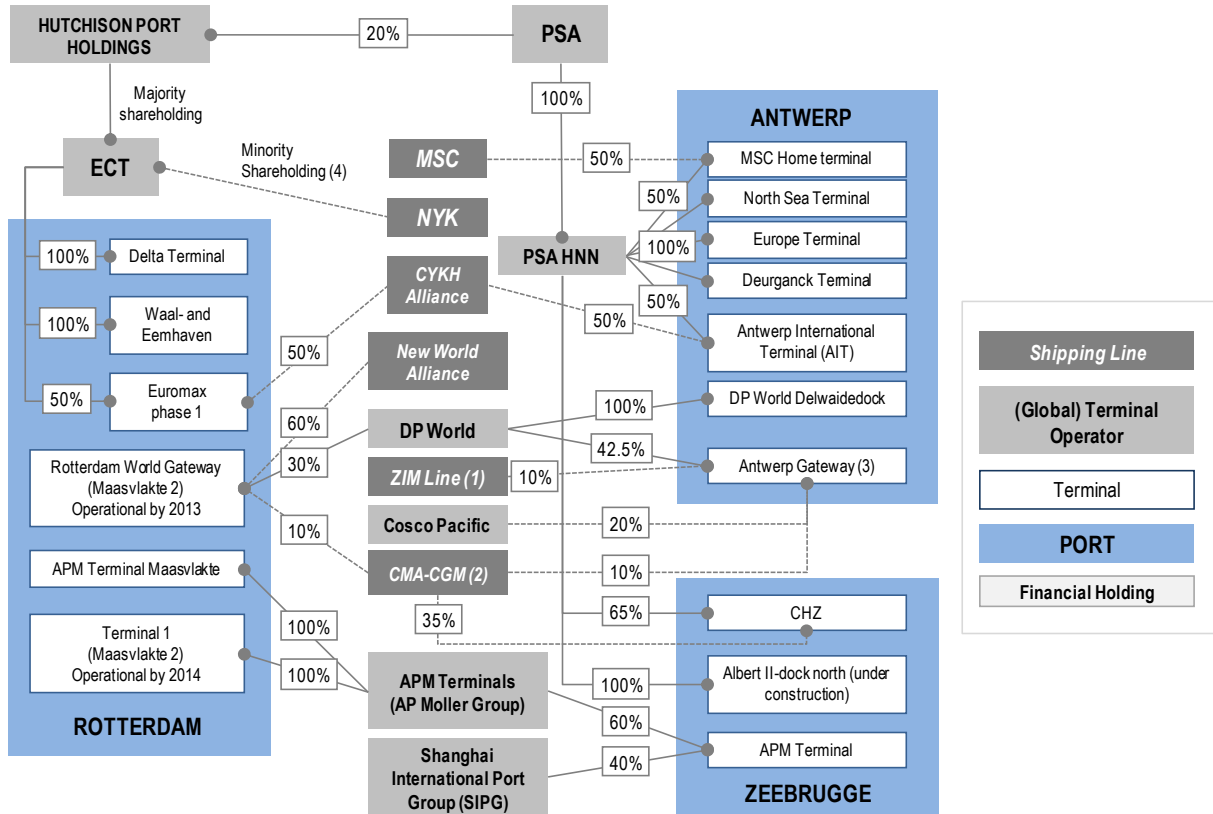
The above developments have led to a growing complexity and regional differences in terminal ownership structures and partnership arrangements. Figures 2 to 4 provide an illustration for selected container ports in Belgium and the Netherlands (Rotterdam, Antwerp and Zeebrugge), North America (New York and Los Angeles / Long Beach) and the Pearl River Delta (Hong Kong, Shenzhen, Zhuhai and Guangzhou). Interesting patterns are emerging:

- The US West Coast has quite an extensive penetration of shipping line terminal operators, mostly Japanese and Korean. This represents the first wave of Asian export-oriented strategies with Japanese and Korean interests able to secure terminal assets in the 1980s and 1990s when there was still the possibility to do so. In spite of their importance, Chinese carriers are less represented as there were few assets left to be acquired or developed with the export-oriented strategy of China came in full force in the late 1990s.
- The Rhine-Scheldt Delta has witnessed an influx of global terminal operators since the mid 1990s. In the last five years or so, this development has been complemented by more complex shareholding structures also involving shipping lines and strategic alliances among them. The complexity and interrelations between the three container ports is expected to increase even further in the near future, exemplified by the Maasvlakte 2 development in Rotterdam.
- PSA and Hong Kong-based HPH and Modern Terminals started to extend their presence in the Pearl River Delta by including terminals in mainland China, particularly in Shenzhen and Guangzhou, thereby lowering Hong Kong's dominance in the region. This penetration in mainland China follows the joint-venture model so common in the setting of manufacturing facilities where a global corporation enters into an agreement with a local Chinese firm (or government branch), commonly specifically created for the purpose. Otherwise, the asset could not have been readily secured due to the regulatory environment.

A large number of ports around the world are now confronted with one or two terminal operators within the port area. A much quoted market-related drawback of having just one player or one very dominant terminal operator in an individual port relates to the limitation of the freedom of choice for the customer. However, a market configuration of one or two operators within a specific port area is said to provide a better answer to carrier power and to carriers' demand and generally offers a larger financial base for investments in expensive terminal infrastructure. Moreover, intra-port monopolies are compelled to perform efficiently as shipping lines demand cheaper and better service. Shipping lines with a large cargo base can challenge the position of major terminal

operators by demanding dedicated terminals. For example, in the late 1990s Rotterdam-based operator ECT eventually had to yield to the demands of Maersk for dedicated facilities. Similarly, MSC used a joint-venture structure with PSA to develop its dedicated MSC Home Terminal in Antwerp which now acts as its north-European hub.

Figure 2. Inter-firm relationships in selected container ports of the Rhine-Scheldt Delta – situation in early 2010

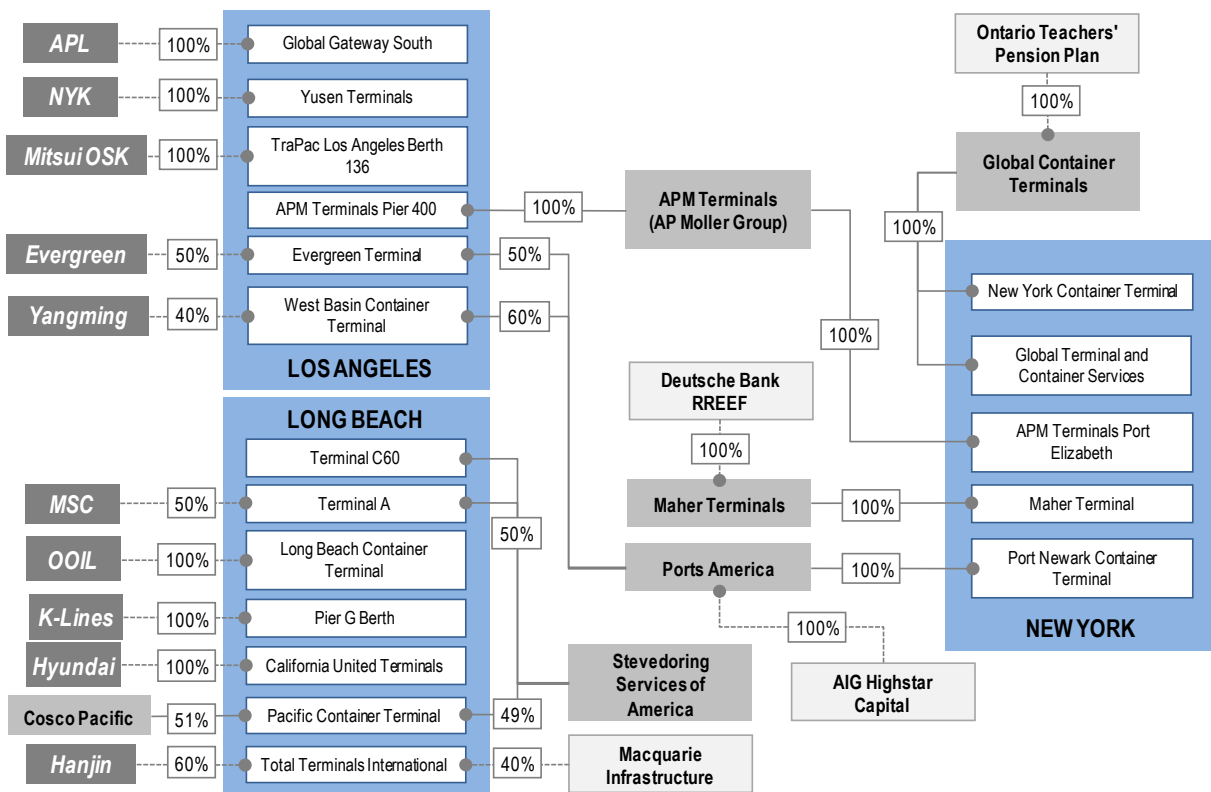


Notes:

- (1) Through subsidiary company ZIM Ports; (2) Through subsidiary company Terminal Link; (3) Duisport is the fifth shareholder with a share of 7.5%; (4) Unconfirmed reports put NYK's ECT interest at 10%.
- The CKYH Alliance includes the shipping lines Cosco, K-Line, Hanjin and Yang Ming. NYK is part of the Grand Alliance that includes the shipping lines Hapag-Lloyd, NYK and OOCL. The Malaysian shipping company MISC was a member of the Grand Alliance till early 2009. The New World Alliance includes the shipping lines APL, MOL and Hyundai Merchant Marine.

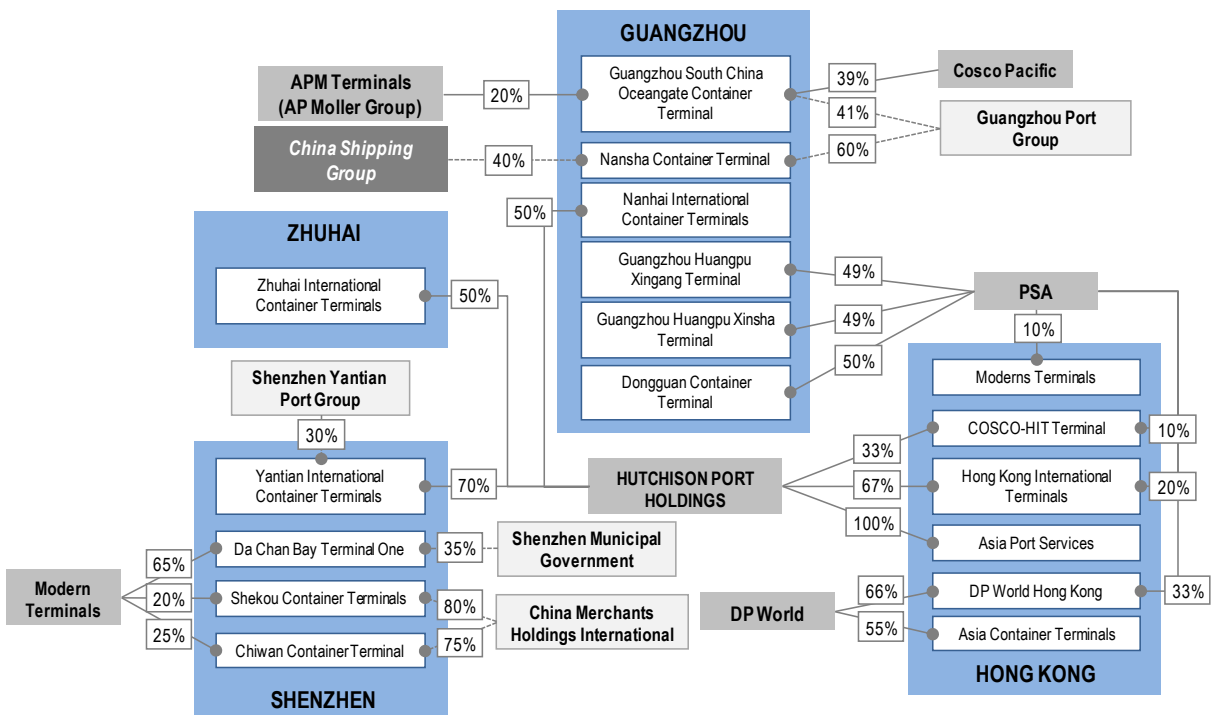
Source: own elaboration based on company information

Figure 3. Inter-firm relationships in selected container ports of North America – early 2010



Source: own elaboration based on company information

Figure 4. Inter-firm relationships in container ports of the Pearl River Delta – early 2010



Note: Dongguan has been amalgamated to Guangzhou for simplicity.

Source: own elaboration based on company information

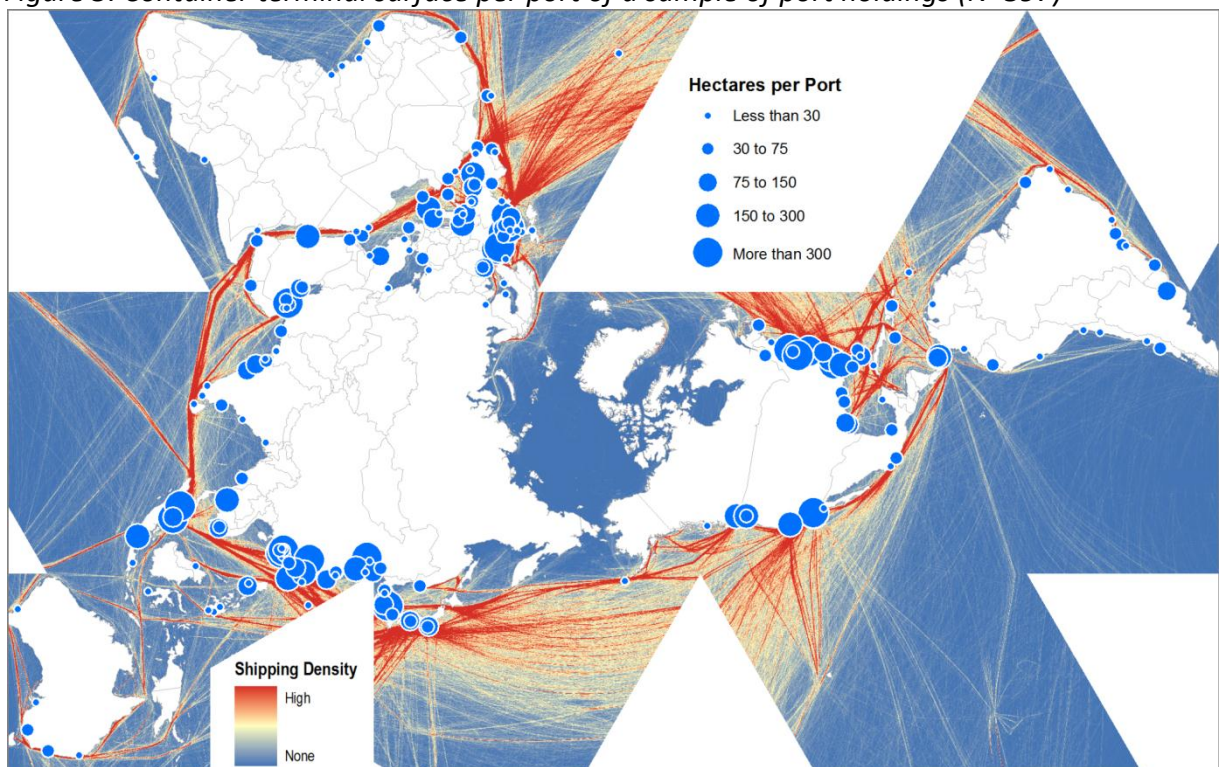
5 | How ‘global’ are the global terminal operators?

5.1 Geographic coverage

Assessing the transnational nature of terminal operators can be done over several dimensions. The first is an overview of the *geographic coverage* of a sample of major global operators in terms of how much terminal real estate is controlled and where. As critical elements of the maritime / land interface container port terminals link the regional activities of production and consumption to global markets. Ownership in whole or in part is an important mean of access to regional freight distribution. Figure 5 underlines that the assets controlled by global terminal operators are servicing every single market of significance, with a particular concentration among the world’s major commercial gateways. The majority of terminals also clearly correspond to the underlying structure of global shipping networks. Therefore, the geographical coverage of global terminal operators is a near perfect representation of global long distance trade.

The spatial concentration of global terminal networks is also very evident when looking at the regional scale, although systems used might differ regionally based on factors embedded in institutional and governance aspects that are regionally bound. Slack and Frémont (2005) demonstrated that the non-carrier based global terminal operators have only moderately penetrated the North American stevedoring market, while at the same time they have expanded business considerably in Asia and Europe. A lack of liberalization in the port sector, dock labor problems and a strong preference towards liner-operated terminals to secure port cargo (port concern) and space (carrier concern) are the main reasons for the specific North American situation.

Figure 5. Container terminal surface per port of a sample of port holdings (N=397)



In Europe, the top five leading operators (HPH, PSA, APM Terminals, Eurogate and DP World) handled an estimated 75% of the total European container throughput in 2008 compared to less than 50% in 1998, illustrating the mature and consolidated nature of this market. The consolidation trend in European container handling leads to some controversy (Notteboom 2002). The industry structure has become sufficiently concentrated to raise a fundamental question about whether market forces are sufficient to prevent the abuse of market power.

5.2 Regional Orientation

A second way to look at the transnational nature of container terminal operators is to assess the *regional orientation* of each holding. As a whole, global terminal operators could appear a truly global industry (as seen on Figure 5), but it is important to see if this also holds true within the geographical distribution of terminal assets by holding company. If this is not the case, then we are dealing with a regionally-focused industry that supports global trade. The size of the terminal holding company is in clear relationship with the multi-regional character of its terminal assets (Figures 6 and 7), an observation that is common for multinational corporations. Therefore, there is a range in the geographical orientation of terminal assets, from regional to global.

Figure 6. Container terminal portfolio of the four main global terminal operators

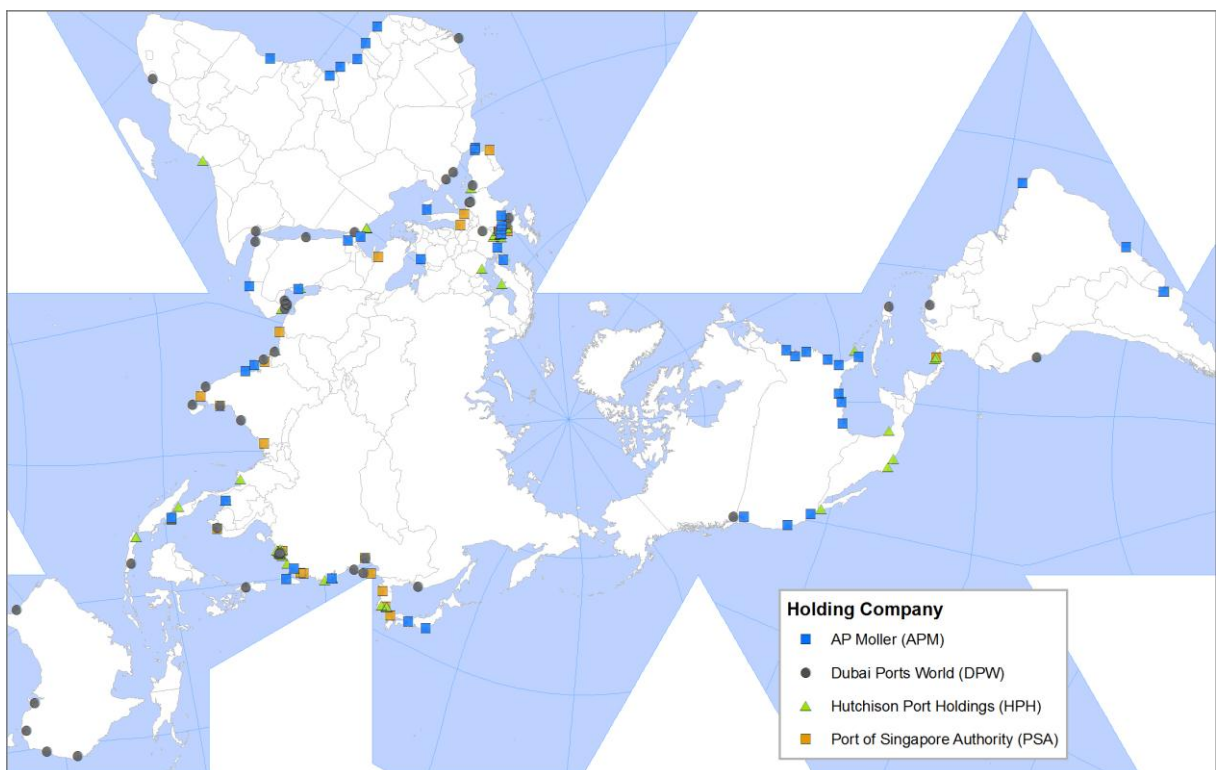


Figure 7. Container terminal portfolio of the minor global terminal operators

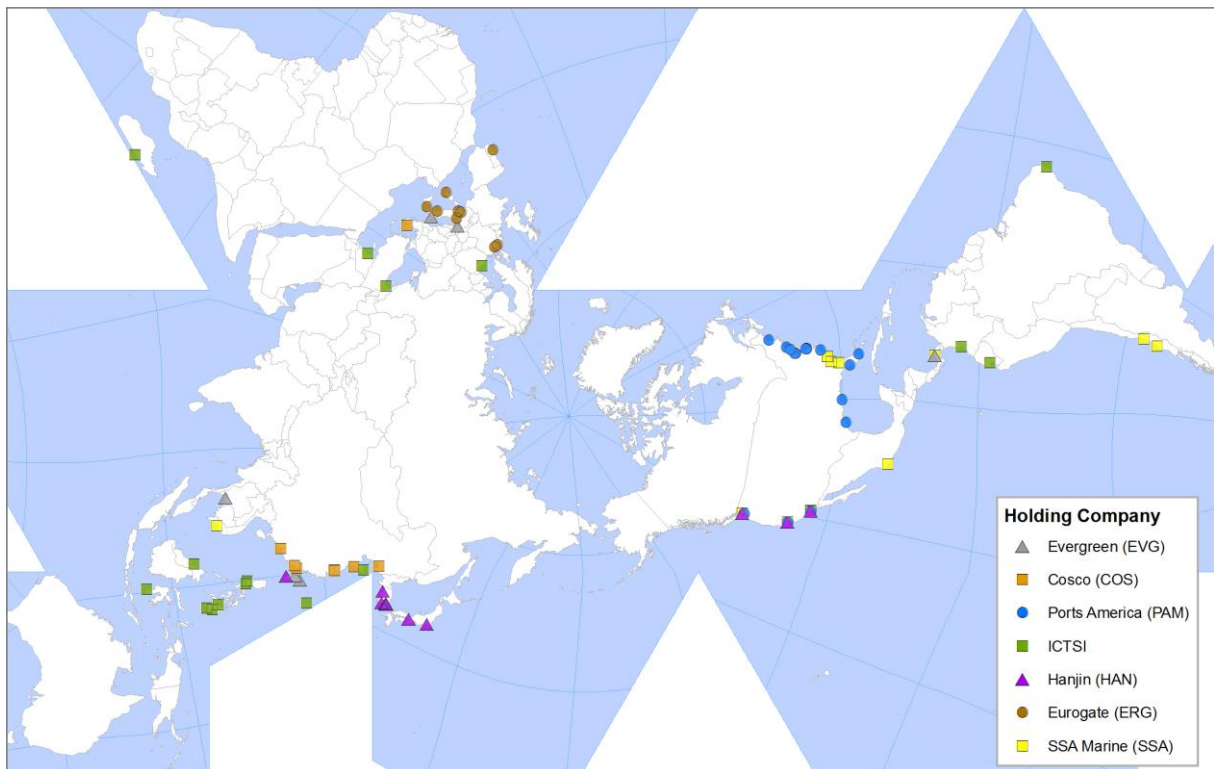
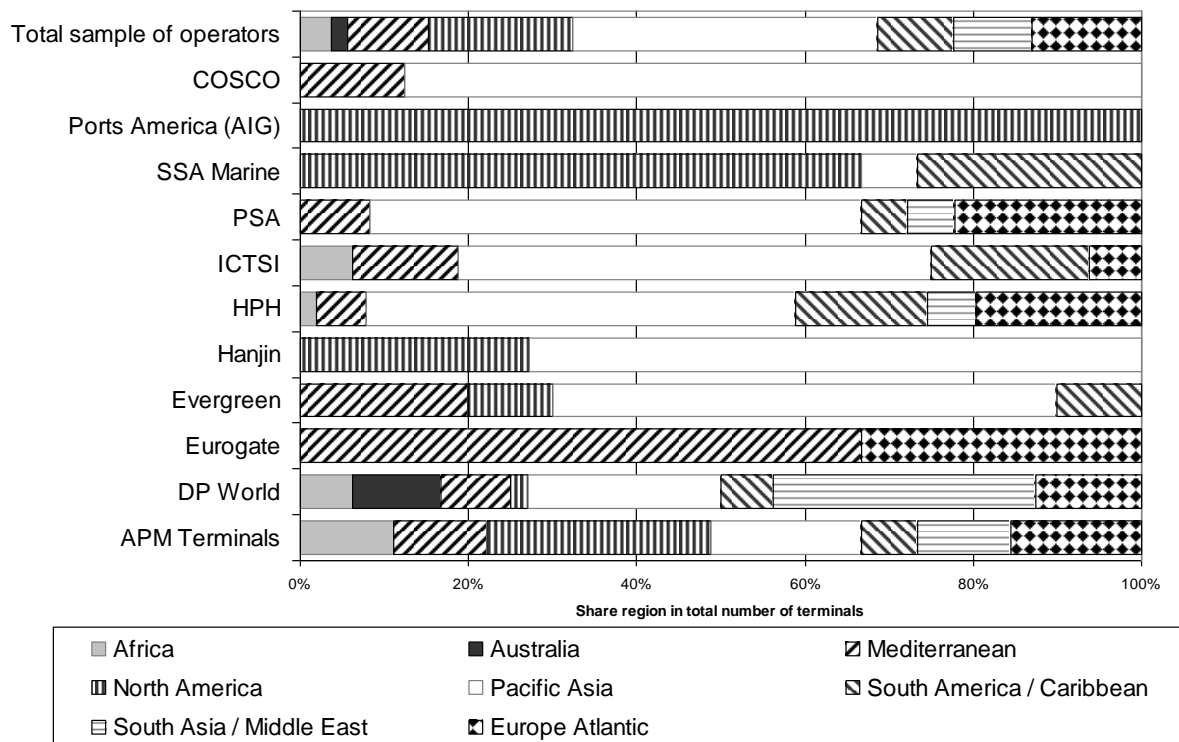


Figure 6 reveals a substantial geographical diversity of terminal assets for the four major holdings. DP World and APM Terminals have the most diversified portfolio of terminals in terms of geographical spread and can thus be considered the most “global” of the global terminal operators. However, a level of regional orientation is already evident at this level. APM Terminals does not have a presence in Australia, while DP World has only a very small presence in North America (CenTerm in Vancouver). PSA has no direct presence in North America, but has Latin American assets, as well as HPH.

Combining figure 1 and figure 6 provides further insight. Both HPH and PSA seem to prefer the control of large terminal facilities since terminal operations is the core of their activities. They were actively involved in the development of large export-oriented port facilities in Pacific Asia. APM Terminals tends to have comparatively smaller terminals, underlining a strategy leaning more on global market coverage to support its sister shipping company Maersk Line. DP World has also a small hectare portfolio comparatively to its sizable number of terminals in which it has the largest equity (51). This underlines an aggressive growth strategy aimed at acquiring existing terminal assets, many of which in lower volume markets having a strong growth potential (e.g. the Mediterranean, South Asia and the Middle East). The first step for DP World is thus to acquire existing terminals and then undertake modernization projects to make the port terminal more productive. Many of the DP World investments are found in secondary port regions, as most of the ports in these regions have undergone extensive privatization or corporatization processes in the last two decades. The governments in these countries are often prone to grant access to global terminal operators with the goal of significantly increasing port productivity.

The strong global character of the largest operators is a bit in contrast with the regional orientation of smaller holding companies (Figure 7). Two in particular, Ports America and Eurogate, are strictly regional operators. Others are embarking into a substantial transnational strategy, mostly by securing concessions at smaller terminals. The above observations are confirmed when the regional share in terms of terminal hectares is tabulated for each of the port holdings in the sample (Figure 8).

Figure 8. Share of regions in the total terminal portfolio of the global terminal operators (based on number of terminals in 2009)



Source: own elaboration based on companies' websites and specialized press

PSA, HPH and Cosco Pacific are among the leading terminal operators with a very strong Asian presence. In contrast to PSA and HPH, Cosco Pacific has limited its European interests to the Mediterranean. Ports America is only present in North America. This is understandable given that the company, owned by American International Group / Highstar Capital, purchased the American assets of DP World in late 2006 after a political debate on the 'dangers' of having Dubai interests controlling the former P&O Ports terminals in the US. SSA Marine relies strongly on its American terminal network (both North and South). Eurogate, founded by German company Eurokai and Contship Italia, is a pure European player with most of its terminals in Germany and Italy.

The above findings are also confirmed when applying orientation indices (Tables 5 and 6). The orientation index compares the share of a given region in a terminal operator's total portfolio of terminals to the share of that region in the total portfolio for all terminal operators considered. A value of 1 indicates equality of actual values and the 'fair share' expected amount. Values above 1 for a given region show a greater than average presence of the terminal operator in that region and values below 1 point to a lower than

5.3 Equity Sharing Agreements and Finance

Various and complex *equity sharing agreements* representing different stakes in regional markets are a third dimension in the globalism of terminal operators as they are linked with expansion strategies to reinforce a presence in existing markets or to expand into new ones. Figures 2 to 4 illustrated that these complex arrangements lead to highly complex market structures at a regional level. Even the largest operators commonly have regional stakes in others' assets, such as PSA's 20% stake in HPH. The common pattern is however a global terminal operator acquiring a stake in a local or regional operator, beginning the process of integrating the terminals into the existing network. This enables to keep existing local expertise and customers while mitigating foreign control concerns. Such transactions are commonly implying terminal expansion projects so that the terminal asset can increase its revenue generation through performance improvements. When entering a local market, global terminal operators can also opt for maximum control through acquisition. Last, but not least, the relationships between the terminal operation industry with *global financial institutions* also reveal a sector with a strong global emphasis that has been particularly successful in recent years at securing financing for capital investments. Terminal operators are as much perceived from an asset management perspective (ROI) as they are from a functional perspective (terminal operation). Global finance and global container terminal operations are thus intractably linked with interdependent leverage; the port holding uses finance to leverage its capital investment opportunities while financial institutions are using port holdings to leverage their rate of return as well as the book value of their assets.

6 | Going beyond terminal operations: integration strategies in the hinterland

The rise of and diversity in global terminal operators is having a structural impact on the port industry. Olivier (2005) and Olivier and Slack (2006) argue that the emergence of global terminal operators required a reconceptualisation of the conventional port as a fixed and spatial entity to a network of terminal operating firms under a corporate logic. This reality also puts the role and function of terminals in a new perspective. Heaver (1993) asserts that terminals rather than ports are adversaries in the competitive struggle between ports. Robinson (2006) underlines that terminals are in essence through locations or elements in logistics pathways from sellers to buyers. The value creation process of a terminal is thus linked to the specific attributes of the supply chains that run through the terminal and the logistics network configuration in which the terminal plays a role. Rodrigue and Notteboom (2009) refer to a terminalisation process in supply chains with a more active role for terminals and terminal networks in shaping global logistics path solutions.

As terminal operators are urged towards a better integration of terminals in supply chains and shipping lines are acquiring container terminal assets worldwide, leading terminal operating companies are developing diverging strategies towards the control of larger parts of the supply chain.

The door-to-door philosophy has transformed a number of terminal operators into logistics organizations and/or organizers/operators of inland services. Not every terminal operator is integrating by acquiring or setting-up separate companies or business units. In many cases, effective network integration is realized through better co-ordination with third-party transport operators or logistics service providers, a strategy known as hinterland access regimes (Van der Horst and De Langen 2008). The services offered include warehousing, distribution and low-end value-added logistical services (e.g. customizing products for the local markets).

Particularly in Europe, a number of terminal operators have integrated inland terminals in their logistics networks or have a direct involvement in rail and barge operations (Notteboom 2009; Rodrigue and Notteboom 2009). Maersk Line wants to push containers into the hinterland supported by its terminal branch APM Terminals and its rail branches. HPH-owned ECT in Rotterdam has followed an active strategy of acquiring key inland terminals acting as extended gates to its deepsea terminals, e.g. a rail terminal in Venlo (the Netherlands), DeCeTe terminal in Duisburg (Germany) and TCT Belgium in Willebroek (Belgium). DP World is following a similar strategy working in partnership with CMA CGM to streamline intermodal operations on the Seine and Rhône axes, while the large terminals of Antwerp Gateway (open since 2005) and London Gateway (future project) are both linked to inland centres in the hinterland. Terminal operators can play an instrumental role in bringing together intermodal volumes of competing lines and as such create a basis for improved or even new intermodal services.

The globalization strategies of terminal operators are accompanied by the regionalization of their hinterlands in regions (e.g. Western Europe) where market situations and opportunities justify such a strategy (Notteboom and Rodrigue 2005). In other regions, global operators have been extremely hesitant to vertically integrate. Olivier (2010) identifies two main factors that hold back full vertical integration of operators. First of all, global terminal operators do not wish to enter business segments in which their own customers have a presence in order not to compromise their business relations. Secondly, in the case of Asian conglomerates, sister firms perform activities in other segments of the supply chain such that when taking a conglomerate perspective, the entire business group has involvement in all aspects of the supply chain.

7 | Conclusions

The last 20 years have seen the emergence of a truly global container port operation industry. Although this globalism is far from being uniform, the four major terminal operators (HPH, APM, PSA and DPW) have a strong globally-oriented portfolio, each with a specific regional orientation linked with its history and its growth strategies. Like many multinational corporations, global terminal operators are market seekers.

The corporate geography of container terminal operators underlines that they have played an active role in the standardization of management practices among different port locations, creating multiplying effects to the functional and operational benefits brought by containerization. Vertical and horizontal integration in the terminal and

shipping industry and a search for portfolio diversification among financial investors have contributed to the global expansion of port operators. On one side, maritime shipping companies went into the terminal operation business to help secure maritime traffic and the profitability of both seaside and landside operations. On the other, stevedore companies expanded their operations from their base port or region into new markets to diversify and replicate their business model, which is linked with terminal performance. Organic growth (new terminals) as well as mergers and acquisitions of existing facilities (and operators) were common strategies, in which terminal operators differ little from their manufacturing and retail counterparts in view of globalization.

Complex and geographically diversified portfolios were thus established in virtually every production and consumption market of the world. The container terminal has become a fundamental node in global freight distribution, with the managerial and operational expertise offered by global holdings an important element in its performance in terms of capacity and reliability. As such, their corporate geography underlines a global system of managerial and physical interactions that tend to be overlooked in light of the global supply chains they are embedded in.

Last, terminals and their operators are part of business cycles, implying that they grow until most business opportunities are captured and their rate of return declines. The fast pace of growth, mergers and acquisitions in recent years underlines that the industry may be close to achieve a level of maturity. If this is the case, the corporate geography of global terminal operators will shift from a system where the dynamics were oriented towards expansion to a system oriented towards rationalization, performance improvements and the search for niche markets.

Acknowledgements

The authors wish to thank Dr. Daniel Olivier of Transport Canada for his extensive and constructive comments on earlier versions of this paper.

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