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The impact of the Global Economic Crisis and its effect on Container Terminal Operators' Investment Strategies with a Special Focus on Country Risk.

by

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## **Abstract**

The past three years, the global credit crunch hit the shipping industry and the derived demand for liner and terminal services. Liner industry faces the worst years of its history, as the crisis reached the industry after the boom of the industry causing a fleet overcapacity and low freight rates which cannot cover even the operational costs of vessels.

Many liner operators in order to survive create alliances in order to share their costs and their risks. Aggressive cutting of liner operators' costs through slow steaming in order to reduce fuel costs, to use the additional capacity and reduce the lay-up of vessels as the cancellation of the massive new-orders wasn't tangible. Container flows in the ports declined and as a result container terminal operators were affected by that.

The crisis found most of the terminal operators in the middle of capacity expansion projects or with new capacity all over the world. The excess container terminal capacity in combination with the declined demand cost to the operators many operational and revenue losses.

The new reality for the container terminal industry required from its operators to revise and adjust their investment strategies according to the new facts.

The top-terminal operators like HPH, APM Terminal, PSA and DPW postponed or cancelled or continued their investment projects, in order to cut costs and to manage their capacity.

Behind the different decisions of each terminal operator there are reasons like the country risk, the risk analysis and the abandon value decision of terminal projects.

This dissertation analyzes how the crisis affected the investment strategies of container terminal operators during the crisis with a special focus in the country risk. The investment strategies of the top-terminal operators are going to present through a theoretical framework analysis.

Which terminal operators cancelled/postponed/continued their investments? Which locations were more attractive? Which were the reasons behind the review of their investment plans? In what kind of investments did they contribute in order to maintain their sustainability and keep their customers satisfied?

The case study of ECT Rotterdam can give a good picture of one the biggest terminal operators in Europe. Under the umbrella of HPH Group, which is the global leader port investor, operator and/or owner of port infrastructures, ECT is a very good example of terminal operator who continues its investments and finishing its capacity expansion plan of the Euromax Terminal, as well as, the development of its key inland connection with the new Delta Feeder Barge Terminal and the TCT Venlo Barge Terminal. Furthermore, innovation was and still is the competitive advantage of ECT's sustainability.

For ECT, as for the rest TOCs, getting out of the crisis stronger is the challenge of the current bad economic situation. In order to achieve that ECT concentrates on its customers demands and provide them the best service through a complete network.

The thesis concludes that the crisis had effects on the terminal operations in terms of volumes, throughputs, revenues, profits, investments, contracts etc. But, the good performance and the development projects of TOCs during the decade before the global crisis, helped enough most of the terminal operators, especially the sector's leaders to sustain and maintain their business.

During the crisis, top terminal operators faced the challenge to keep their sustainability by offering the best product to their customers. Customer was the main priority to the terminal operator's investment. Many opportunities for equipment developments, software upgrading as well as for terminal facilities were rose. The latter opportunity was addressing to the terminal companies with the capability to ensure the high capital investment.

Even though, terminal operators managed to maintain their business, their revenues and manage their cost through the review of their investment strategies. The postponement, the cancelation or the differentiation of their capacity expansion plan was the most efficient measure of container terminal capacity management.

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## **List of Abbreviations**

ASC	Automated Stack Crane
APM T	APM Terminals
ADPC	Abu Dhabi Port Company
AGV	Automated Gantry Vehicle
BOT	Build-Operate-Transfer
CAPEX	Capital Expenses
COSCO	China Ocean Shipping Company
EBITBA	Earnings Before Interest Taxes Before A
ECT	European Container Terminal
DDN	Delta Dedicated North Terminal
DFB	Delta Feeder Barge Terminal
DPW	Dubai Port World
GDP	Gross Domestic Product
ICTSI	International Container Terminal Services
ITF	International Transport Workers' Federation
M&A	Merger & Acquisition
ROI	Return On Investment
RTG	Rubber Tyred Gantry
TEU	Ten Equivalent Units
THC	Terminal Handling Cost
TOC	Terminal Operator Committee
TOS	Terminal Operation System
UAE	United Arab Emirates
UNCTAD	United Nation Committee of Transport and Development

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## **Chapter 1 Introduction**

### ***1.1 Background and Objective***

The current economic downturn, which started at the end of 2007, affected the international trade. Shipping, as a derived industry, was hurt by the crisis badly. Especially, the sector of liner shipping faces the worst days in its history. The low demand for container transportation, as a result of the recession, combined with containership overcapacity of the previous good years, implied a bad performance of global terminal operators.

The demand for container terminals is derived and depends on liner operators' performance, as they are their customers, and on the demand of the main container trade routes. The imbalance of container flows influences the investment strategy of terminal operators and made them revise their projects. The current recession changed the picture of global trade volumes sharply and as a result, the container trade started to shift from head-haul to back-haul.

The new reality of liner industry drives container terminal operators to adjust their investment strategies in the new requirements of liner operators and in the new economic situation. All container terminal operators revise their investment plans. These changes in investment strategies have impacts not only on the terminal operator but also they have impacts on countries, where projects are planned to be realized.

The scope of my research is to recur in a theoretical framework the investment strategies, which global terminal operators implement against the crisis.

The main research questions are how terminal operators revise their investment plans during the crisis? Which were their investment strategies in order to maintain their business, their revenues and manage their cost, during the crisis? Which were the reasons that led container terminal operators to abandon, to postpone or to continue their investment plans? And which was the country risks where investment strategies were applied?

A case study on the European Container Terminal (ECT) in Rotterdam, which is a member of Hutchison Port Holding (HPH), is going to illustrate how HPH focus on the development of container terminal in Northern Sea by investing on the expansion of ECT network. ECT is a representative example of container terminal operator, whose investment strategies was the less affected by the crisis. Of course as all terminal operators ECT faced operational and revenue losses, but its strategy was focused on the capacity management of the terminal and on the enhancement of its performance. Innovation of its terminals plays a major role from the early age of ECT. Despite the crisis, ECT invested in innovative technology in order to maintain its sustainability.

The relevance of the topic to the business of terminal industry is the following: the global crisis affected all industries and especially, the transportation. The crisis effect in the liner industry was crucial for the container terminal industry as these two are related directly. The 70% of the global general cargo trade is carried by liner shipping and the terminal operators are responsible for the distribution of that trade to other transportation modes in order to reach final destination. A container terminal is a substantial part of the transport chain.

### **1.2 Research Methodology**

As the research will be based on primary and secondary data, the methodology of qualitative research will be used. In order to obtain a complete picture of investment strategies a case study on ECT Terminal will be used.

This case study provides us also with important information in order to answer all the important questions that come up in the container terminal industry because of the global crisis (Chapter five).

In addition, the case study is useful in order to make an analysis in a more theoretical framework about the investment strategy of the terminal operator, during the crisis.

Furthermore, the case study will present which reasons drive ECT to continue its projects and cancel some others? What were the benefits and the losses from the revision of investment plans on the company? Were ECT's investment plans affected by any country risk during the global recession?

Moreover, quantitative research will be used in order to gain information about: investment strategies of different players of the industry, throughputs of container terminals before and during the recession, as well as shares of total container handling, number of terminals and shares of regions in the total terminal portfolio of global terminal operators, capacity per year of the companies and capacity plans and financial analysis results (Chapter second, third and fourth).

The collection of the secondary data will be done from electronic databases of companies' sites, as well as from organizations sites and sites related to the operators industry and the liner industry, as [ect.nl](http://ect.nl), [drewry.com](http://drewry.com), [ela.net](http://ela.net), [worldshipping.org](http://worldshipping.org), United Nations statistical office, AXS-Alphaliner, *Cellular Fleet Forecast*, and more from magazines, newspapers and articles.

### **1.3 Thesis structure**

The dissertation consists of six chapters. In the first chapter, the introduction states the research problem, the objectives of the research and the research methodology, that will be used, will be stated. Following the introduction,

Chapter 2 describes how the credit crunch affected the global economy and the seaborne trade. As liner industry is derived to the international trade, the crisis had

inexperienced effects on liner operators. As the demand for liner services declined as it was expected the derived demand for container terminal services declined too.

The decrease of container volumes in port together with the fleet overcapacity as well as with terminal overcapacity made liner operators and terminal operators to reorganize their investment policies.

Next is Chapter 3, which analyzes the effects of the crisis on the container terminal industry and on how terminal operators reacted in order not only to survive by the crisis but to come out stronger.

The 4th chapter is focusing on the revision of the terminal operators' investment strategies in the current economic downturn. Different container operators with terminals all over the world or in a specific region canceled, postponed or continued their investments projects. Furthermore, this chapter is going to analyze in theoretical framework the revision of top-4 TOCs' investment strategies and the reasons behind their decisions. Moreover, a special focus on the reasons behind the review especially, the one of the country risk of the investment in a developing or developed country.

The 5th chapter is a case study on ECT Rotterdam and its investment strategies during the crisis. ECT as a member of HPH, a leader investor/operator/owner of port infrastructure, was affected less than other terminal operators by the recession. Investment strategies of ECT are very important as HPH focused on the development of Northern ports. ECT continued to invest on the Euromax project, as well as, on the TCT Venlo Barge Terminal and Delta Feeder Barge Terminal projects. Important key of sustainability is its services and its performance which can achieve through its complete network.

In Chapter 6 concludes and summarizes the main findings and answers in the questions of the research.

The main difficulties of that thesis were the fact that investment profits, revenues and costs of container terminals are very confidential and any of the terminal operators can provide them. That explains the lack of these data in the case study for ECT, the company's policy is quite strict on data of capacity, throughput, revenue, EBITDA and handled cargo.

#### **1.4 Literature Review**

According to Lincoln Flor and Enzo Defilippi (2003), the reduced tariff barriers in several Latin American countries during the 1990s have increased the relative significance of maritime transport costs in the final value of goods. Recent studies suggest that the maritime transport costs are determined, among other factors, by seaport efficiency, and that the current inefficiencies can act as a potential trade barrier. In their paper, "Port Infrastructure: An Access Model for the Essential Facility", Flor and Defilippi discuss the problem that rises through the increased private participation in the supply of seaport services in countries like Brazil,

Argentina, Chile, Colombia and Peru. Even though the participation of private sector improves the efficiency of these ports, at the same time it creates the potential loss of efficiency caused by the extension of the port operator's monopoly power to the competitive segments of the transport logistics chain. This occurs when a port operator tries to provide integrated services and therefore, incentives to exclude or discriminate against other firms. This paper analyses the main consequences on seaport efficiency of a model access to transport infrastructure recently introduced to Peru.

Eddy Van De Voorde and Thierry Vanelslander (2008) in their discussion paper "Market Power and Vertical and Horizontal Integration in the Maritime Shipping and Port Industry" describes the important role that shipping and port industry started playing in the logistic chain during the last decades. Port is an important node of the maritime logistic chain, this explains why terminal operating companies, shipowners, port authorities etc. trying to gain greater control over the chain, including through vertical and horizontal alliances, mergers and acquisitions. Shipping companies as the major customer of ports which attracts traffic and industrial activity. Terminal operating companies were merged or acquired by shipping companies because of working capital shortage. Shipping companies start being involved in the terminal operating business, not only to diversify their services but to ensure that the sufficient port capacity is available.

During 1996 and 2008, eight of the top-15 Terminal Operators Companies (TOCs) became subsidiaries of shipping companies with varying degree of independence. Vertical integration can provide better services, can obtain good financial results and can increase the market share of the merging groups in the terminal operating business. The question of their paper is how the industry will evolve in the future. How will the port and maritime players respond to the economic downturn? How will declining economic growth translate to the maritime sector? To what extent is the slowdown tangible in industrial output rather than in services? Will players currently operating within the port perimeter, such as terminal operators, be able to survive independently?

Following Antoine Fremont (2008), in his discussion paper "Empirical Evidence for Integration and Disintegration of Maritime Shipping, Port and Logistics Activities" only big players like A.P. Moller Group, China Shipping Container Lines, NYK Group and Orient Overseas International can own and operate port handling companies, intermodal transport and logistics activities of shipping lines. Big players like the above mentioned possess the capital, the know-how and especially the network that all these activities require. Door-to-door service requires co-ordination of the various links in the transport chain, particularly when there is a combination of rail/road and waterway/road modes.

Kap Hwan Kim and Hans –Otto Gunther describes how total container traffic volume between Europe and Asia doubled from 1990 to 1996, whereas in the same time total container flow between Europe and the Americas increased only 10%. As a

consequence the number and capacity of seaport container terminals increased. In addition, container terminals started replacing automated container handling and transportation technology, particularly in countries with high labor costs. As it is described in their article "Container terminals and terminal operations", container terminal operations as well as planning and logistics control issues of container terminals require huge investments. More efficient IT-systems and improved logistics control software systems, as well as automated transportation and handling equipment has increased significantly the productivity of container ports.

Takayuki Mori (2006), through his study "The study about a strategy of global container terminal operators" cites that the oligopoly by mergers and acquisitions (M&A) is not only a trend in liner market but also in the world container terminal industry. The study presents the condition of world container terminal industry, determine the TOCs classification by parent company and by management forms and describes the progress of the oligopoly in the container terminal industry through privatization, BOT (Build-Operate-Transfer) and M&A. The top-4 TOCs (HPH, PSA, APM T and DPW) had already started expansion of their terminals, especially at main trade lanes, like U.S., Europe and Far East Asia, in order to serve the high demand for capacity and in order to be able to serve the new large-size containerships (larger than 8,000 TEU). The construction of container terminal is not easy because of land scarcity and environmental issues particularly in developed nations such as U.S. or Europe. Investments on new or existed container terminals go to new areas of China, Turkey, Central and South America.

Martin Limer (2006), bigger container vessels and the large volumes of cargo originating from Asia required more terminal capacity. But social economic issues and environmental issues had resulted in either cancellations of the large scale investments in so called "Greenfield" terminal projects or renewed investigations on their ecological impact. In his article, "Beating congestion by building capacity: An overview of new container terminal developments in Northern Europe", addresses how container terminal investments in Northern Europe were developing and how the balance between the supply and the demand for terminal capacity in this geographical area would look like in 2010.

Of course, M. Limer hadn't counted the global recession and its impact on the container terminal industry. Before the recession, port and terminal congestion was a big bottleneck on the performance of terminals and extensively of ports. The solution was hiding behind the building of new terminal capacity. Many projects of Northern European container terminals' expansion were on the way when the crisis hit the shipping industry, as most of them were planned to increase the total handling capacity to 72 million TEU and the throughput of nearly 38.9 million TEU by 2010.

Theo Notteboom and Jean-Paul Rodriguez (2000) and Theo Notteboom (2007), Fernando Gonzalez-Laxe (2009) state that the liberalization and deregulation in line with the globalization transformed port operators' regional portfolio,

sometimes with a focus on a single port, to a multinational portfolio. The nature of the shipping transportation is multinational as it serves markets all over the world and container terminals represent the nodes within the global freight distribution system. As, Port-to-Port services replaced by door-to-door services, the maritime transport made shipping lines and port operators to focus on establishing a network of delivery and storage of both products and services in order to achieve economies of scale.

Value added services, general logistics services and value added logistic services are now included in the seaport services. The new trend of higher involvement in logistics and the integration with other means of transportation, as well as the entrance of liner operators in the terminal industry:

- established new trends as regards governance and public/private share in ports, and

- led to a greater concentration of terminal operators' market power which is comparable to that of the liner shipping industry.

In 2001, the volume handled by the top-10 TOCs amounted to 103 million TEU, for a market share of 42%, these figure had risen to about 220 million TEU and 55%, respectively in 2005. (The current European portfolio of leading container operators is on hands of Eurogate, Hutchison Ports Holdings (HPH), PSA, DPW and APM Terminals).

Notteboom (2007) expects that the top-4 players will maintain their lead over the other operators for quite a number of years to come as there are no really big companies left to acquire nowadays. Moreover, the shortage of terminal capacity in some parts of the world as well as high profitability levels enjoyed by terminal operators make existing terminals very attractive for investors. For that reason M&A activity is likely to continue in the coming years but on a smaller scale than witnessed recently. In addition, Notteboom cites that when it comes to takeovers of ports, terminals or terminal operators, more and more financial suitors like banks, hedge funds, private equity groups and investors are directly taking part in the bidding (he provides a list of the recent deals involving such players). Terminal operators try to get control and secure container terminal assets in strategic locations through a very active global investment policy.

At the latest edition of "The corporate geography of global container terminal", Notteboom and Rodrigue (2010) declares that during the economic crisis the EBITDA of terminal facilities have fallen but there are not yet any M&A in the industry to clarify the new benchmark. In addition to that, the authors expect that many investors will have to sell off terminal interests and this may create opportunities for those terminal operators and financial investors who have access to the necessary funds.

Before the credit crunch, TOCs invested not only on new facilities or expanding of existed ones but mostly on purchasing handling equipments (gantry cranes etc.) and on IT systems, which create scale economies. The most apparent advantages of having an elaborate network relate to cost savings (through economies of scale and scope) and a better product to the customer. Methods of hedging the risk of “footloose” transshipment business are: set up dedicated terminal joint ventures, long term contracts with gain sharing clauses between TOCs and shipping lines. Furthermore, vertical integration of the industry is vivid as the international supply chains have become complex. The crisis narrowed terminal operators’ investments on the equipment development and the IT systems in order to provide best quality services when the industry will have recovered.

Market players as shipping lines, forwarders, transport operators and logistic groups are vertically integrated in order to reduce costs, to improve efficiency, to generate revenue and to deliver value and a “one stop shop” service to the customer. Shipping lines, stevedoring companies or transport operators are now acting as forwarders and road hauliers have in many countries become professional providers of shipping lines or shippers’ inland distribution operation. The provision of integrated services does not always need to coincide with the ownership of related assets, the integration can be achieved also through close partnerships with other players.

Notteboom clarifies that hinterland connection of container terminals is very important for them in order to control large parts of the supply chain. TOCs have been engaged into logistics and inland transport by acquiring container terminal assets worldwide, two dominant examples in Europe are APM Terminals, which push containers into the hinterland as soon as the container reach the port with their strong carrier haulage focus of sister company Maersk Line and the rail services of European Rail Shuttle (ERS-also part of A.P. Moller/Maersk Group) and European Container Terminal (ECT) in Rotterdam, which is owned by HPH, is following an active strategy of acquiring key inland terminals in the hinterland, which serve as extended gates to the deep-sea terminals.

According to Notteboom (2007), the top-4 players ‘global expansion strategies try to keep a competitive edge by building barriers to prevent competitors or new entrants(container carriers, logistics companies and investment groups) in their domain. These barriers are based on building of terminals in selected strategic ports all over the world, providing a worldwide package to their customers and on advanced know-how on the construction and management of container terminals. Only, the big players with the deep pockets can meet the high capital requirements to cover initial investments in selected ports around the world, during the current bad market situation.

During one of the distinguished lectures of MEL Course, Chris Bourne (ELAA-European Linear Affairs Association), John Verschelden (Managing Director APM Terminal Maasvlakte II B.V.) and Jan Westerhoud (President of ECT- Rotterdam)

declared that the current recession was the worst for the history of liner shipping and various effects not only on the liner operators but also on the terminal operators.

At the end of 2006, the credit crunch that hit the world economy started showing up its effects in shipping industry at the end of 2007, one year later. Double digit growth of container volumes for the last decades made the industry to built ships, in order to cover the capacity shortage. As C. Bourne (2010) said: "In September 2008, the biggest economic crash the container industry ever experienced was come". The crisis had the following consequences in the liner shipping: collapse of freight rates, huge financial losses, 600 container vessels laid- up as new-buildings' orderbooks were full of new orders and new deliveries were made all the time as small number of vessels could be cancelled.

Furthermore, shipping lines in order to cut costs and reduce the overcapacity by using more vessels, in order to maintain the flexibility and reliability of their itineraries, they reduced speed (slow steaming) and start sailing via the Cape to save the Suez Canal dues. European trades to all over the world, came tumbling down. On the one hand, U.S. and Europe were living on debt and on the other China and Japan had huge balance of trade surpluses which were used to invest in Western countries. The effects of the global crisis couldn't overpassed the container terminal industry, whose demand is derived from the demand of international trade. The drop of containers volumes had consequences on the global container terminal operators, who were in the middle of expansion projects. TOCs had started building new container terminals and/or expanding the existed ones in order to meet the new larger vessel size and the extended demand for more capacity.

According to J.Verschelden (2010), the container trade has changed from head-haul (Asia to EU and US) to back-haul (EU and US to Asia). The first was dominant during 2000-2007 and the latter is on the scene from to 2008. Container lines were hit badly in 2009 with revenue and operating losses of billion USD, as freight rates reached the lowest levels and were not enough to cover vessels' operational costs. In order to face the current situation, liner operators do cash raise actions (cut fuel costs, sale shares, bond issues, government subsidies, loans etc.), press port operators and they have a preference for cheaper price over anything else. Global container volumes (in TEU millions) declined 13% in 2009. Asia's port throughput was the one that reduced less in comparison with the port throughput of Europe, North and Latin America, Middle East, Africa and Australia. The margins eroded for all top-4 container terminal operators (APM T, DPW, PSA and HPH) and TOCs reacted by revising their investments strategies.

Many TOCs' investment projects were postponed, canceled or shelved or even continued because of the global recession. TOCs reacted by adopting their expansion plans to the current market situation. Non financial developments more close to the basics of terminal industry and its common sense like people, safety, health priorities and environmental awareness will be the legacy of APM Terminal in order to come out of the crisis stronger.

Jan Westerhood, President of ECT in Rotterdam, is optimistic for the future of the container terminal industry; container volumes at the ports can grow in a lower rate than previously observed for several years. Shipping Industry needs more than 4 years to recover. ECT is member of the HPH, world's leading port investor, developer and operator. ECT operates Delta Terminal and Euromax Terminal at the Port of Rotterdam as well as key inland terminals, rail terminal and barge terminal in Venlo, DeCeTe terminal in Duisburg (Germany) and TCT in Belgium. Despite the crisis ECT continue to invest on its projects of Euromax Terminal, Delta Barge Feeder Terminal and TCT Venlo Barge Terminal, whose construction had started before the crisis. J. Westerhood believes that key factors within the bad current period are service and performance of ECT terminals in order to give to their customers what they want.

John Verschelden(2010), Jan Westerhood (2010) and Richard Mitchell (2009) (Chief Commercial Officer APM Terminals The Hague, Netherlands) claimed that the challenge of terminal operators, however is not to merely survive but to emerge stronger when the crisis has finally run out its course.

According to R. Mitchell (2009), the three priorities for terminal operators are: a) earn the customer, b) eliminate costs and c) ensure performance, as many port operators have scaled back capital investments. During, his speech R.Mitchell outlined that as the business is cyclical and building ports takes time the current slow period provides an opportunity to plan for the future.

Vitor Caldeirinha (2010), in his note "Ports and Economic Crisis- Future Structural Changes" which is developed from papers of A. Pallis, Peter De Langen and Theo Notteboom, Jean-Paul Rodrigue and Gustaaf De Monie, concludes that the crisis had different effects for the three different categories of containerized cargo: a) food, fruits, canned foods, beverages and dairy products, b) main driver of chemicals which intermediate goods used in the production of paints, automobiles, plastics, medical equipment among others and c) other intermediate goods used in the production of capital goods or consumption. The first category was affected less by the crisis as the global sales of food will remain stable even if supermarket brands switching to cheaper products. The second category which refers to the industrial production had declined as the demand for consumer goods, shipped to Europe, had declined, reflecting the reduction of stocks to reduce risk of logistics. The last category of intermediate goods related to industrial production was also affected by the crisis.

All the above can reassure the depth of the economic downturn in Europe. During the recession and for the immediate future terminal operators face an oversupply of capacity which is not going to be fully utilized for the next years, return on investment only through aggressive cutting costs actions. Liner operators are focused on major route, enhancing strategic partnerships in shipping and reducing the cost of logistics and ports. V. Caldeirinha (2010), in his note based on Notteboom and Rodrigue, states that the answer to lower container flow in ports is

the “foreland – based regionalization”. That means the integration of ports in the hub of regional transport networks, through the hub to act as intermediary ports hinterland.

Liner states that operators are more likely to work together with port operators in order to improve the use of investments, reduce costs and focus on the efficiency of terminals instead of building new terminals. Port Authorities are pressed to reduce port costs and port charges, some ports have freeze their tariffs or have temporary lower prices. In addition, V. Caldeirinha (2010), in his note refers based on A. Pallis that liner operators, banks, investment groups are not any more interested on investing in container terminal industry and some countries (France, Italy) ports asked for government help, such an intervention can disrupt the balance between the competing ports and lead to excessive public financing in the port sector in Europe.

During recession, M&A are not preferable as between 2005 and 2007 and before, because the flow of containers slowed down and that immediately meant that container terminals were not any more very liquid assets, so financial agents couldn't take into account a substantial factor (quick liquidity of assets) for the acquisition of container terminal company. Moreover, port authorities and governments had set high rent prices for the container terminals and the expected return on investments, as well as the net IRR of projects were overvalued. That has as a result large investment and acceptance of excessive risks from the part of private operators. The crisis left many terminals without customers, ships and cargo. The current purchase price compared with EBITDA is 8-12 times instead of 14-25 times (2005-2007) for the acquisition of terminals.

Martin Allison (2009), Managing Director of HPH Sweden, in his presentation the Baltic Ports Conference 2009, cited that HPH Group handled a combined throughput of 67.6 million TEU worldwide. The groups' investments are focused in the Northern Europe. M.Allison refers on the problem of container terminal overcapacity that the crisis created and also to the fierce competition between terminal operators in Hamburg-Le Havre range ports and to the pressure on tariffs and rates. His presentation includes a case study on ECT at Rotterdam. M.Allison refers to the strategy of ECT in order to react at the recession. ECT was focused on capacity management through 3 ways: 1) resource management, b) operational performance and c) hinterland strategy. ECT invested on these three in order to merge stronger after the crisis. For M. Allison capacity management is the key for TOCs to handle the downturn.

Francisco Javier Ramos-Real and Beatriz Tovar, in their paper “ Productivity Change and Economies of Scale in Container Port Terminals”, they present the productivity of Spanish port terminals in order to evaluate the effects on the industry of operational and regulatory reforms enacted in the 1990s. The technological innovation is a very important factor for the sustainability and competitiveness of a

terminal port. Port terminal costs and cargo terminal handling play a characteristic role in the performance of a port terminal especially in a recession period.

Claudio Ferrari, Marco Percoco and Andrea Tedeschi (2010) in their paper 'Ports and Local development: evidence from Italy' describe the importance of port infrastructures, as ports are considered particularly strategic because of the increasing importance of maritime transport in connecting territories. The above paper focuses on the impact of ports on Italian provinces.

Pedro Carvalho, Rui Cunha Marques, Alvaro Fonseca and Pedro Simoes (2010) declared that the inefficiency of Iberian Peninsula seaports is influenced not only by mismanagement or lack of incentives but also by a harmful political interference, labour problems and/or low disposability to expand the seaports area. Country risk can be one of the most important reasons behind the inefficiency of terminal project.

Hercules Haralambides, Mohamed Hussain, Carlos Pestana Barros, Nicolas Peypoch (2010) in their paper "A New Approach in Benchmarking Seaport Efficiency and Technological Change" analyze the seaport efficiency and productivity growth in a sample of 16 Middle East and East African seaports in the period 2005-2007. Authors use measurements of both technical efficiency change (managerial efficiency) and technological change (investment). Although results are different among ports, most of the ports in the region demonstrate a worrying decline of technical efficiency (managerial efficiency), often in spite of positive developments in the adoption of new technology (investment). Regional governments are advised to assign the requisite political priorities, and any necessary budgets, to the development of their port sectors in the clear understanding that ports constitute the most important component of global supply chains which in their turn, are the sole facilitators of export led growth and integration of developing countries in the global economy.

Iris F.A.Vis and Hector J. Carlo (2010) cited that containerized trade market is growing rapidly with the uprising of the Far East. Container Terminals management needs to develop new planning and control technologies and needs to consider the option of investing in new types of technologies. Vis and Carlo's paper "Sequencing Two Cooperating Automated Stacking Cranes in a Container Terminal" is concerned with scheduling seaside and landside storages and retrievals in a stack with two cooperating automated stacking cranes working in a single block. New technologies investments are important for the sustainability of container terminals.

According to the Annual Review for Maritime Transport of UNCTAD, for 2007, 2008 and 2009 there is observed the liner industry through the performance of liner operators and container terminal operators, in terms of throughputs, traffic of the main sea lanes and strategies, during the years before and after the crisis.

Notteboom and Rodriguez in their presentation for the Terminal Operators Conference in Valencia (2010), through their topic "The ramifications of the crisis", they highlighted the current bad situation of the global economy and its reflections

on the seaborne trade and especially on the liner industry. In addition to that Notteboom and Rodriguez represented ways to face the future in order to maintain and develop the quality of container terminal port assets.

## **Chapter 2 The effects of the credit crunch of 2008 on the global economy and the seaborne trade**

The aim of that chapter is to interpret how the global economic crisis reflected into the seaborne trade and consequently into the liner industry. The liner industry includes the liner operators and the container terminal operators.

The demand for liner operators, who are the main customers of container terminal operators, determines the derived demand for terminal operators. For that reason it is important to analyze first the impact that the global crisis had on the global carriers and subsequently to the terminal operators.

The credit crunch of 2007 to the present is the worst financial crisis since the Great Depression of 1930s. The credit crunch hit within a rapid world economic growth and had many bad consequences. The collapse of large financial institutions, the bailout of banks by national governments and downturns in stock markets around the world were some of the results of the credit crunch. In many areas, the housing market has also suffered, resulting in numerous evictions, foreclosures and prolonged vacancies. The current recession contributed to the failure of key businesses, declines in consumer wealth estimated in the trillions of US dollars, substantial financial commitments incurred by governments and a significant decline in economic activity. The global economic downturn had vital effects to every industry. Global merchandise export and seaborne trade, which are enablers of and are supported by, the world economic growth, have also recorded a solid decline.

### ***2.1 The seaborne trade before the recession of 2008***

As the demand for Maritime Transport is derived, the sector remains the backbone of the international trade with over 80 % of world merchandise trade by volume being carried by sea.

During the past three decades, the annual average growth rate of seaborne trade was estimated at 3.1 % (2008, UNCTAD). Although maritime transport has been associated with the carriage of high-volume low-value goods like iron ore, coal etc., over the recent years high value goods, like manufactured goods, carried by sea has been growing (2008, UNCTAD). The strong demand for consumer goods and the rapid industrial expansion in the emerging developing countries, like China and India, continue to drive the seaborne trade. Over 100 developing economies, included least developed countries and transition economies, derive more than 40 % of their export earnings from the export of their seaborne trade.

During 2006, over 70% of China's exports to Africa were manufactured goods, while approximately 60% of China's exports to Latin America were manufactured goods. As it is already mentioned as much as this kind of goods are carried in containers, global containerized trade has grown significantly and started having implications for the world container fleet and the global port handling capacity.

The annual report of UNCTAD for 2007 indicates that the global container trade was estimated to have been increased on an average annual rate of 9.6 % during the last two decades. According to the same resource, the share containerized cargo in the world's total dry cargo had increased from 7.4% in 1985 to 24% in 2006. Furthermore, the trade in manufactured goods, which in terms of value accounted for 72% of the 2005 world merchandise trade, was growing continuously. The growth of the global economy was reflected to the cargo flows between the major sea routes.

In 2006, the imbalance between the eastward and westward traffics had been seeing to deepen. That can be explained in million TEUs between Asia and United States where the containerized trade reached the 13.9 million TEUs when the trade for the opposite direction, United States to Asia reached the 4.6 million TEUs. The second major sea lane, between Asia and Europe reached 12.5 million TEUS when the opposite direction, Europe to Asia, reached 5.8 million TEUs. As far as for the third major sea lane, the transatlantic route, which links Europe with North America, had reached the 6.2 million TEUs.

The rapid growth of trade routes linking Asia, particularly China to North America and Europe, reflects the continued role of dynamic Asian emerging economies as an engine of global trade. Moreover, that growth highlights the impact of new production processes and delocalization from conventional production centers in the West to Asian developing countries.

The effects of globalization and changes in global consumption patterns are giving rise to new shipping flows and trade routes. In addition to East-West trade routes, North-South trades and South-South trades are growing, a fact that reflects in the latter case the new geography of trade and the role of emerging developing economies as industrial centers. The larger the trade routes linking North America and Europe to developing America were estimated at 5.2 million TEUs and 3.3 million TEUs in 2006. Containers flows between and within developing regions are expanding as a faster rate. For example, intra-Asia trade was estimated to reach 8.1 million TEU in 2006.

The volumes were expected to grow even faster with delocalization of production from China to less expensive Asian countries, such as Vietnam and India. Vietnam is developing and is characterized to be the small China, as big manufacturers started to relocate their businesses there in order to reduce their cost.

Vietnam's attractions as an alternative sourcing nation to China and India, attracts investments in its ports and logistics sectors and the phasing-in of direct call services on routes such as the transpacific, helped raise Ho Chi Minh's box throughput by just over 3%. According to J.Fossey (Lloyd'sList2010), further developments on this front should result in a much stronger rate growth in 2010, with Vietnam among the countries expected to lead the world out of recession.

In November 2006, 48 African countries signed trade agreements with China for South-South containerized trade, with China importing raw materials and Africa importing consumer goods from China.

Between 2000 and 2007, industrial production in India, Brazil and the Russian Federation has been growing at a rapid pace compared with the United States, Japan and European Union (2008, UNCTAD).

The above trends show that liner shipping was boosted through the last decades not only from developed countries but also by developing countries. Liner shipping plays a fundamental role in the build and development of new areas. Furthermore, not only the transportation of raw materials, intermediate materials or final consumer products are important for developing countries but also the infrastructure of their ports and their hinterland connection are integrals for the economic growth of a country. Maritime transport has been associated with the carriage of high-volume low-value goods like iron ore, coal etc., but over the recent years high value goods, like manufactured goods, carried by sea has been growing (2008, UNCTAD). As it is already mentioned as much as this kind of goods are carried in containers, global containerized trade has grown significantly and that requires a doubling of the container handling capacity.

In 2007, the world economy and the merchandise exports grew at a firm rate where the dynamic emerging developing and transition economies continued to set the pace (2008, UNCTAD). The economic growth and the trade growth had driven the firm demand for maritime transport, which led to further growth in seaborne trade. The world economic growth was driven by strong performances recorded by emerging developing economies including China and India. Due to globalization and international integration, the emerging developing economies and the economic conditions in developed economies will likely continue to impact other parts of the world. The seaborne trade was estimated at 8.2 billion tons of goods loaded, a volume increase of 4.8% over the previous year. In 2007, Asia was still predominating with a share of 40% of the total goods loaded by region followed by the Americas, Europe, Africa and Oceania.

Simultaneously with the container trade growth there was also an expansion of the port handling activity. The transshipment share in the total container port throughput grown from 10 % in 1980 to 27 % in 2007, that had as result the container port throughput was more than three-fold the volume of the trade. At that point, liner carriers had to address the imbalances and implications for empty containers. The larger the imbalance, the greater the empty container incidence is the more significant the costs resulting from related operational challenges.

In the last quarter of 2008, the decline of the world merchandise trade has as a result the slower growth of the international seaborne trade with a rate of 3.6 % (4.5 % in 2007). The developing countries remained the major loading areas followed by

developed countries and countries with transition economies. The last years, developing countries have increased their imports.

The growth of dry bulk trade is estimated at 4.7 % compared with 5.7 % in 2007. The container trade had the sharpest deceleration in terms of volumes (tons), as its growth rate fell from 11 % in 2007 to 4.7 % in 2008. In addition to these, the recession has affected the oil trade, including crude and oil products, declines recorded in the trade of liquefied trade.

## ***2.2 The effects of the global recession on the liner industry***

According to the Annual Report for Maritime Transport of UNCTAD, in 2007 the Asia- Europe route overtook the Asia-North America route as the largest containerized trading lane (2008, UNCTAD). The trade between Asia and North America characterized imbalanced as the demand for commodities declined. The global housing bubble and the consumer welfare were affected by the crisis. The main reason for the fall in United States was the drop of the import demand especially for housing market inputs like furniture, sanitary, plumbing, heating equipment and mineral manufacturers. The drop in United States imports from Asia has been offset by exports to Europe, driven by an increased demand and a weaker US dollar. The demand didn't increase only in the traditional industrial economies of Northern Europe but also in fast growing Eastern European countries and transition economies like the Russian Federation. Another reason for the decline of container flows in the transpacific route was the capacity constraints of the United States West Coast ports. Over the recent years the congestion on the US West Coast ports led shippers to increasingly seek alternative routes and shift volumes to East Coast ports. The sea trade route of Asia-US was estimated at 15.4 million TEUs, a positive increase of 2.8 % but dwarfed by rate achieved in 2006.

Despite of the Asia-US trade slowdown, the backhaul trade, United States to Asia, grew at a lower rate, reaching at 4.8 million TEUs. For the transatlantic route linking Europe and North America was increased to 7.1 million TEU. That increase was driven by the falling US dollar and the increased exports from US who had as a result a growth on the eastbound containerized volumes. In 2007, a total of 2.7 million TEUs were shipped from N.American ports to destinations in Europe.

In the same year, the total containerized trade between Africa and Europe, the United States and the Far East, increased by 10.7 % to reach 5.1 million TEUs. As far as for the Middle East containerized trade flows with the United States, the Far East and Europe totaled 8.7 million TEUs. The container trade, between the Latin America and the Europe, the Far East and United States, increased by 6.1 %. Containerized flows between Oceania and the Far East, Europe and United States increased by 6.9%. The rise of emerging trade routes between North-South and South-South highlight the potential for further expansion both in terms of geographic scope and composition of trade. The South-South trade plays an important role especially with the potential for some conventional bulk commodities and raw

materials, which are the mainstay of developing countries' trade to become «containerizable».

In the end of 2007, the growth in the world economy and the global merchandise exports decelerated because of the global recession. The demand and the production were reduced and that had as a result of lower trade levels and an undermined growth of seaborne trade (2009, UNCTAD). The sea trade became uncertain because of the adverse loop between the financial sector and the real economy. The global downturn, which started from United States, was led by the developed economies, with their GDP growing by 1 % in US and less than 1% in the European Union.

On the other hand, developing economies and countries with economies in transition were also affected by the downturn. China, which was responsible for the global economic and trade expansion could not afford the effects of the recession when its main partners have already entered the recession. The inter-dependent and globalized economy had caused the rapid spread of the economic downturn. The credit crunch made the trade finance difficult and expensive, while global supply chains have acted as a conduit for economic downturn. The growth in international seaborne trade continued to grow at a slower rate of 3.6 % as compared with 4.5 % in 2007.

In 2008, the world total containerized trade was estimated at 137 million TEUs, an increase of 5.4 % over the previous year. Since the worsening of the global financial situation, the landscape for container trade has changed and the prospects became uncertain. Drewry Shipping Consultants (2007) forecasted that container trade would double by 2016 to reach 287 million TEUs and more than doubled by 2020 to exceed 371 million TEUs. This forecast hadn't taken into account the current recession, the abrupt in container trade volumes since 2008 and into 2009 made the realization of it unfeasible. Although the container trade in certain routes, including South-South and North-South trades, wasn't affected surprisingly from the economic downturn, the growth of container trade slowed down with a 10 % increase in volumes on non-mainlane East-West routes and 3.8 % on North-South routes. The transatlantic route, Europe- North America showed a positive slower growth of 1.5 % in comparison with 2007. The transpacific, Asia-North America, and Asia-Europe routes contracted on both routes.

In 2009, Asia continued to dominate with a share of 40% of total goods loaded followed by the Americas, Europe, Africa and Oceania. The sharp decline in demand for consumption goods, the fall in industrial production in major economies and reduced energy demand, especially in developed countries and the deceleration in seaborne volumes affected all shipping sectors.

According to Peter T. Leach (2010) after collapsing in the first half of 2009, between September and November 2010, the global container freight rate index of spot rates, which includes all surcharges, increased 6%, from \$2,160 per 40-foot container.

Drewry forecasted that average container freight rates, including fuel surcharges, will be about 15% higher in 2010 than in 2009. Based on the same source, cargo volumes and ocean freight rates are rising on Europe-Asia container shipping lanes, but the North Atlantic route is mired in recession. Moreover, the eastbound trade is booming when the transatlantic remains depressed. The Westbound Europe-to-North America shipments were down 7% in November 2010 from November 2009, while eastbound traffic was 12% lower.

### ***2.3 The measures of global liner operators against the global crisis***

The global sea trade was the last sector that was affected by the crisis but in the cruelest way. The demand for shipping transportation declined and caused automatically a decline to the freight rate, as the oversupply of capacity couldn't be balanced with the low demand. As the 70 % of the value of world international seaborne trade is being moved in containers, liner industry experiences the worst downturn of its history. The revenue of the biggest container carriers plunged 35 percent overall in the first quarter of 2009 compared with the same period in 2008. In 2009, it reported a revenue loss of 45 USD billion and an operating loss of 8 USD billion among the top-10 shipping lines.

The loss of consumer confidence in the developed countries, because of the economic crisis, had resulted in plummeting consumption of manufactured goods and consequently, in declining container trade volumes and lower freight rates at a time when tonnage supply were at the peak (2009, UNCTAD). A combination of lower freight rates, depressed trade volumes and tonnage oversupply provided additional reasons for ship-owners to rethink their strategies and reconsider their cost calculations.

Liner operators reacted against the world crisis through a number of measures. The industry was facing and still faces unprecedented low freight levels which no longer covered carriers' costs. Only by aggressive cost cutting liner operators could return to operating profit. Cutting cost through high pressure on port operators, through more cash raising actions and a very short focus on cash and a preference for cheaper price over anything else.

The most urgent for liner operators was their capacity management as the recession hit the shipping industry when global liner operators like Maersk Lines, MSC, and CMA-CGM had increased their global share from 32.4 % in 2006 to 33.1 % in 2007. Liner operators had mass of full order books placed in 2007 and 2008. New buildings for the reorganization of liners' fleets were on the way in order to cover the extended demand for capacity and achieve economies of scale. From 2000 to 2007, TEU capacity deployed on liner trades has more than doubled, it has risen from 5,150,000 TEU to 10,467,000 TEU, a 103% increase (2007, AXS-Alphaliner Report).

In addition to the new orders, some of the first bigger container vessels were coming to be received from Maersk Lines and MSC, vessels with capacity over 10,000 TEU.

The new trend for bigger and more sophisticated vessels came up at the same time with the global recession and the decreased demand for capacity.

The cancellation or postponement of new deliveries wasn't possible because of the contract commitments and penalties, despite the huge cost for the shipping yard. The only way to manage the over-capacity was through the laid-up, scrapping or sale of vessels; as they couldn't be fully chartered as the traffic in many sea trade lanes, like the transpacific, had declined.

In addition to the above mentioned liner operators slowed down the speed of their vessels in order to cut their costs. Through that measure, they increased their fleet requirement, they reduced their overcapacity, by using more vessels in order to cover their frequent itineraries and they reduced their emissions, too. In addition to these, the slow steaming increased freight rates and allowed more port calls because all of a sudden, more vessels were around. The use of 8,000 TEU vessels is more flexible as they can be easily filled than the 12,000 TEU. Asian voyages reduced to 4 from 6, weekly.

Furthermore, shipping lines start redelivering chartered ships to their owners, charter agreements didn't renewed. Another measure on behalf of liner operators was the reduction of transpacific loop, as the traffic for that route had declined. The requirement for better route planning was important for money saving and network optimization. In addition to that, liner operators cut personnel from their shore offices.

Meanwhile, global liner operators who owned/operated dedicated container terminals and railways or logistics companies start re-concentrating to their core business. This is an effective way to cut costs and become more sustainable to their business, as the current economic situation requires. Vertical integration requires high expertise and a huge network as well as high capital investments. Only liner operators with big portfolios and networks, like Maersk Line, COSCO, MSC, CMA-CGM can afford to operate separated subsidiary companies related to their liner businesses without having losses but profits by their operations. Otherwise, vertical integration for small companies is a factor of cost and not a factor of profit particularly in difficult economic times.

Apart from the above measures, liner operators re-organized their solvency by issuing bonds, share placements, capital injections through debt-equity swap, government subsidies and loans in 2009. Examples of these are Maersk line, the leader of liner industry, who issued 2 bonds worth 1.7 USD billion and a share placement of 1.6 USD billion. On the other hand, Hapag-Lloyd did a capital injection through a debt-equity swap of 2.6 USD billion and ensured the guarantee of the German government for a loan of 1.2 USD billion. Moreover, CMA-CGM were in discussion with the French government fund and a lending consortium in order to address its 5.6 USD billion debt and also the company put up for sale its terminal division, Terminal Link. MOL, NOL, ZIM and NYK continue to bond issuing too.

The global crisis changed the picture of mergers and acquisitions (M&A) of shipping lines which continued in 2007 and 2008 but on a much smaller scale than previously. During 2008 and 2009, M&A stopped in liner shipping but there are some expectations that a new consolidation wave might occur in the end of 2010, early 2011. The new wave of consolidation will aim at the take-over of shipping lines which are currently facing increasing financial difficulties. M&A can be pictured on the concentration of top-10 carriers who had a combined market share of 49.3% in January 2000 which climbed at 60 % seven years later (2007, AXS-Alpha liner Report).

The alternative strategy for M&A is the recent phenomenon of global shipping alliances. Through alliances liner operators can offer a global geographical coverage through cooperation, harmonization and dovetailing of their members operations as alliances don't set prices like conferences. Alliances have emerged to exploit economies of scope among otherwise competing operators such as vessel sharing, slot-chartering, joint ownership and/or utilization of equipment and terminals. In 2008, conferences were bounded in Europe but, still exist in other countries. In addition to their core business, liner operators had already integrated vertically in order to offer a complete network to their customers. This enlarged their investment projects and made them players into new industries like stevedoring, forwarding, logistic and railway businesses.

#### ***2.4 The effects of the global crisis on the container terminal ports***

The economic growth of the world before the crisis of 2007 has led container terminal operators to huge investments on new container terminals or on the expansion of existed ones in order to adjust their capacity to the extend demand for containerized cargo. Investment projects of huge initial capital were on the way when the credit crunch hit and caused the decline of the seaborne trade.

The demand for container terminals derives from the demand for liner shipping services, due to that a decline on the demand of one affects the demand for the other during an economic downturn.

The effects of the crisis on the container ports and on terminal operators were printed on the container port throughput which increased at rate of 4 % in 2008, a lower rate than 2007 which had increased 12.1 %. The effects of the crisis had not only an effect on the port volumes but also on revenues, as the high price/earnings ratio that some ports and terminal operators were experiencing in the years preceding 2008 have since decreased (2009, UNCTAD).

The liner operators' strategy of cutting costs is putting extreme pressure on terminal operators which fear that, with plenty of spare capacity around the place, established customers might be prepared to walk, for the right deal. Terminal operators can feel the pressure because for many years they have enjoyed returns on sales 5, 10 and even 20 times higher than those of the ocean carriers.

Furthermore, unlike the liner operators, container terminal sector remained highly profitable in the first half of 2009.

According to the annual review of Maritime Transport (2009, UNCTAD), in 2007 the world container throughput growth rate for developing countries was 14% with a throughput of 311 million TEUs, which accounted for almost 64 % of total world throughput. In the same year out of all 63 developing economies, 29 countries experienced a double digit growth in port throughput compared to 2006. The top-10 countries registering the highest growth according to the above mentioned annual review were the following:

Table 1: Top-10 Countries with the highest throughput growth for 2008

<b>Country</b>	<b>% Growth</b>
Libyan Arab Jamahiriya	81.7
Namibia	74.1
Panama	64.5
Lebanon	59.4
Vietnam	43.6
Yemen	34.4
Colombia	29
Chile	26.8
Dominican Republic	25.5
China	23.2

*Source:* Annual Review for Maritime Transport 2009, UNCTAD

Table 2 Top 20 Container terminals and their throughput for 2006, 2007 and 2008 (TEUs and percentage change)

Port name	2006	2007	2008	Percentage change 2007–2006	Percentage change 2008–2007
Singapore*	24 792 400	27 935 500	29 918 200	12.68	7.10
Shanghai	21 710 000	26 150 000	27 980 000	20.45	7.00
Hong Kong, China	23 538 580	23 998 449	24 248 000	1.95	1.04
Shenzhen	18 468 900	21 099 169	21 413 888	14.24	1.49
Busan	12 039 000	13 261 000	13 425 000	10.15	1.24
Dubai	8 923 465	10 653 026	11 827 299	19.38	11.02
Ningbo	7 068 000	9 360 000	11 226 000	32.43	19.94
Guangzhou	6 600 000	9 200 000	11 001 300	39.39	19.58
Rotterdam	9 654 508	10 790 604	10 800 000	11.77	0.09
Qingdao	7 702 000	9 462 000	10 320 000	22.85	9.07
Hamburg	8 861 545	9 900 000	9 700 000	11.72	-2.02
Kaohsiung	9 774 670	10 256 829	9 676 554	4.93	-5.66
Antwerp	7 018 911	8 175 952	8 663 736	16.48	5.97
Tianjin	5 950 000	7 103 000	8 500 000	19.38	19.67
Port Klang	6 326 294	7 118 714	7 970 000	12.53	11.96
Los Angeles	8 469 853	8 355 039	7 849 985	-1.36	-6.04
Long Beach	7 290 365	7 312 465	6 487 816	0.30	-11.28
Tanjung Pelepas	4 770 000	5 500 000	5 600 000	15.30	1.82
Bremen/Bremerhaven	4 428 203	4 892 239	5 500 709	10.48	12.44
New York/New Jersey	5 092 806	5 299 105	5 265 053	4.05	-0.64
<b>Total top 20</b>	<b>208 479 500</b>	<b>235 823 091</b>	<b>247 373 540</b>	<b>13.12</b>	<b>4.90</b>

Source: UNCTAD Secretariat and Containerisation International Online, June 2009

Through the above Table we can extract the following assessments. China continues to dominate with the highest port container throughput, without including the port of Hong Kong, Chinese ports grew on an average of 6.2 % in 2007 to reach 103 million TEUs. In 2008, the Chinese port throughput grew to around 113 million TEUs. Since 2009, container throughput has fallen significantly, with ports in area Bohai Bay faring better than those in the south of the country. That happened because of the large number of factories located in the north-east China where labor and land costs are lower than in the south China, the development of intermodal links with internal provinces and the fast expansion of intraregional trade in the region.

In February 2009, Dalian, port of China, recorded its biggest fall in container throughput, a drop around 10%. In southern China, particularly around Shenzhen, container volumes fall by 21% in the first two months of 2009 that can be explained from the fact that Shenzhen ports' exports are more concentrated on the transpacific trade route, which was the most affected by the global crisis. In 2008, Shenzhen port achieved a growth rate of 1.5 % compared to 14 % of 2007. During the same period, the port of Shanghai faced a drop of 0.4% within a month, as the port handled 1.9 million TEUs in January dropped to 1.5 million TEUs in February. At

Ningbo port, China, the port throughput dropped to 1.4 million TEUs during the first two months of 2009, approximately 14 % down from the first two months in 2008.

Thirteen of the world's 20 leading container ports are located all in Asia and the rest 9 ports are located in developed countries of United States and Europe. China possesses 7 of the 13 container ports and the rest 6 are in Republic of Korea, Malaysia, Singapore, and Taiwan Province of China and in United Arab Emirates. In 2008, the container throughput in the above ports reached 247.4 million TEUs, which consists a rise of 4.9% from 2007. The busiest port in terms of total numbers of TEUs moves remained this of Singapore, growing at just over 7 % compared to 2007. The port of Shanghai maintained in the second place. Even though the port of Hong Kong had a weak growth rate of 1%, it managed to maintain the third place. In the fourth and the fifth places followed ports of Shenzhen and Busan with a growth rate of 1.5 % and 1.2 % respectively.

Furthermore, Dubai continues its steady upward climb of 11% growth rate as well as ports of Ningbo and Quanzhou moved both up four places reaching an increase rate of 20%. On the other hand port of Rotterdam fell by three places to ninth place because of its static throughput.

Qingdao remained at the tenth place with an increase rate of 9%. Ports of Hamburg in the eleventh place while transshipment for the burgeoning Baltic Sea states helped Hamburg and Bremenhaven boost their market share in recent years, they were hit hard but the distress in the eastern economies (2009, Cargo Systems). Kaohsiung port continued to drop and reached the twelfth place. Antwerp reached the thirteenth place. The port of Tianjin moved up five places because of its neighbouring location to Beijing, the main site for Olympic Games of 2008.

Port of Klang reached the fifteenth position and port of Los Angeles reached the sixteenth position. Long Beach had a 11% reduction in throughput at imports from Asia, which were cut back. Tanjung Pelepas, Bremenhaven and New York/ New Jersey traded places finished at eighteen, nineteen and twentieth places respectively. Port of Tanjung Pelepas (Malaysia), which has emerged as the second largest transshipment centre in Southeast Asia, Salalah (Oman) in the Middle East and the Suez Canal Container Terminal in Port of Said, Egypt, eastern Mediterranean, posted rises in their regional market shares. This was partly attributable to existing customers-liner operators-for example Maersk line-its sister company APM Terminals is the manager of the container facilities in all these ports.

The new reality of liner industry and the decline of port throughputs had consequences on the sector of container terminal operators. The terminal operators had to review their strategies in order to face the downturn.

## Chapter 3 The entrance of the container terminal industry into the global crisis of 2008

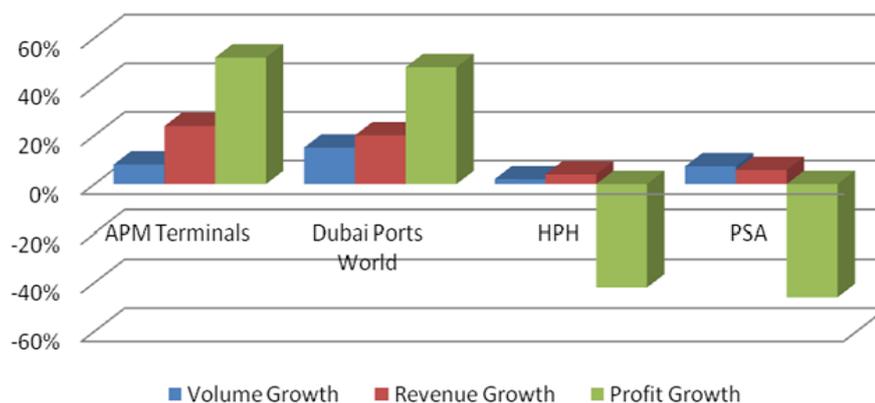
### 3.1 Effects of the global crisis on the container terminal industry

The difficulties of credit in 2008 and the subsequent economic crisis ended a period of growth that lasted more than two decades, during which ports have experienced volume increases of double digits. Annual growth was such that the concerns of congestion were the main focus in recent years before the crisis. The economic downturn reversed this picture.

All the kind of terminal operators had come face to face with the fiercest drop of container box volumes at the same time when additional container terminal capacity was given into operation or where on the way. The global container throughput volumes plummet by between 10% and 15% in 2009.

Container terminal industry is leading by four worldwide operating companies HPH, APM Terminals, DP World and PSA representing some 42% of total worldwide container handling and they had to face the crisis in order to maintain their market share and survive from the recession. As the demand for port is derived from the demand of international trade, which was affected, that led to an unprecedented reduction in the volume of ports, with implications on the strategies of port authorities, ship owners, stakeholders and especially terminal operators. As a result many terminal operating companies start reviewing their existing portfolios and investment strategies. In addition to the difficulty to secure funding for new projects or achieve growth through acquisition, terminal operators couldn't achieve even an organic growth because of the crisis and its impact on world GDP growth.

Figure 1 Global Terminal Operators' 2008 Results



Source: Drewry 2009 Annual Review of Global Container Terminal Operators

As it can be seen in the above figure the top four container terminal operators, APM Terminals, DP World, HPH and PSA faced some positive and negative results in terms of volume growth, revenue and profit growth. APM Terminals and DP World

have positive growth on their volume growth, revenue and profit in comparison with HPH and PSA which faced negative profit growth.

The reaction to the crisis differed from one terminal operator to the other according to their typology and market strategies. There were also effects on terminal operators' contracts, as many of them, which were agreed when the market was at its height, were changed, cancelled or postponed.

### ***3.1.1 The container terminal strategies prior to the global crisis***

The two last decades before the crisis, the globalization and the growth of demand for containerized transportation improved the efficiency of the sector but also increased the capital requirement to build, update and operate container facilities. The nature of the shipping industry is traditionally multinational not only in terms of ownership, but also in terms of the markets serviced and the spread of related assets. Apart from many shipping companies, the port operation industry has established true global liner service networks during the last decades.

The container terminal industry is an industry with increased proportion of fixed costs among total terminal operating costs, caused by ever higher initial capital expenditure on cranes, information technology and deepwater ports.

Container terminal companies have replaced their dominantly regional structure by a multinational portfolio. There is thus an emerging corporate geography in 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.

Container terminal operations have similarities with retailing as both markets servicing activities where accessibility is fundamental. That's why the hinterland connection is of the most important factors of a container terminal.

The trend of liner operators to invest on bigger container vessels, in order to create economies of scale and scope, led container ports to start investing for the development of many container ports in order to be capable to serve the giant container vessels. These giant ships of 10,000 and 12,000 TEU constructions were effecting changes in the ports industry, producing hub and spoke systems.

Ports were not any more just places where cargoes are loaded and unloaded, but places where value added services can be offered through logistics services. Ports are changed into large and complex nodes of the transport chain. The hub and spoke system demands a high level of synchronization between the ports and the various vessels.

Huge investments for the construction, expansion and reorganization of many container ports are done the last decades in order to serve and respond to the tense requirements of their customers – liner operators – who were aiming to offer a

worldwide coverage, expecting a continuously booming trade; ship-owners have commissioned large tonnage capacity keeping shipyards busy.

The need for the heavy capital investments has made governments and port authorities to start using the expertise and investment capability of internationally reputed container terminal operators to build, own and transfer (BOT) such container terminals for periods ranging from 25 to 50 years. The top-4 terminal operators, HPH, PSA Corporation, APM Terminals and DP World are representing some 42% of total worldwide container handling business.

Despite this global process of concentration among container terminal operators in most ports of the world, new concessions and new terminals were effectively leading to enhancing competition among port operators on a local scale. In fact, the growth of the global operators is partially the result of effective policy measures which, in turn, help enhance inter-port and intra-port competition and market contestability. In most countries, a fast growing market and increased inter-terminal and inter-port competition seem to have helped mitigate the potential impact of concentration among port operators.

Capital intensive projects for new container terminals all over the world were planned since 1996. The need for additional capacity and the development of the sea side as well as of the land side are the main focus of terminal operators in order to provide an efficient value added package of service. The role of the container terminal industry, as a node in the transportation and logistic supply chain, increases the need for a high quality performance of the terminal.

Terminal operators started to invest on capacity expansion projects and to enter into new business which was related to the port industry and especially the container terminal industry. Many global terminal operators acquired stakes of railway companies connected with ports where the operators owned or operated facilities in order to offer better hinterland connectivity. The competitiveness of ports is more than often a matter of operational efficiency and of quality of hinterland access.

Even though, China's economic growth and the increasing demand for containerized trade in all new markets of Asia, intra-Asia and India continues to drive the seaborne trade in a more measured pace; terminal operators have to balance expansion with productivity and reduce operating costs considerably if they wanted to deal successfully with the challenging year of 2010 (Port Strategy, 2010).

As far as superstructure investments, better cargo handling equipment and storage facilities may be needed. Improvements in cargo handling are a critical point in the transport chain because it benefits the flow of goods internationally. Most of the port developments which were taking place in developing economies, like China and India and in countries with economies in transition, continued unabated despite the global recession.

Apart from the seaside infrastructure, terminal operators had turned their interest into the landside services by developing their hinterland connectivity.

### **3.1.2 The container terminal strategies against the global crisis**

The changed economic situation meant that terminal operators have adopted a more cautious assessment of future prospects. While there was a lack of transparency about global operator plans as it remained a highly competitive business, press releases made clear that quite a number of capacity expansion projects were being shelved, deferred or cancelled and this at an unprecedented scale. Some terminal operators cut costs and trim their fixed costs by putting cranes out of use, laying off staff and slowing down expansion projects when, liner operators' demand is much more focused on low price and far less on flexibility.

In the rise of the global economic recession, terminal operators had to review and to adjust their strategies to the new economic situation in order to cut costs, increase efficiency and productivity and maintain a competitive advantage. First of all, they have to balance their economic results by managing and clearing their balance sheets. As they are in a complex situation, since their capacity cannot be reduced effectively and they have limited margins to expand their hinterlands. Terminal operators, like liner operators, show their pricing power to be reduced and many of them struggled to retain their value added activities.

Moreover, container terminal operators aim to create a better, more sustainable business model in order to face the challenge of exiting the crisis stronger and not just to survive. Sustainable business model can be also achieved through some non-financial developments such as higher productivity for serving larger vessels, profitability, social aspects like health and safety, citizenship and environmental awareness.

The main priorities for terminal operators during the current economic situation are a) the earning of the customer, b) the elimination of costs and c) the ensure of performance. The customer-liner operator- is the centre of the container terminal business.

The service of container terminal must satisfy the needs and requirements of the customer. In the high competitive environment of the liner industry, terminal operators work closely with the liner operators in order to optimize both their networks and cut costs through improved string efficiencies, lower costs and better access to markets.

The second priority, the reduction of costs is aligned with the need for cash flow and the maintenance of the operator's competitiveness. Terminal operators should adopt strategies which could save money through fierce cutting cost measures. Firstly, in order to cut their costs, terminal operators had to minimize their operating cost. Secondly, terminal operators should revise their investment plans and balance sheet actions to preserve cash flow (J.P.Verschelden, 2010). The cut of terminal operating

cost was achieved though different measures like every liner operator followed when the crisis rose in the liner industry.

In line with the above, some terminal companies cut their costs by reducing their personnel or follow the strategy of the early retirement like DP World has cut 5% of its staff and HHLA did for 60-100 employees in Hamburg (Cargo Systems, 2009). Furthermore, the Federal Employment Office (FEO) supported the short time work in order terminal companies to curb working time for large parts of the workforce for a period of 24 months. Another measure is also the shortening and transferring of a line's berth window from Sunday and Monday morning, this measure allows to the vessel to do its turnaround in one day instead of one and a half, while the liner operator can avoid the more expensive Sunday shifts. The temporary closing of some container terminals was also a method for cutting costs.

Terminal handling charge (THC) is another part of discuss as is an important factor for liner operators and their shippers as well as for the terminal operators. The relationship of terminal operators and liner operators for the handling charges differed within a port by trade route but, after the abolition of conferences in Europe, in 2008 the terminal handling charges were aligned with costs. TCH is a ratio to the freight rates and is variable over time depending on the state of freight rates.

THC is insignificant part of the pricing mix, but during low freight rates as in 2009, THC is a higher percentage of the total transportation bill. THC is usually a negotiable item between terminals and liner operators, at least for large customers (liner operators with high box volumes loaded/unloaded by a particular terminal operator) (EU Commission, 2009).

Some of the terminal operators in Northern Europe, such as Rotterdam and Antwerp reduced the box handling charges when some other local terminal operators like HHLA and Eurogate, in Hamburg, maintained their high box handling charges in order to face their massive fixed costs while the volume was reducing steeply. THC varies by container size in Asia and Americas, while in Europe charges are per container. Global terminal operators like Hutchison Ports Holdings (HPH), SSA Marine, DP World and ICTSI structure their pricing completely differently than local, national or regional operators. In addition to all these, the tough renegotiation of all supplier contracts revisiting concession agreements and taking a fresh look at labor costs. As an example, APM Terminals renegotiated the suppliers' contracts. As the trade between Asia and Europe is four times bigger than the other way around, freight rates goes up at the round Europe-Asia because container boxes are empty. In addition to these, ocean carriers were putting more pressure on terminal operators in order to cut costs. Particularly, liner operators were seeking user agreement changes, reduced tariffs and more value-added packages.

According to the third priority, terminal operators targeted to compose their team of employers with skills and the expertise to ensure the performance of the terminal

under every economic situation. That explains why many terminal operators invested on the education and training of their people (e.g. HPH, APM Terminals).

The crisis brought terminal operators face to face with a loss of \$US 20 billion because of lack of cash, under that situation the year of 2010 is and will be a difficult and challenging year (F.Kranenburg, 2010). The terminal overcapacity has made terminal operators less stringent on dwell times with cargo able to remain stored at terminal facilities for longer periods of time without penalty.

The strategy of terminal operators is focused on the maintenance of their sustainability through key factors like service and performance. High capital investments on infrastructures declined as the growth expectations and the expansion of capacity may not be necessary in the immediate future (V. Caldeirinha, 2010). Operators are trying to mitigate the downturn, through the cost reduction and the strong focus on efficiency and customer and the impact of the crisis on their profitability (Lloyd's List, 2009).

### ***3.1.3 The Review of container terminal investment strategies***

The effects of the crisis were more severe for container terminal operators compared with carriers, as terminal operators have enjoyed returns on sale 5, 10 and even 20 times higher than those of the ocean carriers. In addition to that, unlike liner operators, container terminal companies remained highly profitable in the first half of 2009.

When the consequences of the crisis became visible in the container terminal industry, the most important strategy for terminal operators was the capacity management of their terminal network all over the world in order to adjust the overcapacity of them to the declined global box traffic.

The expansion strategy of terminal operators depends on the type of terminal operator. There are three types of terminal operators, which lean on horizontal or vertical integration processes or diversification strategies. The capacity expansion of terminal can achieved through mergers and acquisitions of existing terminals or the construction or expansion of new terminal facilities.

The following Table 3 categorizes the different process of expansion strategy that terminal operators follow based on their type.

Table 3 Types of Global Port Operators

<b>Stevedores</b>	<b>Maritime Companies</b>	<b>Shipping</b>	<b>Financial Holdings</b>
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)	APM Terminal (Private), COSCO (Public), MSC (Private), APL (Private), Hanjin (Private), Evergreen (Private)		DP World (Sovereign Wealth Fund), Ports America (AIG; Fund), RREEF (Deutsche Bank; Fund), Macquarie Infrastructure (Fund), Morgan Stanley Infrastructure (Fund)

Source: Notteboom T., Rodrigue, J-P., 2010

Container terminals are special assets of liquidity, which, in a flourish economic period, can be liquefied immediately because of the high demand but, as an immobile asset, terminals can become easily illiquid assets if market conditions change (Rodrigue, Notteboom, Monie, 2009) as it happened in 2008 because of the crisis.

Prior to the crisis, the scarcity of land for terminal development, especially in developed countries, excellent prospects for container growth and high returns on investment (ROI), in many cases 15% or more, attracted many investors.

Terminal operators coming from a stevedore background (e.g. PSA) realized direct investments in their terminals for expansion and diversification. On the other hand maritime shipping companies invest through direct investment or through their parent companies on container terminals as a support function. Through their vertical integration, liner operators gain control of terminal capacity deployment allowing them to better deal with problems of vessel schedule integrity, prioritization of their vessels' handling and high schedule reliability.

Several financial investors like banks, hedge funds, private equity groups and investors with no or little knowledge of the terminal business coming from a new background and attracted by the growth prospects of the industry, they entered the industry in the period between 2000 and 2007. These investors were aiming at the diversification of their portfolio through terminal assets and their several value propositions like: a. the intrinsic value of terminals which is directly related to the traffic they handle, b. the operational value of terminals as they provide a source of income linked with the rent they generate, which in turn is directly proportional to the

traffic handle; the future traffic growth expectations result in income growth expectations and c. the risk mitigation value through the spread of terminal assets in different regional markets, particularly 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.

Apart from these financial investors, some shipping lines, who weren't sure whether they should established a specialized terminal company, they get into a joint venture with either a terminal operator or another liner operator. In a market where the world's shipping lines now deploy ever larger ships following ever tighter schedules that require fast turnarounds at a terminal, any port that fails to deliver the capacity will lose customers.

The years before the crisis, the demand for additional container terminal capacity and the investors' demand for financing new terminal facilities, as cargo projections were very positive and competition from potential investors intense drove port authorities/grantors of concessions and governments to set very high prices for their port facilities, especially the container terminals. Due diligence from the part of PA and governments became a formality and the expected net returns on investment and projects internal rate of return (IRR) were overrated as they were based on the belief that the container port throughput will continue to increase. In the table 4 are recorded all the purchases of port assets from global terminal operators and investor groups.

Table 4 Port Terminal Acquisitions since 2005

<b>Date</b>	<b>Transaction</b>	<b>Price paid for transaction compared to EBITDA</b>
<b>2005</b>	DP World takes over CSX World Terminals	14 times
<b>Early 2006</b>	PSA acquires a 20% stake in HPH	17 times
<b>Mid 2006</b>	DP World acquires P&O Ports	19 times
<b>Mid 2006</b>	Goldman Sachs Consortium acquires ABP	14.5 times
<b>End 2006</b>	AIG acquires P&O Ports North America	24 times
<b>Early 2007</b>	Ontario Teachers' Pension Fund acquires OOIL Terminals	23.5 times
<b>Mid 2007</b>	RREEF acquires Maher Terminals	25 times

Source Notteboom T., Rodriguez J., De Monie G.

In the above table, mergers and acquisitions (M&A) were boosted between terminal operators and other financial suitors taking place from 2005 up to the mid 2007, because of the high return on investments, the liquidity of these assets in a period of high capacity demand in contrast with the low capacity supply. Additionally, quite a number of terminal operators have taken shareholdings or increased their existing stakes in individual terminal businesses. Some traditional stevedoring companies decided to integrate horizontally through M&A, in order to counterbalance the consolidation trend in liner shipping.

In every M&A, the valuation of port and terminal assets has key importance for the investor. During 2005-2007, port companies were valued and paid for at EBITDA (Earnings Before Interests, Taxes, Depreciation and Amortization) multiples in excess of 20% times, which reflected the scarcity of land for terminal development especially in developed countries. That period was exceptional in M&A perspective as never before have so many major deals been closed in such a short space of time and at such high valuations.

The worst was that bidders of the terminal developments in order to be sure that they won't lose their project, they were ready to put themselves not only in huge investments and tariffs reduction, but they were also accepting excessive risks.

Since late 2008, the above scheme changed radically as the terminal operators and all the other financial investors. Container terminal industry became less attractive for investors, because of the cash flow problems that occurred from the bad economic environment and the fear for structural overcapacity in the market. The overcapacity led to a drop of tariffs and that consequently undermined the ROI of terminal investments.

Investments on the container terminal sector slow down as terminal operators, liner operators and financial institutions started to revise their investment plans in container ports globally. As a result, several terminal operators were trying to extricate themselves from expensive deals, often signed with onerous investment criteria and large cargo volume guarantees, when the market was strong.

Terminal operators started to re-plan their investment plans especially of their capacity expansion projects. When a terminal operator reviews its expansion investment project there are three options to abandon it, postpone it or expand it or contracted it.

The option to abandon a project may consist of selling the project's assets or employing them in another area of the enterprise. In either case, an abandonment value can be estimated, that value is the value of a project if the project's assets were sold externally or alternatively, its opportunity value if assets were employed elsewhere in the firm. Certain projects, however, have no external market value or alternative use, and for them the abandonment value is zero.

Funds should be removed or divested from a project whenever the project does not economically justify their continued use. In general, an investment project should be abandoned **a.** when its abandonment value exceeds the present value of the project's subsequent future cash flows and **b.** it is better to abandon the project at that time than it is to abandon it at some future date. When the ability to abandon exists, the worth of an investment may be enhanced.

On the other hand, the option to postpone the investment project is the one that the project does not have to be undertaken immediately. By waiting a company can obtain new information on the market, prices, costs and perhaps other things as well. However, waiting causes a firm gives up the early cash flows and, possibly, a first-mover advantage as well. When the firm makes the decision regarding a new product or service, management has the option to launch the product now or to defer its introduction. If the product is launched now, the company will realize cash flows earlier than if it waits. But if it waits, the company may be able to execute the launch more advantageously. As happens with others managerial options, the greater the volatility of possible outcomes, the greater the value of the option to postpone. In the case of a downturn period, the decision depends on the nature of the business. In our case, container terminal industry which is a volatile sector from its nature, especially under the high volatility due to the crisis, terminal operators postponed projects that was in the early stage of its completion (less than 50% completed) in order to gain cash flow and avoid the excess capacity.

The option of expansion or contraction of a project depends on the success of a firm's service. In the case of terminal industry, lack of capacity in the years before crisis was a problem, now the problem is the overcapacity of the terminals. The overcapacity is problem because of the imbalance between the demand and the supply of the international trade. The new reality made terminal operators to differ their investments. That means that some expansion projects completed or contracted in order to be adjusted at the new economic situation. Especially, projects in emerged regions like China, India and Africa where the demand for container terminal capacity is necessary for their economic growth.

The crisis created many purchasing opportunities of terminal interests which only terminal operators or financial institutions, with the right access to the necessary funds, could take advantage of. The most likely terminal portfolios which might become available were those owned by liner operators as well as terminal operators' portfolios, especially if they have overinvested in new or expanded terminal assets. With all container lines under severe financial pressure, and some bankruptcies expected, the sale of some terminal assets owned by carriers in the near future seems likely (Notteboom & Rodrigue, 2010).

The new benchmark for the value of port companies multiples for around 8-12 times EBITDA, but there has yet to any major M&A deal go through to verify these new levels on the market. It is declared then that the financing of large terminal projects has become a more difficult task than before. Notteboom and Rodrigue (2010)

underline that the consolidation process may have reached limits, they explain that most of the global terminal assets are already part of the portfolio of global terminal operators and moreover, diminishing returns are likely to play a view of growing competition and questionable future growth opportunities. Some industry observers even predict that M&A activity in the container terminal industry is likely to slow down significantly in the years to come as a result of the sudden excess supply of port capacity and the lower profitability levels enjoyed by terminal operators. Moreover, top-4 terminal operators will maintain their lead positions for quite a number of years to come, as there are no large companies or terminal assets left to acquire nowadays.

Apart from Mergers and Acquisitions, another way to acquire port businesses or at least a share of them is by buying shares in companies listed on the stock exchange like DP World, HHLA and ICTSI. As a result of the bad economic situation, the share prices of these companies have dropped markedly. Even though, this tends to overlook the earning power and resilience of these companies and suggests that they are undervalued. This may persuade some investors to acquire stakes in the near future, in the expectation that there will be a significant recovery of the share price over the next years.

The heightened risk of terminal project created disputes between the concessionaires which led to litigation. For that reason, many legal companies, like Holman Fenwick and Willian (HFW), set up a specialist Ports and Terminals (P&T) group. The group provides full legal services that cover all issues affecting the ports and marine terminals industry (Cargo System, 2009).

Terminal operators, such as DP World, HHLA and ICTSI, quoted on the stock market suffered as stock markets declined globally and the share prices of all these companies dropped markedly in 2008 and 2009, e.g. DP World faced a drop of \$ 0.18 on its share in March 2009 from its initial public offering price of \$ 1.30 in December 2007. However, this tends to overlook the earning power and resilience of these companies and suggests that they are undervalued. This may well persuade some investors to acquire stakes in the near future, in the expectation that there will be a significant recovery of the share price over the next few years (Notteboom, T., Rodrigue, J-P, 2010).

The global leader terminal operators like HPH, PSA, DP World and APM Terminals re-planned their investment strategies in order to cut their costs, to maintain their business, their revenues and to manage their capacity. Many of the terminal projects were cancelled, shelved or continued. Many vertical integration strategies of terminal companies have been stalled, as the attention was back on the seaport terminal operations. Many joint ventures started realizing between terminal operators and between terminals and liner operators in order to share risks and customers.

### ***3.2 Reasons behind the review of container terminal investment strategies***

Global investors base their investment strategy on exhaustive analyses of profitability, of operational efficiency and of growth potential. In addition to these, the ability to take firm control of the supply chain is a competitive advantage as it leads to a functional integration between transportation and distribution. Important factors are also the level of indigenous cargo (the higher, the better), a stable political and economic outlook and the potential increase in the valuation of the terminal asset.

The downturn made terminal operators to review their investment plans in order to survive from the crisis. Many capacity expansion projects, which were on fire when the crisis hit the liner industry, were abandoned, shelved or deferred. Back from the re-planning of terminal investment strategies can be hidden different kind of reasons.

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 advantage of global terminal operators is very visible in one market and is lagging in another. It is argued that the outcome of investment strategies of terminal operators are in large part confined by the “windows of opportunity” in specific ports or regions and the “critical junctures” in concessioning procedures (Notteboom & Rodrigue, 2010).

Like in any other business, container terminal investors are confronted with two broad categories: cost risk and revenue risk. Both cost and revenue risks have the same consequence if they materialize: the financial viability of the project will be endangered.

The cost risk of a terminal development can occur because the initial cost estimates for the construction and operational phase may be exceeded. Besides development costs, operating costs can be inflated by unforeseen regulation, for example stricter labor laws.

The revenue risk can occur when the realized revenues might turn out to be lower than initially expected. The container terminal revenues are determined by multiplying by the number of container units handled with the respective tariff charged per unit (handling rate). It is clear that revenue risk in container terminal projects is mainly defined by two probabilities, namely that the initial traffic predictions and/or the assumed tariffs will not be met in reality. The cost and revenue risk are the final consequence of a variety of risks connected to terminal projects. Some of those risks are related to the project itself (its development and operation) and others to the country in which it is undertaken.

All investments projects can face some kind of risks like the customer habits change, the appearance of new competitors or other factors outside of investor's control that can delay its project. Especially in the container terminal sector, the role

of risk is high not only because of the high initial capital required for the terminal facilities and equipment but also because of the customer decisions. If the customer-ocean carrier is not satisfied from the terminal service in terms of performance or pricing, he has the right to shift its volumes to an alternative terminal operator. In that case, terminal operator can have a big drop of its traffic volumes which put on a risk its business. If there is a recession the risk increases as the pricing of the terminal operators is that which counts in the decision of liner operator to use a terminal. Of course, there are terminals which unrivalled (e.g. Port of Rotterdam) which provide high quality of services in low prices especially in the crisis.

A way to predict these risks is the risk analysis and risk management that can help the investor to assess risks and decide what actions to take to minimize disruptions to its plans.

The risk analysis process includes four steps: **1.** The identification of some threats such as human, operational, reputational, procedural, project, financial, technical, natural, political and others, this step is very important as there is high probability to overlook important threats ; **2.** The estimation of the risk that means that the investor has to estimate the likelihood to of the threat being realized and to assess its impacts; **3.** The management of the risk, at that step the investor has to look at ways of managing the risk. This step requires special attention from the investor as he must choose a cost effective approach in order to eliminate the risk, as there is the possibility to spend more to eliminating a risk than the cost of the event if it occurs. Potential ways of risk management are within the use of existing assets, the contingency planning or the investing in new resources; and **4.** The review of the project's risk analysis.

The sources of container terminal risks can categorized into country risks, project risks and commercial risks. This thesis is going to focus on the effects of the crisis on the investment strategies of container terminal operators with a special focus on the country risk.

### ***3.2.1 The country risk as one of the reasons behind the review of container terminal investment strategies***

The *country risks* are mainly determined by political, legal and regulatory risks (T.Wagner, 2006/2007). Many ports around the world are managed based on the landlord concept. Landlord port authorities lease the land to private port operators on the basis of long-term concession agreements. Port concessions normally run for 25-30 years and thereby they exceed the duration of the political cycle. Under these circumstances, even if the government is considered stable, port policies and the relevant legal framework might change during the concession period. In addition to all these, the government can intervene for reasons of public service, security or environmental protection. The concessionaire has hardly any influence on such interventions and he cannot escape them too, since a port is by nature bound to its location. Regulatory risk can affect both the revenues and the cost of the

concessionaire. In cases where the tariffs are regulated by the public authorities without participation of the concessionaire, there is a potentially high revenue risk.

On the other hand, the cost risk can be amplified by changing port labor requirements, environmental and safety regulations as well as higher taxes or royalty payments. Another threat is that the government can block foreign exchange payments, since the dominant currency in shipping and terminal operations is the US dollar. Force majeure risks in the port sector are related to labor strikes, which are very usual during crisis. Forces of nature can be relevant in certain geographical locations. Also, general monetary risks refer to interest and exchange rates as well as inflation and are not atypical in port projects.

As the concessionaire is coming across with political, legal and regulatory risk during the concession period, he has normally no measures to prevent public interference. That is why he has to have effective means of compensation afterwards, by including detailed provisions in the concession contract that allow for renegotiation in case of legal or regulatory changes. In case that is necessary, dispute settlement and litigation should take place in a neutral jurisdiction. Moreover, regulatory and legal risks can be allocated to the government by means of guarantees, like tariffs and interest rate guarantees.

Other risks like political and monetary risks are relevant in developing and developed countries. In the case of political risks, the participation of influential multilateral organizations, as shareholders or lenders of the project, can make host governments refrain from any measures that could put the project in difficulty. In the case of monetary risks, terminal operators can hedge these risks, by using an offshore account for incoming payments. The constraint of that solution is that it must be accepted by the local authorities. In addition to the above risks, force majeure risks are not controllable by any of the terminal project parties and thus consequences should be evenly distributed between them.

In a volatile market, like terminal industry during the years of the crisis, country risk is one of the dominant reasons for terminal operators to re-think and reorganize their portfolios. Countries are becoming more protectionist after the crisis and this crucial for the terminal industry as it is going to come across with more strict and restrained legislation.

The government intervenes and imposes new legislation for the environmental protection of the areas where terminals operate. Regional and local legislation are toughest than IMO's legislation, especially for environmental issues. Terminal operators are trying to do business by being green in their business ("Greenfield" container terminals), through their environmental awareness.

The countries' currencies and the GDP impacted by the crisis and that affected the infrastructure investments. United States as the most responsible for the crisis, with its general monetary risk and the low valued dollar, the country doesn't represent a location good for terminal investments anymore, apart from the Latin America.

## **Chapter 4 Crisis Effects on container terminal operators' investment strategies with a special focus on the country risk**

### ***4.1 Review of top-4 container terminal operators' investment strategies***

The crisis of 2008 reached the container terminal industry in a period when, ambitious investment projects were on process or planned. In mid 2007, International Transport Workers' Federation (ITF) declared that all 4 big names of terminal operators HPH, PSA, APM Terminals and DP World were planning or they had already entered process of expansion developments of new container terminals or existed ones. Moreover, new or additional equipment were on process in emerged countries like China and India as well as in the US, Europe, Australia and Africa.

The strategy of terminal operators was based on the spatial expansion of their terminal in the view of an organic growth. While organic growth has certainly contributed to the rise of global terminal operators, their scope to achieve organic throughput growth is now inevitably being limited by the recession. The financial crisis made more difficult to secure funding for new projects, or achieve growth through acquisition. The viability of many planned projects had also been put into question by forecast reductions in container throughput growth levels.

Due to the crisis, port owners and terminal operators are willing to work together more than ever in order to improve the use of investments by maximizing the use of existing facilities without major investments in new facilities, reducing costs, focusing on the efficiency of the terminal, instead of building new terminals. Through joint ventures between terminal operators and local partners, terminals can set up successful operations within the confines of the local commercial, economic and regulatory environment. 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 (e.g. the case for PNCT (AIG) and MSC in the port of New York). The truth is that there are no real global partnerships between carriers and terminal operators, as the first 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.

Drewry Shipping Consultants and other analysts predicted that container volumes will not recover for at least until 2012 and some others believe it will be longer. The dramatic reductions in container box movements mean a long, drawn-out recovery period (Port Strategy, 2009).

Terminal operators cut their costs and managed their cash flow by revising their investment strategies. Many capacity expansion projects were deferred, canceled or postponed. Some terminal operators stopped capacity construction projects unless it was more than 50% complete, considered to be of utmost strategic significance or

the contract clauses were cast-iron and too onerous to amend or get out of. For example, HPH withdraw from its investment project in Izmir (Turkey), Thessaloniki (Greece) and Manta (Ecuador), APM Terminal canceled 6 projects and DP World suspended nearly half of its projects capacity expansion, including the London Gateway terminal, on the river Thames.

Moreover, other ways for capacity management are available including the disposal of shares in the concession and the possible conversion of a BOT deal into a lease model, which, for the terminal operator, preserves cash flow by allowing the company to pay in installments over the lifetime of the concession. The latter option is not easy as most concession agreements contain termination clauses. In addition to that, other partners of the concession might object to any sale of shares to another terminal operator or financial partner or want first right of refusal at a knock-down price. Similarly, the port authority or local government may have something to say on the matter, making any such deal protracted and costly.

In November 2009, Media Kit of APM Terminals declared that “the industry projections call for a doubling of global container port throughput from approximately 500 million TEUs in 2008 to 1 billion TEUs by 2020, even with the current global financial crisis affecting international trade levels severely. Much of this increased traffic will be generated in the developing nations where the infrastructure deficiencies are most acute such as India and the nations of sub-Saharan Africa and Latin America. Many national governments, notably China, have specifically targeted infrastructure spending as part of stimulus packages designed to prevent, or drive economies out of recession.” Even though, china’s listed terminal operators faced a significant decline in net profit, which forced them to put their merger and acquisitions plans on hold.

In 2009, the focus of terminal operators has been aimed at improving productivity and efficiency levels at existing terminals and spending any limited capital available on adding equipment and modernizing systems in readiness for the recovery. Terminal operators should try to take advantage during the down cycle, in order to be better positioned once the economy rebounds.

According to Michael Schwank<sup>1</sup> (Cargo Systems, 2009) terminal operators must ensure that the technology investment, like the upgrade of an unsupported of outdated terminal operating system (TOS), is timely and offers efficiency improvements to provide the desired return on investment (ROI). Most of the operators are finding the current bad economic period the most appropriate for the implementation of new technology for two reasons. Firstly, the potential distraction of the staff and disruption to operations may be significantly mitigated during low volume periods. Secondly, when the economy recovers, the terminal will be better prepared to handle increased volumes with the new system in place.

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<sup>1</sup> Michael Schwank is president of Tideworks Technology, a provider of software solutions and technology services to terminal operators and other sectors of the transport industry.

Many terminal operators turned their focus on non financing developments like safety and security and stricter environmental requirements.

However, the crisis creates opportunities for long term investment profits. Many investors who had the cash flow to invest in the industry, they focus on port terminals in the Latin America as well as in Europe. The investments are forced from the fact that the containerized flows are going to be realized through terminals, where the service level is high and prices are low. Moreover, the interest for this kind of investments is more intense in the case when the port has a strategic location and it is an important hub in the logistic chain.

## ***4.2 Investment strategies from the top-4 container terminal operators***

### ***4.2.1 Hutchison Port Holdings***

Hutchison Port Holdings is a subsidiary company of Hutchison Whampoa, which a Chinese company. HPH is the world's leading port investor, developer and operator, throughout Asia, Middle East, Africa, Europe, the Americas and the Australasia. The company also owns a number of transportation-related service companies. The advantage of HPH is that is a fully independent and not a state owned company, neither controlled by a shipping line. That gives the company the flexibility to invest where it thinks this fits best.

In 2009, HPH group handled a combined throughput of 65.3 million TEU worldwide in comparison with the throughput of 2008, which was 67.6 million TEU worldwide.

Despite the effects of the global crisis on Hutchison Whampoa 2008 profit, which tumbled 42 % as the economic crisis hampered growth at various businesses. The drop of the trade amid the global downturn restrained growth at company's massive ports and terminal operation, with total revenue rising only 4%. Even though, China's economy and stimulus measures would help cushion Hutchison Whampoa was facing the most challenging environment in recent times as growth slows in markets around the world and major economies struggled through recessions.

Although the unprecedented economic environment will have differing adverse effects on the group's various businesses around the world; all the group's established businesses are still expected to continue to perform satisfactorily. HPH declared that it will keep buying terminals, which are in prime locations and their price is right.

Since the start of the economic downturn, in December 2008, HPH increased its stake in Alexandria International Container Terminals from 38% to 50%. Even though the crisis, there are some bright points in the region of North Africa which offer new opportunities to terminal operators, even if they are doing so less aggressively than the past. In the first quarter of 2009, HPH reported an 8% drop in global throughput to 30.3 million TEUs, due to that the company start looking to cut costs and slow down projects.

In the beginning of 2008, HPH invested US\$ 200 million for the terminal in the port of Brisbane, which the company will lease for a period of 42 years under the subsidiary company of HPH, Brisbane Container Terminals. The port is Australia's third largest container port and plays an important role on the increasing trade activities between Australia and Asia. In May of the same year, HPH financed the project for the construction of the Felixstowe South Reconfiguration. The shortage of deep-water container terminal capacity at the region represented a good opportunity for the company in order to enable the first major port of UK to provide the much needed additional capacity for deepsea container operators. Moreover, HPH signed a concession agreement to operate the container terminal at Stockholm Free Port. The concession paved the way for HPH to develop new container handling facilities at the Port of Nynashamn, Norvikudden, 60 km south of Stockholm.

Furthermore, HPH get into a joint construction and development project of the Shenzhen Yantian East Port Phase I with Shenzhen Yantian Port Group (YPG). In order to optimize the use of resources and lower operational costs, Yantian International Container Terminals (YICT) will manage East Port Phase I along with existing facilities at West Port, Phases I, II, III and the expansion project of Yantian Port. The company also invested in the second phase of the Zhuhai Port project. HPH invests in the development of the region for over 15 years and it is aiming to develop the port into a leading international container shipping hub in South China. The terminal started to be fully operated in August 2009.

HPH focus in Northern Europe, in areas of Benelux/Germany, Eastern Europe, the Alps region/ N. Italy and Scan Baltic region. HPH operates a number of container terminals in ports of Northern Europe like Sweden, Netherlands, UK and Belgium. Dispute the crisis HPH continue and complete its projects in Netherlands, where it operates through its subsidiary ECT. In the fifth chapter of this thesis, the case study on ECT is going to give more details about the investment plans of HPH in Netherlands.

Furthermore, HPH started a giant share swap-shop with Nippon Yusen Kabushiki Kaisha (NYK) and the Evergreen group. Through these deals HPH become a majority shareholder of NYK's Amsterdam-based Ceres Container Terminals (CTE), while NYK had a minority stake in Europe Container Terminals (ECT) in Rotterdam. HPH changed CTE's name to Amsterdam Container Terminal (ACT).

In addition to that, HPH become a shareholder of the Taranto Container Terminal, one of Italy's top five container ports, while Evergreen group gained a minority stake interest in London Thames port and ECT Delta. The aim of these investments was that HPH would gain its first transshipment presence in the central Mediterranean area from Evergreen and strengthened its presence in Northern Europe, as CTE had a good hinterland and feeder connection. For NYK and Evergreen, the benefit was that they would be able to tap into HPH's network of European ports and port developed systems (Port Strategy, 2008).

In 2009, HPH and Huizhou Port Affairs Group Company Limited opened the first dedicated container terminal in Huizhou port. The project was one of the largest investment projects for HPH, since it began participating in the development of the port in 2005. The port is located close to well developed manufacturing hinterland. HPH complete the second phase of the Jakarta International Container Terminal (JICT) expansion program. The port is jointly owned by HPH and PT Pelabuhan II Indonesia.

The port of Jakarta is aiming at the capacity expansion of its container capacity in order to ensure Indonesia's export competitiveness in the future. In December 2009, PT Jakarta International Container Terminal signed with International Finance Corporation (IFC) a US\$ 70 million loan agreement to partially fund a US\$ 160 million expansion of JICT container terminal. IFC's loan comprises a US\$30 million loan for its own account, repayable over 7 years and a syndicated loan from HSBC of up to US\$ 40 million, repayable over 5 years. The loan proceeds will support JICT's 1 million TEU expansion through investment in 4 additional quay cranes, 18 RTG cranes, 30 head trucks and chassis together with the construction of 12 hectares of additional container yard plus associated roads, parking areas and administrative facilities.

The completion of JICT together with the completion of the new Jakarta Outer ring road will create a container terminal of a truly international standard. The remaining US\$ 90 million of the expansion project is funded out from HPH and its high valued partner, Pelindo II. By the investment of HPH in the port during 2009, JICT is now able to deploy up to 6 Super Post Panamax Quay Cranes on the biggest vessels calling at JICT today. This represents a level of service and productivity being provided only by the biggest ports operated worldwide by the HPH group. The expansion will deliver improvements in service levels that will benefit port users including shipping lines, exporters and importers.

In December 2009, HPH signed an agreement with Sidney Ports Corporation (SPC) that clears the way for the development and operation of the third terminal at Port Botany, Australia. Sidney International Container Terminal is whole-owned subsidiary of HPH, which had been established to operate the third terminal of the port, which is going to be leased for 30 years. The terminal will underpin import and export trade in and out New South Wales and Australia. The terminal is going to be operation in 2013. HPH is optimistic about this project as the future growth of the Port of Botany as trade increases between Asia and Australia in line with the recovering world economy.

HPH pulled out from its investment plans Izmir, Thessaloniki and Manta and froze expansion projects. In addition to that, the company froze Amsterdam's container terminal operations.

In the case of Izmir, the global downturn has minimized the aggression that characterized bids for earlier concessions in the country.

Furthermore, Hutchison Whampoa extended its debt maturity profile and reduced its interest expenses from 5.2% in the first half of 2008 to 3.6% in the first half of 2009. In addition to these, the company issued a bond worth 3 USD billion. In 2009, HPH withdrawn from the concession with the port of Thessaloniki, Greece, where the company offered the highest bid from other rival operators like DP World and Cosco in order to manage and develop container terminal operations to the port. The project was a joint venture between HPH and the Greek pharmaceutical group Alapis. The cancellation of the concession resulted from the difficulty of securing bank financing for the project because of the global crisis and the lack of trust that characterize the interbank relationships.

In 2006, HPH assured a 30 year concession for the modernization and operation of Ecuador's Manta cargo port, on the pacific coast. The contract called for \$240 million in infrastructure investments, \$161 million in equipment and \$122 million for maintenance. Some 30% of the total \$523 million in investment is meant to be disbursed during the first six years. The concession contract also required the additional \$55 million of investment from the state to build the fishing port.

The investment was aiming at the development of the port which can be the ideal first port of call in the region for global shipping lines. In 2009, HPH was facing the threat of being expelled from Ecuador's president, because the company didn't meet the timetable for its investments at the port. The port authority of Manta gave 90 days to HPH to fulfill its contract terms. The port authority of Manta and HPH renegotiated the contract. Finally, the government of Ecuador made changes in the concession, which lead HPH to withdraw from the project on February 2009. The project was the first major abandonment by HPH which take the opportunity of the weak economic situation in order to reorganize its business.

Moreover, in 2008, HPH took over the development of the Fos 4XL container terminal in the port of Marseille. The concept of the project is a "Twin Hub" which will develop by HPH Northern Europe as a "Twin Hub in the Med" of its Rotterdam facilities, linked to its "sister terminal" by a comprehensive multimodal network. The project will support an ambitious strategy of Euro-Mediterranean consolidation. The construction and operation of the project will be aligned with market demand and it is not expected to start commercial operations before 2017-2018 (Cargo Systems, 2010).

In early 2009, the EU5 service loop of Grand Alliance, OOCL, had been suspended when on April of the same year, the liner operator's EU2 service stopped calling Amsterdam Container Terminal (ACT) and it transferred its Netherland's port call in Rotterdam at the facility of ECT, which is also owned by HPH. The loss of these two services cut throughput at ACT by at least 70% (Lloyd's List, 2009). The operations of the terminal froze as the terminal didn't have any contract after the shift of EU2 service to the port of Rotterdam.

#### **4.2.2 PSA Corporation**

PSA is a Singapore based global container terminal group which operates container terminals in the Americas, Asia, Europe and Middle East regions. The ports group has interests in substantial European container terminals at Antwerp and Zeebrugge, Rotterdam and a recently opened North Sea facility at the port of Great Yarmouth, UK.

The spatial expansion of PSA was formed through its first stronghold build at its home base Singapore before taking the step towards global scale and coverage. Its focus at Singapore enabled PSA to develop its competency in terminal handling as additional real estate for port development is extremely difficult to come by within the city-state. When the company established itself as an international benchmark, PSA's ambitions went global through mixed strategy of organic growth through new terminals and acquisitions backed up by a sound financial status. The development of the company was accelerated by increased competition at its Singapore terminals.

In 2006, PSA acquired 20 % of stake in Hutchison Port Holding's global terminal portfolio for a reported USD 4.93 billion, following its earlier purchase of strategic shareholdings in a number of other Hong Kong operations.

PSA International and APM Terminals withdrawn from then US\$ 2.3 billion project for the second phase of development at Morocco's Tanger Med terminal, which was including the third and fourth terminal facilities (T3 and T4).

In mid 2007, PSA invested in the development and operations of a container terminal, at the Rodman port which the pacific entrance of the Panama Canal. The investment was the company's first investment in the Americas. The company counts on the importance of the Panama Canal and the Malacca Straits which represent strategic waterways in the world. Both Panama and Singapore play a major role towards the facilitation of the world trade. The importance of this investment is completed with the widening and expansion of the Panama Canal which is currently underway.

The competitive advantage of PSA isn't integration along the supply chain but its strong focus on innovation and excellence at the level of its core business. Recently, PSA integrated its terminal and ship planning software house Cosmos.

In 2009, PSA handled 56.93 million TEUs at its terminals around the world or a decline of 9.9 % over 2008. As a result, PSA took urgent measures in 2009 to reset its capacity needs and reduce operating costs.

In 2010, PSA HNN, the Belgian subsidiary of the company, missed the deadline of operating a planned European deepwater container terminal at the Dutch port of Vlissingen (Flushing). PSA would have the exclusive right to develop the new terminal. The decision of the company wasn't irrational given the global economy and the ambitious scale of the Dutch project for Vlissingen. In addition to these, the

fact that a number of existing container terminals in northern Europe are idle or working at much lower throughputs, so the demand and timescale for additional European box handling capacity has receded over the horizon (Lloyd's List, 2010). Another reason could be the denial of MSC, which is the leading client of PSA in Antwerp, to shift its volume from Antwerp to Vlissingen, because of the extra logistical costs, principally barge shuttle.

### **4.2.3 APM Terminals**

APM Terminals is a subsidiary container terminal company of A.P Moller-Maersk Group; the company reports its results as a separate business entity within the group, since 2008. That gives flexibility to the company to invest wherever it thinks this best fits to its strategy and to have contracts with other liner operators apart from Maersk Line.

APM Terminals is one of the world's largest and more geographically balanced terminal portfolios. The company operates terminals in Americas, Europe, Africa, Middle East and Indian Subcontinent, and Asia Pacific.

The company is running a program of construction and expansion in Africa, Europe, South America, China and Southeast Asia.

In 2008, APM Terminals invested nearly three quarters of US\$ 1 billion in terminal development and expansion.

In the first three quarters of 2009, APM Terminals reported a 9% decline in its number of containers handled, as compared with a 15% decline in overall global container throughput. The company's global terminal network handled 22.8 million TEUs during that period (APM Terminals, Media Kit, 2009).

In the first half of 2009, APM Terminals reported an 8% drop of container volumes, a 6% fall in revenue and a drop of profits, compared with the same period in 2008. The crane lifts of the container handling company fell 16% across its global terminal business in the first quarter of 2009 compared with 2008, with operations in North and South America most affected. During the first three quarters of 2009, APM T was involved in 8 new terminal development projects worldwide, including Maasvlakte 2, at the Port of Rotterdam.

Due to the crisis, APM T reviewed its investment projects in Luanda (Angola), Apapa (Nigeria) and Cai Mep (Vietnam). Moreover, APM T has withdrawn from the concession to develop and manage the third container terminal at Tanger Med in Morocco.

Despite the recession, emerged countries of Africa, the Middle East and India present a continuous need for infrastructure investment. In July 2007, APM T joined the concession team of Bollere Africa Logistics<sup>2</sup> and its local partners on the project

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<sup>2</sup> Bollere Group, created in 1822, is among the world's 500 leading groups. The group is one of the five leading transport organization groups covering all areas of logistics activities, with a network of

of the deepwater container terminal at the port of Pointe-Noire in Republic of Congo. The port of Pointe-Noire is in the Gulf of Guinea, which is a natural gateway to the increasingly important Central African region. APM Terminals and Bollore have a long association, which includes facilities at the West African ports of Abidjan, Ivory Coast, Douala, Cameroon and Tema, Ghana.

APM Terminal reduced their CAPEX plans to 2.2 USD billions and cancelled 6 projects and postponed some others in order to save cash flow.

Jade Weser Port project is Germany's largest harbor project, located in Wilhelmshaven, supported by the federal states of Lower Saxony and Bremen. The project cost was €1 billion and be the second European hub after Rotterdam for the next generation of mega-container carrier. The terminal was expected to open on October 2011, but its terminal operators APM Terminals and Eurogate ( joint venture of 70:30 respectively) wanted a further push back on the Jade Weser opening because of the global downturn in container volumes (Lloyd's List, 2010). The project delayed by 3 months to February 2012.

On the other hand, the state of Lower Saxony, which finances a major part of the construction costs, wants to complete the project as soon as possible, while APM and Eurogate wanted a further delay because they were feared of introducing overcapacity, which would hurt their existing facilities at Bremerhaven. The fear is rising from the fact that the geographic location of Jade Weser port has an advantageous position for feeder transport in Baltic Sea region, a region where the container traffic of manufactured goods is mainly done by feeder services the Baltic Sea and the hub ports of Bremerhaven, Hamburg and Rotterdam. Even though, Eurogate had agreements with other lines covering cargo for Jade Weser, there was an uncertainty whether they could met the volumes of the agreement. However, Maersk Line was planning to shift some of its services from Bremerhaven to Wilhelmshaven.

In order to solidify its balance sheet, the company issued APMM 2 bond worth 1.7 USD billions and a share placement of 1.6 USD billions.

APM Terminal's is focused on getting best out of the crisis, which means being more profitable by earning the customer, taking costs out and driving performance. APM T started giving high priority on environmental sustainability through efficient terminal operation, pollution prevention and continuous improvement of environmental performance and compliance with all international, national and local rules and regulations. The company planned to reach its target through innovative operational initiatives, best practice sharing, benchmarking, strategic investments and energy-conscious planning at every terminal.

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500 agencies in 88 countries. Bollore Africa Logistics is the leading private port operator in Sub-Saharan Africa, it is present in Abidjan, Tema, Cotonou, Lagos, Douala, Libreville and Pointe-Noire. Today, its port concessions are of European standard and show performance that rival those of Europe's greatest ports.

Terminal operators have turned their focus on container handling equipment innovation like the development of Eco-RTG, an environmentally-friendly rubber tired gantry crane that operates with less fuel and the ability to cycle energy during the lift/lift off phase of operations. As an example, APM Terminals through its “Eco-Efficiency” program provides more services to customers while decreasing resource and energy consumption and reducing waste and pollution. In addition, the company has the philosophy “replace, don’t retrofit”, within which it replaces aging equipment instead of retrofitting them. On October of 2009, APM T opened a new power distribution network at the Port of Rotterdam facility, which cost EUR 12.5 million. The new power distribution center supplies the required energy for 13 gantry cranes, 2.250 refrigerated container units, lighting and other needs.

The above investment and generally equipment investments are supported from the fact that global terminal operators, like APM Terminal, HPH, DP W and PSA, 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.

In 2010, APM Terminals sold 13.7% of its stake in Yantian Terminals at price of \$520 million to the Cosco Pacific, the world’s fifth largest port operator. In addition to that, the company announced that it would transfer some of its terminal facilities (pier 76 and 77) in Kaohsiung (Southwestern Taiwan) to Hanjin (pier 78). The latter action is aiming to divest part of APMs portfolio in order to rationalize company’s assets.

Furthermore, APM Terminals is to progressively take over responsibility for the A.P Moller Maersk Group’s involvement in inland trucking and container depot activities from its Container Shipping and Related activities division. The decision of APM brings the company into the inland arena, joining other established players such as ECT, Eurogate and HHLA. In this way, shippers will have the option to directly negotiate inland haulage and depot deals with APM instead of through ocean carriers or logistics agents, which would further dilute ocean carriers’ involvement in carrier haulage.

In addition to that, APM Terminals introduced an independent service provider, Crane & Engineering Services (CES), with the mission of serving customers outside A.P. Moller-Maersk Group. The unit is founded as a separate business within APM Terminals, in 2009. CES has offices in Germany and the Netherlands, apart from the office out of Shanghai, which operates from 2006 in cooperation with ZPMC (sole source supplier of APM cranes). CES has responsibility for crane engineering, procurement and project management for APM T’s global terminal network which has over the past years seen the purchase and installation of 139 STS cranes and 268 RTGs and RMGs worldwide.

#### **4.2.4 DP Worlds**

DP World is a subsidiary of Dubai World. Dubai World is a global holding company which focuses on the strategic growth areas of Transport & Logistics, Dry-docks and Maritime, Urban Development and Investment and Financial Services.

Dubai World owns 77 % of DP World. DP World formed in September 2005, with the integration of the terminal operations of the Dubai Ports Authority (DPA), which was focused on the United Arab Emirates' major ports of Rashid and Jebel Ali, and DPI (Dubai Ports International), which had been set up to export this success internationally. Moreover, DP World manages container, bulk and other cargo terminals and it has interests in logistics businesses in Hong Kong and China, notably ATL (the market leading logistics operator based at Kwai Chung, Hong-Kong).

In 2005, the strategic acquisition of the CSX World Terminals (CSX WT) (see *Table 4*), the international terminal business of CSX Corporation from DP World, gave a strong presence in Asia, especially in Hong Kong and China, as well as in Australia, Germany, Dominican Republic and Venezuela. In the same year, DP World acquired CSX WT's strong project pipeline, which included the 9-berth Pusan Newport, South Korea, where DP World holds the management contract as well as a significant equity interest, and other projects in the rapidly expanding markets of India and Middle East. Through this acquisition DP World create a balanced terminal portfolio covering most of the world's trading regions, which should protect it against the risk of the downturn in any particular region (Notteboom & Rodrigue, 2010).

In addition to that, DP World signed an agreement with Cochin Port Trust (CoPT) to construct, develop and operate an international transshipment terminal at Vallarpadam, Kochi, India. It is the largest single operator container terminal currently planned in India and the first in the country to operate in a special economic zone. The new terminal will make Kochi a key centre in the shipping world reducing India's dependence on foreign ports, like Colombo and Singapore, to handle transshipment. The completion of the first phase realized at June 2010, the project was a public-private partnership between DP World and Cochin Port Trust. DP World is planning to reach a capacity of 3,000,000 TEU by the final phase of the project.

In addition to these, DP World was awarded a 30 year concession to develop and operate the container terminal at the Port of Fujairah, in the UAE and the awarding of a management contract for Mina Zayed Port, at Abu Dhabi. The above concessions enabled DP World to streamline operations at the major container facilities of the UAE and further increase the choices available to their customers.

In March 2006, DP World expanded its portfolio of terminals with the acquisition of P&O Marine Services (see *Table 4*). The combined container throughput of both companies for 2005 was more than 35 million TEU across terminals from the Americas to Asia. This grew nearly 42 million TEU in 2006. The addition of the P&O

in the DP World Group create the ambition for new projects that will continue the future expansion of DP World, independent of acquisitions, across key markets globally.

The first months of 2009, DP World faced a volume decline across its ports network of 10%. For the whole 2009, DP World handled 25.6 million TEU across its portfolio of 28 consolidated terminals reflecting a decrease of 8% compared to 2008. The biggest traffic losses were in the Americas and Australia (-15 %). Excluding the contribution from new terminals which joined the portfolio during 2009, volumes declined by 10%. Across all 50 terminals DP World handled 43.4 million TEU in 2009, a decline of 6 % over 2008.

The company responded to the crisis by deferring about 50% of its global capacity expansion plans until such time as market demand recover (Port Strategy, 2009). While the recession has created many challenges for the industry, it also created opportunities and DP World seized one of them to enter one of the vibrant new markets, like this one of Brazil. The company acquired a majority stake in Empresa Brasileira de Terminais Portuarios (Embraport), which is built adjacent to Port of Santos, the key port city for Brazil's capital, Sao Paulo.

The chief executive officer of DP World stated that the global recession didn't affect their strategy (Connexions, 2009). The cost of the project is approximately US\$ 500 million, despite the crisis DP World invested in this project because the company didn't have a presence in Brazil whose economy is the largest in Latin America and one of the most dynamic in the international market. Moreover, the site is important both for imports and exports, and most shipping lines include double calls at Santos both south-bound and north-bound. It is also serves usually as a first port-of-call for Asia-ECSA services, coming via South Africa, and hence has a significant potential a transshipment location.

In addition to the above acquisition, another acquisition of a 25% stake in Russian's Vostochny Container Terminal by DP World in 2009 reflects the interest of the company on the BRIC countries.

The project on which it was working included the Khalifa Port in Abu Dhabi, a large new port at King Abdullah Economic City in Saudi Arabia, Rotterdam's Maasvlakte 2 terminal and UK's London Gateway port as well as the expansion of container facilities in Southampton.

Due to the global downturn, DP World reviewed its project for London Gateway, Maasvlakte 2 and the third terminal at Jebel Ali in Dubai faced delays. In addition, DP World postponed its CAPEX for Abu Dhabi, Kulpi and Dakar.

The project for London Gateway, which DP World inherited with the acquisition of P&O, in 2006, struggled because of the difficulty to raise financing for the \$1.5 billion container port project. According to Financial Times, the project for London Gateway was the most significant for the UK, but it is not possible to be realized without

suitable government funding. The discussion between banks and DP World were inefficient as UK banks were concerned about the DP World's ability to complete the port scheme because of the debt of Dubai World (mother company), in 2008. The credit crunch made banks to be more reluctant to lend to any port developer unless, they are absolutely convinced of the viability of the project.

However, on the 8<sup>th</sup> of January 2010, DP announced that the company commits itself to the foundation stage of its London Gateway project despite the market downturn. The new port development project is located at the former Shell Haven installations about 25 miles downstream of the City of London. The works under the revised scope have to be executed for the account of London Gateway Port Limited (DP World) for a total amount of GBP 400 million ( € 442 million). The works have to be completed in a period of 54 months from the start of dredging works (March 2010) from DEMA company Dredging International, which is by end 2014. The new London Gateway port will be fully automated deepwater container port for the latest generation container vessels. DP World will fund the entire project which includes quay walls, superstructure, dredging and reclamation and connecting road system.

The exceptional growth of the company during the three quarters of 2008 masked the significantly weakly performance of the company during the final quarter; when volumes declined across most regions as global trade responded to the more challenging macroeconomic climate.

DP World had a solid balance sheet because its debt matures post in 2013. In addition to that, the net debt of the company stands under \$5 billion but DP World holds \$ 3 billion in cash. Moreover, the crisis caused a US \$59 billion debt to the mother company, Dubai World, accounting for nearly  $\frac{3}{4}$  of the emirates US \$80 billion debt. For that reason, the company asked from its creditors to defer payments for six months.

At that period there were rumors, that DP World, as the world's fourth largest port operator, could be used to prop-up its parent's debt. While financial results of DP World were negatively affected by the crisis, the government confirmed in November 2009 that DP World and its debt are excluded from the financial restructuring process of Dubai World.

At May of 2010, Dubai World reached an agreement "in principle" with most of its lenders bank to restructure debt worth of \$23.5 billion. But the deal must still be approved by other banks that were not involved in the negotiations.

Dubai's financial problems didn't have any impact on DP World's investment on Europe's biggest container terminal in Maasvlakte 2, port of Rotterdam where the company has a 30 % share.

Despite the recession, DP World completed successfully its new terminals in Aden and Ma'alla (Yemen), Sohka (Egypt) and Tarragona (Spain) in 2008. In addition to these, DP World completed the Doraleh Terminal in Djibouti which opened and its

project of Terminal 2 in port town Jebel Ali (UAE), in early 2009. The construction of the \$ 1.3 billion third terminal in Jebel Ali delayed until the second terminal reaches a certain utilization level. In addition to that, DP World was constructing a new port at Mina Khalifa (Abu Dhabi) whose, the first of five phases is going to be operated in 2012. The project didn't face any financial problem because it will be funded by the Abu Dhabi government. The port will be operated by Emirates Ports Company, which is joint venture between DP World and ADPC (Abu Dhabi Port Company). The importance of one port strategy can be seen through this relationship and the critical need for infrastructure to support the accelerated growth of Abu Dhabi's industrial and commercial sector.

The capital expenditure of DP World for 2008 was \$ 1, 397 million of which almost 50% was spent on the expansion of new capacity in existing terminals, Jebel Ali being the major beneficiary. The 36 % was on new developing including Doraleh at Djibouti, Callao, at Peru and Ho Chi Minh at Vietnam.

In 2008, DP World increased its shareholding in two of their terminals in Chennai (India) and Karachi (Pakistan) to 100% and 75% respectively. The same year new capacities added, as projects contracted, before the crisis, were roll out. Furthermore, the company continued with excellent progress the construction of new terminals which were in the final phase of completion, at Callao (Peru) and Ho Chi Minh. DP World ensured that the above two ports, which joined its portfolio in 2008, will benefit from investment in equipment. These equipments developed the ports into cost efficient, higher margin terminals. The company invested US\$617 million in its Muelle Sur development in Callao, which started its operations in July 2010. In 2009, DP World complete on time the facility of Saigon Premier Container Terminal close to Ho Chi Minh City, is a 80:20 joint venture between DP W and the Vietnamese state-owned Tan Thuan Industrial Promotion Company (IPC).

During 2009, DP World upgraded the Jeddah's south container terminal by investing on six super post-panamax STS gantry cranes and 12 RTGs. The company was aiming to increase the productivity and assure the highest operating standards at DP Word Jeddah by investing on the largest cranes in the world. By enhancing its productivity and efficiency, the port will be the only terminal in the Red Sea with the capability to handling vessels of 13,000 teu and above. As far as it concerns, the timing of the work commence on expanding Aden Container Terminal (ACT) in 2011, which is a joint venture between DP World and Yemen Gulf of Aden Ports Corp, depends on economic and trading conditions of the region. In November of 2009, DP World of Antwerp port received three new gantry cranes for the Gateway terminal, as a part of the second phase of expansion project. The project includes extension of the quay length, an additional five automatic crane modules and 12 new straddle carriers. The investment is aiming to improve the stacking capacity and the efficiency of the terminal and it will enable Antwerp Gateway to service two large ships simultaneously, increasing the number of berthing windows and the overall marketability of the terminal.

Most of the terminal operators turned their interest on Asia Pacific ports. DP World has been supported that the Philippines have immense potential for growth in the country and expressed an intention to explore the investment opportunities which were emerging there. China, India and Australia were also three important countries for DP World to invest, particularly to have more coverage in China. In addition to these, APM Terminal and DP World are major players in North-West Africa.

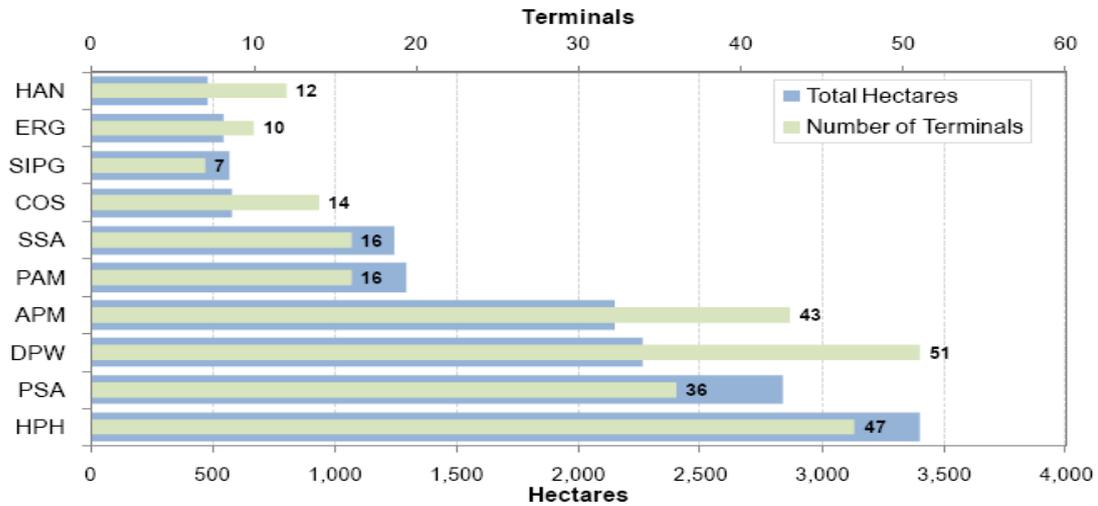
### ***4.3 Why the top-4 container terminal operators have different strategies?***

As it is already mentioned expansion strategies of terminal operators differed due to their different types and lean on horizontal or vertical integration processes or diversification strategies. In the case of terminal operators' investment strategies review, the type of the container terminal operator played a major role.

In the previous sub-chapter 4.2 is analyzed the investment strategies of top-4 container terminal operators which were adjusted on the new economic scene. The review of their expansion investment plans were based on the different types of terminal operators.

Leader terminal companies like HPH and PSA prefer the control of large terminal facilities since terminal operations is the core of their activities. They have actively involved in the development of large export-oriented port facilities in Pacific Asia. On the other hand, 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 sizeable number of terminals in which it has the largest equity. This highlights an aggressive growth strategy aimed at acquiring existing terminal assets, many of which have a strong potential of growth in lower volume markets like South Asia, Middle East and Mediterranean. In the Figure 2 is illustrated the number of terminals and its total hectares controlled by the ten largest port holdings in 2009:

Figure 2 Number of Terminals and Total Hectares Controlled by the ten larger port holdings - 2009:



Source: Notteboom, T., Rodrigue, J.-P, 2010

The global crisis affected the container terminal industry by causing unprecedented volume declines. Even though, the top-4 terminal players remained the same, and their market shares stayed close to 2007 levels.

The regional orientation of terminal operators is also another important feature of container terminal strategies. HPH and PSA have a very strong Asian presence in comparison with their limited interests in the Mediterranean. HPH and PSA don't have direct presence in North America, but they have assets in the Latin America. On the other hand, APM Terminals and DP World have an overrepresentation in Africa (this can be confirmed from Appendixes 1 and 2). APM T and DP W have the most diversified portfolio in terms of geographical spread and can be considered the most "global" of the global terminal operators. APM T doesn't have a presence in Australia and DP W has a small presence in North America.

The vertical integration of terminal operators is a factor that affects the strategy of the terminal operators during the crisis. For their better integration in supply chains, terminal companies have developed diverging strategies towards the control of larger parts of the supply chain. In many cases, terminal operators integrate effectively their network through better co-ordination with third-party transport operators or logistics service providers, a strategy known as hinterland access regimes. This strategy is adopted from most of the terminal operators instead of acquiring or setting up separate companies or business units (e.g. HPH focus on inland logistics in China and Europe).

Some terminal companies have set up road haulage companies. ECT of Rotterdam (member of HPH) established Maasvlakte Transport in order to transport between the Maasvlakte Districts in Rotterdam and the container terminals of ECT on the Maasvlakte. In addition, a number of container terminal companies operate their

own feeder services (e.g. ECT). The integrated inland terminals play a vivid role in terminal operators' logistics networks. Inland terminals serve as extended gates for deep-sea terminals. Extended gateways are unrivalled features for a container terminal network as they add value to terminal's performance.

All the leader container terminal operators invest on inland terminals where it is feasible and beneficial for their network. ECT, owned by HPH, has realized an active strategy of acquiring key inland terminals. DP World has a similar strategy where, the company is working in partnership with CMA-CGM to streamline intermodal operations on the Seine and Rhone axes, as the large terminal of Antwerp Gateway and London Gateway (future project of DP W) have both high hinterland connections. Terminal operators can bring together intermodal volumes of competing lines and as such create a basis for improved or even new intermodal services (Notteboom & Rodrigue, 2010).

On the other hand, there are terminal operators (e.g. PSA) who don't follow a visible vertical integration strategy. These operators develop effective network integration through their focus on innovation and excellence at the level of its core business.

#### ***4.4 Focus on the Country Risk of expansion investment projects***

The business of the global container terminal operators are spread all over the world, in order to offer a complete coverage to their customers, through a worldwide network. The regions where terminal operators perform are Americas, Europe, Asia, Middle East and Africa and Australasia. The country risk of these regions is a fundamental factor for the investment strategies of each terminal operator.

Every time that an operator examines a new terminal or an expansion project, he has to consider risks that can be occurred by these projects.

The complexity of the container terminal business is for the terminal operator to get access to a port and secure a customer base, which in many ports around the world that means a concession agreement with the local port authority where a port operator negotiates the terms of the leasing agreement. Port Authorities have developed specific bidding procedures to grant concessions to the best possible operators. They can partially shape the entry profile of segments of the local port industry through the bidding procedures used, by including some clauses in the concession agreement that should allow the port authority to end the concession in case specific performance measures, for example traffic volumes, are not met by the terminal operator after a specific period of operation.

In the current funding climate, concessionaires may face difficulty in terms of financing. Proceeding by way of a separate lease, which can be registered in the relevant jurisdiction can be of advantage in that this results in a tangible asset which be offered as security to potential investors and funders. The funder is then likely to have the comfort of having its interest in the lease protected on the land registry. However, this is subject to the particular laws of the relevant jurisdiction. In some

jurisdictions, Dubai for example, only locally registered financial institutions can register charges over interests in land.

More fundamental than any other restriction on registration of charges of land at the relevant land registry is the fact that the port authority or relevant government entity will often want to restrict the concessionaire's ability to use the relevant assets, including land, as means to secure its finance and may wish to include provisions that effect. In certain jurisdictions the grant of a long-term lease or concession does allow the transfer of property rights to a third party.

The role of joint ventures between terminal operators and local partners is fundamental in order to make the operation within the confines of the local regulatory environment. In addition to that the ownership in whole or in part is an important mean of access to regional freight distribution. 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.

For example, the ports in the North America are characterized by their lack of liberalization in the port sector, dock labor problems and a strong preference towards liner-operated terminals to secure port cargo and space are the main reasons for the low appearance of non-carrier terminal operators in the N.American stevedoring market. In 2006, DP World acquired the North American assets of P&O Ports, including terminals in New York, Miami, Philadelphia and New Orleans. However, DP World was politically pressured to relinquish these assets and sold them to AIG.

In the other side, the consolidation trend in the European container handling, from the top five leading terminal operators might even increase further because of the new massive terminal projects. In answer to this, the European Union competition regulations have already affected HPH's expansion within North Europe and it is likely that any future moves by PSA and DP World will also carefully scrutinized by the regulatory authorities. Regulatory bodies aim to encourage cost reductions and at the same time avoid the abuse of oligopolistic market powers.

The role of the country risk can become more urgent during a world economic downturn, like the current one, as political, legal and regulatory risks can occur when the government of each country is setting measures through its port policies or other relevant legal framework.

The majority of the port authorities and governments apart from the development of their port areas, they are focusing also at the development and protection of the surround area and its natural treasure. The government can intervene in terminal operators' projects by imposing laws about the safety of the facility and the environmental protection of the port area from the operation of the terminal. In addition to that, Port Authorities can set higher taxes for environmental and safety regulations.

The existence of unions in many state-owned ports can be forced in labor strikes because of the crisis' consequences such as salaries' reduction or cutting off personnel.

#### ***4.4.1 Country risk in developed countries***

Most of the countries of Western Europe, if not all were severely affected by the global economic crisis. Countries of the Northern Europe like the Netherlands, Germany, Luxemburg, Norway and Denmark have very low country risk (CTR-1). Belgium has a little higher country risk in comparison with above N. European countries which is categorized as a CTR-2 (see Appendix 3). On the other hand, the Eastern European countries of Bosnia and Herzegovina, Belarus, and Ukraine have a very high country risk (CRT-5) and Poland has moderate country risk (CRT-4) (see Appendix 4).

Europe followed the next techniques to face the crisis such as stabilization in retail spending, consumption leveled out, more stable, industrial production improved because of the low value of euro and the demand from developing countries. In addition to these, the population in developed countries getting older and that creates a demographic issue, as there is no resource for new labor and that makes more expensive to hire a labor. Western Europe is a highly developed and affluent region. The European Union is facilitating a single European market with standardized regulatory systems and free movement of people, goods, services and capital. Most, if not all, of Western Europe is experiencing a severe economic slowdown and many countries are or soon will be, in an official recession. While the European Central Bank has cut rates to spur demand, economic growth in the region has stagnated.

The high national debt levels Spain, Portugal, Italy, Greece and Ireland whose high create an uncertainty. If this situation depress their economic performances further and affect consumer sentiment then gateway traffic will come under further pressure.

Even though, United States facing the worst crisis since the Great Depression the economy contracted at around 3% in 2009 and the unemployment reached double digits. While the US government has taken strong policy action, both monetary and fiscal, are not expected to recover until the 2011. North America is dominated by the United States of America and represents a low country risk tier of CTR-1 but the Latin America and the Caribbean have high and very high country risk, CRT-4 and CRT-5 respectively (Appendix 4). The US economy is the largest and more advanced in the world, due to its dual advantage of being rich in natural resources but also capable of producing high end products. The political system of US is stable and has a strong legal system. The financial system in US is going through a vulnerable period with the government intervention with large corporations such as Citigroup and AIG.

In United States used to be the benchmark of the low country risk; however the credit crunch of US hit the positive financial position of US. The depreciation of the US dollar and the sovereign debt made the position of US government not much better from the position of Spain, Portugal, Greece, Italy and Ireland. The uncertainty about the growth prospects and the mixed news about the recovery in Europe and United States weakened investor's confidence.

The "economic bubble" was bad for those investors that paid 25 times EBITDA for some of the most prime port real estate in the Americas during 2005 to 2009 (Cargo Systems, 2009). The state of the American jobs market is that which will dictate the final outcome for the container shipping in the US trades (Lloyd's List, 2010).

#### ***4.4.2 Country risk in developing countries***

At mid-2008, Middle East was facing a softening traffic volumes and cancellations or delays of investment projects in many of its container ports. Since the third quarter of 2009, trading volumes have begun to stabilize in the region. The good results reflected the continuing resilience of the Middle East, Southern Asia and Africa regions to the global economic downturn. But the young and increasingly affluent populations of many Middle East nations are buying more consumer durables and fashion goods. More of them are imported in containers from Europe, North America and especially the Far East. As a result, box-handling demand in the M. East remains among the strongest in the world (Cargo Systems, 2009). Ports in the Middle East are looking forward to see modern well automated container terminals as one of the answers to the Iran's fast-growing import/export exchanges.

Africa needs decent infrastructure which means well equipped and efficient ports which will accommodate the growing trade volumes and will provide better regional transport links (Containerisation International, 2010). For that reason, the Infrastructure Consortium for Africa (ICA) and the World Bank's International Financial Corp has organized a conference in order to call for greater levels of private investment in the continent's ports. The ICA is focusing on the facilitation of infrastructure financing in Africa, including private sector investment. The governments are working on the structure of investment opportunities that balance the interest of private investors with the needs of the community for long-lasting economic and social benefits. The need for cooperation and streamlined bureaucratic processes are vital as well as that local governments and port authorities work in an environment which embraced and were favorable to the private sector.

United Arab Emirates' economy was hit, particularly Dubai, by the financial crisis of 2007. In 2009, when the most developed countries reported double digit declines, UAE remained a major exception as performance continued to be less impacted than other regions. Due to its massive construction boom, the expanding manufacturing base and the thriving services sector helped UAE to diversify its economy. As a result UAE is one of the most developed economies in West Asia and it is the thirty-sixth largest economy at market exchange rates and has a high

per capita gross domestic product. In addition, more than 200 factories operate at Jebel Ali complex in Dubai, which includes the largest deepwater port between Rotterdam and Singapore, and a free zone trade for manufacturing and distribution.

In 2009, the UAE's economy shrank by 4%. The crisis of Dubai cost by the bust of the property boom. Abu Dhabi was that which helped with the power of its liquidity to soften the blow of the crisis. Abu Dhabi prevented a complete collapse of markets in Dubai by using a part of its liquidity and its stability. A consequence from the UAE's real estate decline was the \$ 59 billion debt of the state-owned holding company, Dubai World Group. The above debt accounted for nearly three quarters of the emirates US\$ 80 billion debt. Even though, the timetable of DP World's project in Maasvlakte 2 haven't been impacted as DP W was excluded from the restructuring of Dubai World. On May 2010, Dubai World reached an agreement with a consortium of lender banks to restructure \$ 23.5 billion in debt.

Furthermore, Singapore and Panama, two cornerstones for the international trade, signed a Free Trade Agreement in 2006, which provides collaboration of the two countries in areas such investment promotion and science and technology apart from trade agreements, financial services etc. Panama is the largest trading partner of Singapore in the Latin America. The great scope of the two economies is to enhance collaboration in a variety of fields as maritime logistics, infrastructure development and knowledge industries. So, there are not restrictions that can affect investment plans of the Singapore's based terminal company, PSA in Panama, as there is the Free Trade Agreement creates greater certainty for their investments.

BRIC countries, Brazil, Russia, India and China expected to spearhead global economic growth this century. BRIC countries have fast growing economies with the biggest source of labor.

India has moderate country risk, CTR-4 (Appendix 4) and it has great economic potential due to its large labor force. The declines in investments and domestic demand because of the crisis decelerated the country's growth. India's government supports the development of its country with improvements in infrastructure and regulation. The Indian government is working to align its regulatory and accounting standards with international best practices. The weakness of India's economy is the worsening budget balance, as the deficit reached the – 7% of GDP in 2008 and 2009. However, the Indian financial system has fared relatively well during the global downturn.

On the other hand, Russia is rich in natural resources and has a strategic location. The Russia's has a high country risk (CRT-4) economic decline has been felt throughout Central Asia, as the economic and political role of Russia is significant in the region. The country has high political risk because of the continued military conflicts, the state intervention in the private sector, the lack of regulation transparency and inefficient and corrupt legal system weigh on the cost and pace of

doing business. During the crisis the government has been injecting trillions of rubles into the banking sector. The value of ruble fallen sharply with a 40% depreciation in 2009. Since the summer of 2008, the credit extended to the private sector was limited.

Brazil's economy is Latin America's largest and one of the most dynamic on the international market.

In Asia, emerged countries like China and Vietnam were affected by the crisis but the only consequence was that they reduce their pace of development as they don't have the same volumes with the before crisis levels but with a low pace. Vietnam is increasingly considered an up-coming alternative to China for sourcing goods for the world's main consumer countries because of its low cost manufacturing base. The downturn in trade in the first eight months of 2009 saw throughput at the country's principal port complex, Ho Chi Minh, decline 18.3% to 1.93 m TEU. In order to curb the bad economy and inflation the Vietnamese lawmakers have taken immediate measures to bring the economy under control. As a result imports brought down because of the increased duties. However, the 500% increase of the countries ports' throughput between 1998 and 2008 and the BMI's country risk analysts forecast for 5% growth of Vietnam's export in 2010 keep the government alerted for the need of further investment in the sector to keep up with the future demand.

Another constraint of the investments in coastal deepwater container facilities is the insufficient hinterland connectivity. The poor road network of Vietnam is a bottleneck that compels to use barges to transport containers via river ports to deepwater terminals. Vietnam needs a more focused and consolidated action in planning maritime facilities in the country. However, container terminal operators like HPH, APM Terminals and DP World, who operate container terminals in ports close to the Ho Chi Minh City, are expecting to improve their present access limitation. When access via Highway 51, which running through Dong Nai and Ba Ria Vung Tau provinces, will be expanded from 4 lanes to 8 lanes by 2013, the project will meet cargo transport demands of major ports in Cai Mep - Thi Vai area and industrial parks along the highway.

Global liner operators consider Vietnam as one of the important locations to operate in, as it has prospects as a supplier to the international market. Liner operator APL is loading 53ft ocean-capable containers from Cai Mep to the US, but this size of containers are still not allowed on Vietnamese roads, so APL do trans-loading at the port. For that reason, APL expects changes to the country's regulations to come, as the competition between Vietnams' ports increasing with the raft of new ambitious container terminal development projects coming on stream in the next few years.

China didn't revalue their currency (YEN), as "temporary" policy of the government against the crisis. In this case the Chinese government is holding its currency at an artificially low price to keep its exports cheap- a distortion that could have dangerous implications for the entire global economy. By distorting prices the government

distorts the overall allocation of resources, leading to inefficiency and bigger trouble down the line. The “price mechanism” is an essential gauge by households and firms making investment decisions. The US dollar began falling against other currencies before 2008. The undervalued YEN pegged to the dollar in July 2008 and that made US to react and ask from the Chinese government to revalue its currency. But the Chinese government is less keen to revalue it because as its reliance on exports means that any significant rise in the YEN could hurt economic growth and more importantly push up unemployment.

That explains the tense investment wave of terminal operators in China during the crisis.

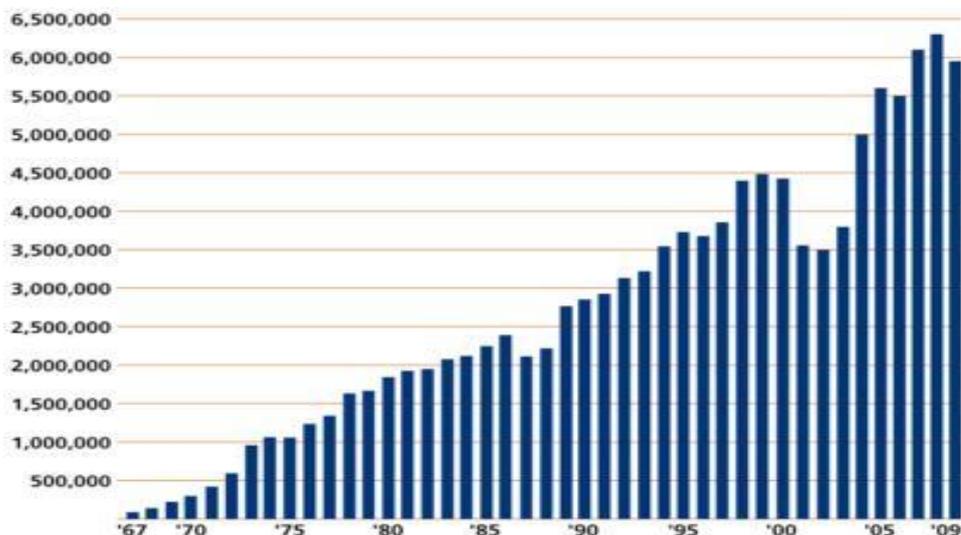
## Chapter 5 Case Study on European Container Terminal (ECT)

The aim of this chapter is to draw a picture of the crisis consequences on the container terminal industry. Even though, ECT is not a global terminal operator like APM Terminals, PSA or DP World, the company is a member of HPH Group, the leader port investor, operator and developer and its terminals are located in the most important location in the North Sea. Furthermore, ECT is Rotterdam's largest container handler, with 6.3 million TEU in 2008; the other 4.5 million units were handled by APM Terminal Rotterdam, RST, Uniport and a series of smaller terminals. The case study will analyze in a theoretical framework the investment strategy of ECT in order to face the crisis.

### 5.1 The history of ECT 1966-2010

ECT was founded in 1966 as box handling company in the port of Rotterdam and the company served officially a container ship in 1967. In 1970, the small company was handling 160,000 containers and 13 years later, in 1983 the company handled more than one million containers. That is illustrated in the following figure.

Figure 3 Development of Volume (TEU) at the ECT Terminals 1967-2009



Source: European Container Terminal (ECT site)

In 1985, ECT opened officially its new container terminal, Delta Terminal, in Maasvlakte 1. In 1988, ECT entered into a contract with the liner operator company Sea-Land for the establishment of a dedicated container terminal at the Maasvlakte 1. The dedicated terminal was the first ever automated terminal which used AGVs for the transport between the quay and the stack as well as the use of Automated Stacking Cranes (ASC) in the stack yard. The terminal opened officially in 1993 and was operated as a dedicated terminal for Sea-Land until 1999, when the company (Sea-Land) was acquired by Maersk Line. Meanwhile, ECT with the port of Rotterdam opened Delta Dedicated East Terminal and Delta Dedicated West

Terminal in 1996 and 2000, respectively. Both terminals were also automated. After, the acquisition of Sea-Land, the dedicated terminal renamed Delta Dedicated North Terminal and started serving new customers.

In 2002, ECT became member of Hutchison Port Holdings Group (HPH). HPH is a subsidiary of the multinational conglomerate Hong-Kong based Hutchison Whampoa Limited (HWL). Furthermore, HPH is the world's leading port investor, developer and operator with interests in a 51 ports, spanning 25 countries throughout Asia, the Middle East, Africa, Europe, the Americas and Australasia. HPH has more than 99% of ECT's shares and ECT plays an important role in the European strategy of HPH. On the other hand, the automation of ECT's terminals reflects the high labor costs in Western Europe. For that reason, HPH is also considering the concept for other locations. In addition to that, the "know-how" of ECT and its good cargo catchment area were fundamental for the expansion of HPH's business in the Northern Europe.

ECT continued with the expansion of the company through the acquisition of Hanno Terminal in the Waalhaven, Rotterdam, in 2004. The hinterland connection of ECT's terminal is a very important issue for the company's strategy that explains the investment of ECT in hinterland development railway and the acquisition of ECT Home Terminal and ECT Hanno Terminal in 2004. The two terminals were 1 km apart of each other and their location was important for certain clients as they were closer to their markets. ECT was fully committed to inland investments, as the company characterizes that inland terminals are the "logical extension of the sea terminals". Through its investment project, ECT is aiming to strengthen its network of Extended Gateways. In addition to that, ECT maintains strong relationships with its logistics partners, railway partners apart from its customers.

In the same year, ECT announced the construction of Euromax Terminal on the northern side of the Maasvlakte 1.

ECT's expansion program didn't stop at this point, but continued through the years of the world economic boom and the flourish of the liner industry. As the international trade was requiring for bigger ports and more box port capacity, ECT has been investing in its expansion strategy and its hinterland connection.

The location of the port of Rotterdam has a strategic and vivid role in all the major economic centers in Europe which characterizes the port the beating heart of the European container handling. Apart from that, the port access is easy for big container vessels like Emma Maersk, which has capacity of 15,000 TEU and a draught of 15.5 m, as the draught of the port is 19.6 m. The port of Rotterdam offers frequent and reliable connections via all modes transport like barge, feeder, truck and train. In addition to these, an important feature of the port is the economical bunkering that it offers. Because of these, many liner operators choose ECT as their first and last European port of call.

In addition to that, the port is fully integrated in logistic services and offers a high added value logistics services. Moreover, the port is located near a wide range of European distribution facilities and that increases ECT competitive advantage as it can offer a higher quality of services to its customers' customers-shippers. The port uses EDI (Electronic Document Interchange) and internet in order to offer complete and valid information and communication services; as for the company the "information" is a key factor for its effective performance.

At the same time ECT owns and operates a growing network of inland terminals in Netherlands, Germany and Belgium which increases the competitive advantage of the port of Rotterdam in comparison with other ports of the Northern Europe. In the Netherlands, HPH owns and operates ECT Delta Terminal, Euromax Terminal and ECT City Terminal in Rotterdam and the tri-modal container terminal in Venlo and has partnerships with the inland terminals, Amsterdam Container Terminal (ACT) and Moerdijk Container Terminal (MCT).

One of the trump features of ECT is its customers who are all top-20 liner operators like MSC, CMA-CGM, Evergreen, Hapag-Lloyd, Cosco, NYK, OOCL, MOL etc, with the exception of Maersk Line, which has its own terminal, APM Terminal, in Rotterdam, sometimes ECT handles some containers but not regularly.

From the land side, ECT has also some of the top global operating forwarders such as DHL, which is responsible for over 100,000 TEU through the company's terminals annually.

### ***5.2 ECT's investment strategy between 2005 and 2007***

During 2005, when the liner shipping industry and especially, container terminal operators were experiencing a high demand for capacity and the constraint of the land scarcity, ECT was in the middle of an investment program entailing 270 million euro.

In that year, the container handling company had four priorities, the improvement in service, the capacity expansion at the Delta Terminal, the construction of Euromax, a 50:50 joint venture with P&O Nedlloyd, and the future of ECT as a player in Maasvlakte 2 (Fast Forward, 2005). In 2006, P&O Nedlloyd (as it is already mentioned in the previous chapter) was acquired by Maersk- Sealand that made the future division of the Euromax's ownership changed. At the end, Euromax Terminal became 100% owned from HPH and a joint-venture with CKYH<sup>3</sup> was under discussion (Appendix 5).

In 2005 and 2006, the 270 million euro investment program was including 572 metres of extra quay, 8 quay cranes for deep-sea vessels, 84 Automated Stacking Lanes, 55 Automated Stacking Cranes, 5 Multi Trailer Tractors, 12 Multi Trailer Systems and 11 straddle carriers (Fast Forward, 2006). Apart from the addition of a

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<sup>3</sup> CKYH is an alliance between liner operators COSCO, K Line, Yang Ming and Hanjiin Shipping)

lot of extra equipment, ECT introduce new working methods such as dual cycling, twin carrying and twin lifting which could boost productivity at the same time.

In addition to that, ECT recruited an additional 318 new operational staff and the company was preparing for a complete change of the software in order to develop the administrative handling of the containers and the Delta terminal's operational systems. The role of the valid information is a vivid factor for the performance of terminal as it minimizes the port time and consequently the port cost for the vessel-liner operator. Moreover, the correct and advance information enables ECT to properly anticipate situations as it operates at the crossroads of deep-sea, feeder, rail, inland barge and road transport. The expansion project added an increase in ECT's capacity of 53% at the end of 2006 and was aiming at the enhancement of services and productivity of its terminals (Fast Forward, 2005).

Meanwhile, ECT was constructing the Delta Barge Feeder Terminal at Rotterdam, which would create additional capacity for deep-sea vessels; as from ECT in Rotterdam there are regular sailings to more than 110 European ports. In addition ECT secured a 51% majority share in DeCeTe Duisburg, which is Germany's most important industrial centre and is an ideal hub between the North Sea, the Ruhr area and consequently the European hinterland. The ambition of ECT was to penetrate even deeper inland by using German's front door especially, when the construction of Betuwe Route which is going to link Rotterdam port directly with Germany in 2 hours. The Betuwe Route freight-only rail track is vivid for ECT because it starts and ends at the Maasvlakte rail terminal, right at the ECT Delta's front door.

Moreover, ECT expanded its rail terminal in Venlo with the addition of a barge terminal. For ECT good barge and rail connections are critical for a further modal shift, because of the need to get cargo off the road. The expansion of TCT Belgium, which is an inland tri-modal container terminal, located between Antwerp and Brussels, created a total surface of 6.5 ha. The area is surrounded by huge distribution centers which enjoy an efficient connection with the sea ports via inland shipping through TCT Belgium, which maintains a daily barge connection with Rotterdam. The inland terminal provides its customer with discharging and loading, temporary storage and delivery and/or collection of containers by truck at their front door (door-to-door service).

The inland container shipping is successful as it guarantees that the cargo reaches its destination at the appointed time and at the lower price for the customer; that depends on the organization, the equipment and the nature of the inland shipping entrepreneur.

In 2007, ECT celebrated its 40<sup>th</sup> anniversary and faced a challenging situation on the first quarter of the year, as ECT's operations were hampered by industrial actions like customs working to rule and tugboat strikes, bad weather conditions and a temporary over-full stack at the ECT Delta Terminal. The above mentioned reasons that cost the bad performance of the company during the first months of 2007 it was

in most instances a case of force majeure. The investment projects of ECT were focusing on the avoidance of such exceptional occurrences. However, ECT continued to invest heavily in terminal capacity by constructing the Delta Barge Feeder Terminal (DBF) and the first phase of the ECT Euromax Terminal, as well as most emphatically in staff.

Through the above mentioned about ECT's strategy is easy to understand that ECT started as small stevedoring company but through the years and after its acquisition from the world leading port investor, HPH, was become the biggest terminal operator of Northern Europe. Not only because of its strategic location in the port of Rotterdam but also, because of its investment strategy. ECT didn't invest only in its capacity expansion as a container terminal but also at its development as a logistic hub which is connected with major economies of the Europe. The investment plan was focused on the development of the ECT's services and performance; in order to reach customers' real and daily needs in a world where the time and the cost plays a fundamental role for the flexibility and the reliability of ECT's customers.

ECT did the right investments, the right period, on the right parts of its core business. The one part is the box handling service by purchasing new automated equipments, which added value by reducing the time of the vessel on the port and by serving more ships at the same time. The second part is the value added logistic services that ECT can offers to the liner operator's customers-shippers by the high hinterland connectivity and the inter-modality of its terminals, in Rotterdam and its inland terminals.

### ***5.3 Investment strategies of ECT since the end of 2007***

Apart from the bad performance of ECT during the first quarter of 2007 because of reasons which were mentioned, the year was characterized by the complete renaissance of ECT. As the 270 million euro expansion program at the ECT Delta Terminal was completed. At the same time, the new computer system was running successfully and the construction of additional capacity through the construction of DBF and the Euromax were steadily progressing and were going to become operational from mid 2008.

The end of 2007 is indelible in the memory of everyone and especially for its causes on the international trade and thereafter on the liner industry. However, ECT had more than 12% increase of volumes at its sea terminals (Fast Forward, 2008). The increase was reached because of the growth in numbers of inbound containers from Asia.

On the other hand, the port of Rotterdam was the port with the smaller decline in container volumes in comparison with the rest ports in the Northern Europe like Hamburg, Antwerp, Bremen, Le Havre, Southampton and Felixstowe. The following table illustrates that the port of Rotterdam showed a stable throughput in 2007 and 2008, and a 15.1% decline in the first half of 2009.

Table 5 Container Throughput of Northern Europe ports (1994-2009)

Series ID	41002	91012	12238	46336	34704
	Container Throughput - Antwerp	Container Throughput - Bremen/Bremerhaven	Container Throughput - Hamburg	Container Throughput - Le Havre	Container Throughput - Rotterdam
Date	TEU	TEU	TEU	TEU	TEU
1994	2,208,000		2,725,700	873	4,540,000
1995	2,329,000	1,526,421	2,890,181	970	4,787,000
1996	2,654,000	1,543,405	3,054,300	1,020,000	4,936,000
1997	2,969,189	1,703,000	3,337,477	1,185,000	5,445,000
1998	3,277,610	1,850,000	3,567,327	1,320,000	6,032,000
1999	3,614,246	2,180,955	3,738,307	1,378,379	6,343,242
2000	4,082,334	2,736,741	4,248,247	1,464,901	6,275,000
2001	4,218,176	2,915,169	4,688,669	1,525,000	6,095,502
2002	4,777,151	3,030,000	5,373,999	1,720,000	6,515,449
2003	5,440,000	3,190,000	6,138,000	1,980,000	7,100,000
2004	6,063,746	3,469,104	7,003,479	2,150,000	8,200,000
2005	6,482,029	3,735,574	8,080,000	2,105,422	9,280,000
2006	7,013,029	4,473,574	8,900,000	2,130,000	9,700,000
2007	8,000,000	4,900,000	9,800,000	2,600,000	10,800,000
2008	8,663,736	5,500,709	9,737,000	2,488,654	10,800,000
2009	7,309,639	4,535,842	7,010,000	2,200,000	9,743,290

Source: © Clarkson Research Services Limited 2010

In comparison with other North Sea ports of Hamburg, Bremen, Antwerp and Amsterdam, the fact that the port of Rotterdam maintained its low pricing strategy, which depends on the harbor dues and leases, was a cornerstone for the port to have a small throughput decline. During 2007 and 2009, the port of Rotterdam didn't increase harbor dues more than 2.0% yearly. The pricing policy of the port of Rotterdam was based on its financial targets and transparency. Due to that the port increased its market share in container sector from 26.1% in 2008 to 28.0% in 2009. The port authority of the port of Rotterdam lending the land to ECT and also constructs the quay walls, for the first ECT pays rent and for the second quay dues. The target of Rotterdam was to gather as much as possible cargo flows by providing low charged services without reducing their quality.

ECT adjusted its strategy to the global economic scheme by adopting all kind of budgetary measures, postponement of investments. The most important issue for ECT was the capacity management. ECT focused on the capacity management through:

1. The resource management through maintaining its labor flexibility and expertise and the utilization of its hardware and equipment in order to be best prepared for upturn in market conditions.
2. The operational performance of the company by providing easy accessibility to its terminals, efficient handling and reliable terminal services and regular and fast connections to the hinterland

3. Expansion of its hinterland connection by strengthening its partnerships. That achieved through neutral inland corridors/terminals with new connections and/or in cooperation with partners and development of new services to optimize all the processes in the logistic chain.

All the above can be shown in the following paragraphs where it is analyzed the investment strategy of ECT against the global economic downturn.

The company has continued its investment projects which were partly made before the credit crunch by following a long-term prospect such as Euromax, Delta Barge Feeder terminal and TCT Venlo. The last two investments were small compared to investments in deep-sea terminals. But the main reason is that ECT believes in the strategy behind the investments and the necessity to have these facilities available when the market will recover. Euromax terminal has a sustainable importance for ECT's capacity flexibility in the port of Rotterdam and for the port's capacity as it will offer additional transshipment capacity. The Delta Barge Feeder terminal is a dedicated terminal for feeders and barges within ECT Delta complex, the terminal will guarantee berths as they won't rely anymore on the availability of mooring spaces at the deep-sea quays. The TCT Venlo barge terminal is an integral part of TCT Venlo, which is ECT's successful rail terminal for more than 25 years which represents the perfect inland hub for the Dutch region of Venlo and the German Rhine/Ruhr area as it is located only a couple of kilometers from the Dutch-German border.

In addition to that, ECT took out the barge terminal in the Hartelhaven, in Maasvlakte, as this subject wasn't very important. Even though, ECT was planning to participate in the project of the Container Transferium in Alblasterdam, finally the company won't have a stake in the terminal (Appendix 5).

Moreover, the ECT Home Terminal, the inland terminal of ECT, is operating under the new official name of ECT City Terminal. The City Terminal handles more than one million TEU of fruits and meat reefer cargo from South America. The terminal is used intensively for reefer transshipment. ECT realized investments on new eco-version straddle carriers of the terminal in order to optimize its operations by saving 20% of fuel. Additionally, ECT City terminal increased the number of reefer plugs by investing in 260 new plugs.

One year earlier, ECT sold the 100 % Hanno deep-sea terminal and the rest 50% of the Rotterdam Short-sea Terminal (RST) to Dutch stevedoring group Steinweg Handelsveem, which already owned the other 50%. ECT was led to sell RST as short-sea container handling never was a core activity for ECT (Appendix 5). The different terminal concepts and equipment that short-sea requires was away from the business of ECT which preferred to focus more on its core business.

However, ECT was not bothered and is continuing its project of providing the best added value package of services to its customers. In the spring of 2008, the president of ECT Rotterdam, J. Westerhoud stated at "Fast Forward" that this year

was a challenge for ECT as the company had to handle the double-digit volume growth (see *Figure 3*) with its existed capacity as the Delta Barge Feeder Terminal and Euromax wasn't yet available. For that reason ECT focused on further boosting service levels, efficiency and with that the performance at its terminals.

At September of 2008, the construction of 3 billion euro Maasvlakte 2 project started, the project was the second bigger investment after Euromax Terminal project for the port of Rotterdam. Both projects will increase the container handling capacity of Rotterdam's port. Global players like APM Terminals and DP World have already their piers in Maasvlakte 2. In line with the impact of the economic crisis on the container sector that means overcapacity in North-Western Europe for many years to come, there is also the uncertainty that ECT faces from the coming on stream of new container facilities on Maasvlakte 2. If new capacity is brought on the market too soon, the market will only further deteriorate. The project of Maasvlakte 2 is a challenge for ECT and makes it more competitive on its services and performance from now in order to be unmatched when Maasvlakte 2 will become operational at 2013. As the company won't have a share in Maasvlakte finally.

Instead of the bad economic environment and its bad consequences on the international trade and consequently to the liner industry and the logistics sector, ECT opened officially the first phases of Euromax Terminal and the Delta Barge Feeder Terminal in September 2008. The first one started to operate with its partner of the CKYH Alliance for a testing period. The Euromax Terminal passed from the test phase to the operational phase in June 2010. The latter have opened commercially six weeks later (Fast Forward, 2008). As far as for the other two phases of Euromax Terminal, which had been planned to be completed into three phases, depends largely on market developments and agreements made.

The uncertainty of ECT for the future due to the fact that the throughput of ECT was declined from 6.3 million TEU in 2008 to 5.95 million TEU in 2009. ECT was facing the uncertainty of the future by offering to its customers and logistical partners an even more efficient product. One of the most important strategies is the capacity management of ECT within Rotterdam, something that was learned from the liner operators as they are the first who experienced the crisis. The drop of container volumes maintains the uncertainty for the short term scheme in the terminal industry and not only that's why ECT is focusing its attention at the satisfaction of its customer's need.

In 2009, ECT started to feel the consequences of the global recession more as the container volumes have hit bottom as all the links in the logistics chain have severely affected by the lack of sufficient volumes. ECT saw its throughput figures stabilizing at between -10% and -15% of what they were in 2008. ECT felt the slump most strongly at the City Terminal in the Eemhaven area. The Delta terminal produced "normal" figures because of the fact that large vessels were kept in the

market and they are handled at the Delta terminal. ECT used the slack period to fine-tune the Euromax Terminal.

ECT has already invested on its main projects Euromax and Delta Barge Feeder Terminal. At that time the most important point, that ECT had to focus on, was the open and intensive cooperation between ECT, its customers and the transporters; in order to seek out and implement potential cost savings. Joint ventures set up between terminal operators and local partners within the confines of the local commercial, economic and regulatory environment.

The cooperation between ECT and its partners is aiming to cut costs by offering a flexible value added package to their customers according to the weekly or even daily developments in the container sector. The location and the hinterland connection of the port, in comparison to others West European ports, create economies of scale to its customers especially in a period like the current one. Also, the creation of extensive networks makes it possible to spread investment risks. The aim of both, ECT and its clients, is the concentration of cargo flows in the port of Rotterdam.

Due to the fact that the location is not enough in itself, even more during a volatile economic background, the importance of the high value added service package, through the flexibility that the terminal offers at the sea side as well as in the land side can make the difference. ECT counts on its efficient and reliable hinterland network as the port competition focuses increasingly on that.

For that reason, ECT postponed the renovation of the ECT Delta Dedicated North Terminal in order to adjust its investment project at the economic environment and in order to conduct the most extensive tests possible at the Euromax Terminal prior to its starting as fully operational, in an effort to give to its clients the opportunity to concentrate their cargo volumes in Rotterdam.

The part of innovation had always a vital importance for ECT in order to be sustainable. Since 2007, the most important innovation projects of ECT were the Euromax Terminal, which is the most modern and sustainable terminal in the world because of its diverse innovation. Secondly, the extension of its hinterland network with terminals, connections and additional services and the diverse package of measures for improvement of ECTs services, quality, maintenance and sustainability.

Furthermore, ECT turned its interest on “Greenfield” investments and investments on safety and security which are fundamental issues for the sustainability of terminals facilities. Not only because of the countries’ regulation that requires from terminal operators to operate their business with respect to the environment but also because can operators minimize their cost. The Euromax terminal is a “Greenfield” project as it uses “green” electricity for its equipments. Moreover, ECT invested in new eco-version straddle carriers at the ECT City terminal. These projects require investment on equipments and software, many global operators often have central

purchasing departments at their headquarters involved in making large contracts with the suppliers of terminal equipment such gantry cranes and terminal tractors. The pooling of orders for various terminals reduces the unit purchasing price of cranes and yard equipment. The same arrangements are made for the purchase and maintenance of terminal planning software.

The interest of ECT is not only turned to the capacity expansion or the equipment development of its terminals but also to its people. The possession of modern and advanced facilities is not enough for the high performance of a terminal, for that ECT invest on the frequent education and training of its people. All the new and high automated equipments need to be operated from specialized personnel who have the knowledge and the experience. Furthermore, ECT enhanced its value added services by acquiring the status of Authorized Economic Operator (AEO), which is a customs certificate introduced by the European Union and is aiming to stringent guidelines and procedures as regards security and operations in response to the crisis.

Another advantage of the port of Rotterdam and especially for ECT was the role of the port as a feeder hub not only for container traffic to and from UK and the Iberian peninsula but also for the Scan Baltic. Even though, the relatively long sailing times, the role of Rotterdam, as a feeder hub for the Scan Baltic seems rather less logical but, the “natural” advantages of the port and the economical bunkering offer an important incentive. The Rotterdam option can cut transit times by one to two days. In addition to that, the route from Singapore to St .Petersburg - transshipment via Rotterdam can also work out cheaper price-wise. The port, terminals and feeder operators are showing their commercial competitiveness, especially in these challenging times. The role of ECT, as a feeder service provider, is not by chance, as the company has invested heavily in optimizing its role as a feeder hub. Under this role, ECT attracted a lot of feeder traffic to and from Scandinavia and the Baltic Area to Rotterdam. A part of that traffic used to be handled in Hamburg before. The benefit is of course that it is extra business and that ECT has strengthened its position in that area.

In the first and second quarter of 2010, the positive volume trend in the global container sector is faced by the carriers and terminals in a manner that would not risk the recovery. The uncertainty still exists and is going to exist for the coming years, as economies all over the world have been hit hard by the recession. For Netherlands, the recent collapse of the government was also not really conducive to a quick economic recovery, as the lack of consistent economic policy affects the performance of the economy in general. However, Jan Westerhoud stated that ECT won't follow a conservative investment strategy but, it will continue to invest in the quality of their customer service.

That means that ECT has already started the full renovation of the quayside of the Delta Dedicated North Terminal (DDN) whose renovation had been postponed. During the project ECT will realize a number of other modifications such as the shift

of several quay cranes from other terminals to DDN. Through these modifications, DDN will gain more capacity for handling the largest deep-sea carriers. At the same time, the transfer points of the stacking lanes will be modified to enable so called twin carrying (the transport of two 20 foot containers by a single AGV). As well as DDE and DDW terminals, DDN will also boast six parallel AGV lanes rather than the current five. The project will be finished by early 2011.

In addition to that, the company is in the middle of the process to renovate the Eastern Rail Terminal. ECT is going to continue to invest and work on the optimally and sustainably accessible European Gateway Services (EGS) through its European hinterland, with more emphasis on transport by train and barge. The EGS network is a competitive advantage of ECT that gives to the terminal sustainability, reliability, flexibility through the fast and document free process of connectivity between the terminals. The figure below illustrates the extended gates of ECT from Rotterdam to Amsterdam, Moerdijk, Venlo and Duisburg.

Figure 4 The European Gateway Service network of ECT



Source: European Container Terminal, Rotterdam

At the beginning of 2010, ECT realized two more investments in the Delta Dedicated East Terminal (DDE) and the Delta Dedicated West Terminal (DDW), which equipped with a sixth lane for Automated Guided Vehicles. Through these investments ECT responded to the increasing economies of scale in the container shipping sector.

It is clear that ECT as terminal operator didn't face huge difficulties from the crisis, as all the global terminal operators, the company adopted the main strategies in order to face the crisis and to come out of it stronger. The president of ECT cited that "The uncertainty of the global economy is a bottleneck for us to conclude that ECT did good or bad that it continued to invest during the recession, this is something that will be clear through the years" (Fast Forward, 2009).

The most remarkable point of ECT's investment strategies was that the company completed the 1<sup>st</sup> phases of its three main expansion projects on Euromax, Delta Barge Feeder Terminal and the TCT Venlo despite, the bad economic condition. After all, the company concentrated its interest and its investment on its customers and on the seeking of new customers in China, Scandinavia and Baltic area.

ECT has done investments in the right location and time. The expansion of its capacity and its hinterland network were two fundamental issues for ECT and by extension for HPH's strategy in the Northern Europe.

Generally, the Netherlands, and particularly Rotterdam, don't have specific country risks, which can affect terminal operators' investments. The main risks have to do with the international trade. ECT looks at the market when it comes for its investments. Everything is determined by sound business cases, as country risks are not an issue in the Netherlands.

The Netherlands is as CRT-1 country with very low levels of risk across all three categories. CRT (Country Risk Tier) reflects A.M. Best's assessment of three categories of risk: Economic, Political and Financial System Risk. That means that, the country has a predictable and transparent legal environment, legal system and business infrastructure, sophisticated financial system regulation with deep capital markets and mature insurance industry framework. The global economic recession did not significantly impact the country until late 2008, later than most of its euro-zone neighbors. Even though, the Netherlands felt the full impact of the global turmoil.

As it is already mentioned the reason behind the postponement of DDN terminal expansion project, was the need of the terminal in order to be better served the carriers and Euromax terminal be better tested before become commercially operational.

Even, the collapse of Netherland's government which wasn't a good development for the course of a quick economic recovery didn't change the plans of ECT for further investments in the quality of its services. The strategic location of Rotterdam's port and the strong relationship between it and the country's government are aiming in the development and maintenance of Rotterdam as the main and unrivalled European gateway.

The investment strategy of ECT during the downturn was aiming not only at the maintenance of its competitiveness against the other ports but, also at the development of its performance level in the long term, when the crisis will be past.

ECT through its investment strategy aims to smooth, reliable and cost effective inland connections that will influence the port of choice. The hinterland cost reduction is a key for customers. In addition, the performance of the inland transportation modes affects the performance of the terminal. ECT invested in the development of both sides in order to achieve a balanced and smooth performance in its network. That is clear through its investments on the Euromax terminal, Delta Barge Feeder Terminal and TCT Venlo, as well as through the DeCeTe.

The case study on ECT proves that the location and the management of a container terminal play a remarkable role on the effects that an economic recession can have on the planning of a company's investment strategy. In the case of ECT, HPH didn't cancel or postpone any of its projects instead of that, HPH concentrated on investments which were vital for the present and future of its terminals in the Netherlands.

The relationship between ECT and its customers and partners is a cornerstone for the success of the company during the years and especially for its survival from the economic downturn. In a difficult economic period when the investment plan of a company can be threaten the only way to gain cash flow is through cancellation or shelving of those investments that are not necessary.

In the case of HPH, ECT's expansion projects were planned in phases, after the completion of first phases the company didn't do any further investment until the market recover and express the need for more capacity. ECT turned its focus smaller investments as it concerns the education and training of its personnel, the safety and security of its services, the environment and the smooth and effective operation of its terminals. An example of the latter one is the cargo cut-off procedure in the ECT Delta Terminal (procedure through which ECT created the time necessary to optimally prepare for the arrival of each vessel), the "Roadmap Pre-gate" project which aims to boost truck handling capacity and to ensure the compliance of the terminal with more stringent customs requirements (RTO) and the regulations of the ISPS code.

The message of ECT's investment strategy is optimistic as the terminal operator managed its expansion investments and has adjusted its investment in the needs of the difficult economic situation. The company managed to survive from the crisis and come out of it stronger and ready to compete with the other operators of the port of Rotterdam and the rest of the world when the global economy recovers.

## Chapter 6 Conclusion

The global economic crisis decelerated the aggressive development of the liner industry and especially of the container terminal sector. Terminal operators came face to face with a loss of \$US 20 billion because of the lack of cash. During last decades, terminal operators have enjoyed returns on sales 5, 10 and even 20 times higher than those of the ocean carriers. Terminals as liquid assets with excellent prospects and high returns on investment attracted several financial investors apart from the still stevedoring companies. The growing demand for consumer goods, the larger container vessel size and the importance of “just-in-time” “door-to-door” services required high capital investment on container terminal capacity expansion projects all over the world.

The severe hit of the global economic crisis on the container terminal industry made all terminal operators to take different measures against the recession. The strategies have been adjusted to the type of the container terminal operator, its geographic location and its integration strategy.

The main measure against the crisis was the capacity management which was applied by the review of terminal operators' investment projects. Many projects were differed, postponed or cancelled in order operators to maintain their business, their revenues and manage their costs. Expansion projects which weren't completed at the 50% were stopped. Capacity construction projects held on the side until the market recovers.

The top-4 terminal operators, HPH, APM T, PSA and DP W represent some 42% of total worldwide container handling business. Despite the unprecedented volumes declines of 2008, the top-4 players remained the same and their market shares stable close to 2007 levels. The consolidation of the industry, especially in the European ports has reach a limit and thus, the merger and acquisition activity is likely to slow down in the years to come. Many opportunities for those operators and investors with deep pockets have become available as some container lines or terminal operators might sold off part or whole facilities shares. In addition to that, the new benchmark value of port companies has been formed at EBITDA multiples of around 8-12 times instead of 14-20 in the mid-2007.

Most of the terminal operators turned their focus on investment which enhanced their performance and reduced their costs in order to handle the bad economic situation. The customer, more than ever, became the centre of terminals' operations. Terminal operators aimed at the smooth, flexible and efficient service of the customer by offering quality and low prices.

Investments were concentrated more on innovation and technology, software systems, environment, safety and security. Innovation is vivid factor for the efficiency and competitiveness of leader terminal operators. Moreover, investment

on ECO equipment reduces energy consumption and minimizes the operational cost of terminals.

Investments on the education and training of terminal personnel were required for the efficient operation of last generation equipments and software systems.

More than that, terminal operators invest on their relationship and co-ordination with their partners, in order to concentrate cargo flows to their facilities (e.g. port of Rotterdam).

Furthermore, there are some reasons that led container terminal companies to revise their investment strategies. Risks like the project risk, commercial risk, revenue risk, cost risk and country risk are some of these.

The most important of them is the country risk especially for the container terminal business which has multi-regional character. The global network of terminal operators is a way to spread their risks but also a way to be exposed in other regional risks.

The most common is the regulation which can affect the port governance and consequently the terminal operator. Most of the ports are managed based on the landlord concept. That means that both the port authority and the terminal company operate on the basis of long-term concession agreement. The agreement can determine every inch of the relation between the two according to the clauses that are included. In addition to that, the ownership of the terminal facility plays fundamental role on the land rights of terminal operator (case of lease agreement instead of BOT, e.g. Dubai)

In a recession period, the port authority or/and the government of a country might redefine or impose new regulations on the land exploitation, the environment or the safety. Moreover, another bottleneck for an investment can be the general monetary risk of developing countries with high or very high country risk and the union's action.

The case study on ECT underlines the importance of the strategic location of a terminal, the timing and the right investments, the continued development of the terminal network and its hinterland even in a difficult economic environment. The investment on prime importance projects is the key for the performance and competitiveness of a business. ECT like most of the operators aimed on the enhancement of their performance not only in order to survive but to become stronger and ready for the years when the market recovers. All these were supported by the fact that the company is member of HPH and its unrivaled location.

The growth will return but in a slower pace and from different directions. As container trade shifting from head-haul to back-haul, more attention is paid on the port and hinterland development of emerging countries (India, China etc.), which are going to drive the global economy from the recession.

The message from the terminal operators is optimistic and it confirmed from their investment strategies. The recession led them to delay or withdraw some capacity expansion projects but they didn't lose their enthusiasm and their willingness to invest on other things also important for them and their customers. The potential of the industry are endless but is on the hand and the philosophy of each company to define and take advantage of them.

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## Appendices

### Appendix 1 Orientation indices for the geographical spread in the terminal portfolio of global terminal operators-based on number of terminals

	Africa	Australia	Med	North America	Pacific Asia	South America / Caribbean	South Asia / Middle East	Europe Atlantic
APM Terminals	3.33	0.00	1.23	1.31	0.51	0.69	1.33	1.23
DP World	1.88	6.25	0.93	0.10	0.65	0.65	3.75	0.99
Eurogate	0.00	0.00	7.41	0.00	0.00	0.00	0.00	2.63
Evergreen	0.00	0.00	2.22	0.49	1.71	1.03	0.00	0.00
Hanjin	0.00	0.00	0.00	1.34	2.08	0.00	0.00	0.00
HPH	0.59	0.00	0.65	0.00	1.46	1.62	0.71	1.55
ICTSI	1.88	0.00	1.39	0.00	1.61	1.94	0.00	0.49
PSA	0.00	0.00	0.93	0.00	1.67	0.57	0.67	1.75
SSA Marine	0.00	0.00	0.00	3.28	0.19	2.76	0.00	0.00
Ports America (AIG)	0.00	0.00	0.00	4.92	0.00	0.00	0.00	0.00
COSCO	0.00	0.00	1.39	0.00	2.50	0.00	0.00	0.00
Subtotal	1.12	1.12	1.08	0.84	1.03	0.93	1.12	1.03
Grandtotal	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Source: Notteboom, T., Rodrigue, J.-P, 2010

### Appendix 2 Orientation indices for the geographical spread in the terminal portfolio of global terminal operators-based on terminal surface in hectares

	Africa	Australia	Med	North America	Pacific Asia	South America / Caribbean	South Asia / Middle East	Europe Atlantic
APM Terminals	3.54	0.00	1.69	1.44	0.50	0.36	1.86	0.91
DP World	3.15	7.93	0.87	0.06	0.71	0.75	4.80	0.89
Eurogate	0.00	0.00	6.38	0.00	0.00	0.00	0.00	2.90
Evergreen	0.00	0.00	4.35	1.27	0.84	1.38	0.00	0.00
Hanjin	0.00	0.00	0.00	2.06	1.48	0.00	0.00	0.00
HPH	0.28	0.00	0.24	0.00	1.51	2.17	0.44	1.48
ICTSI	2.67	0.00	1.29	0.00	1.45	3.26	0.00	0.82
PSA	0.00	0.00	1.21	0.00	1.74	0.43	0.28	1.31
SSA Marine	0.00	0.00	0.00	3.33	0.19	2.70	0.00	0.00
Ports America (AIG)	0.00	0.00	0.00	4.38	0.00	0.00	0.00	0.00
COSCO	0.00	0.00	1.96	0.00	2.38	0.00	0.00	0.00
Subtotal	1.10	1.10	1.09	0.88	1.03	1.02	1.10	1.00
Grandtotal	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

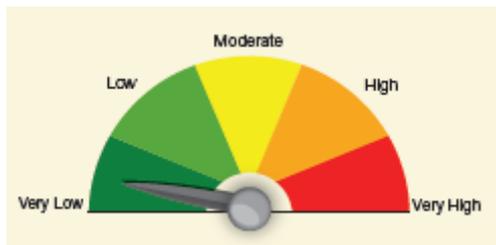
Source: Notteboom, T., Rodrigue, J.-P, 2010

### Appendix 3 AMB Country Risk Report

CRT-1	CRT-2	CRT-3	CRT-4	CRT-5
Very Low	Low	Moderate	High	Very High
Australia	Barbados	Bahamas	Brunei	Algeria
Austria	Belgium	Bahrain	Egypt	Belarus
Canada	Bermuda	China	India	Bosnia and Herzegovina
Denmark	Hong-Kong	Cyprus	Indonesia	Dominican Republic
Finland	Ireland	Israel	Jordan	Ghana
France	Italy	Kuwait	Kazakhstan	Jamaica
Germany	Japan	Malaysia	Mauritius	Kenya
Gibraltar	Liechtenstein	Malta	Morocco	Lebanon
Guernsey	New Zealand	Mexico	Panama	Nigeria
Luxemburg	Slovenia	Oman	Philippines	Ukraine
Netherlands	South Korea	Poland	Russia	Vietnam
Norway	Spain	Qatar	Tunisia	
Singapore	Taiwan	Saudi Arabia	Turkey	
Sweden		South Africa		
Switzerland		Thailand		
United Kingdom		Trinidad and Tobago		
United States		United Arab Emirates		

Source: IMF, Swiss Re and A.M Best

### Appendix 4 Country Risk Tier



Source: A.M. Best Company Inc.

### Appendix 5 Questions to Mr. Rob C. Bagchus about ECT projects during the crisis

1. HPH has a 60% of ECT's stake? Who has the rest?
2. Euromax Terminal, first phase started being operated at 2008? When the crisis had already hit liner shipping. How this affect the operation of the new terminal?
3. -At the beginning, Euromax was a 50-50 joint venture between ECT and P&O Nedlloyd, after the acquisition of P&O from Maersk what happened

- with this partnership? The new partnership is between ECT and CKYH, which the percentage of the joint venture between them?
4. In the Fast Forward of Winter 2005, there is mentioned an investment program of 270 million euro, that amount includes only the construction of Euromax Terminal?
  5. The initial investor of Euromax is HPH? And who else?
  6. The investments are done by the private sector and by the public sector; can you mention if there is any financial institution that funds the Euromax project?
  7. Which is the role of the Port Authority of Rotterdam?
  8. As I read the construction of Euromax was planned to complete in 3 phases, the first phase is operated. What happened with the other two phases? Are any plans or the postponement is a part of ECT adjustment in the current situation?
  9. How the postponement of Delta Dedicated North Terminal renovation remained the flexibility of ECT during the recession? Did the renovation rescheduled about May 2010 until January 2011 or it is abandoned? Is Euromax replacing the DDNT?
  10. In one of the World cargo news online of 2007 is mentioned that Steinweg bought 50% of ECT stake and the whole Hanno deepsea terminal. Is that true?
  11. In the same source mentioning that in 2008 HPH was negotiating to sell 10% of ECT's stake at NYK in exchange for 50% stake in NYK's Ceres Paragon Terminal in Amsterdam. Did this happen?
  12. Which were ECT's cost cutting measures and cash flow management since 2007?
  13. Which was ECT's capacity management since 2007?
  14. Innovation has a vital importance for ECT in order to be sustainable. Which innovation projects were the most important of the last 3 years and how these affected the performance and service of ECT?
  15. How ECT could afford to construct TCT Venlo delta terminal and Delta barge feeder terminal investments in the middle of the severe downturn? Generally the whole inland investments when other terminal operators cancel or shelved their investments?
  16. Which of the ECT terminals was affected more by the recession? Reasons and consequences?
  17. Mr. Westerhoud said at the last FF (spring 2010) that: "The impact of the recent crisis will be felt for a long time. Like Southern Europe countries already have felt. But in our country, the recent collapse of the government is also not really conducive to quick economic recovery". How the collapses of the government influence ECT's operation and investment?
  18. Which was/were the main country risks of ECT or HPH investment strategies the last 5 years?
  19. How ECT participates in terms of stake in the project of Container Transferium in Alblasserdam? Is the transferium planned to open at the end of 2010?
  20. Have you already planned major renovations for the Eastern Rail Terminal of Delta complex?
  21. ECT's magazine, Fast Forward (spring 2009), mentions that ECT become a ScanBaltic Hub for transshipment for Scandinavian countries (Sweden, Finland) and Baltic States (Lithuania, Estonia, Latvia), Poland and Russia. Did that happen? Which were the real benefits for ECT?

22. Apart from the collapse of the government the last year, do you have to mention any other country risk that affected the investment strategy of ECT?

