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Worldwide Analysis of Ship Ownership and its Relationship to Shipbuilding, Repair and Maintenance Markets

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Abstract:

Proposed by Holland Marine Equipment (HME), the following thesis focuses on analyzing worldwide ship ownership and its relations to the ship building and repair markets. This is of most importance to HME so they can position the Dutch equipment and technology sector for shipbuilding and repair in the global market. The industry is showing a greater involvement of Asian shipowners and by identifying the importance of these shipowners and geographic regions, the study will use this information to pinpoint the existence of maritime clusters in the ever growing Asian markets. Maritime clusters gather entities dedicated to maritime services, education or manufacturing so it become a focal point of the research as for the equipment and technology companies', that HME represents, depend on exports and cluster dynamics for future growth. Moreover, by benchmarking Asian emerging markets and established European maritime clusters through economic indicators and fiscal climates, the study will recommend which of the Asian countries is best suited for foreign investment and eventual location for HME expansion.

Table of Contents

Table of Figures

Chapter 1: Introduction

1.1 Holland Shipbuilding Association, HME

Globalizations together with the evolution of ocean shipping has made possible the development of many adjacent services that support the industry, for example the equipment and technology sector for repair, maintenance and shipbuilding. Apart from providing needed service to shipyards and shipowners, this industry also gives an opportunity to individual companies and countries in becoming involved in research and development, creating innovations for ships that will benefit the industry in becoming world class businesses.

The Netherlands plays a very active role in maritime business, as we all know by now, by being one of the most internationally oriented countries that is both innovative and proactive in all maritime businesses. In the Global Competitive Index provided by the World Economic Forum, the Netherlands comes in ranked in tenth position[1], further stressing the fact that not only in maritime, but in other sectors of the economy, the country has the right platform for long term sustainable success. This great business atmosphere together with a world class port provides a well organized structure for international companies to prosper. In addition to healthy industry for dredging inland shipping, yacht building, repairs and maintenance, "the Dutch maritime cluster contributes to research and development in energy at sea, new transport concepts and high quality and professional fisheries" (Holland Shipbuilding Association, 2009). Its strengths are based upon the fact that they keep international alliances with all types of companies and strives on the promotion of international export taking advantages of free market conditions In 2007, "the Dutch shipbuilding cluster had a turnover of 7.6 billion euro (6.2 billion in 2006); in terms of order intake, the Netherlands became Europe's largest shipbuilder in both ships numbers and ship tonnage" (Holland Shipbuilding Association, 2009).

The Dutch Shipbuilding position in Europe helps the equipment and technology sector of the country be one of the most competitive in the world, as it gather at least 275 companies representing this sector. Holland Marine Equipment or HME is an active trade association with the main purpose of seeking the most competitive position possible for the Dutch maritime supplier industry. Its 275 members provide parts and equipment for shipbuilding, repair, shipping and offshore activities, as well as technology for all these sectors in the euro zone and all over the world. The association is the primary representative of the Dutch maritime supplier industry as it provides information about and lobby on behalf of the sector. Holland Marine Equipment Association is an active participant in the Dutch Network and a co-founder of the European trade organization EMEC[2]. HME belongs to the umbrella structure of Holland Shipbuilding Association which is the Central organization for HME, VNSI[3] and trade association of FME[4].

[1] See table in Appendix I

[2] EMEC = European Marine Equipment Council

[3] VNSI = Vereniging Nederlandse Scheepsbouw Industrie

[4] FME = Federation for the Metal and Electrical Industry

To promote success, The Holland Shipbuilding Association has taken the initiative, with five strategies, toward securing the importance of the Dutch shipbuilding cluster by 2015.

The five strategies promoted are[5]:

1. To compete through talented workforce by taking advantage of the sector's knowledge and craftsmanship.
2. Making sustainability and innovation a pillar of the Dutch maritime cluster; innovation is the a propeller of industry growth .
3. Increasing synergies within the cluster to strengthen relationships through greater cooperation.
4. Cooperation with the government, were they are legislators, clients and partners.
5. The international branding of the Dutch shipbuilding cluster; Dutch maritime expertise is highly regarded around the world.

The Dutch equipment and technology industry, being export oriented, depends on the strength of these strategies and of the cluster dynamics to further attract customers and stay as a leader in the global market.

1.2 Purpose & Objectives for the Study

The purpose of this report is to further understand the current trends of ship owning and how will this affect shipbuilding around the world. This is important for Holland Marine Equipment because by understanding where the top ship owners of the world are, Holland Marine Equipment can locate the best position possible for the Dutch equipment suppliers to further increase their market share in a highly competitive industry.

The shipbuilding and repair industry is crucial for the Dutch equipment suppliers which depend on export dynamics to increase their global business, now that most of the shipbuilding activity happens in foreign countries, especially in Asia. Although Dutch shipbuilding is very strong in Europe, being the number one shipbuilders of the Euro Zone and its maritime cluster is one of the most important clusters in the industry, it is not enough to sustain the equipment suppliers which confront heavy competition from countries like Germany, Norway, Denmark, Japan, and United States, amongst others.

Shipbuilding & repair, shipowing and the equipment industry are highly correlated due to the fact that they depend on each other to exist. During the last decade, companies have incremented their capacities, filling up order books at shipyards, more entities have become ship-owners and the equipment industry has benefited from this rise in economic activity in the sector. The rise of marine trade is a testament of macroeconomic conditions which have affected the factors of production of most of the consumer products demanded by western societies. With more and

[5] (Holland Shipbuilding Association, 2009)

more production centers moving to Asia, it is only a matter of time in which these Asian countries will contribute to the maritime industry and HME wants to be ready for whatever market trend comes up in the near future. Even though warnings of over capacity were said to be a threat to the industry, shipping companies were not ready to submit to those warnings, ordering more and more ships. With production facilities further moving eastward to Asia taking advantage of lower labor and transportation costs as well as high frate rates; the increased trade from east to west, created a perfect scenario for ship builders, ship owners and equipment suppliers to grow. Yet, after 2008, the financial crisis shifted global demand forecasts creating a scenario were over capacity was the norm. Equipment suppliers for repair and shipbuilding business looked positive until the finical crisis hit the market and these, together with shipping companies, had to react to market trends to further increase their business in volatile times. A ship owner plays a central role in building, repairing and retrofitting ships, and even though specialization and globalization have an impact on their decisions, it is not always clear where these are taking place.

The thesis study can be divided into five chapters which have for objectives to report on the historical economic trends of global marine trade of the past decades as well as on the strategies Holland Shipbuilding Association have to assist HME and its equipment sectors marketing agenda. Another objective is to report on ship building/repair industry, describing the types of vessels being built, the movement of production centers from Western to Eastern countries and who the leaders of the industry are. Ship owning will also be closely analyzed as it is critical for HME to know who and where are the most important owners, and what types of ships they are operating.

To further understand the relationships between these three different sectors; shipbuilding, shipowing and equipments; the definition of clusters and cluster dynamics will be discussed to see how the marine industry operates according to these theories. As it will later be explained, the equipment industry depends on cluster dynamics to be successful so understanding these intra-industry relationships would allow HME to have a better sense of what's out there. By benchmarking successful clusters to emerging ones, we will be able to understand these market trends specifically if Asia will become the next great cluster.

Because market scenarios have changed recently, as a final result, HME seeks to understand where are the decisions being taken according to shipbuilding and repair and "who is who "in ship owning, to better position the Dutch equipment and technology sector in this vast global market. The main question to be asked is if:

The dominance of worldwide fleet ownership will shift from European owners to Asian owners making Asia the most important shipping cluster in the coming decades.

1.3 Literature Analysis and Methodology

The qualitative analysis study will be done based on the description of the shipowing and shipbuilding industry through recent articles from journals and news reports, literature on maritime industry, comparative advantage theory, cluster theories and information from figures and graphs provided by well known international organizations and consultants. “There is no single method or approach on how to make good analysis as it will vary from industry to industry and largely depend on its motives for doing the analysis” (Wijnolst & Wergeland, 2009). However, it is important for the purpose of the study to make good descriptions and intelligent assumptions supported by definitions and strong theoretical structure to achieve the end results.

Extensive internet research was done to identify the top shipping companies of the world, were 130 different companies were looked at to establish information on the percentage of where these international companies are situated according to their geographic position. These will illustrate the concentration of ship owners worldwide. To add to the shipping companies’ information, Lloyds List provides a daily report; the top 50 shipping companies’ index based on their market capital in USD $. Moreover, a time line divided in 5 year intervals from 1990 to 2009 of the top 35 ship owning countries provided by the UNCTAD[6] Report on Maritime Transport will serve as a guide to understand which countries have been leaders in shipowing. The information is broken up into two types of data: leaders depending on deadweight and leaders depending on amount of vessels owned. Not necessarily is the case that a country with a significant size of deadweight leads to the fact that this same country is the leader in amount of vessels owned.

The UNCTAD Report on Maritime Transport also provides valuable information on the world fleet composition depending on vessel types. Again, a time line from 1985 to 2009 was prepared to understand the trends on ship building in a 45 year span. The building of vessel types reflects market conditions in which ship owners took advantage of during these years. From this information, we can present as well, graphs of how tonnage of deadweight has evolved and grown to further reflect the increase in global marine trade. Five vessel types are then picked out from this information to identify, by geographic region, which of the regions has the top shipowners with these types of vessels. The vessels are: Chemical Tankers, Bulkers, Multipurpose Vessels, Offshore Supply Vessels and LNG[7] Vessels. This information is available through the Clarksons Consultant Ltd. data bank and is necessary, to further understand who is demanding these vessels and which type of vessels are being built. Through Clarksons, it is also possible to identify and illustrate the top 50 newbuild ship yards in maritime industry to further add the analysis, especially, where the vessels are being built. It is assumed by the UNCTAD Reports and Clarksons Consultant that if a certain company appears in their lists, those companies’ management offices are located in the countries which they represent.

The content of these documents will be the core information together with comparison done through indicators provided by the World Bank to establish strengths of Asian leaders in the industry. The comparisons of indicators of the different Asian countries will provide a detailed

[6] *United Nations Conference on Trade and Development*.
[7] Liquid Natural Gas

profile of which of these countries might be suitable for HME to position its operation and efforts, if it is the case that one of these countries will become the next world class maritime cluster. Five indicators were selected from a wide range of possibilities, with the idea that they support the necessary criteria for these countries to be considered as a business venture. The indicators provided by the World Bank are:

1. Technology Index
    - Research and Development Expenditure as a percentage of GDP
2. Business Environment Index
    - Ease of Doing Business
3. Transportation Index
    - Quality of port infrastructure
    - Customs procedure
    - Liner Shipping connectivity
4. Economic Activity index
    - GDP % Growth
    - Unemployment Rates
    - % of Exports of Goods and Services
5. Fiscal climate

These are selected to demonstrate the strength and weakness that will allow good business to exist in these countries and provide a framework for cluster dynamics. Clusters need to be supported by a combination of public and private efforts to establish good policies, academic institutions, accessibility to local and foreign entities, economic sustainability, global recognition, competitive service and manufacturing sectors together with research & development, to ensure that the necessary structure is in place to allow the cluster to flourish. A detailed comparison of each of these indicators between Asian maritime leaders; China, Singapore and South Korea, will determine which of these countries has the best platform for HME to establish their presence for the benefit of the Dutch equipment industry.

The indicators from the Asian countries will also be benchmarked with the successful European maritime clusters of Norway, United Kingdom and The Netherlands will be done to establish, to which extent, if the Asian countries have economic and fiscal similarities to these the maritime cluster. By using information from the book “Attracting the Winners” by Erik W Jacobsen and “European Maritime Clusters” by Nikko Wijnolst, together with the information on each chapter, the study will establish if one of this Asian countries will be the next maritime cluster in the near future.

The global competitive market has given people around the world possibilities of reaching places that they never thought possible years ago. Together with technological advances, the competitive stakes have been raised and whoever has an edge over their competitors will provide the difference of existing or not in the business. The Dutch maritime industry is world renowned and has an edge over its competitor because of its history and excellent track record, but other countries and emerging markets are catching up, providing the same or similar quality of products and services that only European expertise were able to provide. This is the reality of

2010 and beyond, hence, HME need to be prepared to continue the maritime tradition of the Dutch industry.

Chapter 1 will include the introduction, literature and material analysis together with qualitative methodology as well as Holland Shipbuilding Association and HME framework and strategy markets and competitors. Chapter 2 will include historical background of global marine trade, the global economic crisis and Maritime Equipment & Technology Markets Potential. Chapter 3 contains issues concerning ship owners and companies like flag registry, financial & commercial strategies and freight rates, trends in ship owning countries, important geographic regions, number of vessels and dead weight. Chapter 4 will point out major players, types of vessels, the shifts of shipbuilding from western to eastern countries. Chapter 5 will include information on cluster and cluster dynamics definitions through publications by Michael Porter & Niko Wijnolst amongst others; the selection of emerging Asian maritime industries, their cluster implications and the benchmark with successful European clusters by macroeconomic and fiscal indicators. Chapter 6 will be the conclusions and recommendations for HME future decisions. This study should be considered more as a guideline to understand what the future may present in the maritime industry according to the recent trends that affect ship owning ship building and eventually the equipment industry; were HME has its interests. The main texts used to provide an all around view of the maritime industry information plus the core definitions on key terms and market trends will be Maritime Economics 3rd edition by Martin Stopford and Shipping Innovations by Nikko Wijnolst and Tor Wergeland

Chapter 2: Maritime Industry & Trade

2.1 Seaborne trade and shipping

With the transport industry further evolving, globalization has paved the way for the shipping industry to become one of the most dynamic business atmospheres that exist in the global economy. It has not evolved only in transportation and logistics of goods and people, but in services that compliment transport for example: finance, repair, shipbuilding and scrapping, dredging, equipment and technology as well as port and stake holder management strategies, universities and specialized institutes. The shipping industry's main characteristic is that it's demand depends on global economic trends, which eventually affects the movement of transportation of goods around the globe. That derived demand is a key factor, no matter which strategy ownership or management prefer for their shipping operations as for shipping is a catalyst and advocate of trade.

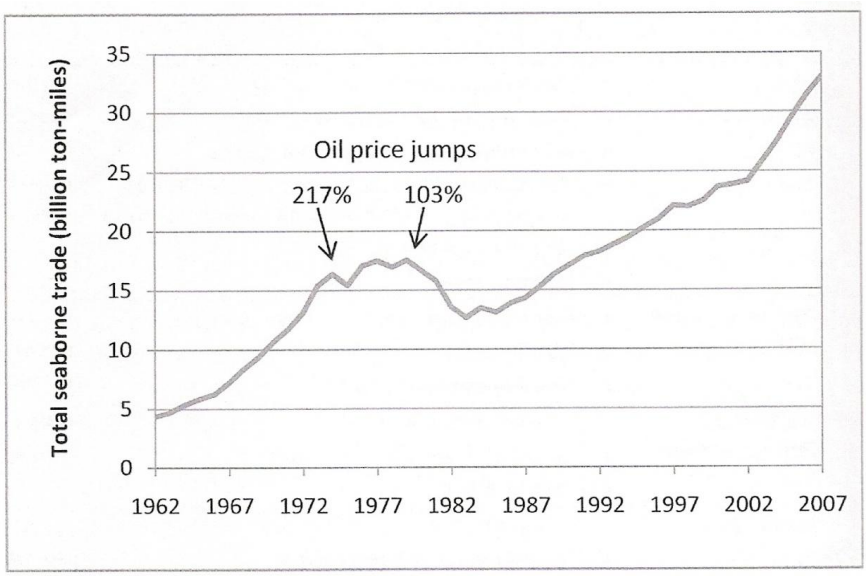
Moreover, trade liberalization amongst countries has produced further integration of markets separated by geographical distances and shipping has become the main link between the market players. With greater integration of markets, network infrastructures, which include ocean, river, land and air, needs to be established in a way so that the global supply chains are not interrupted as for it will increase costs; and the management and lowering of costs is one of the most important activities for any business.

In Europe, shipped products are received mostly through ports, either at deep seas ports like Port of Rotterdam, river ports like those of Antwerp and Hamburg or Mediterranean Ports in Greece France Spain or Italy. Out of all these mentioned, Port of Rotterdam has the potential of being known as Europe's most important port not because of its ocean side facilities which are state of the art, but because its modal split services. Apart from being able to accommodate the largest ships in the industry, and perform feeder services as a hub and spoke network, its hinterland connections allows shipments from all over the world to be transported efficiently through river barges, rail and truck and support the demand of a population ranging to almost 500 million inhabitants of the Europe Union and Border countries. These gateways are the first to respond to the flows of the global supply chain networks, increasingly performing door to door delivery to its customers. Countries with port facilities have, once again, become very important in world trade having in mind its geographic position and modern infrastructure facilities.

In recent decades, macroeconomic conditions have shifted in a way that it has led to the production and manufacturing of many consumer goods in Asian countries like China and India which take advantage of their labor intensive economies with low wages. Although production centers are geographically far away, demand for these products in European communities and western societies, can be satisfied by taking advantage of economies of scale, and low transportations costs; distance has become irrelevant. Yet, not only consumer goods from Asia need to be transported, as for fruits like bananas, cocoa beans, coffee from South America take part of the global supply chain together with raw materials like ores, minerals and oil products from around the world, especially Africa and the Middle-East.

In the next figures, it will be clearly denoted, the trends of seaborne trade throughout the years. In Figure 1 seaborne trade is shown in a relative positive slope from 1962 to 2007. Only after the years of 1972 and 1980 where oil price jumped and created the oil crisis the years that followed, is where we can see dips in the economic cycle of trade. It serves as an example of how volatile the industry can be and if hit hard by crisis, how difficult it is to recover. It took at the most, a decade, for world seaborne trade to recover to 15 %, the same as it was before the crisis during the 1980's.

Figure 1: Seaborne Trade Development 1962 to 2007

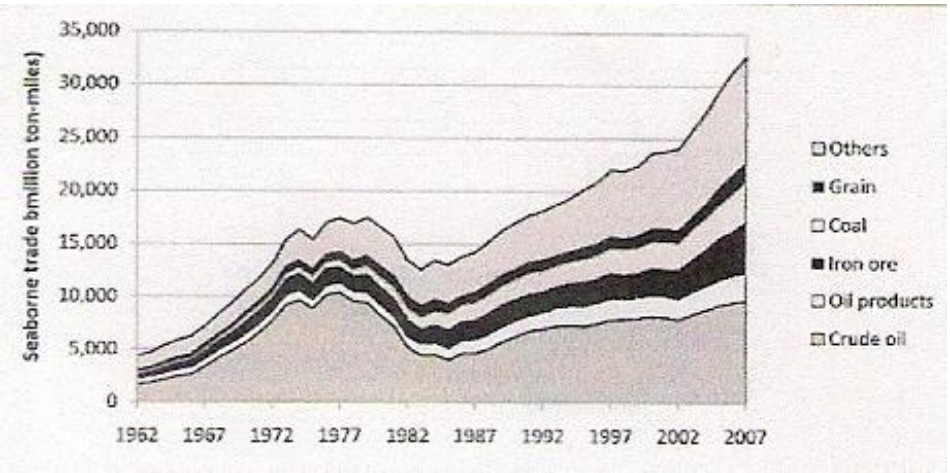


Source: Wijnolst , 2009

During and after the 1990's, an era which is characterized by liberalization, integration of markets and the dot-com era, world trade began to rise at an accelerated pace; demand for products and raw materials was high. Yet it must be noted that "international shipping depends extremely on the transportation of a few commodities were they represents 57.7 % of all seaborne trade" (Wijnolst and Wergeland, 2009). Figure 2 strictly shows how these different types of cargo were increasingly being transported around the world in a span of 45 years.

The commodities are: grain, coal, iron ore, oil products and crude oil. Between these five, grain is the leader in commodities transported in billion ton-miles, followed by the rest in the same order of importance as mentioned. In later chapters we will see that this coincides with the ship owning market and the dominance of bulk ships in the industry. In the figure, the highest line represents other products, which is over the 30,000 billion ton-miles; transported in general cargo and containership vessels.

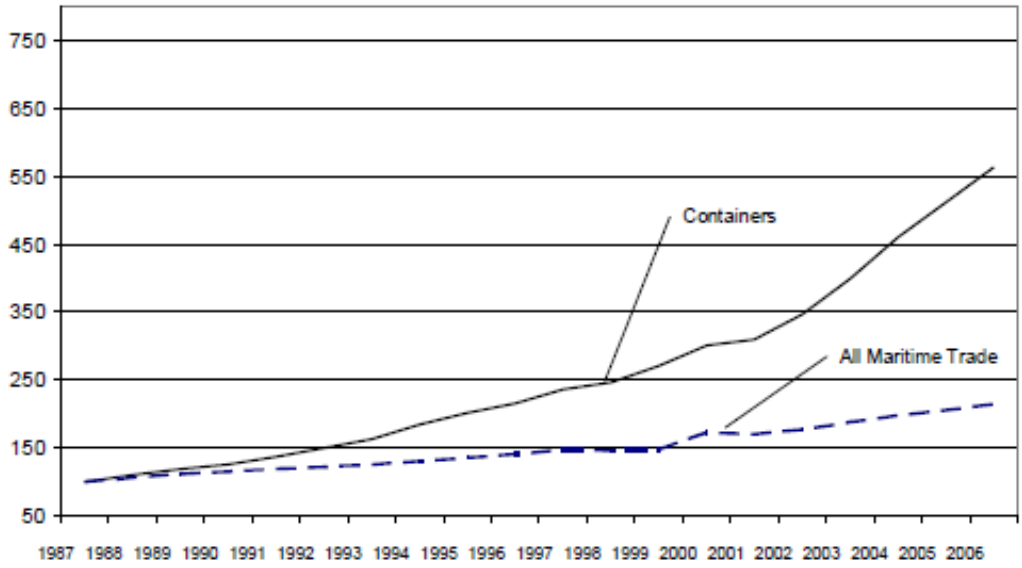
Figure 2: Seaborne trade, billion tons-miles (Fearnleys)



Source: Wijnolst, 2009

The movement of all these different types of cargo is one of the many reasons that have led to the specialization of vessels and the emergence of many different ship owners and shipping companies. One market trend that further helped the shipping business, which started during the 1960's, was the introduction of the container by Malcolm McLean. This innovation, which was born by a simple idea of a metal box, propelled shipping into a truly global industry. The container changed the way cargo was being transported in break bulk ships and began the age of specialization of vessels. Containerization paved the way for the evolution of different types of ships, often carrying only one type of cargo and eventually becoming bigger and faster than ever.

Figure 3: Growth of World Maritime Trade 1987 to 2006 (INDEX: 1987 =100)



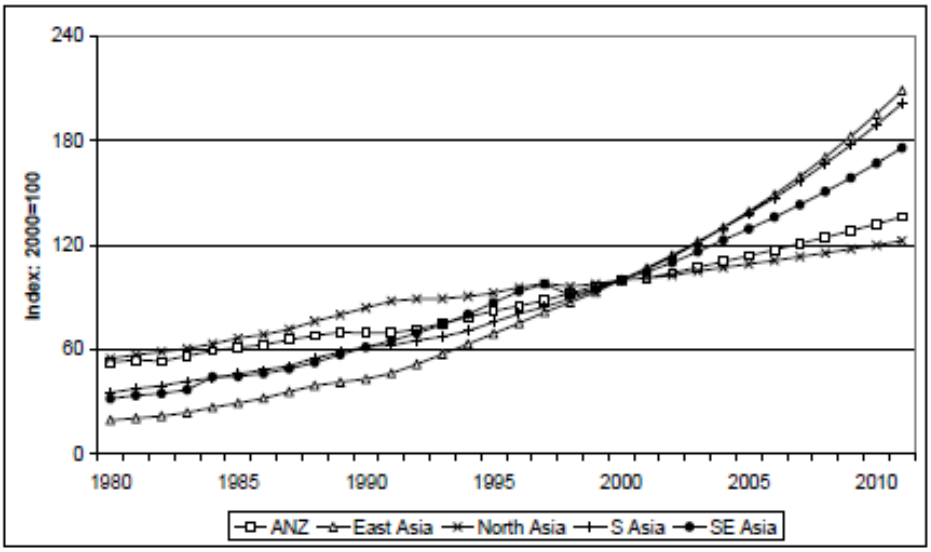
Source: United Nations, 2007

Figure 3, in the previous page, illustrate the relationship between container traffic and all maritime trade. "Container traffic grew at an outstanding 9.5 % per year over the same period

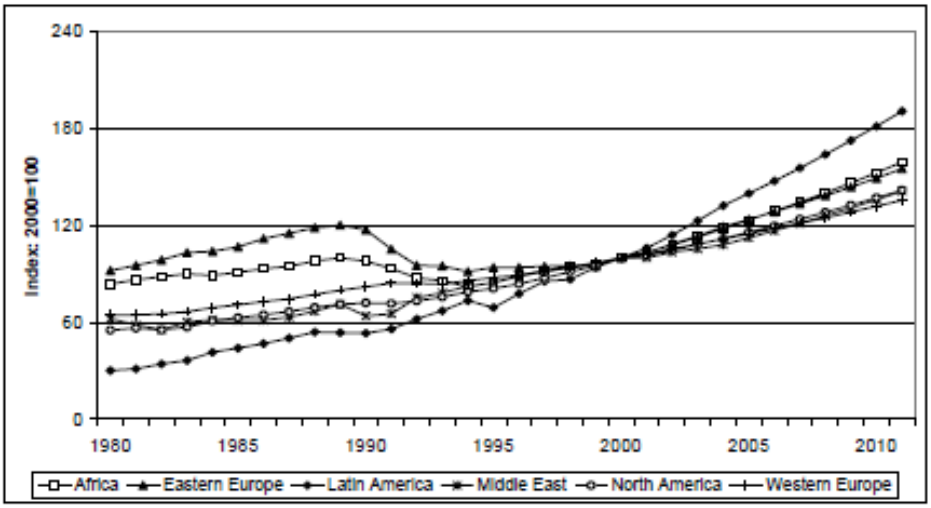
where all marine trade grew at an average 4.1% per year" (United Nations, 2007). In 2006, seaborne trade was almost double the amount than in 1990 but it is revealed that the market for goods transported in containers and general cargo vessels represented led an even higher path of growth throughout the years. Shipping companies saw this market conditions and took advantage of them, pushing for more container trade fed by global demand, which forced the construction of more vessels, increasing capacity, which later would be affected by the crisis that hit the financial markets during the summer of 2008.

Figure 4: Forecast GDP Growth by Region

(a) Within ESCAP



(b) Outside ESCAP



Source: United Nations, 2007

Figure 4, illustrates the tendency of GDP forecasts for all major geographic regions of the globe inside or outside of ESCAP[8]. Again in both cases, world GDP was forecasted to rise after the 1990's and beyond showing a relationship between seaborne trade and GDP which further adds to evidence of how the shipping industry was bound to be successful according to the industry experts. The signs where clear, for example, capacity during the mid 2000's was reaching its highest level yet at the Port of Rotterdam, which led the corporate management study and produce a project to increase that capacity for the future. The Maasvlakte 2 is still in construction today.

Because containerization, the interest for infrastructure improvements on the sea and land side, grew in a sense that it positioned port infrastructure on the fore front of industry evolution and core business. Creation of bigger and faster cranes, sensors, automation of port vehicles, stacking strategies and yard planning, dredging became as important as shipping itself. This is the point where lands meets the sea and were historically people developed great towns that became great cities, and which today are global centers of trade. The new vessels developed throughout the years for different types of cargo have pushed the private sector, port authorities and governments to further improve infrastructure to maximize and optimize time, efficiency, costs and services.

All these factors proved to be important for the shipping industry and its growth, but it would be known at the later years of the decade that for the industry to prosper, certain things have to be set. It must be remembered these conditions are critical for the shipping industry to flourish and for the growth forecasts to be sustained. Together with global demand for goods, Holland Marine Equipment's provides a list of other set of conditions for industry sustainability: (Bastiansen, 2005)

- The long term availability of reasonable priced oil and other energy sources
- Limited Political confrontation between the world's economic/religious groups
- Development in and consequences of global warming/human made pollution
- Scarcity of other natural resources, e.g. fish

During the beginning of this century, forecasts were holding up and the industry couldn't look better. Shipping companies generated more revenue than ever before. Between the years of 2005 to 2008 shipping companies generated more revenue than the previous 20 years combined, which lead them to the construction of more, bigger and faster ships to take advantage of economies of scale, high freight rates, and low transport costs. Government were funding infrastructure projects, thinking that growth was eminent, yet, no one was ready for what was about to happen.

[8] ESCAP = Economic and Social Commission for Asia and the Pacific

2.2 Global Economic Crisis

Although financial crisis was at the footsteps of the global economy in 2008, the European maritime community has a strong legal framework that allows for a favorable atmosphere which allows shipping businesses space to operate. In the summer of 2008 the financial crisis that started in United States, and eventually spread to the global markets affected gravely the maritime industry in ways seen before during the oils crisis of the 1970's The shipping industry, because of its derived demand characteristics, would be one of the industries that suffered the most during the crisis, as it is still "struggling with the serious consequences of a truly massive contraction in economic activity, with global trade estimated to have declined by nearly 10% in 2009" (International Chamber of Shipping, 2010). When people and countries stopped demanding goods because they had no more buying power, ships started to be laid off, freight rates, new build ship and chartering prices pummeled; many order books were cancelled and ship owners and shipping companies were left to handle over capacity of vessels never experienced before. Only the innovative companies would survive the crisis as many shipping companies couldn't sustain operations due to low freight rates and poor demands. Just like the governments had to intervene to save the financial institutions in dire straight by arranging financial packages, in the form of subsidies, to support their operations, the same can be said of the shipping industry players in certain countries like France, Germany and Greece were government intervention was eminent to further improve their conditions. Jacques Saade, chairman and founder of CMA CGM, was at the forefront of government intervention in the shipping business during this hard times and he stated that:

> "European shipping companies were being handicapped by EC rules that were introduced last October when their antitrust immunity was repealed and their conferences abolished so they could no longer confer on prices, capacity and other market issues… 'The Chinese, the Koreans, the Asians in general are not subject to these regulations and have a freedom that is prejudicial to us in Europe' " (Staff, JOC 2009).

Some countries like Denmark which is an important industry player, opposed subsidies, clamming it would disrupt free market competition, in comparison to Asian companies were , government subsidies are more of the norm than the free market atmosphere that Europeans prefer. These issues mentioned on crisis and industry strategies are just a bumps in the long-run economic cycle, composed of short-run economic intervals, just like the one the summer of 2008 unleashed on global markets.

Before the summer of 2008, forecasts mentioned that the shipping industry was stronger than ever. According to the Platou Report of 2009, in shipbuilding, "although ordering activity during 2008 was relatively high compared to previous years, what most people remember was the massive drop in demand for tonnage in the second half of year especially for dry bulk and container ships" (RS Platou Report, 2009).The crisis pushed many ship owners and companies to cancel their ships because demand forecasts weren't holding up like they supposed to. These cancelation affected many different sectors of the industry other than shipbuilding, for example

the equipment suppliers, due to the fact that shipbuilding goes hand in hand with the equipment and technology sector of the industry.

Figure 5: **World economic growth, 2006–2009** [a]
(annual percentage change)

Region/country [b]	2006	2007	2008 [c]	2009 [d]
WORLD	3.9	3.7	2.0	-2.7
Developed economies	2.8	2.5	0.7	-4.1

Source: UNCTAD , Review of Maritime Transport, 2009

Experts stated that shipping and economic growth was eminent and with it, the equipment industry would flourish, as shipping, shipbuilding and equipment industry are highly correlated. In Figure 5, we can see the decline of the world economic growth, when all of a sudden there was a significant decrease from 2007 to 2008 and from 2008 to 2009, the economy contracted to negative numbers. Financial institutions were not able to support their policies and strategies, which served as a catalyst of the domino effect that trickled down to all sectors of the economy. Cycles are very difficult to predict and although there is “evidence that supports the existence of cycles in 7 or 8 years intervals” (Stopford, 2009) but this doesn’t prove anything but that the industry is very risky and volatile, were at any point in time, anything is possible. The most shipping companies can do is study and interpret these cycles due to the fact “they dominate shipping risks” (Stopford, 2009) and risk management is an important part of any company’s core strategy.

2.3 Maritime Equipment & Technology Markets Potential

First of all, the equipment and technology markets have to be separated in two, were one side deals with servicing the new build ship markets and the other responds to repair and maintenance strongly connected to conversions and upgrades, he shipbuilding industry will be discussed in a more specific matter, regardless, for new build vessels, prices differentiate depending on type of vessel, according to its cargo and size, but mainly its main determinant is the supply and demand.

> "On the demand side the key factors are the freight rates, financial liquidity and credit, modern second hand prices and most importantly expectations. On the supply the key issues are production costs number of berths available and size of orderbook. As a result ship building prices are volatile" (Stopford, 2009).

Regarding the ship repair industry, according to the UK based Ocean Shipping Consultants Ltd, they say that it is entering a period of transformation. "The main feature is one of progressive expansion supporting an aggregate growth rate of 2.1 % over 2001 to 2005, accelerating to an aggregate 2.5 % between 2006 and 2010 before easing around 2.0 % between 2011 to 2015" (Ocean Shipping Consultants Ltd, 2002). The repair market can be divided, as well, into two different categories; planned repair or unplanned as result of an accident. Depending on countries polices, a ship must be taken after a period of time, usually 5 years, to a dry dock to be checked for things that need repair. Accidents pose as the other option that supports the repair sector.

Compared to new build ship market, the repair market is more unpredictable because if freight rates are high, surely a ship owner will not sacrifice stopping the vessel, so they can take advantage of the market and increase the company's revenue. For new builds its more a reliable type of business due to the fact that vessels are composed of thousand of parts and technology and according to orderbook, you know what to expect from the orders. Yet macro economic trends also affect if new builds are needed, making this sector of the maritime industry one of the most dependent on other sectors involved. .

Summary

In this chapter we have see the main characteristics of seaborne trade, types of cargos, the global economic crisis and how it has affected the shipbuilding industry, Dutch involvement in the maritime industry, the relevance of their cluster according to the equipment and technology markets and the potential markets were HME and the Dutch Shipbuilding Association strive to be leaders . this chapter sets the frame work so we can understand how shipbuilding and ship owning trends affect HME and the equipment and technology industry, now that volatile time have changed market structures for the sale and growth of this industry while new market players and geographical clusters have generated new supply chains. Because manufacturing of most of ships, machines, cranes, and platforms take place in Asian shipyards, it is important for HME to understand what will affect their business in the future.

Chapter 3: Ship Owning

3.1 Strategies, Flags & Freight Rates

Ship owning is one of the most lucrative and risky businesses that exist in the global network. As stated in Chapter 2, the shifts in factors of productions has lead the multinational companies to move to different countries, which still require raw materials from all over the world, and ship owners are a major player in the dynamics of these global supply chain networks. "A ship owner is an individual who owns the controlling interests in one or more ships" (Stopford. 2009) where they can make an arrangement so that the commercial operations are dealt by a management company or rather they take care of the operations themselves. On the other hand, due to the risks and hard business decisions, "shipowners arrange their operations into a shipping company which is a legal organization that owns ships" (Stopford, 2009). They could be separated into legal partnerships subject to specific fiscal policies or corporations that are quoted in equity markets and need to be transparent for the public and financial obligations.

The ship owners may have the choice of buy brand new or secondhand vessels depending on the capital availability the owners possess and the cost structure that they want to manage. They are able to gather their capital in three ways; from private funds, financial institutions or global equity markets, and depending on the age of the vessels, their cost structures will vary. For example, older ships require less capital to finance their operations , but usually more crew to operate and are less efficient in fuel consumption, while the new ships although they need more capital to be financed, as they operate with more technological advances, still they require less crew and are more efficient in fuel consumption. Fuel consumption alone is the highest costs incurred by a shipping operation. In a global financial crisis like the one experienced in the summer of 2008, the age of the vessel had a major impact in the decisions companies had to make according the operations. Companies with new vessels needed to find ways to be fully operational so they could repay the financial institutions the money that was lent, while older vessels aren't bound to those financial obligations. In 2008 low freight rates and high oil prices lead to many ships being laid up and finical institutions having to repossess the vessels because they weren't able to repay their investments. Another strategy a shipping owner may use is to buy fairly 'young' vessels, like a five year second hand, as they can be a lot cheaper than new vessels and still have enough commercial years, as most vessels enjoy at least 15 to 20 years of commercial life.

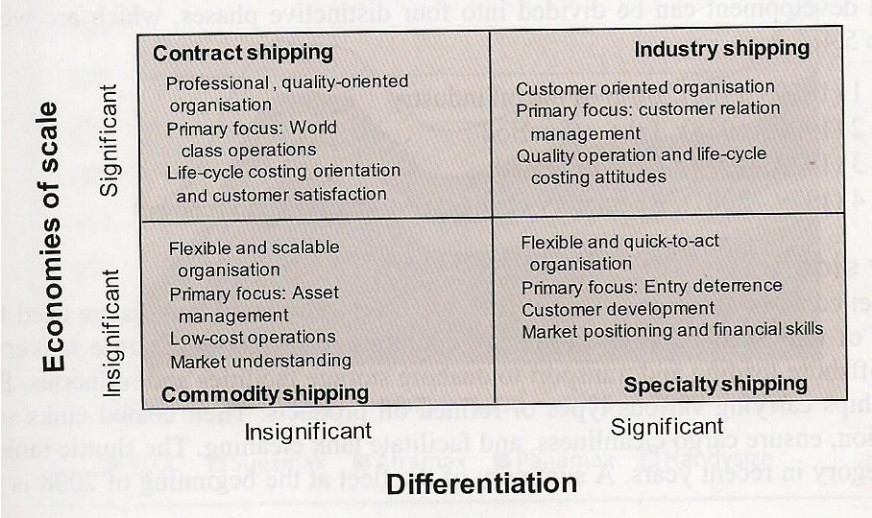
No matter which strategy of ownership is selected, this industry provides a lot of opportunities, from the most simple and generic type of trade, to the very complex involving niche sectors. Not necessarily if one of different sectors in trade is under market pressures, is the case that the others are going to suffer. Whether it is an individual ship owner or a legal partnership or corporation, after purchasing the vessels, both have to decide where to register their ship as this may benefit their tax structure, international conventions compliances, financial laws, crewing and political acceptability between countries. Ship registry can be divided into three different groups which include: national registry, international registry and open registry.

> "National registers treat a shipping company in the same way as any other business registered in the country where they are subject to the full range of national legislation; international register is an alternative invented for strong shipping countries, where they treat the company as an open registry, generally charging a tonnage tax, and provide a national flag environment and open register, which offers ship owners commercial alternatives to registering under their national flags. The success of open registry depends on the ability of the country of attracting international ship owners and gaining acceptance of the regulatory authorities" (Stopford, 2009)

"Normally ship owners and managers use a mixture of flags for their fleet although they generally have a 'preferred flag'" (Haralambides, 2001). The top five countries with national registers include Greece, Japan, Germany, China, and USA; the top five countries with international register include Singapore, Norwegian Int. Registry, Hong Kong, Marshal Island and the Isle of Man; the top five open registries include, Panama Liberia, Bahamas, Malta and Cyprus. It must be noted that not necessarily if the vessel is registered in any of this countries, does it mean that their operations or management interest rests in the country of registry. Recent studies have shown that there has been an increasing trend in flagging out or registering vessels in open registry flags systems because they might give better opportunities to ship owners in which their national flag or regulations create difficulties for global business. To have an idea, from all flag registry, the Panamanian flag is considered the most used by Asian owners. "Japanese tonnage in Panamanian flag is up 74% followed by Taiwan with 42.8 %, South Korea with 41.2%, United Arab Emirates with 30.9 % and China with 26.6 % of their tonnage" (UNCTAD, 2009). According to H. Haralambides, he states that "open registry fleets have expanded at a faster rate than any other fleet in the world" (Haralambides, 2001) creating on its way limits in the growth of national fleets, issues with national defense, fiscal revenue, environmental disasters and seafarers. In all cases, the decision of flag registry must be carefully assessed by the ship owners together with the legal and financial advisors as it will establish the 'rules of the game' once the vessel enters the global marine trade. Types of vessel and flag registry are important because they affect what type of shipping strategy owners might choose. From single vessel companies to companies composed of numerous vessels for different cargo types, ship owner and shipping companies face everyday decisions which are products of a capital intensive industry operating in volatile economic markets. Because of the difference in size of companies and types of business that global maritime trade provides, companies must strive to achieve better commercial results according to the strategy that they choose to pursue.

Figure 6 illustrates a chart in which, depending on economies of scale and differentiation of services, shipping companies are subject to choose different types of strategies that will benefit their operations. By assigning the properties of significant and insignificant*; contracting shipping, industry shipping, commodity shipping and specialty shipping* are possible. For example, where economies of scale and differentiation are both significant, *Industry Shipping Strategy* will be a customer oriented organization which is not flexible, has high costs, and it's focused on relationship between the parties involved to secure long term business. This type of strategy describes Liner Shipping which is one of the most important types of shipping today.

Figure 6: Four Strategic types of shipping



Source: Wijnolst, 2009

On the other hand for commodity shipping which depends on certain commodities being transported where it is more flexible, less costly and calls for asset management, economies of scale and differentiation is not significant. This type of strategy describes Bulk Shipping which has become a major market player, as many raw materials from different geographic areas need to be transported far east where production centers are developing. The major difference and key elements in both of these extremes are the flexibility of entering or exiting the market and the sunk costs[9] involved. Hence, It is of most importance, to "know the characteristics of the markets in which one is operating and try to design organizations and strategies suitable for the structure of the market" (Wijnolst & Wergeland, 2009).

Never the less, no matter what type of strategy, vessels or flag any ship owner decides upon their business, whether it is an individual ship owner or a global enterprise, they need to be aware, as well, of freight rates or transportation costs as they are a main indicator of strength or weakness of the markets in which the ship owner decide to operate. "As a result of technology, competition, and economies of scale, freight rates have declined substantially over the years from 10% to 3 % of the price of transported goods and this has enhanced global trade making ship owners one of the pillars of globalization" (Haralambides, 2009-2010).

But they still play a pivotal role in the decision being made by ship owners as they can dictate when to pull out or come into a market, when to stop or not the operation of the vessel for maintenance and repair as well as regulate and change of the trade patterns and production strategies between countries. In 2008-2009, it is the case that, iron ore was so cheap to transport from Brazil to China, that Chinese iron ore plants were closed, launching the country's ambitious plan in generating its own dry bulk fleet to take advantage of the market situations. The production of this important commodity in China is more expensive than transporting it form the other side of the world.

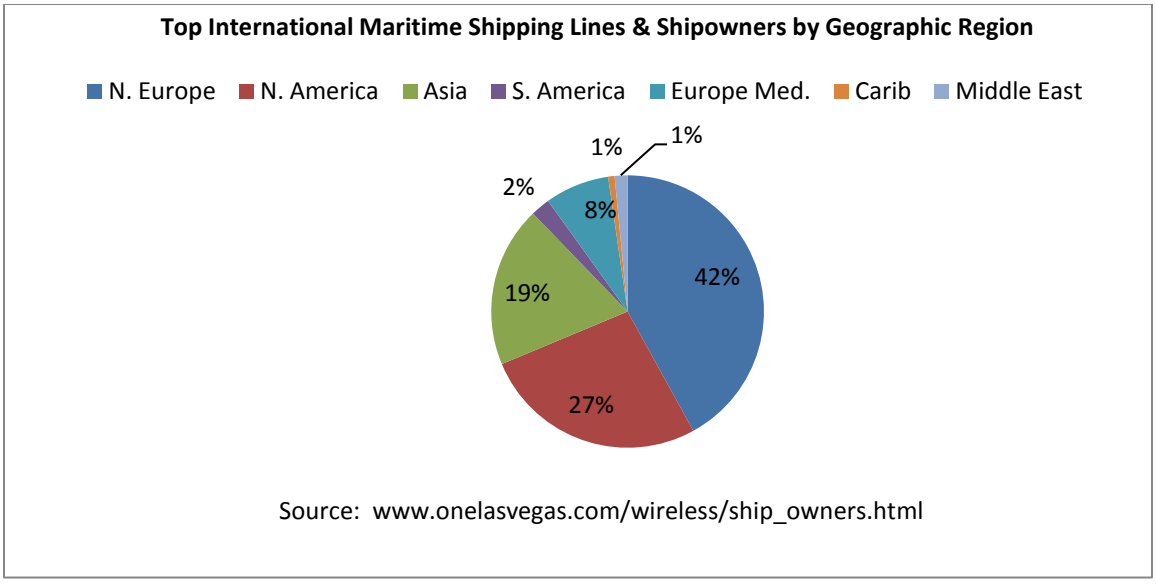
[9] Costs that are not recoverable

Now that commercial and financial strategies, flags and freight rates are discussed in respects to ship owning, the next section will provide a detailed analysis on the most important shipping companies and ship owning countries. This is important for HME to understand who are the major players and geographic area to be targeted for future business opportunities.

3.2 Ship Owning Companies & Countries:

As we have seen in the previous section, "ownership is a major commercial issue in the shipping business" (Stopford, 2009). It is affected on all sides by political and socio-economic situations which make the shipping industry a "highly complex system characterized by uncertainty both in structure and accuracy measurement" (Haralambides, 2001). Yet these characteristics don't stop numerous entities in different countries to take advantage of shipping opportunities as a wide range of companies exist around the world. Figure 7 illustrates the percentage of today's top international shipping lines and ship owners separated by geographic region. Northern Europe, by far, takes the lead with 42% of the top 130 international shipping companies selected. By any means does this figure indicate the economic or business position of the companies selected; it is more like a tool to point out where are shipping companies concentrated to understand the importance of the regions studied. North America comes in second with 27%; Asia comes in third with 19%; Mediterranean Europe comes in fourth with 8% and Caribbean & Middle East comes in last with 1% each.

Figure 7:



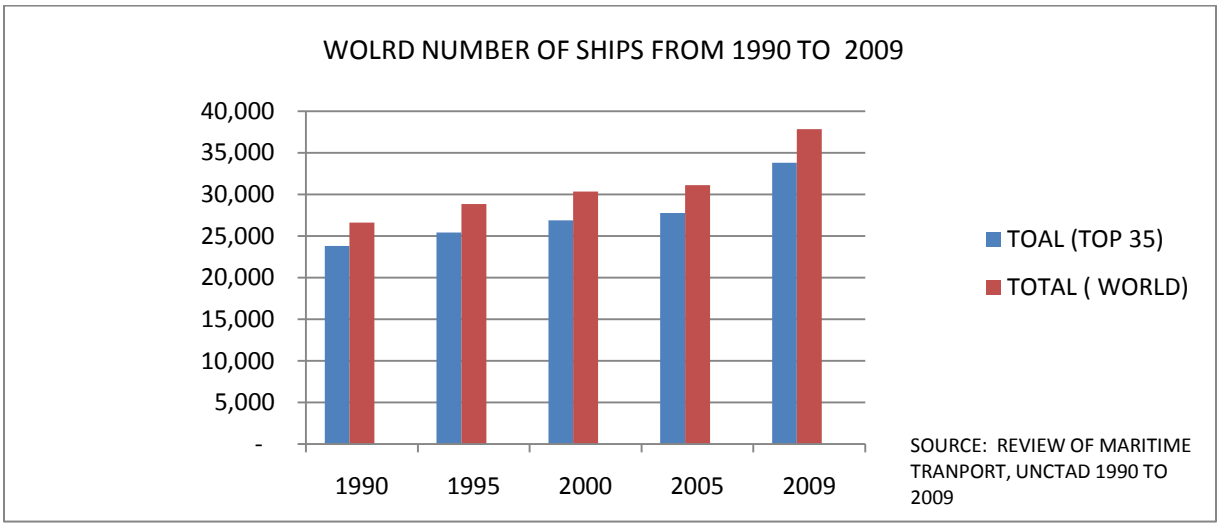
Source: www.onelasvegas.com/wireless/ship_owners.html

This figure pinpoints important geographic areas concerning the shipowners and companies and is no surprise that Northern Europe is the leader of them all. Historically, this geographic area is the epicenter of the shipping world, dating back centuries. Many of the past empires and

important trade routes were possible due to these maritime countries which include United Kingdom, Norway Denmark Holland and recently Germany. Off course the maritime culture throughout the years became part of this geographic area's identity. In later chapter we will discuss maritime clusters, their dynamics and why they are important for Holland marine equipment. In North America, although it's shipowners and companies seem to have a strong presence, the owners are subject to protectionist measures under the Jones Act and its cabotage laws making them a difficult industry to be involved in if you're an outsider. The next important geographic area is Asia, which should be no surprise, as they are getting more involved with maritime shipping due to more production centers moving eastward. Although Asia sits in third position later on we will see that this information is not indicative in their importance or involvement in the shipping industry as for the following figures will illustrate otherwise.

To further add to the ship owning data by geographic region, the UNCTAD Report on Maritime Transport was used in five years intervals from 1990 to 2009 to understand the trends of important shipping countries in the past 20 years through amounts of ships and their deadweight tons. Figure 8 illustrates the relationship of the top 35 ship owning countries' number of ships between the world total number of ships, and it is clearly seen that the top 35 countries basically dictates and takes care of most of the maritime trade. Percentage wise the top 35 shipping countries owns approximately from 88% to 90 % of the world fleet in this 20 year span. At the beginning of the 1990's USSR which later converts to the Russian Federation after the soviet collapse, was the leader in amount of ship owning until 2000 when Japan and Greece surpassed them and China and Germany grew their capacities rivaling the Russian Federation's years of dominance. It is not a surprise that these four countries bulked up their fleet capacity at the beginning of this decade as forecasts together with strong maritime cultures, new financial structures and emerging production centers in Asia led entrepreneurs in creating one of the greatest economic booms in shipping the world had ever seen.

Figure 8:



Of course some countries in the list register greater amounts of vessels than other countries as is the case of Russia in the early 1990's, but the amount of vessels are not indicative of the fleet 's carrying capacity and world trade importance in comparison to dead weight tons. So according to national fleet's deadweight tons Japan, Greece United States Norway and Hong Kong in the 1990 were the leaders in DWT, but Russia had more vessels than all of these countries. By 2009 Japan, Greece Germany China and Norway, are the top five countries with the most registered DWT, yet Germany and China have more vessels than Greece; Russia has fallen off the top ten in owning vessels as it was always in that part of the list in most of its recent history.

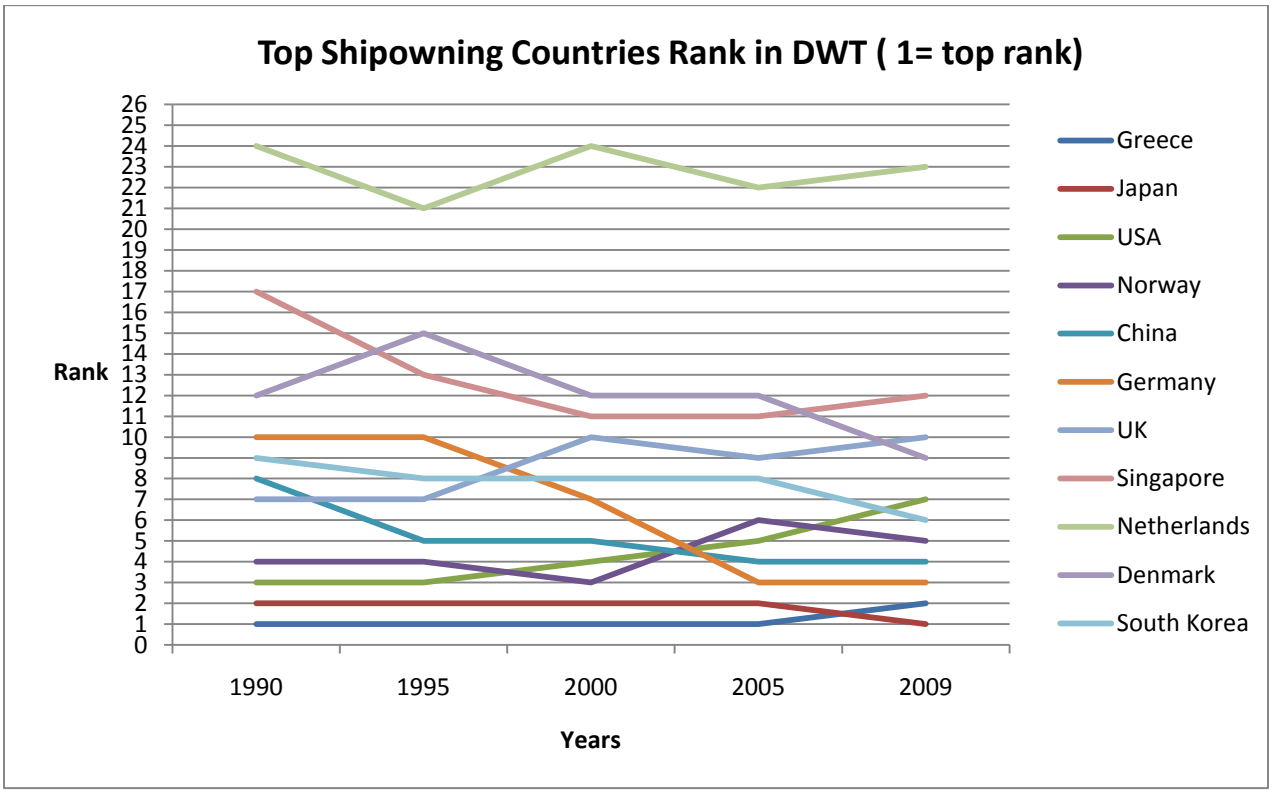
For the reasons explained above, the dead weight tons will be used to show who is leading the way according to ship owning; these will serve as indicators of the importance of Asian Ship owning for the purpose of the study. Several trends are shown according to the global DWT by countries in figures provided by the UNCTAD Report for Maritime Transport which can be found in Appendix II. One of the trends is the presence of Asian countries in the top 35 and the eventual entrance of a new Asian country in 2009; Vietnam. The countries are (in order of importance): Japan, China, S. Korea, Hong Kong, Taiwan, Singapore, India, Malaysia, Indonesia Vietnam and Thailand. From 1990 to 2009 these Asian countries made up part of the top 35, representing a 32% of global DWT. The figures shows Asian involvement in world trade but still European countries gather more combined global DWT by repressing 45% of the top 35 countries. It must be noted that in 2009, from the top twelve, half are Asian countries, Japan being the country with the most DWT, with approximately, 173,285,235 tons, followed by China in the 4th position, S. Korea in 6th, Hong Kong 8th and Taiwan and Singapore 11th and 12th respectably. By 2009 the top 35 countries are responsible of owning 95% of the world's DWT. This information is not enough evidence to support the strong involvement of Asian shipowners in maritime trade but it does reflect their presence.

Another trend from the figures is the decline of important European shipping countries form the top 35; were in 1990 Europe was represented by 19 countries and by 2009, the number was down to 16. An example to show this can be seen through UK. In 1990, the country was in 7th position and by 2009; it had dropped to 10th out of the top 35 ship owning countries. Other European countries that dropped position were Cyprus, Spain, Italy, Switzerland, Norway, Greece, Russia, while Germany gained positions as well as the Netherlands, Belgium, Turkey and Denmark. In that same year we can see the presence of Croatia as an important ship owning country when it takes control of the 34th position. In the case of USA, in 1990 they were 4th in the list regarding DWT, and by 2009 they are in 8th position compared, to its North American partner, Canada, which showed the most impressive growth in DWT from all the countries. In 1990 Canada was in 35th position and by 2009 they occupied the 16th. In these 20 years, Poland, Philippines Finland, Australia Argentina and Pakistan left the list, paving the way for Saudi Arabia, Malaysia, United Arabian Emirate, France Thailand and Bermuda to join the top 35 shipping country's list showing a shift in shipowners worldwide.

A third trend that can be seen in the figures is related to the top ranked countries, where changes were made in the top 5 shipping countries. In 1990 the top five list included two Asian countries two European and one form North America. In this same order, Greece, Japan, United

States, Norway and Hong Kong spearheaded the world as the leaders in DWT. It remained relatively unchanged for 15 years until 2009 were it changed significantly.

Figure 9



Source: UNCTAD Report of Maritime Transport, 1990-2009

Figure 9 was composed from the information of the top 35 shipowning countries included in the Appendix II, so it would be easier to see the shifts in rank. It is clear here in the Figure the changes in the top 5 ranking countries.

Due to shifts in market trends and innovations, Japan took the throne, as the leader in deadweight, away from Greece, a position they had held for over 20 years. This same year, we see the emergence of two new countries in the top five, Germany and China as major players in ship owning taking the 3rd and 4th positions respectably. Norway dropped from 4th to 5th position. United States dropped 4 spots, from 3rd to 7th and although Hong Kong is not in the top 5, it's still in 8th position making China very strong in ship owning. Although there are three European countries and two Asian Countries in the top five, things look much better for Asia as a geographic region, now that Japan has taken the lead of deadweight and China is becoming one of the strongest economies in the world, generating record GDP growths and production output as well as involving the Asian countries around them in a growing Intra-Asian trade. The most significant change is that of Germany which in 20 years moved from tenth to third position.

We can see Efforts from Denmark and Norway as they have lowered their ranks from 2005 to 2009 and Chinas stability as the fifth shipowning country.

These trends show how the top shipping countries have changed in the last 20 years but is not enough to cement Asian shipowners as the most important because European shipowners still have a strong presence in the market as it is revealed that they, as a region, have the most combined DWT of all the different regions of the world and three of the top five in the list. Still it can be seen that Asia is a major player of the shipping markets and it's no surprise that they are due to the fact that there has been a lot of economic changes when it comes to production centers relocating in the Far East.

Yet According a the July 5th 2010 publication of Lloyds List, the Top 50 Shipping Companies Index suggests that even though Northern Europe has more shipping companies and more DWT as a region as illustrated in the figures of the chapter , the Asians seem to have the most important companies regarding trade and economic activity. The difference between Figure 7 and Figure 11 which both show percentage of international shipping companies, is that in Figure 11, these companies are quotes in the equity markets and Figure 7 does not go into that type of detail. It can be deduced by Figure 11 that with a 48% of the top 50 shipping companies in 2010, Asian ship owners and shipping companies are the most important according to their market capital. Of these top 50 shipping companies, it must be noted as figure 10 will show that out of the top 10, eight companies are from Asian countries; China, Japan, Singapore and South Korea. The other two companies are from European countries; Denmark and Netherlands.

This 48% represents the market in 2010; the strength of the region and the rise of Asian Shipowners as important global market players. Still Europe and North America shall not be overlooked, as it's shown that they responsible for the remainder 30% and 20 % of the Top 50 Shipping Companies Index and are leaders on DWT. They are historically important for the shipping industry, apart from general shipping activities, European and North American owners are involved in niche markets with specialized vessels; when Asian shipowners are not part of these types of industries due to lack of knowledge, technology, capital investment, or simply are reluctant to enter unchartered waters with high risks. But the old guard in shipowing looks as if the tides are turning as for "the chain of events in Europe in the first half of 2010, following the threat of sovereign default by Greece and the financial troubles of other major EU nations, has led to a fall in purchasing power by European shipowners… Those owners are facing tougher funding conditions at European banks."(Leander, 2010).

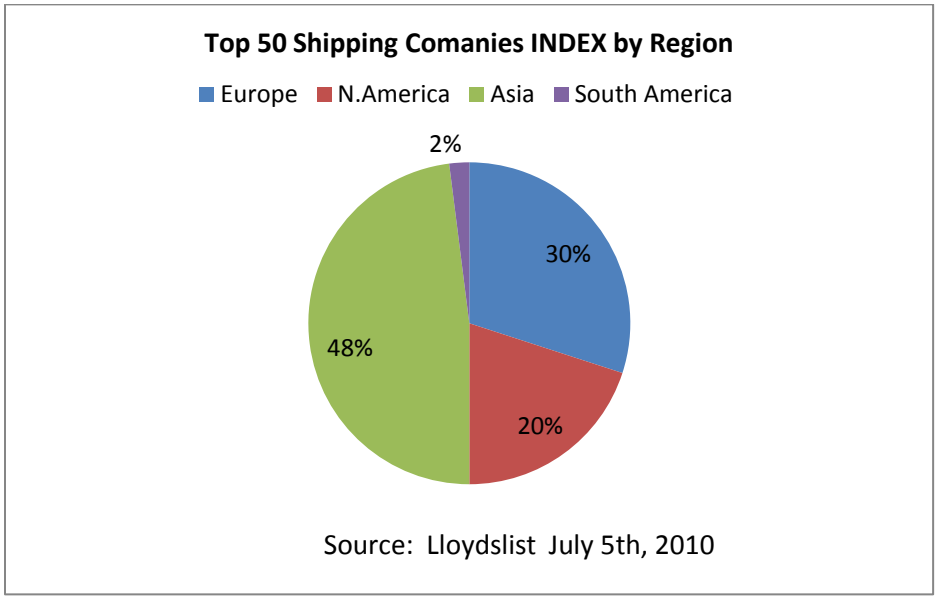
Top 10 International Shipping Companies by Market Capital

Figure 10

Name	Country
AP Moller - Maersk A/S	Denmark
China COSCO Holdings Co Ltd	China
Mitsubishi Heavy Industries Ltd	Japan
Mitsui OSK Lines Ltd	Japan
China Shipping Container Lines Co Ltd	China
Orient Overseas International Ltd	Hong Kong
Nippon Yusen KK	Japan
China Shipping Development Co Ltd	China
Koninklijke Boskalis Westminster NV	Netherland
Hyundai Merchant Marine Co Ltd	S. Korea

Source: Lloyds List, July 5th, 2010

Figure 11:



Summary:

In the last chapter we discussed how shipping countries together with shipowning has evolved throughout the year. HME needs to understand where are the most important ship owners established and that is the aim of this chapter as it discusses, different types of financial and commercial strategies according to the type of business ship owners can select, flag registries depending on the benefits shipowners want to enjoy together with the importance of freight rates to the ship owning and maritime business as a whole. After discussing this general information which is of much importance to ship owners, several figures are presented to show the trends of the top 35 shipping countries according to the number of vessels owned and amount of DWT registered. The figures serve as indictors of the importance of different geographic regions according to DWT and it's established that although Europe holds more of the DWT and more shipping companies, Asian companies have a strong presence in the shipping world. Asian owners are becoming more important as their strength is further supported through the final figures which showed that Asian shipping companies, percentage wise, represent the highest concentration (48%) of important companies depending on their market capital. This is empirical evidence that Asian shipowners have become one of the most important groups of shipowners in the industry.

In the next Chapter the Ship Building and repair industry will be discussed to understand in what geographic regions are the ship owners ordering to build and repairing their ships and especially what types of ships are being built. This is of most importance to HME so it can pinpoint which are the most important geographic regions according to Ship Building now that ship owning has been discussed.

Chapter 4: Shipbuilding:

4.1 History and Major Players

In this chapter the purpose is to dig even deeper in the analysis and understand what the trends in ship building in the past 30 years are looking at geographic areas of shipbuilding, what types of ships are being built and where the geographic concentration of these types of ships according to ownership is. This is valuable information to understand whether or not Asian countries will become a maritime cluster which HME can take advantage to promote the Dutch equipment and technology brands.

In 2009, according to the International Chamber of Shipping & International Shipping Federation Annual Report:

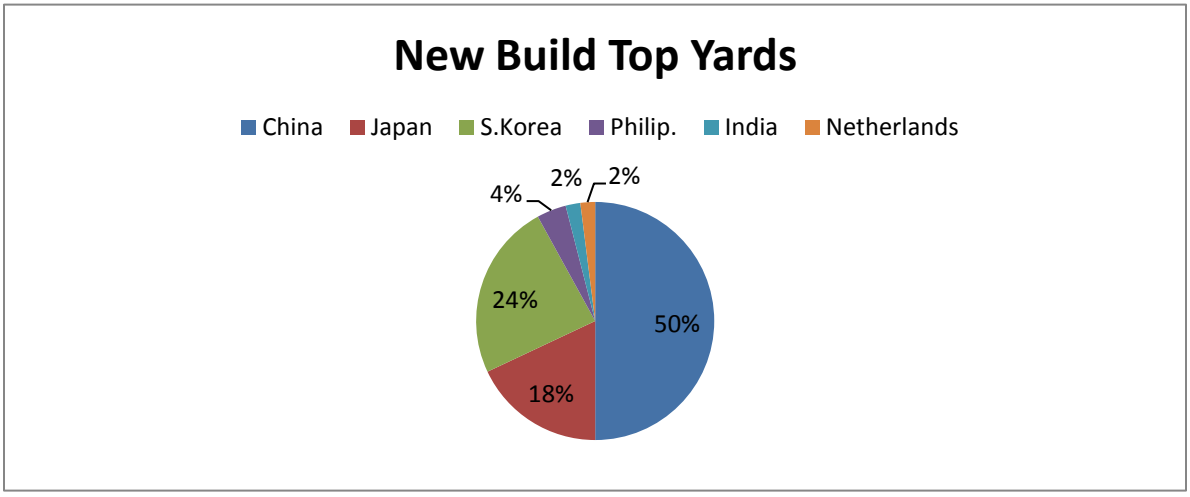
> "Apart from the massive contraction in global trade, the most pressing concern for the commercial health of the shipping industry is the massive overcapacity in the shipbuilding sector. The size of the current world order book is truly daunting, even accounting for the large number of cancelations or deferments, by shipping companies themselves, caused by the non- availability of finance" (International Chamber of Shipping, 2010).

This statement is relevant to understand the shipbuilding sector of the industry and how it's affected by macroeconomic and policy conditions which the industry cannot control. Shipbuilding is not like any other type of manufacturing industry although people might think otherwise. It has become a global industry dominated by the dollar market which is affected by supplies, demands and competitive advantages in labor as a factor of production. "The comprehensive exposure to worldwide competition plus the fact that WTO trade policies do not affect this sector makes shipbuilding very different from most manufacturing industries" (Commission of European Communities, 2003).

"Despite the global economic downturn of 2008, shipbuilding in that same year, reached heights in DWT tons delivered, never seen before with deliveries totaling the 82.3million DWT" (UNCTAD, 2009).This was possible because the shipyards kept building the vessels that were ordered before the economic crisis; the downturn had affected global demand resulting in the creation of a vessel overcapacity that is still a problem today. In response to the dangers of over capacity in the market, the International Chamber of Shipping, in an OECD Workshops, has stressed the need for governments of shipbuilding nations to "avoid focusing in the expansion of their market shares" (ICS and ISF Annual Review 2010). On the other hand, over capacity at shipyards has created interest in other countries from the Asian region, with low labor costs, to participate in shipbuilding. This market trend has emerged due to the limited amount of berth at the leading shipyards and these production centers have "popped up" to satisfy the demands of ship owners. This can be seen in Figure 12, apart from the obvious leaders, when countries like Philippines and India have entered the sector to provide berths to those companies willing to use their services.

The following figure illustrates the percentage by country of the Top newbuild yards in 2009. By just looking at Figure 12 we can see that only the Netherlands belongs to a geographic region outside of Asia. This coincides with what was discussed in previous chapters that The Netherlands is the top shipbuilder of the European region. The rest of the shipbuilding countries are: Japan, South Korea, Philippines, India and off course, China. According to Clarksons, China is responsible for the 50% of the new build deliveries in 2009 followed by S. Korea and Japan. It is no surprise that Korea and Japan are still major players in shipbuilding as they have historically been part of it for many decades, the two new shipbuilding countries are result of market conditions and them wanting a piece of the pie after forecasts reported economic prosperity for year to come.

Figure: 12



Source: Clarksons Shipping Intelligence Network

In recent decades, Asia has become the leader in manufacturing of all types shipping vessels, offshore platforms and machinery for the industry etc. but it has not always been this way. History and Economics have shaped the shipping industry and shipbuilding. It's because of history that the maritime culture has endured and developed in different parts of the world but it has been economics that has affected these maritime centers which traditionally built their own ships and now because of globalization, parts and technology from all over the world reach the productions centers in a handful of countries that produce most of the tonnage needed for the shipping markets.

Traditionally Europe was the leader in ship building especially the United Kingdom, Netherlands, Norway, Sweden and Germany. But by 2005, "Europe's market share had dropped from 66% in the 1970's to10% as Asia's grew from 22% to 84 %" (Stopford, 2009). Japan and Korea dominated most of the shipbuilding during the 80's and 90's with China close behind but is not until the 2000's that the shipbuilding phenomena takes flight and South Korea took the

significant lead as the world producer of shipbuilding. Together with China, the forecasts assured shipping owners that global trade would exceed expectations and "brought a surge of new Asian shipyards in emerging countries like Vietnam, India and Philippines" (Stopford, 2009).

The movement of shipbuilding to emerging countries in the Far East is a direct response to economic conditions and globalization. We all know that in manufacturing, the world has witnessed slowly, how companies go to where they can get the best results at lower costs and in this business this is a rule of thumb. Being such a specialized industry, when most of the products built and materials being used sum up to millions of dollars, it is more crucial than ever to lower costs and look for higher efficiency. It had become a trend; moving production centers not only for shipbuilding but in all types of manufacturing, to low labor costs countries to control company costs with these competitive advantages. In time these countries became better in production processes and technology making them the leaders in shipbuilding and in the case of China; leaders as well in container production and cranes for land side operation.

Shipbuilding countries developed hundreds of years ago. It was a key economic activity for the development of any old or modern society, as it provided the machinery which would allow trade between great civilizations and empires to develop. In modern history, shipbuilding was always related to the United Kingdom, Nordic Countries or Mediterranean societies. One thing is for sure; that it was purely a European enterprise for many years. But as we have discussed, economic factors have led to the decline of their involvement in the industry during the last century, paving the way for other regions to be the caretakers of shipbuilding.

The evolutionary movement in shipbuilding has gone from UK to Japan to South Korea and recently China. In comparison to the new leaders, previous shipbuilders like UK and Japan, operated merely for the construction of domestic tonnage and some for export; shipbuilding as an export was not viewed as a business plan by either Europeans or Japanese shipyards. Is not until the South Koreans, which are the first to build its business primarily around the export market that shipbuilding became a prominent Asian industry, with China close by emulation this strategy by developing their export based economy including shipbuilding in the mix. "The competition has always been based in who can provide lowers costs of production starting with low labor costs and large efficient facilities" (Stopford, 2009). And as in 2009-2010 there is a dispute of who is the world leader in shipbuilding between China and South Korea.

4.2 World Order Books, Fleet Composition and Most Important Vessel Types

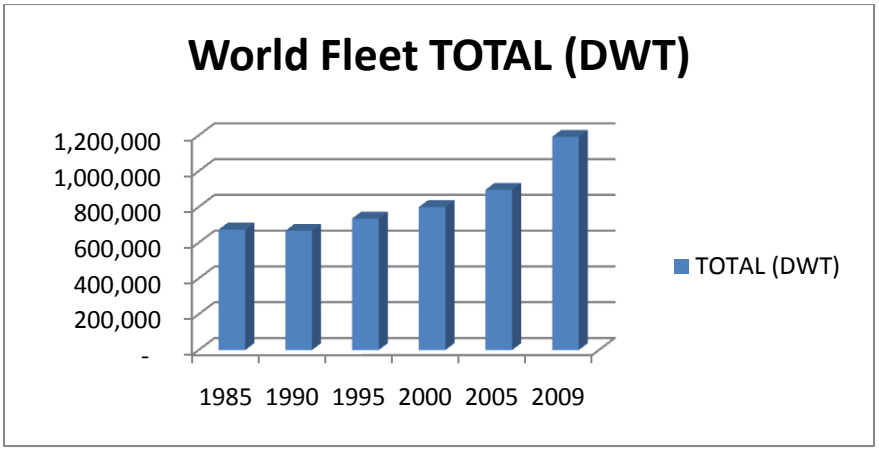
In this section we will see several Figures which illustrate Total Dead Weight Tons from 1985 to 2009, World Fleet Composition by Vessel Type from 1985 to 2009 and World Order book Development in the last decade together with Top Owners by geographic regions of these vessel types as the means to understand what has been the trend in the last 30 years according to shipbuilding , what type of development is still in orderbooks and who are the major players according to the ships being built and delivered in 2009. Together with the figures, a brief

explanation of supply & demand, prices and shipbuilding cycles will be discussed as further understand the dynamics in the shipbuilding industry.

Main characteristics of shipbuilding that have yet to be discussed is the fact that it is a long-term cycle market where its prices depend on the different factors that affect demand and supply. The long-term cycle refers to the fact that by the time a ship owner or shipping company places their order at the yard and it gets delivered, 3 to 5 years will go by and the owners will have to manage their new tonnage under economic forecasts that sometimes cannot be satisfied. Many times, the owner will order ships when the trading market for a specific commodity is reaching its peak or it's already there and by the time the vessel is delivered, that market may not be as strong as it once was. As a result to this, many shipowners who were trying to take advantage of this type of demand creates overcapacity at the yards. "The combination of demand side opportunism and supply side inflexibility tends to slow the market adjustment process, leading to some very long shipbuilding cycles" (Stopford, 2009)This poses as a great threat to market conditions and makes the shipping business, as it is disused in previous chapters, a very risky one.

To understand the cycles of shipbuilding and order books Figure 13 and Figure 14 are great example which illustrates the market trends since 1985. The following figures will also serve the analysis to identify which are the leading types of vessels being built according to the commodities being trades. Figure 13 illustrates the Total Deadweight Tons and can clearly be seen that it has almost doubled from 1985 to 2009. This represents a growth trend in shipbuilding which is no secret for the past years.

Figure: 13



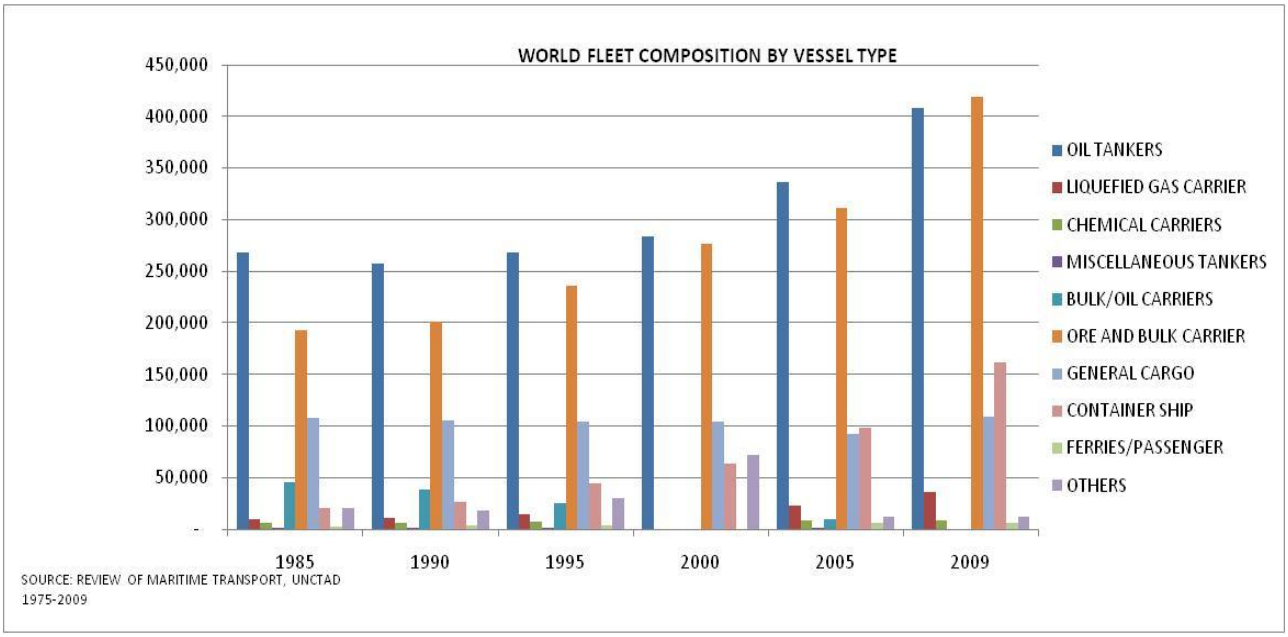
Source: Review of Maritime Transport, UNCTAD 1985-2009

Furthermore, by using the information from the UNCTAD Review of Maritime Transport, It was possible to construct the following Figure 14 to illustrate the world fleet composition by vessel type. In 1985 the world was emerging from an oil crisis in the late 1970's and you could see how oil tankers were by far the most built type of vessel because of past forecasts of oil production, it

is followed by ore and bulk carriers. These two types of vessels coincide as well with the fact that most of the word ocean trade is concentrated in the movement of five types of commodities discussed in chapter 2 and 3: Grain, Iron Ore, Coal, Oil Products and Crude Oil. One type vessel that has increased in amount throughout the years is the ones used to transport Liquid Natural Gas. This commodity has become very important as an alternative to oil based fuels which contaminate less and the supplies of it are still unknown to experts. This commodity is a great example of how market trends and global policies affect shipbuilding. Due to more rigorous "GREEN" policies being implemented in all types of industries the market has made LNG into a commodity that has attracted countries like China and Australia to diversify their energy usage and invest in LNG technologies.

According to The Australian/News Corp. in 2004 Australia signed contracts with China's Guangdong province to administer LNG to that province; it was Australia's biggest export contract at the time The news report states that: "As part of the deal the Shelf project and Guangdong have agreed on a dedicated shipping service and the formation of an Australia-China natural gas technology partnership fund, which will train plant operators for the receiver terminal in China" (Wilson, 2004). LNG showed a growth pattern for example "trade of LNG distribution in 1987 was only 1% of all commodities transported while in 2009 it had reached 3%" (Wijnolst and Wergeland, 2009). It might seem as a small percentage change, but an increase in percentage of trade is projected as thousands of tons that need to be transported, and obviously ships that need to be built.

Figure: 14

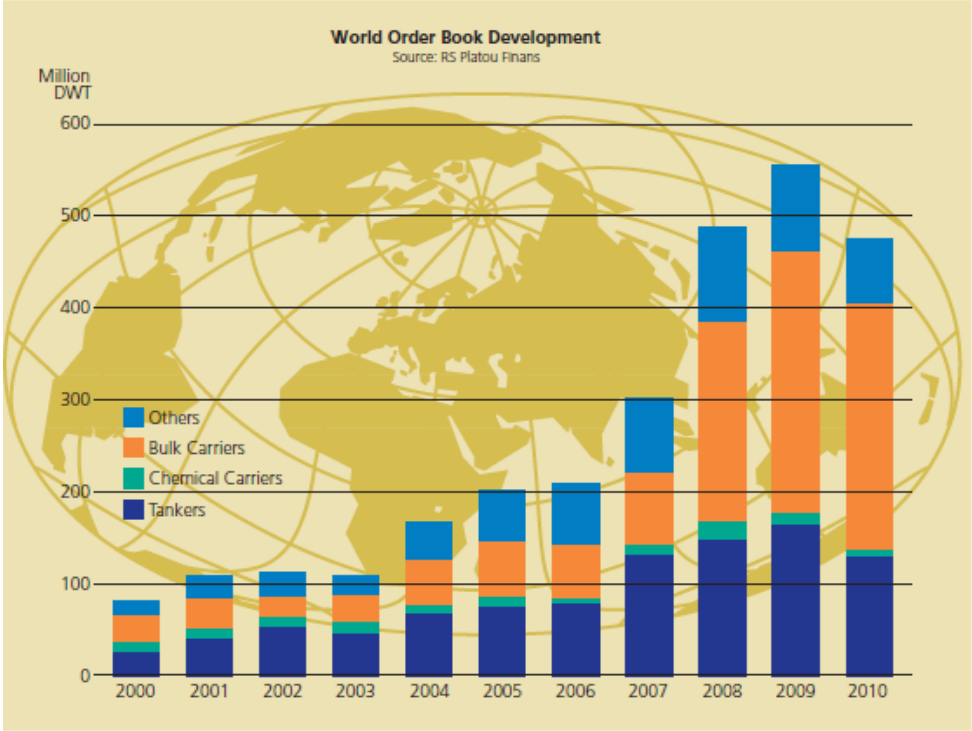


Container ships are another type of vessels that has seen an increase in building, especially in recent year that they have become bigger and faster than ever before. In the mid 1990's container ships rarely reached above the 8,000 TEU and by 2009, they can reach the size of up

15,000 TEU. General cargo vessels and chemical carriers did not change as much throughout the time line and ships like bulk/oil carriers and ferries are extinct in 2009, were they have no importance in the world fleet composition. These ships that are not growing or have disappeared from the list are a direct result to the fact that vessels have a life cycle of 15 to 25 years. Obviously, they don't show an increase because the capacity for this type of market is satisfied or the demand for that type of vessel is not needed. On the other hand even though the long cycles exist, the figure indicates which commodities are being transported and how global demands for these commodities affected shipbuilding throughout the years.

Next we will look at Figure 15 which will show the World Orderbooks during the 2000's decade. It must be noted that in 2009, ships ordered in 2005 were still being delivered, meaning that from 2006 till 2010 most of these ships are still in their construction stages. One thing shipowners have done, because of the economic crisis; the order books are still full because many of the owners asked for later delivery dates as a strategy fight back at low liquidity to pay for those vessels. Instead of terminating the contracts, prolonging them provides extra time for the shipbuilding long-cycle to be adjusted.

Figure: 15

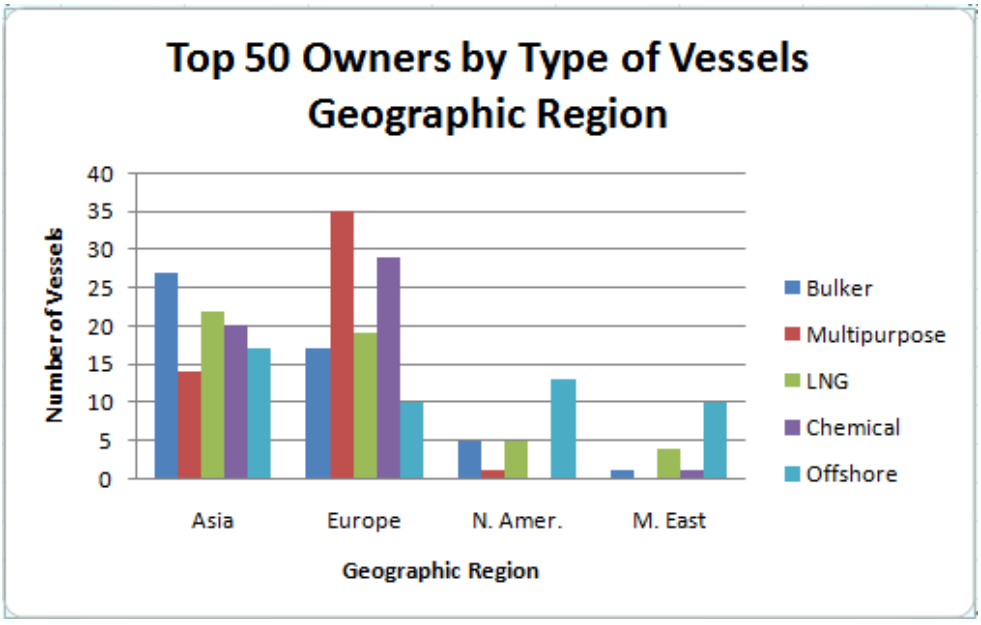


Source: International Chamber of Shipping, 2010.

The order book composition is very similar to the world fleet composition; we can see how chemical tankers by 2010 have become less relevant and how bulk carriers and tankers have increased in the orderbooks throughout the years. Figure 15 is important because other than showing the similarities with previous figures, it illustrates as well the decline in orderbooks in 2010. Due to the financial crisis, the shipping industry has found itself with low levels of liquidity and because global demand for transported products has diminished as well, so has the construction and orderbooks for new built vessels. According to Lloyds list "Between the third quarter of 2008 and the first quarter of 2010, the downturn in the global shipping industry resulted in cancelations of 250 vessels comprising to 7m dwt" (Ching-hoo, 2010). Also in that reports, the president of the China Association of the National Shipbuilding Industry; Zhang Guang adds regarding European owners that "The financial position of European shipowners remains weak and many of them are finding it difficult to access capital markets to finance the vessels they ordered from Chinese shipyards" (Ching-hoo 2010).

Finally to link owners and ship building, five different vessel types were chosen, representative of the commodities that dominate the seaborne trade and those that are interesting to HME strategies, which has launched the increase in shipbuilding. Through the Clarksons data base, it was possible to identify according to the different types of vessels, were the concentration of the top 50 owners lie according to their geographic region. Figure 16 shows the vessel types which are: Chemical tankers, Multipurpose vessels, LNG tankers, Bulk Carriers and Offshore supply vessels. For chemical ships, although the previous figures show that chemical trade and shipbuilding is not as important as before, still it is a commodity that is traded where the most important region with these types of owners is Europe followed by Asia with 58% and 40 % respectably. Multipurpose vessels are another type of ship important to HME and the data shows that 70% of the top 50 owners are from the European region as well. From the vessel types selected, these are the only two were the percentage of the top 50 owners lie in the European region. It must be noted that after them, Asia have the most owners in both vessel types.

Figure 16



Source: Clarksons Shipping Intelligence Network

From the remaining three vessel types, Asian owners control most of the percentage of the top 50 owners in LNG carriers, Bulkers and Offshore Supply vessels. LNG and Bulk carriers are predominantly owned by Asian shipping companies with 44% and 54 % respectably. In Offshore Supply vessels, although they are also leaders, we can see that other geographic regions are involved in this type of ownership. Asia represents 34% followed by North America with 26% and Europe and the Middle East sharing the remaining 40 % with 20% each. This is indicative of the relevance of each of the regions which produces oil, like The Middle East and the USA gulf coast and the significance of this type vessel for world trade as offshore platforms are one of the most expensive assets of any type of business and very important to oil producing countries.

Figure 16 shows the differences in concentration of types of vessels in different geographic regions. It seems that Asia and Europe are the two geographic areas with significant ship ownership as said before; Europe only leads in two of the five commodities further strengthening Asia's involvement in shipping.

In conclusion, these five types of vessels reflect the importance of Asia owners in 2009-2010 for the shipping industry as they control the world fleet of the types of ships that are being built the most in recent years or are still in the order books of ship building countries.

In the next sections we will give brief explanation of modern trends in shipbuilding according to China and South Korea which are the leaders in shipbuilding activities as an export product. Ship repair will also be looked because it has become an important sector for the equipment and technology sector HME represents as well.

4.3 Ship Repair

Like in shipbuilding, Asia has become the leader in ship repair as well. Again, lower labor costs as factors of production have fueled efforts in China to overcome the already established repair centers in Singapore Japan and the Middle East. According to the Ocean Shipping Consultants Ltd., China has increased pressure amongst the region trying to improve efficiency and using cost cutting mechanisms. They also add in their report that "foreign investing in Chinese repair facilities and skills are set to sustain long term growth and increase the volume of higher repair and conversion contracts over the forecasted period" (Ocean Shipping Consultants Ltd, 2005).

As for European countries, they cannot compete with the lower costs offered by their Asian counterparts so they have to focus on intra-regional markets as well as high advanced conversions and special types of vessels. "The region must look into offering services in high expertise using its superior technology and knowledge to offer a type of quality that is not found anywhere else" (Ocean Shipping Consultants Ltd, 2005).

For the North American repair services, because of the Jones Act, which is a protectionist measure, they have their own facilities as they only focus on their own ships.

4.4 Shipbuilding: China vs. South Korea

According to Lloyds List, “China has surpassed South Korea as the world’s largest shipbuilder in 2010” (Leander, 2010) although it has come in a time were the shipbuilding activity has become weaker than before, as reports say, European owners have less money to invest in shipbuilding and low demands for goods pose as a threat to sustained growth of the shipbuilding industry. Yet this country had a plan of becoming the manufacturing leader by 2015 and it was actually reached four years before their projected forecasts.

In comparison to China, South Korea’s biggest strength is its “design capabilities and technological superiority” (Yong, 2007) which should still be attractive to customers from all over the world. In addition Yong Jin Dan adds that “a relatively abundant workforce, openness to innovation, strong R&D investment and development of related industries will also play key roles in remaining competitive in the industry (Yong, 2007). To add to the South Korea’s case as the world leader in ship building, Lloyd’s List states that of all the major shipbuilding nations, South Korea has the greatest exposure to European owners, which are still important today as previous analysis has shown; “about 60% of its yards’ orderbooks and revenue breakdown comes from companies in Europe” (Leander, 2010).

But because of financial woes in Europe after the summer of 2008, ship owners preferred to use Chinese yards to save on the cost structures of their own operations and confront the financial crisis with the best possible solutions. The financial crisis extended to more than 2008 and 2009; as the chain of events in Europe in the first half of 2010, “following the threat of sovereign default by Greece and the financial troubles of other major EU nations, led to a fall in purchasing power by European shipowners” (Leander, 2010). Hence, the decline of shipbuilding and orderbooks, as it was illustrated Figure 15. In South Korea, as their European clients face tougher conditions to obtain financing, their yards also become a greater risk to the international banks that lend to them. Their cost of financing goes up, as well. “This bind has strengthened the competitive position of China’s yards” (Leander, 2010).

Were China’s competes as well with South Korea and the rest of the world is in a sector that no shipbuilding country or any other country can duplicate; it’s in pure labor force like anything seen before. The following figure will demonstrate the direct employment in the shipbuilding industry during 2004, when China was the # 2 shipbuilding country of the world. Of course 6 years have gone by and China has overtaken the # 1 spot, so imagine the position the Chinese labor force in shipbuilding today, where more shipyard capacity has been added in these last six years.

Figure: 17 **Number of direct employment in the shipbuilding industry, by regions, 2004 (Sources: IAW 2006, Suzuki 2006)**

China	287,702
South Korea	71,781
Europe (without Russia and Ukraine)	154,872
Japan	40,264

Source: Tholen, 2006)

Furthermore, as of 2007, China has 51% of orders place worldwide, which include 81 % share of the low end vessel market. “This threatens not only South Korea, but also other shipbuilding countries with its price competiveness aggressive capacity expansion and technological cooperation with western countries” (Yong, 2007).

When talking about ship prices, in 2007, “the average ship costs in China was $34 million, compared to $36 million in South Korea, 38 million is small Japanese yards and 48 million in large Japanese yards and finally $52 million in European yards” (Stopford, 2009). Remember that these prices are before the financial crisis so expect them to be a bit lower in these times were they need to attract shipowners to take a risk.

Simply it was a matter of time when China became the leader in global shipbuilding. The future market conditions and supply and demand dynamics will only tell what strategies they need to take to stay at the top, as for history and economics have proven that they look over tradition and new places will emerge as important shipbuilders in years to come.

Summary:

In this chapter we have seen the history of shipbuilding, different factors that affect the industry and the dominance of Asian countries through the years, after it was traditionally a European industry. The chapter also presents the development of world tonnage according to different types of vessels and the world order book to understand what type of ships, owners are ordering. It was established as well, that there's a correlation between commodities being traded and ships being built, by using LNG carries as an example.

To link shipbuilding with shipowners, an analysis was produced by looking at 5 different types of vessels built and where are those owners concentrated. Again as the previous chapter concluded, although there is European presence in the different shipowners, Asian owners have become very important in the vessel types selected. So important that out of the 5 types selected, the Asian region collects the most percentage of the top 50 owners in three of the five, LNG Bulker and Offshore vessels. To end the chapter a brief explanation of ship repair and shipbuilding trends between China and South Korea was discussed to further analyze Asia's position in the maritime industry.

The next chapter will look at Cluster dynamics and macroeconomic and policy differences that may finally decide one and for all whether or not any Asian country will become a maritime cluster unless they are already

Chapter 5: Maritime Clusters and Benchmark

5.1 Clusters & Cluster Dynamics:

In previous chapters it has been established that Asia has become a major player in the shipping world. Even though Europe has a prominent participation, having within its territories very important maritime clusters like Norway Netherlands and UK, the Asian geographic region holds the most important shipping companies in 2009-2010 according to their market capital; the region is responsible for the top owners in three of the five most important type of vessel being built and to cap it off, Asia has become the leader in all types of manufacturing activities for the shipping markets; from vessels to offshore platforms, containers and cranes, as well as repair. These are indicative of Asia's involvement in maritime businesses and a prospect of becoming the next marine cluster. In this chapter, we will look at cluster dynamics and cluster theory to understand whether or not Asia can become a maritime cluster.

First it must be established that Asia as a whole cannot be a cluster; it must be divided by countries with important maritime sectors to really understand and denote where can HME provide their services as it is crucial for the equipment and technology sectors for shipbuilding that cluster dynamics are well established. This sector is interdependent on other maritime businesses so determining which Asian country provide the best structure for the maritime business is crucial for HME strategy of expansion. The main question of the thesis was to find if:

The dominance of worldwide fleet ownership will shift from European owners to Asian owners making Asia the most important shipping cluster in the coming decade.

The study has determined that Asia's importance is the shipping industry with regards to ship owning is undeniable. But is it enough to be for the region to be considered a maritime cluster for HME's advantage; the definition of cluster and clusters dynamics will explain if this is possible.

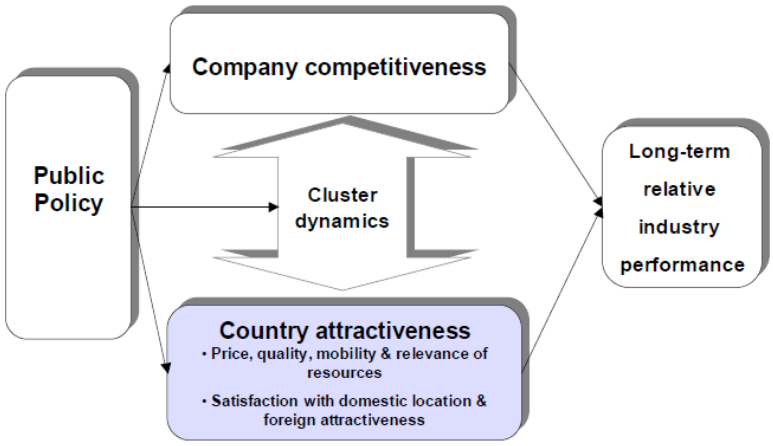
According to Michael Porter's article on clusters, he defines them as "geographic concentrations of interconnected companies and the institutions in a particular field. Clusters encompass an array of linked industries and other entities important to competition" (Porter, 1998). For cluster to exist, there has to be a balance between government policies and private entities which will allow the growth of the region and invite different sectors of the specialized industry that should include: manufacturers, industries related to technology, services and skills, intellectual centers like universities, vocational training, information research, technical support, research and development technologies together with economic prosperity and good fiscal climate to do business. Once all this types of industries are conglomerated into a geographic region, there has to be a certain amount of connectivity, distribution of resources and flow of information, which allows cluster dynamics to further increase the importance of the region and attract more companies. In the book*, "Attracting the Winners"*, which offers a comparative approach to the competiveness of European maritime industries; it discusses the relationship between the competitiveness of certain industries and the location attractiveness. HME as a representative

of the equipment and technology sector seeks exactly this “A nation that provides the companies with resources that increase their competitive advantage…attractive locations increase the competitiveness of industries” (Jacobsen, 2007). That’s why the study has concentrated in the analysis of the Asian region to understand, where the most attractive country is for HME to locate new businesses. But to understand Asia, first we will look at clusters dynamics and examples of successful clusters in Europe as to benchmark the Asian maritime industry.

Erik W. Jacobsen adds to this discussion that “if the geographic distribution of resources is uneven and the geographic mobility is limited, then companies’ capabilities to execute their activities in an effective way will be contingent on the location of the activity” (Jacobsen, 2007). The following, Figure 18, explains the components needed for a country to be attracted to a certain area. Apart from manufacturing and transport activities, what makes a maritime cluster attractive is the services component for example legal, finance, classification education, etc. In particular, the benefits of cluster dynamics are actively sought by sectors in the clusters such as maritime service providers and marine equipment” (Danish Shipowners Association, 2010), as they depend on the manufacturing sector and their activities to be successful.

Components for Successful Clusters

Figure: 18



Source: Jakobsen, 2003

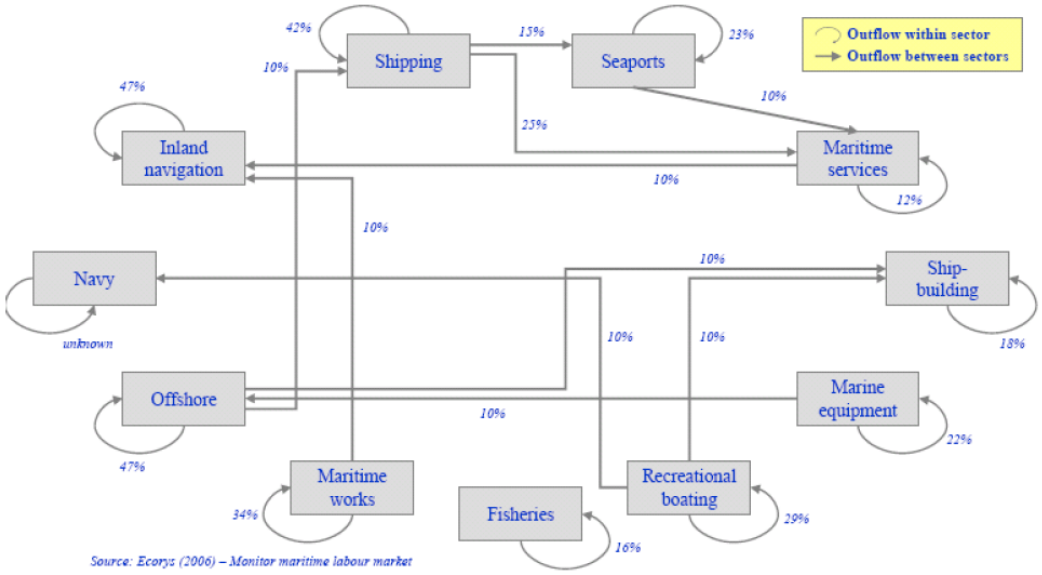
The relationships between the combinations of public policy, company competitiveness, country attractiveness, long term relative industry performance is possible if cluster dynamics and mobility is present in the geographic region. Clusters dynamics are crucial because they will increase competition in the sector and as we know, competition drives for better services, prices and innovation to achieve greater results. Cluster dynamics can be described as linkages, cooperation and innovation pressure (Jakobsen, 2003) which allow the service and manufacturing industries in the cluster to flourish. The greater the dynamics between these

industries then, the more attractive it will be for others to come into the cluster depending on the how easy it is to enter.

Clusters dynamics also determines the flow capital and of labor between the industries as this will show how interconnected the industries are. Figure 19, shows a diagram of the interdependency relationship between industries of the Dutch maritime cluster according to labor. It also serves as an example of a successful cluster as it shows the wide range of interconnected industries and what other regions need to do to be considered one. According to the Danish Shipowners Association, a number of studies have indicated that marine equipment sectors "rely heavily on cluster dynamics for competitiveness and growth and although some sectors like shipping are less reliable to those clusters dynamics; they are still essential to the functioning of the cluster, upholding the cluster dynamics and demand on which other sectors depend" (Danish Shipowners Association, 2010).

Dutch Maritime Cluster

Figure: 19



Source: Danish Shipping Association, 2010

This discussion on clusters and cluster dynamics will serve as the frame work of what countries and regions need to do so their industry becomes a successful. It is very difficult to establish these types of relations between industries because it takes a lot of effort form different sectors to come together and become one. Emerging markets are characterized as having a lot of opportunities to different players that compete with each other to become leaders of those markets. This reality does not provide the necessary maturity in these emerging markets for the companies that operate within to cooperate and create the interdependency needed for cluster to develop. The next section will look at successful clusters to identify what makes them successful in their region according to the services they provide.

5.2 European Maritime Clusters

In this section we will look at successful European Maritime Clusters and what do they offer so we can have an idea of the developmental steps, emerging maritime regions like Asia need to take to be considered a cluster by European standards. The countries selected were: The Netherlands, Norway and United Kingdom, as they are three different regions in Europe that provide different services in the maritime industry and yet are considered clusters in their own right.

The Netherlands

The Dutch maritime cluster is possible because it "includes strong internal relations, a rapid diffusion of innovation connecting links in transport chains and overlapping labor markets between the maritime sectors" (Wijnolst, 2006) as Figure 19 illustrates. Apart for being the European number one shipbuilder, and having an important ship owning sector, they are also world leaders in "ports, dredging, inland shipping & modal connectivity, heavy lift, towage, equipment, offshore support, model testing and integrated systems" (Wijnolst, 2006) which gives a sense of the variety of manufacturing and service the cluster provides. From the analysis of Figure 19, the Dutch shipowners have the strongest or second strongest linkage in each case with yards and equipment producers; that from all the sectors this three have the greatest amount of linkage to the other parts of the cluster that were investigated" (Danish Shipowners Association, 2010).This is a great example of the importance of ship owning to the ship building and equipment sector as they benefit and depend on each other, it also serves as an example of what Asian cluster must do to be successful by having a balances between manufacturing and services.

Norway:

The Norwegian maritime cluster was the first European cluster to be identified in the mid 1990's. Its rich tradition in maritime business makes this country one of the most sought after clusters in the maritime industry. They are responsible for having a manufacturing sector which includes specialty building and repair, equipment and technology. In services, they provide architects and high education; their P& I clubs and legal expertise are esteemed as one of the most important of the world and ship finance through KS funds strategies are matched only by the German KG funds. Other services that they provide are world class ship brokerage companies that may provide their services in all parts of the world. "Their cluster frame work is based on the combination of political bodies, facilitating associations, educational and research institutions" (Wijnolst, 2006). "The country gathers very important ship owners for one of the country's main economic activities which is offshore energy sources that includes tankers and bulk, cruise and ship management agencies" (Wijnolst, 2006). It's very hard for any emerging country to emulate Norway as they are a cluster that is very important the country's economic structure. It can be said if you think of Norway you think automatically of the maritime industry.

United Kingdom:
UK is a very special maritime cluster because contrary to what theory says of a combination of manufacturing and services, UK does not follow that model but yet is considered the most important maritime cluster in the industry. It focuses mainly in the service area of the industry ,were all countries from around the world come to get expertise in the following sectors: arbitration and mediation, average adjusters, bankers, classified societies, insurance brokers, lawyers, port operators, shipbrokers, shipowners and managers, surveyors, underwriters, P&I Clubs, universities and training college" (Wijnolst, 2006). UK's maritime presence is unprecedented, as it's considered to be the "Mecca" for all maritime business even though it stopped having an important manufacturing sector as it was explained in the previous chapter due to economic conditions. Any country that is involved in the maritime business regardless if they want to develop into a cluster must have a presence or any type of involvement with sectors based in the United Kingdom.

The existence of each of these clusters, by any chance, is mutually exclusive. Their closeness to each other makes this Northern European area the best example to emulate and become a cluster in any type of industry. A lot of collaboration exists between these countries and is because each one has something different to provide the industry, where they can learn from each other because at the end of all, interdependency and collaboration will boost up their clusters and maintain them as the leader in maritime business like they are today.

5.4 Asian Emerging Maritime Countries & Cluster implications:

The previous chapters, the study analyzes the involvement of Asian countries in the maritime business according to ship owning and ship building and repair. From all the Asian markets, China, Japan South Korea and Singapore are the ones of most interest to foreign countries to invest in their industries as they are in some way or the other a leader in one of the maritime sectors. For the purpose of this study, although the Japanese industry is one of the most important in the world, they will not be considered because they are a closed market for foreign industries to participate. In regards to ship owners, according to Lloyds List in 2010:

> "Japanese owners continued to be a major supporter of the country's shipbuilders, continuing a trend that had been seen over at least the two previous years. The association said that 60 vessels totaling 3.3m gt were ordered for export between April and September. In tonnage terms, 82% were placed by Japanese owners. The figures, which are the latest available, show Greek owners ordered 4% of the total, equivalent to 132,000 gt." (Wallis, 2010)

As they support their shipping industry, HME as a representative of the Dutch equipment and technology sector will face huge barriers to compete with their local equipment suppliers which are mainly for Japanese vessels.

South Korea shows a similar tendency towards foreign companies and maritime cluster development as Japan; they lean towards local business. Although South Korea is one of the most important amongst shipbuilding countries, even though in 2010 China has overtaken the number one spot as the premier shipbuilding country in the world, and in 2009 according to the top 35 shipowning countries list in Appendix II, South Korea is number six; the country has no indications of becoming a maritime cluster. Yes it has the most exposure towards European owners to perform their shipbuilding duties but due to higher costs and minimal capacity at shipyards, business is moving to low cost countries. Its most important port is in the city of Pusan and they are well involved in the maritime industry but we will later see that compared to other Asian countries like China and Singapore, South Korea does not offer the structure, services and growth patterns as the other countries mentioned.

In the case of China, findings from an analysis by Lars Christian Finckenhagen show that there exists no complete Chinese maritime cluster. Maritime China as of today consists mainly of shipbuilding and shipping companies and is too incomplete to be labels a cluster. But "the study points toward the existence of a Chinese maritime cluster in a distant future" (Finckenhagen, 2008). In Asia they have very few open borders and treaties with each other and rules are not flexible**.** Although European knowhow and expertise is still better than any Asian country; "total lending by region shows that Asian countries are providing enough equity to finance maritime operations, further increasing the prospects of becoming a strong cluster. This shows how governments are increasingly facilitating through policies and measures the means for Asians to become industry leaders" (Jakobsen, 2007).

In China, Shanghai is said to be the next maritime region to be developed. Although Hong Kong is already considered a more developed region for maritime activity, Hong Kong has an identity in itself apart from China which is trying to develop Shanghai to be its new financial, intellectual and service hub. "Currently, Chinese local banks don't know how to do shipping finance while foreign branches in China are not allowed to do it. Obviously Shanghai has a long way to go, it is estimated that the talent gap of Shanghai covering shipping finance register, insurance and broker is around 40,000 to 50,000 persons"(Asiasis, 2010). Moreover, according to the ShanghaiDaily.com, "foreign owned ship broking enterprises will soon be able to get business licences in Shanghai, the first time for such companies on the Chinese mainland" (Feiran, 2010) which shows progress but is still not enough. To start considering China as a maritime cluster, it is recommended that further studies be made on the percentage of employments connected to their maritime activities and how much does that maritime activity contribute to de China's GDP. This will serve as an indicator of how involved is the maritime culture in the Chinese economy.

Singapore on the other hand, has one of the most structured economies for foreign investment, and is on the forefront of the maritime business. They are already established as leaders in repair of vessels in the Asian region together with an array of financial and maritime services which make them an ideal country for expansion towards the Asian markets in any type of business. In The Global Competitiveness Index 2009–2010[10], Singapore is positioned number 3 amongst all the countries in the world, with Switzerland and USA ahead in 1st and 2nd place

[10] Apendix I

respectably. The closest Asian country in competitiveness to Singapore is Japan in 8th position; South Korea is in 19th position and China in 29th position. Singapore is part of a movement in the region, one of the Asian Tigers which have had an "economic miracle" in the last couple decades, and the maritime business is one of the pillars of their strategy. "Singapore enjoys a per capita GDP higher than that of most developed countries, the economy depends heavily on exports, particularly in consumer electronics, information technology products, pharmaceuticals, and on a growing service sector (Trading Economics, 2010) Moreover, "with over 5000 shipping companies contributing about 7% of the GDP, Singapore is a leading International Maritime Center, connected to more than 600 ports in over 120 countries. Given its reputation as a premier global port, Singapore is the preferred choice for many wanting to establish shipping or maritime business operation." (Janus Corporate Solutions, 2001)

5.5 Indicators & Benchmark

To strengthen the position of these Asian countries discussed above, the study will focus on 4 different indicators and the country's fiscal climate to identify which has a better structure to become a maritime cluster. Furthermore, a comparison with the indicators of successful the maritime clusters of United Kingdom, Norway and The Netherlands, will serve as benchmark to f support the positions between the Asian countries .The indicators are updated 2010 information, which include:

1. Technology Index
    - Research and Development Expenditure as a percentage of GDP
2. Business Environment Index
    - Ease of doing business index ; 1 being the most business friendly
3. Transportation Index
    - Quality of port infrastructure index
    - Customs procedure index
    - Liner Shipping connectivity index
4. Economic Activity index
    - GDP Growth Index
    - Unemployment Rates
    - Percentage of Exports of Goods and Services
5. Fiscal climate

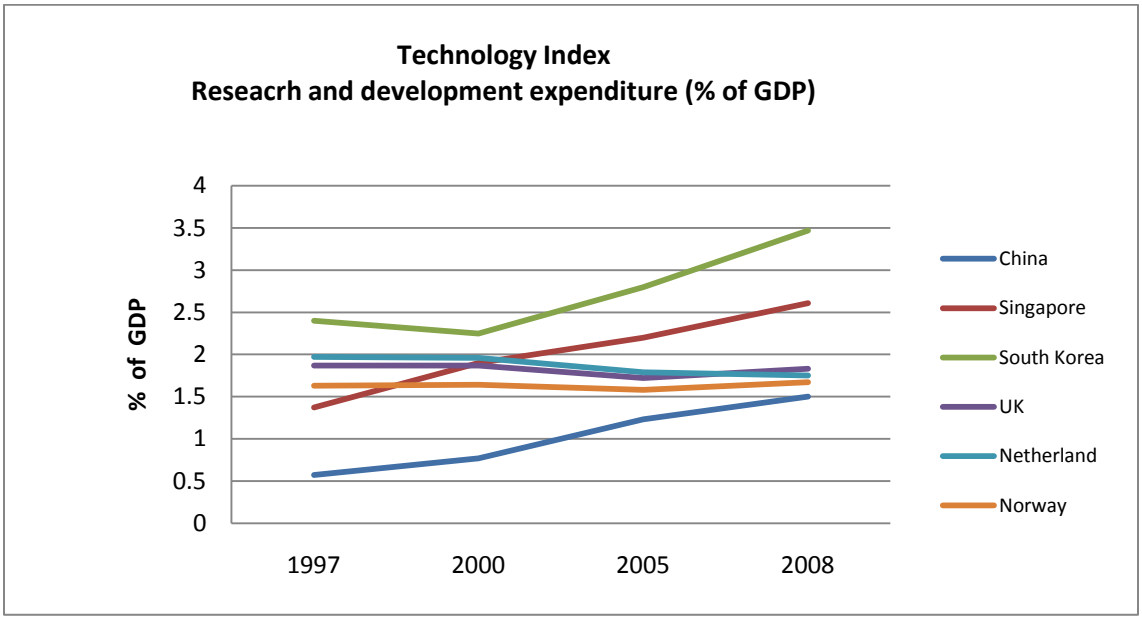
These indicators were selected because they gather the necessary information which shows to some extent, how advanced some of these countries might be for the global business of shipping and the surrounding sectors. The framework needed for these countries to offer attractiveness for foreign companies to become part of their global economy depends on the business environment of each, how advanced they are technologically, that the

transportation infrastructure has to be set in place to be competitive and economic activity together with fiscal climate must be positive. Not only maritime business depends on these indicators for prosperity; but all aspects for their future growth.

The Technology Index:

This index is based on the research and development expenditure as a percentage of GDP of each of the countries. From the three Asian countries, South Korea has the highest percentage at 3.5 % followed by Singapore with 2.8% and China with 1.5; this shows how each of the country invests in having innovations in their industries. S. Korea is surely a leader because they produce and export high technology equipment and have a well developed educational system. As for China, although they are leaders in manufacturing, their products are more generic and low value, and because of their recent involvement in globalization, they have a lot of ground to cover when it comes to technology although they are fast learners. Singapore, they are not involved in much manufacturing, although they are world leaders in repair, which gives them an edge in that niche market over South Korea or China. Compared to the proven European Maritime Clusters of The Netherland, United Kingdom and Norway we can see in Figure 20 that the Asian countries are showing lots of efforts to increase their R&D expenditure, even surpassing the European countries efforts in Singapore and South Korea. China is almost at the same level of the European countries but it does not mean that they are equal. Still it shows how Europe is not investing in R&D and not competing in the fore front while Asia has taken this particular sector and really focus on its development. South Korea and Singapore are way above the European countries and China is reaching the same levels as the European counterparts.

Figure: 20



Source: Trading Economics, 2010

The Transportation Index:

This index is based on three different figures: the Quality of Port Infrastructure, 1 being under developed and 7 being extremely developed; Burden of Customs Procedures, 1 being extremely inefficient and 7 extremely efficient and finally Liner Shipping Connectivity[11]. In Quality of Port Infrastructure, the leaders In Asia are: Singapore, South Korea and China with 6.78, 5.1 and 4.28 as the representative numbers respectably. Singapore has the best infrastructure of them all as they are the major hub for transshipment in the world and offer the best services in their sate of the art facilities. South Korea is a bit over China but not a lot as for the Chinese government is definitely improving their infrastructure rigorously to be worldwide competitive. In Burden of Customs Procedures, in Asia, Singapore again is in first place with 6.38 and South Korea and China are a close 4.57 and 4.55 respectably. This shows the commitment of the Singapore government policies in having the best custom procedures for their clients amongst not only Asian countries but the rest of the world. Finally in Liner shipping connectivity, China is the leader with 131, Singapore second with 99 and South Korea with 86. This is indicative of the amount of liner shipping occurring in the ports of these countries. Off course China is the leader in these respects due to the fact that being the second economy of the world as of 2010 shipping companies go to Chinese ports to transport goods around the world. From the three indicators, Singapore is the leader in two and a close second in one which shows their dominance of the transport sector in the region. Compared to the proven European Maritime Clusters of The Netherland, United Kingdom and Norway, Singapore surpasses all the European countries in Burden of Customs Procedures and Quality of Port Infrastructure, but the European countries are all above South Korea and China. The top number in both indexes goes up to 7 as the most efficient or most developed and out of the six countries, 5 countries, except China are well over 4.5 meaning that they are positively on track according to ocean transportation. The Liner shipping Connectivity Index shows how the countries are connected to global shipping networks, and is no surprise that China is at the top of the list. Because they are one of the biggest importers and exporters of the world, of course many ships go to their ports. On the other hand, Norway although a maritime country, they are well below the standards of the rest of the countries in this index. This could be explained by the fact that Norway is not globally positioned near the major ocean trading lanes for liner fleets and that their maritime industry is inclined to other services mainly in the offshore and energy industry. The Netherlands is the top European country with 88.66, due to the fact that they have the most important port for liner shipping in the West and control the inflow of goods for the demand of more than 500 million people in the Euro zone and beyond. In this index, Asian countries are the leader amongst all of the countries studied.

[11] **The Liner Shipping Connectivity Index captures how well countries are connected to global shipping networks. It is computed by the United Nations Conference on Trade and Development (UNCTAD) based on five components of the maritime transport sector: number of ships, their container-carrying capacity, maximum vessel size, number of services, and number of companies that deploy container ships in a country's ports. For each component a country's value is divided by the maximum value of each component in 2004.**

Figure: 21

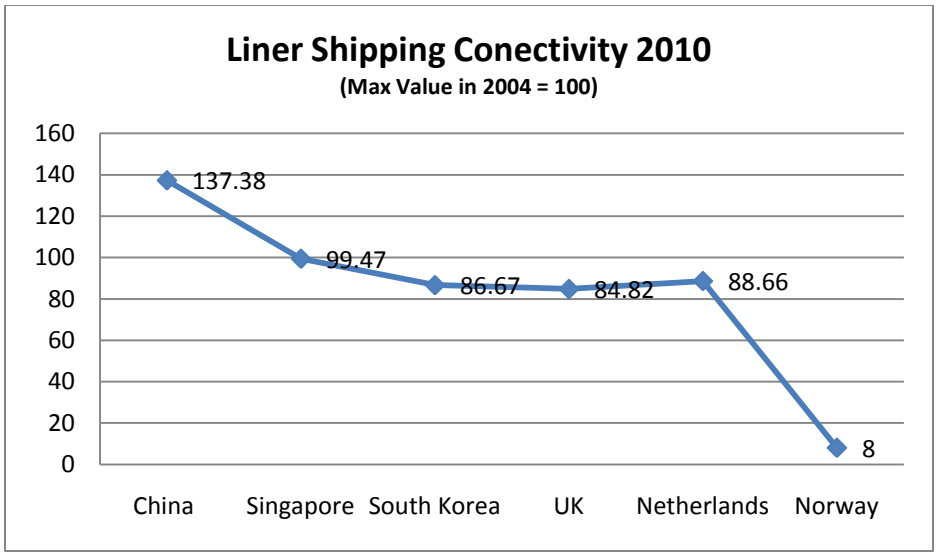


Figure: 22

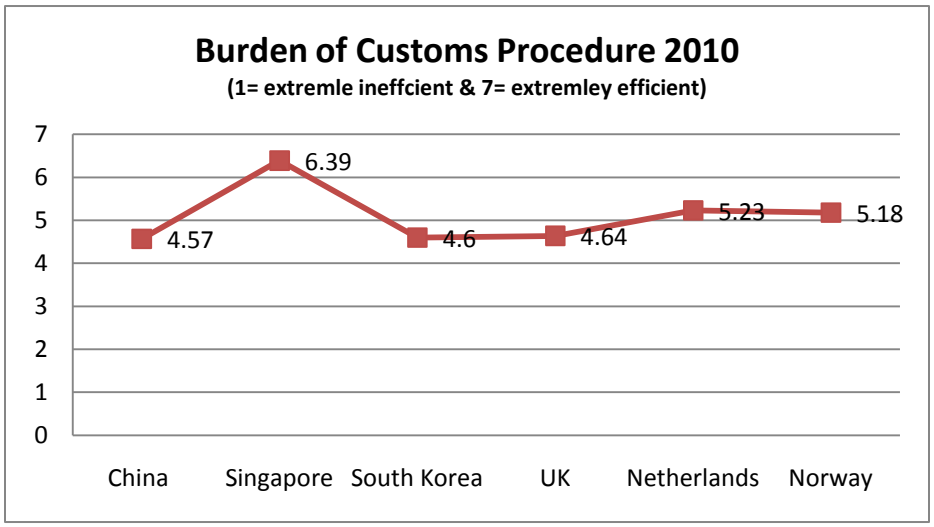
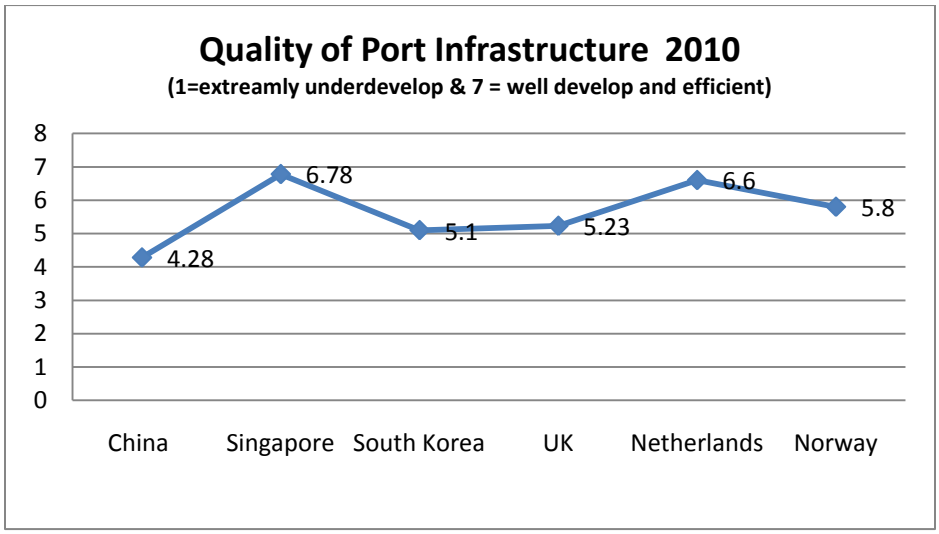


Figure: 23

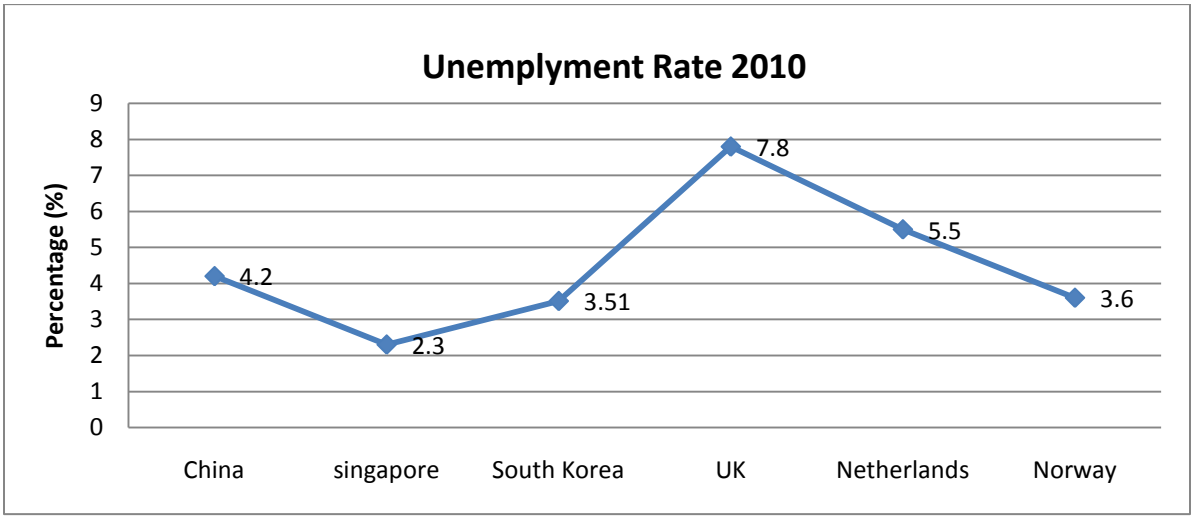


Source: Trading Economics, 2010

Economic Activity Index

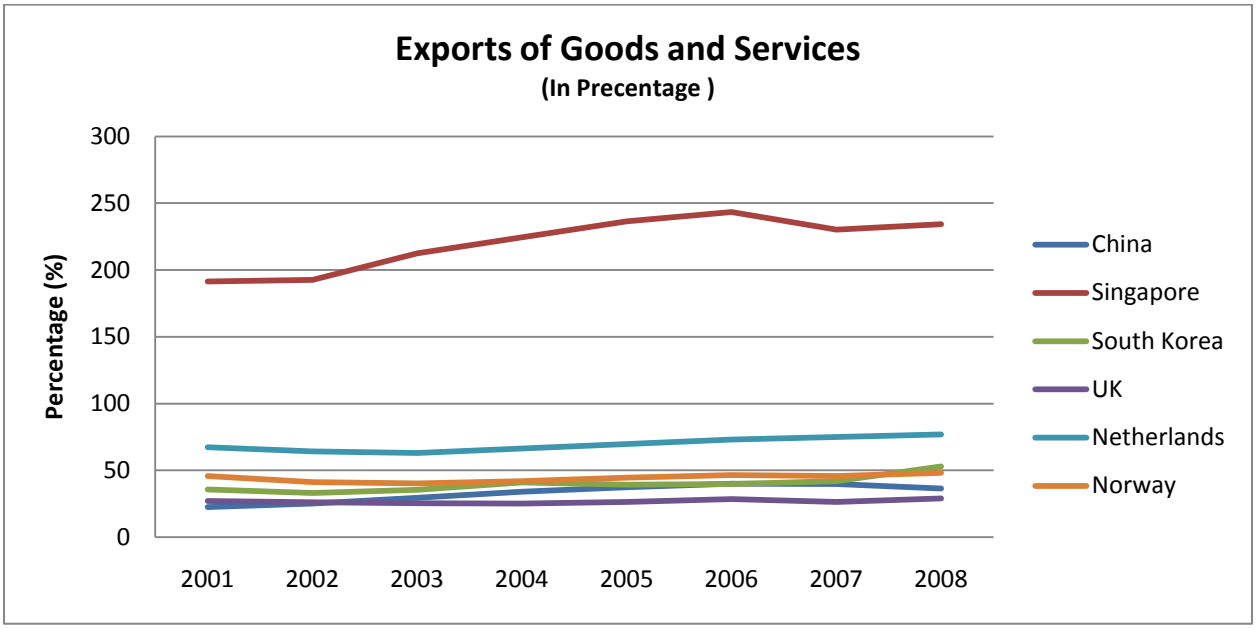
This index is based on three figures surrounding the economic activity of each of the 6 countries in the study. The figures are: Unemployment Rates in 2010, Exports of Goods and Services Percentage and GDP Growth Annual Percentage. These three figures reflect certain aspects of each of these countries' economic activity which are vital for foreign investment and eventual development of a maritime cluster. The Economic Activity indicators show that Singapore is the best equipped country when it comes to is economy; its unemployment rate percentage is the lowest, exports of goods and services is the highest amongst the six countries and in GDP annual growth rate, although China has a larger percentage , Singapore is right there together with the rest of the Europeans. In GDP annual growth percentage we can see how the Singapore GDP and the South Korean GPD rates act similarly according to the yearly trends; in 1998 both countries take a dip and recover almost the same the next year. The three European countries basically respond the same throughout the years. In unemployment rates the European countries are all well above the Asian countries meaning that there is more job opportunities and growth on Asia and finally in percentage of exports of goods and services except Singapore, the other 5 countries show a similar trend in the last decade. Like mentioned before, in this last indicator Singapore has almost 3 times higher percentage than the rest of the countries, showing the strength of their economy in the last decade with a 234 registered percentage in 2008. This information has to be carefully looked at as their percentage level is very high and data availability is limited. The next successful country is The Netherlands, which in 2008 has a 78%. Compared to the proven European Maritime Clusters of The Netherland, United Kingdom and Norway the Asian countries have lower unemployment rates, in exports of goods and services only Singapore is way over the other countries and in Annual GDP growth China surpasses every other country with a 9% growth, UK is the lowest country in this indicator with a 0.71% of GDP annual growth. It must be noted that the unemployment rate information are the official numbers and its validity cannot be revised; methods for calculating unemployment rates defer from country to country.

Figure: 24



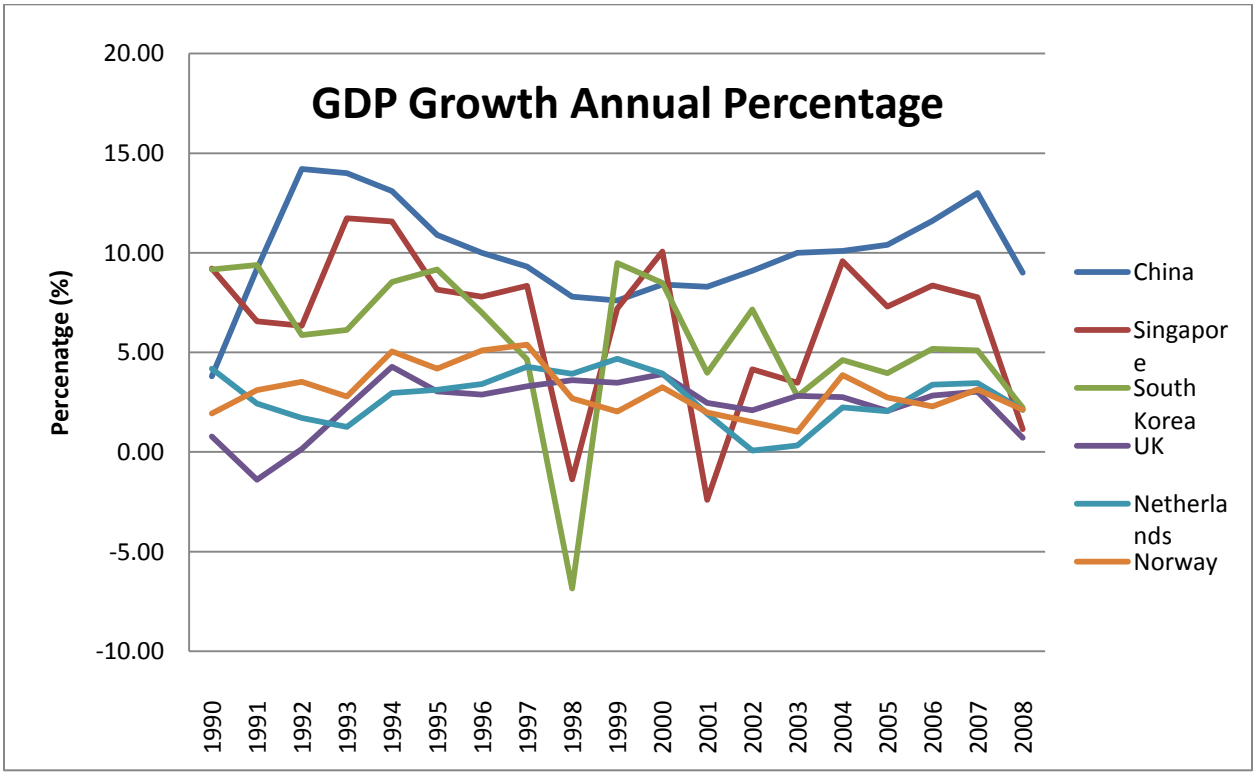
Source: Trading Economics, 2010

Figure: 25



Source: World Bank, 2010

Figure: 26

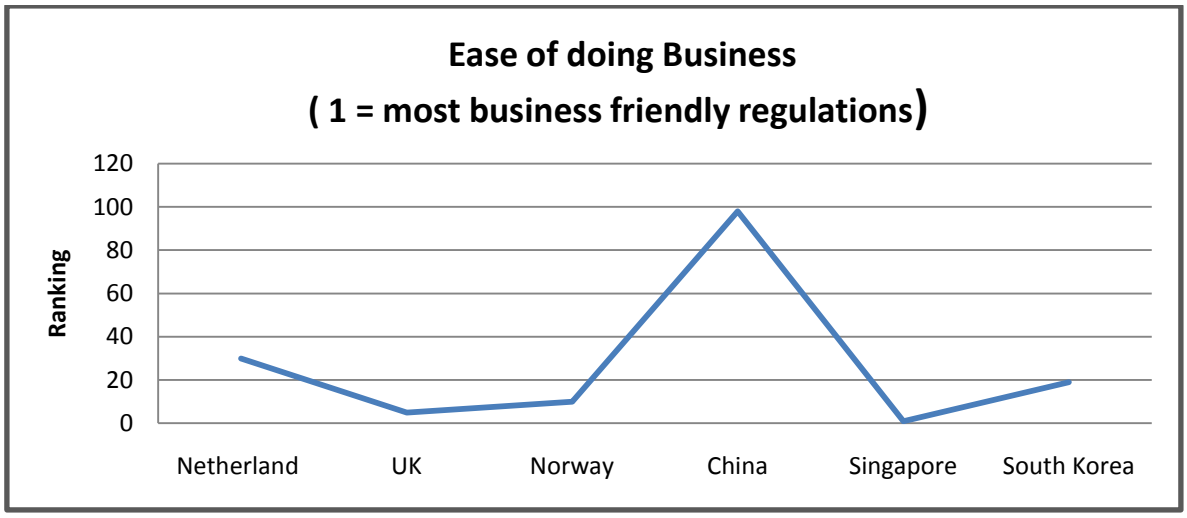


Source: World Bank, 2010

The Business Environment Index

Based on the ease of doing business, where 1 is the friendliest of environment and 100 is the worse. According to the figures, Singapore has the best business environment of the three with a perfect score of 1, while South Korea comes in second with 19 and third place China with a whopping 89. As a foreign investor I would definitely look at this indicator. The business environment is one of the most important because this assures me that my business will be well positioned and externalities won't affect as much. South Korea is not that bad in business compared to China which has a very difficult number to asses. Is no surprise that Singapore is number one, as it has one of the most dynamic economies for foreign investors in the past decades. Compared to the proven European Maritime Clusters of The Netherland, United Kingdom and Norway, Singapore has the friendliest regulations. South Korea has better regulations the Netherlands but China has to be improving a lot to become friendly for other foreign countries to make business. UK is the best equipped European country for business which makes it ideal for countries in the maritime and any other type of business to put offices there as it has been proven for many years. This is a great sign for Singapore, to have better numbers than UK, as it will be seen globally by foreigners that this Asian country provides a nice atmosphere for future investors.

Figure: 27



Source: Trading Economics, 2010

Fiscal Climate: Asia & Europe

China:

According to the Ernst & Young Shipping Industry Almanac 2010 the standard income tax rate for foreign shipping companies is 25% and there are no incentives available for the shipping company and the shipping industry. Because of China's government structure of being a state controlled and planed economy, there are certain restrictions on foreign investors participating in direct investment in the shipping industry, these restrictions are: (Ernst & Young, 2010)

Foreign investment in shipping agencies is allowed subject to Chinese investors ownership being not less than 51%

- Foreign investment in ocean shipping tally services is allowed in the form of equity joint ventures or contractual joint ventures only
- Foreign investments in inland waterway transport or international transport of passengers or cargos by vessels is allowed subject to the Chinese investors ownership being not less than 51%, except for freight forwarding agencies, the restriction effectively mean foreign investors in the shipping industry cannot operate as wholly owned companies in China

Singapore:

According to the Ernst & Young Shipping Industry Almanac 2010 the most commonly used company structure is the limited liability company where there is no dividend withholding tax for the companies. There are no specific subsidies provided by for any shipping company, but shipping companies do have certain incentive to be registered in Singapore for example: (Janus Corporate solutions, 2010)

- Approved International Shipping Enterprise (AIS) scheme - offers shipping companies tax exemption on qualifying shipping income for 10 years.
- Approved Shipping Logistics (ASL) scheme - offers shipping companies a concessionary tax rate of not less than 10% on incremental income derived from providing freight and logistics services.
- Maritime Finance Incentive (MFI) scheme - offers shipping companies that finance maritime vessels and sea containers tax concessions for up to 10 years on their qualifying leasing income.
- Maritime Cluster Fund - offers scholarship schemes, course fee subsidies and attachment programs for the development of manpower, local training infrastructure and capabilities within the maritime industry.
- Maritime Seed Fund (MSF) - offers financial assistance to start-ups or growing maritime companies that strive to introduce innovative products and services in the industry.

South Korea:

According to a report from The Journal of Commerce, the South Koreans are doing a lot of changes in their tax structures to benefit the shipping companies registered in the country. “Till 2009, they calculated depending of the fleet tonnage or tonnage tax which puts them in disadvantages when the industry is in a downturn” (Leach, 2009) and based on the information provided, they will let shipping companies t base their tax payments on earnings until December 31 2010. Only time will tell if their tonnage tax system will hold or be an entry barrier, when many other countries prefer having a taxation treaties that benefit their operations. Other countries that use tonnage tax are Greece which owns most of the world bulk carriers, but South Korea does not come close to the amount of ships registered in Greece. The ministry of Korea siand in a statement that:

> “We will preemptively repair the tax system and tentatively implement the changes for two years so corporate restructuring can be pursued in a timely manner. We will strengthen our tax policy support to help the economy.” (Leach, 2009).

In respects to subsidies South Korea like many other Asian countries in the region, provided subsidies during the economic crisis because government are well intertwined with the shipping companies as they prose a big part of their economic structures . South Korea as one of the largest shipbuilding nation is in their interest to help these countries to survive the economic downturn

United Kingdom:

According to the Ernst & Young Shipping Industry Almanac 2010, the United Kingdom facilitates two separate corporate income tax regimes; one is the Tonnage Tax and the other is Value Added Tax (VAT). This gives alternate options for shipping companies to bring business into the UK. Although there are no special tax benefits for shipowners, they have one of the most extensive number of tax treaties with over 206 countries of which 11 are major Asian maritime countries; Japan, South Korea, China, India, Indonesia, Philippines, Malaysia, Vietnam, Thailand, Taiwan and Singapore. The most commonly used corporate structure is the Limited Liability Company and government support is limited to shipbuilding and traning and not operation matters. The United Kingdom is known for being a center for financial and insurance services for many years now, and it still remains the most important Maritime Center in the world.

The Netherlands:

According to the Ernst & Young shipping Almanac 2010 the following tax facilities are available in the Netherlands which makes it one of the countries that offer a lot of options for taxation:

- Tonnage Tax
- Accelerated Depreciation
- Temporary advanced depreciation facility
- Regressive Depreciation
- Investment Deduction
- Zero rating for value added tax (VAT)
- Recovery of Dutch VAT incurred in costs
- Wage cost deduction

The Netherlands has avoided double taxation schemes with over 80 countries of which 11 are Asian countries; India, Indonesia, China, Japan, South Korea, Malaysia, Philippines, Taiwan, Thailand Vietnam and Singapore. Different from other countries, if by any chance an individual want to use Dutch shipping management companies, while they have the vessel registered somewhere else, the shipping activities will be subject to taxation in the Netherlands. The most generally used corporate structure is the private limited liability company or BV. The Netherlands is known to be a major global player in maritime, logistics and transportation business and in regard to Europe it is probably the most renowned maritime country of the European Union followed closely by the maritime areas of Antwerp, Belgium and Hamburg, Germany.

Norway:

According to the Ernst and Young Shipping Industry Almanac 2010, If it's the case that the shipping owner does not select the Tonnage Tax system, the Norwegian government will apply a Standard Tax were profits go through the countries corporate income tax regime. The profits will be taxed at 28%. There are many cases were international foreign shipping companies will have their management operations done by a Norwegian companies, and these are not subject to the tax structures of the country. Norway has tax treaties with over 80 countries were they have eliminated the double taxation regimes, including 9 Asian countries which are: India, China, Indonesia, Malaysia, Philippines, Thailand, Japan, South Korea, Vietnam and Singapore. For shipping companies to be established, the most generally used legal corporate structures are Joint stock companies and General/limited partnerships. Norway is one of the major players in the global maritime business but is in the region of the North Sea that they are most distinguished.

Summary:

This chapter gathers information on what are maritime clusters and the cluster dynamics which are so important for the equipment and technology sector for shipbuilding. It also provides general information on established European maritime cluster of Norway UK and Netherlands and emerging maritime Asian countries of South Korea China and Singapore. After discussing the emerging Asian countries and their cluster implications, the comparison of different indicators amongst China Singapore and South Korea provides an idea of which of these is the best country with strong framework for investment. Then these countries are compared to the successful European clusters to see where they stand according to the European economic and fiscal standards. According to the indicators discussed in this section, Singapore has the best structure for any foreign company to establish themselves in the Asian region.

The only time that Singapore is not a leader in the indicators is in the Technology Index, were South Korea is the country amongst the six countries discussed that has the most expenditure in percentage of their GDP for research and development. China and South Korea battle for the second position in all other indicators amongst Asian countries and if it comes down to fiscal climate, China is the most disadvantages of them all. Chinese officials will not allow a wholly foreign owned company in their state controlled government and economic system. These indicators discussed allow us to understand what the necessary components for a maritime cluster to develop are, and it is very clear that Singapore is the best country in 2010 to be positioned to start business as they are the maritime center in region and their economy is based around the shipping industry.

Between China and South Korea, although they are two countries with important shipping industries based on the manufacturing of maritime assets, China is more inclined than South Korea to become a maritime cluster. Still both countries need to develop better business climate and incentives for foreign investors to establish their operations on their countries and compete in the region in becoming a maritime cluster. Both countries can't be identified as a cluster just because they have most of the manufacturing; they need more intellectual and services improvements for their shipping industry to become a cluster.

Compared to the economic and fiscal indicators selected form European clusters, Norway, UK and The Netherlands, the Asian counterparts are improving their structures and framework to allow more entrance of free market enterprises as in western society. The major difference from the Asian countries is the number of tax treaties they have with other countries in the world which allow them to be open to foreign investment. China and South Korea are more restricted than Singapore and the European counterparts. The Europeans have fiscal structures which offer different alternatives to shipping companies. This makes it attractive for foreign companies to do business in these areas and Asian countries should adopt these measures. Economically, in transportation, technology, business environment and fiscal climate, Singapore's indicators measures up to any of the countries selected with successful clusters.

Chapter 6

6.1 Conclusions & Recommendations:

Holland Marine Equipment has the obligation to find which region in the world would be better suited, according to the economic and fiscal policies of the countries selected, to position the Dutch equipment and technology sector and become more competitive. Although The Netherlands provide manufacturing expertise where they can use their equipment and technology in specialized vessels, it is not enough to sustain the sector. That's why it's so important to understand where HME can position the Dutch brand; as the equipment sector depend purely on exports.

A detailed analysis of world trade was presented to understand what the main components of the shipping industry are according to the main characteristics of seaborne trade, types of cargos plus the global economic crisis. It is established that the shipping industry works in short term and long term cycles that affect all levels of the industry. In 2010 it is more important to understand these market indicators due to the fact that the global economic crisis affected the global demand and with it the dynamics between shipowners, shipbuilding and equipment which are strongly correlated sectors.

HME's approach for the expansion of the Dutch equipment sector is through the understanding if ***the dominance of worldwide fleet ownership will shift from European owners to Asian owners making Asia the most important shipping cluster in the coming decade.*** The study concentrates in determining whether Asian owners have become important for the industry and if this is enough to consider Asia a maritime cluster. With this in mind, the information will be vital to know where decisions are being made regarding ship building and repair.

Several figures are presented to show the trends of the top 35 shipping countries according to the number of vessels owned and amount of DWT registered. The figures serve as indictors of the importance of different geographic regions according to DWT and it's established that although Europe holds more of the world DWT and more shipping companies, Asian companies have a strong presence in the shipping world. Their strength is further supported through the final figures of chapter 3 which showed that Asian shipping companies, percentage wise, represent the highest concentration (48%) of important companies depending on their market capital. This is empirical evidence that Asian shipowners have become one of the most important groups of shipowners in the industry in the recent decade.

Once established that there is a growth of importance in Asian shipowners, the next chapter looked at shipbuilding because it has an interdependent relationship with the equipment sector and off course with shipowners and the commodities that are being traded. An analysis on this sector offers an insight of what types of vessels are being constructed mainly in South Korea and China although there are other Asian countries involved in this service. The Netherlands is the sole European country represented in shipbuilding due to the fact that it is the number one shipbuilding in Europe, which is great for HME.

According to the analysis, the shipyards were building vessels for owners depending on the commodities being traded and form 1985 to 2009, bulk carriers and tankers were the most important vessels constructed together with container ships. These two types of vessels transport commodities which make part of the most commonly traded commodities in the world. The commodities include bulk, dry bulk (ores and grains), gases, chemicals and petroleum based products. The analysis also shows that LNG tankers are on the rise, because it is used as an alternative to more contaminating fossil fuels. This further supports the notion that shipbuilding depends on the commodities traded due to the fact that LNG trade has increased. Depending on those commodities traded, through Clarkson's data base it was possible to identify the main owners by geographic regions in LNG, Bulk, Offshore Supply, Multipurpose and Chemical vessels. It is established that Asian owners control most of the percentage of the top 50 owners in LNG carriers, Bulkers and Offshore Supply vessels. LNG and Bulk carriers are predominantly owned by Asian shipping companies with 44% and 54 % respectably. In Offshore Supply vessels, although they are also leaders, we can see that other geographic regions are involved in this type of ownership. Asia represents 34% followed by North America with 26% and Europe and the Middle East sharing the remaining 40 % with 20% each. In all, out of the 5 vessel types that are interesting to HME, Asian owners are the most important in three of them and come in close second in the other remaining two.

These chapters answer the first part of the question that HME wants to know; if there is a growing importance in Asian Shipowners. The evidence points that there is. If the Asian region keeps growing as forecasts say that they will, and become more open to free trade economies, it is a matter of time that they will become the most important group of ship owners in the world. It is highly recommended to look closely at the commodities being traded and which country needs these commodities as they serve as an indicator of where transport is needed and if the countries involved invest in shipbuilding. This might benefit HME in the sense that they will know which countries demand a specific type of vessel were HME companies can offer their products.

Moreover, to see if it is enough to call the Asian region a maritime cluster due to the growing importance of Asian shipowners, an analysis on cluster and cluster dynamics together with the explanation of successful European clusters served as the framework to understand what are the components needed for a country or region to be called a maritime cluster. It is of most important to HME that clusters are developed due to the fact that because of the nature of the equipment sector they "rely heavily on cluster dynamics for competitiveness and growth" (Danish Shipowners Association, 2010). "Cluster dynamics can be described as linkages, cooperation and innovation pressure" (Jakobsen, 2007) and as it is stated in the analysis, they determine as well the flow of capital and labor between the industries which shows how interconnected the region is for the benefit of the equipment sector in HME's case.

Through the description of UK, Norway and The Netherlands, as successful clusters, we can see a trend in that all of these countries apart from having a strong maritime culture; they are or were leaders in manufacturing and service sectors of the industry. According to theory, a clusters needs to be supported by the interdependency of these two sectors; the Norwegian and the Dutch maritime clusters go hand in hand with this description. However, UK is the exception because although they are not involved in much of manufacturing in the last decades, they are

unmatched in the types of knowhow and expertise that they can offer according to all types of services and education. From the two sectors that are involved in clusters, one thing can be said; more importance is stressed on the service and education sector of clusters than on the manufacturing because is through service and education that these clusters can truly develop, manufacturing alone just isn't enough.

With this in mind, it is accurate to say that none of the Asian countries as of today can be considered a maritime cluster because they need to improve on the intellectual and service sectors of their industry. It is clear that Asia is the leader in manufacturing and is becoming important in ship ownership but it is not enough considering the existing examples of successful European clusters. What we can see as a trend for example in Singapore, according to reports, is that "it is common that foreign firms, particularly insurers and financiers, send their newly appointed local staff to the home location for training. When they return to Singapore, the obvious benefit for these people has been their exposure to new ideas and cultures that it is hoped will benefit the entire country" (Wallis, 2007). This practice ensures that on the long run the knowledge will remain in the country and it will develop its maritime cluster.

With both parts of the question asked by HME answered, the study then focuses on identifying which of the Asian countries is suitable for foreign countries to invest and expand their operations. The countries of Singapore, China and South Korea were chosen and compared through 5 different indicators which are Technology Index, Business Environment Index, Transportation Index, Economic Activity index and Fiscal Climate in order to single out which of these countries is better suited to be a cluster. The comparison points at Singapore as the country with the best frame work to be considered a positive location according to the indicators selected. The Asian countries' indicators were also compared to the same indictors of Norway, The Netherlands and UK; Singapore has better indicators than all of the European countries examined, which serve as evidence of the potential and forward thinking ability of this country in becoming a maritime cluster. South Korea is not attractive like Singapore and studies say that China promises a lot of prosperity and growth for the future. China's case is more uphill than Singapore or South Korea, even though it shows promise for the future, because they have to develop regional areas inside their country, so the whole country cannot be called a cluster. This can be seen in recent developments pushed by the Chinese central government to make Shanghai a maritime center but much is needed to be done. Many regulations need to be loosened for free enterprises to operate in this country.

The main purpose of finding where the most important ship owners in the world are was to identify where the decisions are being made when it comes to shipbuilding and repair. The study has led us to believe that shipowning is a footloose business in the sense that many ships owned by individuals or companies operate their vessels in geographic areas that are not near their home base. But given the fact that maritime clusters can be identified, it is safe to say that many shipowners are located near these geographic locations to benefit from the maritime services provided by these clusters. The study was able to provide evidence which show that owners will make decisions depending on market demands and commodities traded; this being

one of the trends discovered in Chapters 3 & 4 which is one of the main reasons why the importance of Asian shipowners has grown. Asia's demands and economic growth has given way to more Asian owners to appear. Yet, once again, it is not enough to identify any Asian country into a maritime cluster.

Although there are still no Asian clusters identified, the comparison in Chapter 5 of the five different economic and fiscal indicators strengthens the idea of Singapore being a productive geographic location for foreign operations to settle there. Its connectivity to international shipping lanes will provide the necessary flow of information of any emerging ship owner in Asia or existing ones wanting to expand its operations. A report from 2007 states that "Singapore has raised the stakes in its quest to become Asia's premier maritime hub with a series of initiatives to induce companies to set up in the lion state… These include Siba Ships Asia, a local offshoot of Italian livestock shipping company Hartmann Shipping and the Norwegian Hull Club." (Wallis,2007). Further on the report, it also points out that figures show that the Singapore Shipping Association Group "has attracted 18 new members in the first six months of this year, with the North of England P&I Association one of the latest to join" (Wallis,2007). Clearly the measures are being taken, and although the global economic crisis might have slowed down the progress of certain initiatives, it's a matter of time in which an Asian country becomes a premier maritime cluster.

Obviously, with the forecasted economic growth in Asia, created by the many production center and services that have moved to the region throughout the years, more opportunities have emerged for Asian businessmen to become ship owners. It is common knowledge now that many of the consumer products that are sold all over the worlds start at an Asian factory. Hence, the growth of ownership and opportunity in Asia is inevitable. This makes it very important to have a presence in any of these countries. Holland Marine Equipment would have no problems, being a Dutch Association with maritime prestige, to establish itself in Singapore which welcomes many foreign enterprises. It might not have most of the shipowners as a country compared to Japan, China or South Korea but it provides a maritime frame work more advanced than any of the Asian counterparts.

Ownership determines many things, but as we have seen through the study, it is not enough to develop maritime clusters. For HME is important to know this because they must position themselves close to these owners which determine together with world demand, which vessels are being built. If the case is to move to Asia, Singapore is the country that best offers opportunities in the region as they are already established in the maritime sector and are one of the most open economies for foreign investors in the world, not only Asia. Ownership is a footloose business and as history have shown the ups and downs of the economic cycles may promote one region at some point as it will promote another at a different stage of the cycle. This footloose characteristic makes it very hard to identify where decisions are being made according to shipowners; this poses as one of the major limitations of the study. It would take a longer period of times to make a collection of the most important companies and communicate with them directly so a data base of major shipowners can be constructed and easily identified. Unfortunately due to time constraints, the study was concentrated in identifying those

geographic areas with important ship owners and maritime significance. It may be great for future research to actually contact the shipowners and work with them directly to understand the trends and decisions that affect this volatile and risky business.

Another constraint that was evident in the study is based on the fact that because these are geographic areas with different government and business structures compared to the traditional western countries, many records and information are restricted to the public or basically not enough has been done or recollected to identify owners in these new “up and coming” regions and emerging markets. Especially in China which is a much protected country by the state government, information can be very hard to come by; hopefully the tides will change and these countries will organize to provide better information. Developments in these areas are happening so fast that it’s hard to keep track of the most recent information.

On a more positive note, one thing that is determined in this study apart from the main questions is that emerging markets are gaining power and influencing the directions the industry is headed. This may be another trend that can be looked upon to understand market demands and potential areas for investment. HME has already foreseen this by establishing in Brazil one of its international offices because there is a lot of shipbuilding activity in that country. Simon Kennedy reports in a Lloyd’s List report that “The populations in emerging markets, especially in Asia, are large and they are getting more educated and income levels are rising, which make these countries very attractive for companies. China is a favorite for stock investors but we’re seeing more interest in Indian, Brazilian and Russian markets.” (Kennedy, 2010)

To expand the research, additional information on the Japanese maritime cluster could be very relevant to further understand the dynamics within its geographic region and growth of maritime clusters as a whole. Japan as we could see in the Chapter 4 has the highest number of deadweight per vessel in the world and it’s very important maritime country and industry. But Japan is a closed market mainly for Japanese owners and Shipbuilders so it was not included as the focus of the study. Looking at the growth potential of European shipowners could further improve the research and how cabotage rules affect trade not only internationally but in local regions where European ships are not allowed to trade.

As final recommendations, it is suggested that based on the research, HME should look into Singapore as an important country to show their presence. From there, other developing regions could be looked from a closer location, for example Shanghai, and were HME could further be involved in the development of these same maritime regions. For the identification of exact location of shipowners, due to its footloose characteristic, more cooperation with ports authorities and shipyards would benefit HME as well because there they could identify all the different shipowners that call port, build or repair their vessels to construct a data base of world shipowners.

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APENDIX I

The Global Competitiveness Index 2009–2010 rankings and 2008–2009 comparisons

				GCI 2008–2009
Country/Economy	Rank	Score		Rank*
Switzerland	1	5.60		2
United States	2	5.59		1
Singapore	3	5.55		5
Sweden	4	5.51		4
Denmark	5	5.46		3
Finland	6	5.43		6
Germany	7	5.37		7
Japan	8	5.37		9
Canada	9	5.33		10
Netherlands	10	5.32		8
Hong Kong SAR	11	5.22		11
Taiwan, China	12	5.20		17
United Kingdom	13	5.19		12
Norway	14	5.17		15
Australia	15	5.15		18
France	16	5.13		16
Austria	17	5.13		14
Belgium	18	5.09		19
Korea, Rep.	19	5.00		13
New Zealand	20	4.98		24
Luxembourg	21	4.96		25
Qatar	22	4.95		26
United Arab Emirates	23	4.92		31
Malaysia	24	4.87		21
Ireland	25	4.84		22
Iceland	26	4.80		20
Israel	27	4.80		23
Saudi Arabia	28	4.75		27
China	29	4.74		30
Chile	30	4.70		28
Czech Republic	31	4.67		33
Brunei Darussalam	32	4.64		39
Spain	33	4.59		29
Cyprus	34	4.57		40
Estonia	35	4.56		32

Thailand	36	4.56		34
Slovenia	37	4.55		42
Bahrain	38	4.54		37
Kuwait	39	4.53		35
Tunisia	40	4.50		36
Oman	41	4.49		38
Puerto Rico	42	4.48		41
Portugal	43	4.40		43
Barbados	44	4.35		47
South Africa	45	4.34		45
Poland	46	4.33		53
Slovak Republic	47	4.31		46
Italy	48	4.31		49
India	49	4.30		50
Jordan	50	4.30		48
Azerbaijan	51	4.30		69
Malta	52	4.30		52
Lithuania	53	4.30		44
Indonesia	54	4.26		55
Costa Rica	55	4.25		59
Brazil	56	4.23		64
Mauritius	57	4.22		57
Hungary	58	4.22		62
Panama	59	4.21		58
Mexico	60	4.19		60
Turkey	61	4.16		63
Montenegro	62	4.16		65
Russian Federation	63	4.15		51
Romania	64	4.11		68
Uruguay	65	4.10		75
Botswana	66	4.08		56
Kazakhstan	67	4.08		66
Latvia	68	4.06		54
Colombia	69	4.05		74
Egypt	70	4.04		81
Greece	71	4.04		67
Croatia	72	4.03		61
Morocco	73	4.03		73
Namibia	74	4.03		80
Vietnam	75	4.03		70
Bulgaria	76	4.02		76

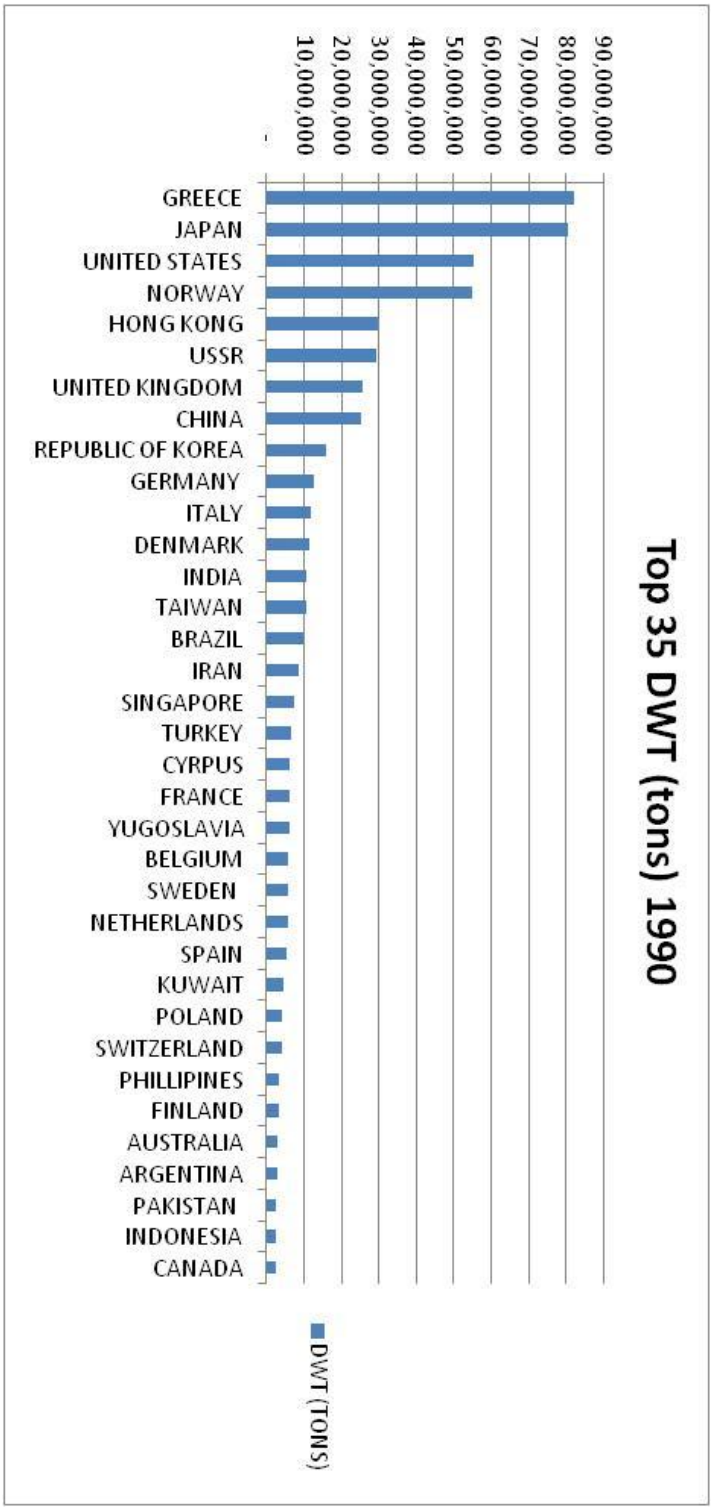
El Salvador	77	4.02		79
Peru	78	4.01		83
Sri Lanka	79	4.01		77
Guatemala	80	3.96		84
Gambia, The	81	3.96		87
Ukraine	82	3.95		72
Algeria	83	3.95		99
Macedonia, FYR	84	3.95		89
Argentina	85	3.91		88
Trinidad and Tobago	86	3.91		92
Philippines	87	3.90		71
Libya	88	3.90		91
Honduras	89	3.86		82
Georgia	90	3.81		90
Jamaica	91	3.81		86
Senegal	92	3.78		96
Serbia	93	3.77		85
Syria	94	3.76		78
Dominican Republic	95	3.75		98
Albania	96	3.72		108
Armenia	97	3.71		97
Kenya	98	3.67		93
Nigeria	99	3.65		94
Tanzania	100	3.59		113
Pakistan	101	3.58		101
Suriname	102	3.57		103
Benin	103	3.56		106
Guyana	104	3.56		115
Ecuador	105	3.56		104
Bangladesh	106	3.55		111
Lesotho	107	3.54		123
Uganda	108	3.53		128
Bosnia and Herzegovina	109	3.53		107
Cambodia	110	3.51		109
Cameroon	111	3.50		114
Zambia	112	3.50		112
Venezuela	113	3.48		105
Ghana	114	3.45		102
Nicaragua	115	3.44		120
Côte d'Ivoire	116	3.43		110
Mongolia	117	3.43		100

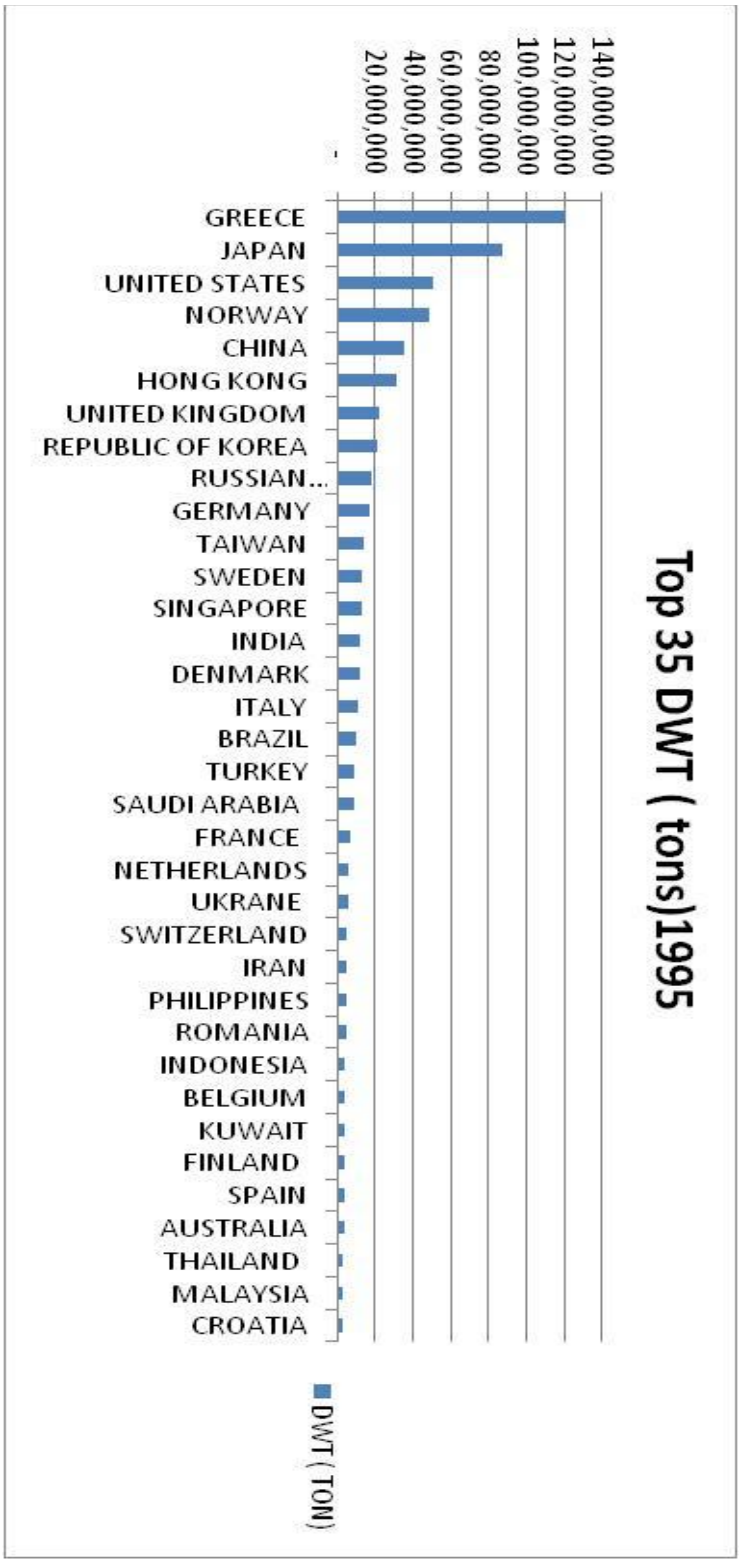
Ethiopia	118	3.43		121
Malawi	119	3.42		119
Bolivia	120	3.42		118
Madagascar	121	3.42		125
Tajikistan	122	3.38		116
Kyrgyz Republic	123	3.36		122
Paraguay	124	3.35		124
Nepal	125	3.34		126
Timor-Leste	126	3.26		129
Mauritania	127	3.25		131
Burkina Faso	128	3.23		127
Mozambique	129	3.22		130
Mali	130	3.22		117
Chad	131	2.87		134
Zimbabwe	132	2.77		133
Burundi	133	2.58		132

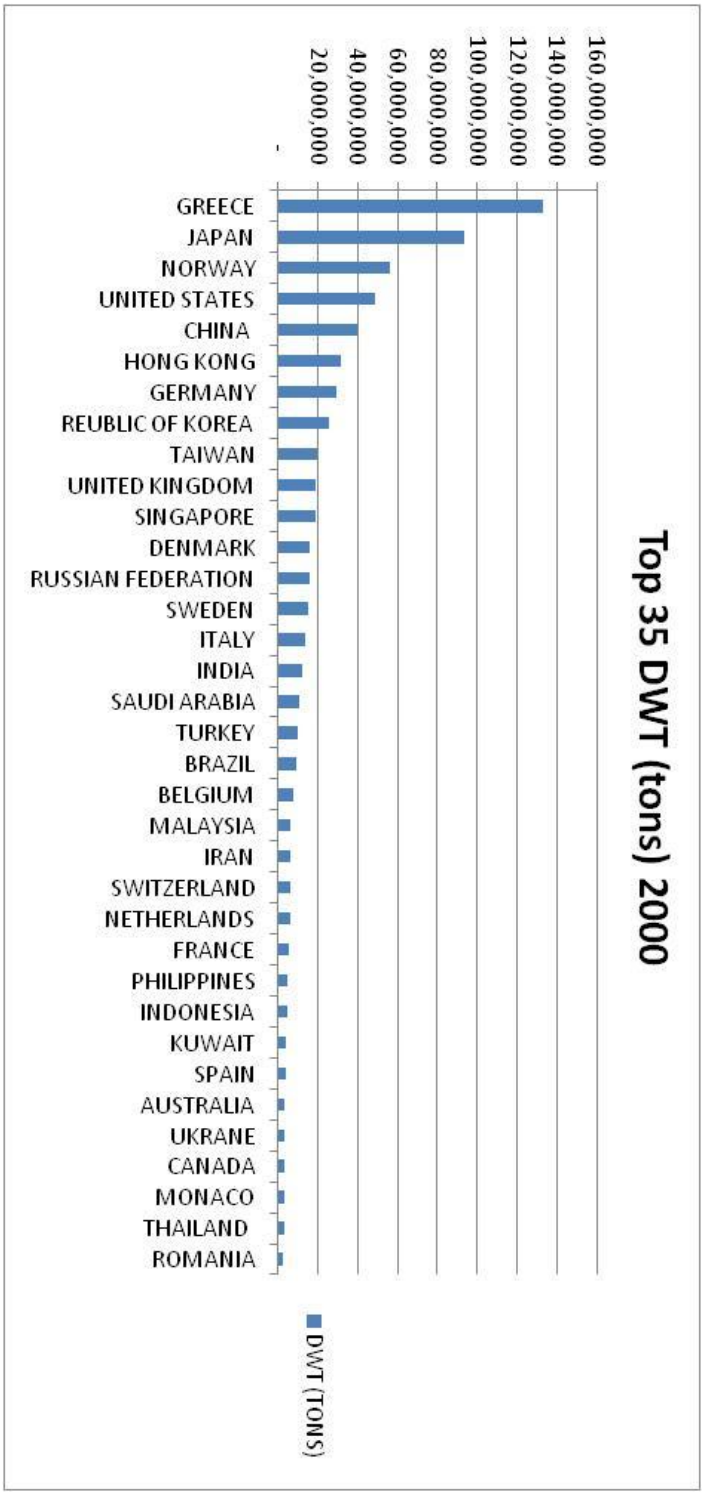
*The 2008-2009 rank is out of 134 countries. One country covered last year, Moldova, had to be excluded this year for lack of Survey data.

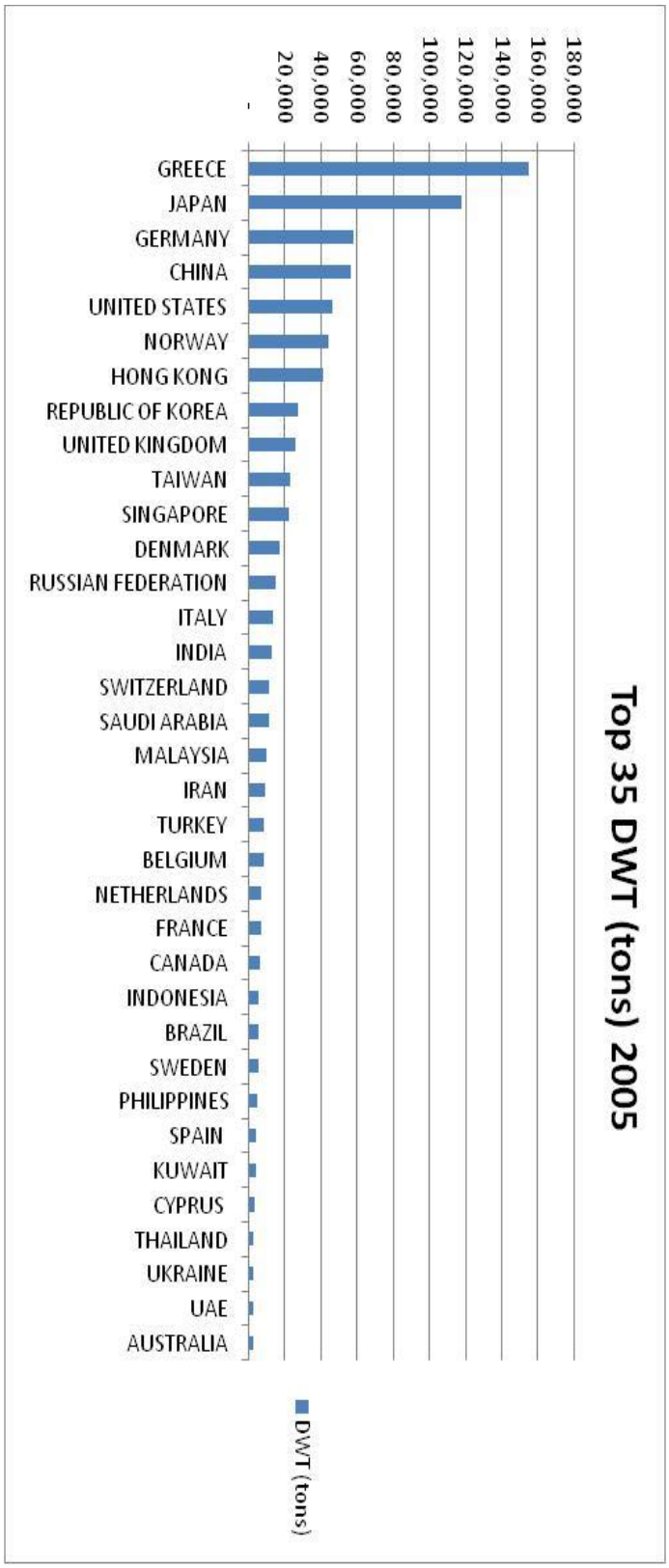
APENDIX II

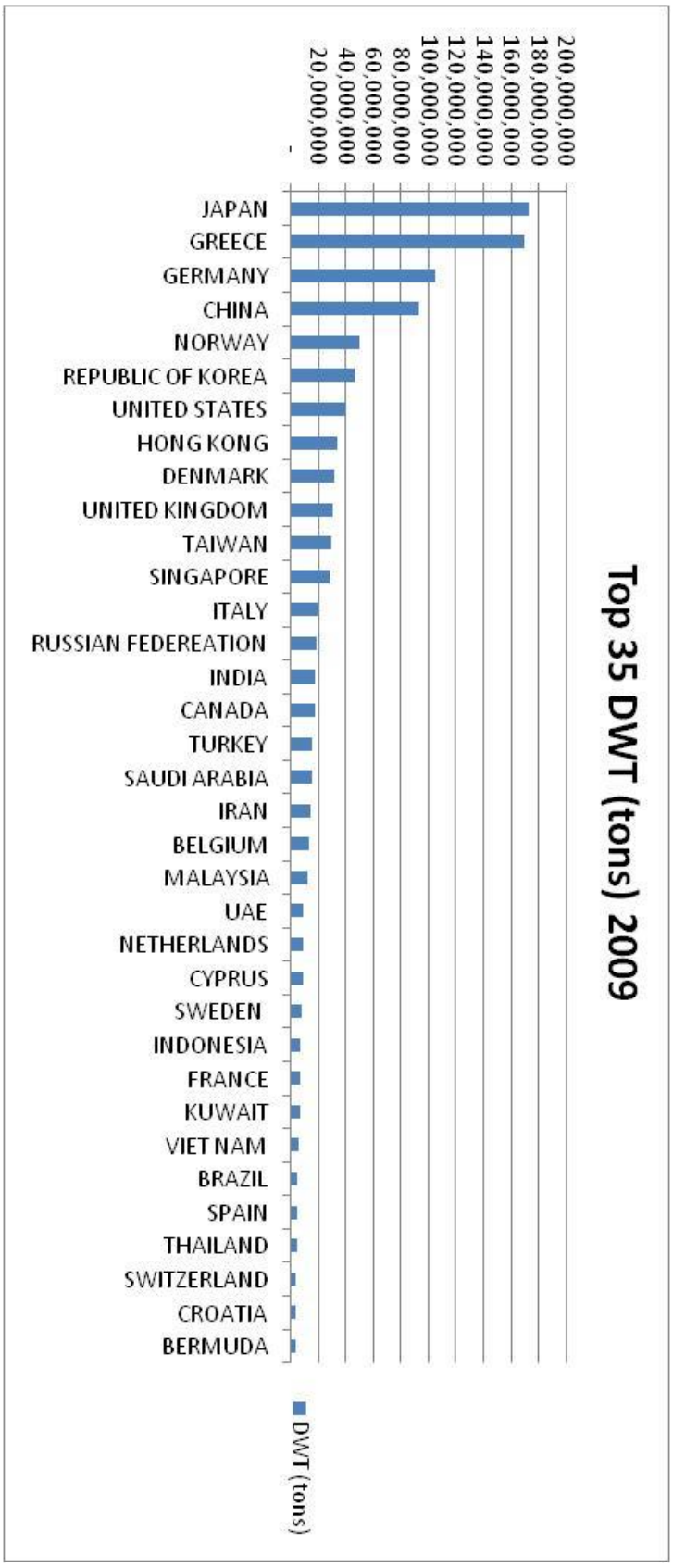
UNCTAD TOPS 35 Shipping Companies according to Dead Weight Tons




Top 35 DWT (tons)1995
140,000,000
120,000,000
100,000,000
80,000,000
60,000,000
40,000,000
20,000,000
-
GREECE
JAPAN
UNITED STATES
NORWAY
CHINA
HONG KONG
UNITED KINGDOM
REPUBLIC OF KOREA
RUSSIAN...
GERMANY
TAIWAN
SWEDEN
SINGAPORE
INDIA
DENMARK
ITALY
BRAZIL
TURKEY
SAUDI ARABIA
FRANCE
NETHERLANDS
UKRANE
SWITZERLAND
IRAN
PHILIPPINES
ROMANIA
INDONESIA
BELGIUM
KUWAIT
FINLAND
SPAIN
AUSTRALIA
THAILAND
MALAYSIA
CROATIA
DWT (TON)


Top 35 DWT (tons) 2000
160,000,000
140,000,000
120,000,000
100,000,000
80,000,000
60,000,000
40,000,000
20,000,000
-
GREECE
JAPAN
NORWAY
UNITED STATES
CHINA
HONG KONG
GERMANY
REUBLIC OF KOREA
TAIWAN
UNITED KINGDOM
SINGAPORE
DENMARK
RUSSIAN FEDERATION
SWEDEN
ITALY
INDIA
SAUDI ARABIA
TURKEY
BRAZIL
BELGIUM
MALAYSIA
IRAN
SWITZERLAND
NETHERLANDS
FRANCE
PHILIPPINES
INDONESIA
KUWAIT
SPAIN
AUSTRALIA
UKRANE
CANADA
MONACO
THAILAND
ROMANIA
DWT (TONS)


Top 35 DWT (tons) 2005
-
20,000
40,000
60,000
80,000
100,000
120,000
140,000
160,000
180,000
GREECE
JAPAN
GERMANY
CHINA
UNITED STATES
NORWAY
HONG KONG
REPUBLIC OF KOREA
UNITED KINGDOM
TAIWAN
SINGAPORE
DENMARK
RUSSIAN FEDERATION
ITALY
INDIA
SWITZERLAND
SAUDI ARABIA
MALAYSIA
IRAN
TURKEY
BELGIUM
NETHERLANDS
FRANCE
CANADA
INDONESIA
BRAZIL
SWEDEN
PHILIPPINES
SPAIN
KUWAIT
CYPRUS
THAILAND
UKRAINE
UAE
AUSTRALIA
DWT (tons)


Top 35 DWT (tons) 2009
200,000,000
180,000,000
160,000,000
140,000,000
120,000,000
100,000,000
80,000,000
60,000,000
40,000,000
20,000,000
-
JAPAN
GREECE
GERMANY
CHINA
NORWAY
REPUBLIC OF KOREA
UNITED STATES
HONG KONG
DENMARK
UNITED KINGDOM
TAIWAN
SINGAPORE
ITALY
RUSSIAN FEDEREATION
INDIA
CANADA
TURKEY
SAUDI ARABIA
IRAN
BELGIUM
MALAYSIA
UAE
NETHERLANDS
CYPRUS
SWEDEN
INDONESIA
FRANCE
KUWAIT
VIET NAM
BRAZIL
SPAIN
THAILAND
SWITZERLAND
CROATIA
BERMUDA
DWT (tons)