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The Economic Crisis Impact on Liner Shipping Connectivity: A Quantitative Approach

By

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Acknowledgments

Here I would like to thank all the people who supported me during the tough year of my studies.

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Abstract

Shipping is an industry contributing to almost 90 per cent of the volume of world merchandise transportation trade. Globalization has been a major driver towards the immense growth of world trade followed by increasing integration of maritime transport in the world economy being the most reliable and economical transport mode. By continuous expansion of world seaborne trade it becomes more significant to improve the trend by increasing service coverage, productivity of ships and optimizing the port throughput, etc.

Connecting to global shipping networks is the key for countries' participation in globalized trade. Although it looks straightforward, the real connections are a complex network and optimizing this network to ensure best possible connections would mean great economies of scale and vast growth for the shipping industry in particular and the world trade as well as the world economy in general.

An economic crisis is a long term economic state characterized by unemployment and low levels of trade and investment. The current global economic crisis which started from the United States was originally considered as a concern only for the US with minor short run impacts on countries with advanced economies. However by persisting and broadening the pressure it touched almost all countries, both developed and developing ones. The recent economic crisis caused great credit crunches and as a result high instability in prices followed by a harsh decline in demand. Loss of consumers' confidence led to a dramatic slump of consumption, production and investment. The shipping industry being the main and cheapest mode of transport for world merchandise trade was not immune from this brunt and experienced a severe hit in an unexpected short period. Blend of cyclical nature of markets in shipping, rapid consequences of economic downturn and dynamics of oil prices caused notable imbalance in trade volume and fleet capacity and severe decline in freight rates.

The aim of current research is to study economic impacts of liner shipping connectivity, as a significant element of port or country connectivity, and then to examine how the current economic crisis influences shipping in general and the liner shipping sector in particular. Further it will discuss how this affects countries' incorporation into the liner shipping network and countries maritime connectivity in long run.

For this research and analysis the author used the data on liner shipping connectivity for 162 countries from 2004 to 2009 from the United Nations Conference on Trade and Development (UNCTAD) which is derived from Containerization International. The trend of growth for liner shipping connectivity for countries from 2004 is also highlighted when the data is available. The possible impacts of the economic slowdown on the contribution of liner shipping connectivity to economy as well as possible options for liner companies to cope with the current economic downturn have also been discussed.

To My Parents

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List of Abbreviations

CCTI	Clarkson Containership Time-charter Index
CI	Containerization International
CIM	Container Intelligence Monthly
CMA CGM	Compagnie Maritime d'Affretement Compagnie Generale
COA	Contract of Affreightment
CS	Cargo Systems
ECLAC	Economic Commission for Latin America and Caribbean
EDI	Electronic Data Interchange
ELAA	European Liner Affairs Association
EOS	Economies of Scale
GDP	Gross Domestic Product
ICT	Information and Communication Technologies
IMAE	International Association of Maritime Economists
IMF	International Monetary Fund
IMO	International Maritime Organization
ISL	Institute of Shipping Economics and Logistics
JIT	Just In Time
JOC	Journal of Commerce
LPI	Logistics Performance Index
LSCI	Liner Shipping Connectivity Index
M&A	Mergers and Acquisition
OECD	Organization for Economic Cooperation and Development
PCC	Pure Car Carrier
PIERS	Port Import Export Reporting Service
RMT	Review of Maritime Trade

RO-RO	Roll On- Roll Off
TEU	Twenty-foot Equivalent Unit
THC	Terminal Handling Charges
TI	Transhipment Index
ULCV	Ultra Large Container Vessel
UNCTAD	United Nations Conference on Trade and Development
WTO	World Trade Organization

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Chapter I: Introduction

1.1 Background and Objectives

Shipping is an industry responsible for carrying almost 90 percent of the world trade volume (www.marisec.org/shippingfacts/world_trade/index.php). On the other hand, 60 percent of the value of goods transported by the sea is general cargo which is mostly carried by the containerships [42]. So for the liner shipping being responsible for carriage of almost half of the world sea traded goods, it is important to understand the economic structure and the economic impacts of the sector.

Liner shipping is defined as a service which is offered with a regular schedule and originates back from the arrival of steam ships [41]. It is because the sailing ships were not predictable being dependant on wind. Benefiting from reliable, identified and regular schedules, fixed sequences of ports of call and fixed announced freight rates, liner shipping was able to get the attention of shippers specially those who were not willing to pay extra for smaller parcels or those who looked for more secured packaging for the cargo to avoid damages during transportation. Reliability of service schedule, safety of goods, liberalization and globalization raised the penetration of liner shipping in economy which is noticeable from the growing figures of containerized trade from total of 15 millions of TEU in 1973 (CI, Yearbook) to above 500 millions of TEU in 2008 (Drewry). For such a quick growth in the industry it is essential to have an optimized service network and an effectual access to the international trade through various means of transport or various service networks which for the purpose of this study is called connectivity. The connectivity is important from the economic point of view because empirically it goes hand in hand with lower freight rates through competition among the shipping companies, economies of scale and higher vessel frequency and less time spent at sea as well as additional income for countries' port.

An economic crisis is a long term economic state branded by unemployment, low prices and low levels of trade and investment. Liner shipping being the centre of transport for manufactured goods seems to receive the major hit by the current recession mostly because of the enormous decline in demand which has a derived nature in transport service.

There are different evidences for the shipping industry being affected by the current recession:

- Decline in the demand and so reduction of the trade;

Statistics compiled by PIERS (Port Import Export Reporting Service) Global Intelligence Solutions (www.piers.com) show that volume on Asia to United States routes declined 7.8 percent in 2008

- (...) forecast in the RMT 2009 (forthcoming): World merchandize trade minus 9 per cent

- Decline in the freight rates;

“Financial crisis hits ocean shipping too, as rates plummet; $2800 to just $ 700? Regretting the Megaship boom” published on October 2008 by SupplyChain Digest

- Idle ships;

"Rivers fill with laid up ships as credit crunch bites hard" 13 January 2009, Cornwall News, London, "The slump in container shipping appears certain to extend into 2010 or beyond. Some companies won't survive," said Joseph Bonney, editor-in-chief of the Journal of Commerce (www.joc.com)

"Idle Box Fleet Hits 484 Ships", Bruce Barnard, Mar 16, 2009, the Journal of Commerce Online

- Fail in the payments for the new builds and so delay in deliveries;

"Shipyards Agree to Container Ship Delays": "There have been no new contracts for container ships since September 2008, the first time no orders have been placed for three consecutive quarters since deals were first recorded in 1965" said Bruce Barnard in JOC on Jul 21, 2009.

The aim of this thesis is to review the nature of liner shipping economics as an element of connectivity for the seaports and countries' trade and to examine the impacts of the recent crisis on the liner shipping industry. Based on a review of these impacts of the crisis on this very particular segment of the industry, the author will evaluate how the liner shipping industry responded or is opting to react and what the consequences are for countries' connectivity.

During the present research the author had access to the database of the United Nations Conference of Trade and Development for previous years and contributed to compile the data of 2009 from CI online where she had the chance to review some cases closely and make conclusion.

By going through the relevant literature, some choices for the liner companies to respond to such turmoil have been found, the impact of which is analyzed and discussed later.

Exploiting the liner data from Containerization International, the author has done studies on selected countries and analyzed the trend of connectivity level for each in particular.

1.2 Hypothesis and Methodologies

The hypothesis for this research is that the current global financial crisis urged the decline in shipping industry as a whole and had negative impacts on liner shipping and indeed weakens the liner shipping connectivity. For this hypothesis the author goes through two phases; first the economic crisis is considered as an independent variable and the liner shipping as the dependent variable; where the author will try to find out the impacts of the economic downturn on the liner shipping sector and in the next phase the liner shipping is assumed as

the independent variable and the countries' connectivity as the dependent one. As per latter assumption the author is examining whether the liner shipping connectivity is weakened as a result of the crisis.

The methodologies which are used in order to accomplish above objectives are as follows:

- *Desk Research*, where the author has studied the relevant literature in order to observe the theory aspects of maritime and in specific liner shipping economics and also formulated the main problem(s) and the structure of this thesis.

- *Data Collection and analysis*, where the author downloaded and compiled the data of liner shipping for last year (July 2008 to July 2009) and she combined it with the similar available data from UNCTAD for the past five years in order to analyze the economic impacts of connectivity through liner shipping.

- *Case studies*, where the author complied the liner service data for a number of selected countries in order to check the impacts of the economic situation on the country level of connectivity in details.

1.3 Structure

This thesis is structured as follows:

Chapter I: Introduction

Here a synopsis of the liner shipping sector has been provided, and the main problem and objectives of this thesis have been defined. The author has also presented the hypotheses and formulated the structure of the study as well as the core questions which are to be examined, evaluated or analyzed through this thesis.

Chapter II: Shipping and Connectivity

Initially in this chapter there is an introduction to the maritime industry and specifically the liner shipping segment and then the concept of connectivity for countries and important elements for measuring the level of connectivity have been introduced. Later in the chapter a deeper introduction of liner connectivity being the significant component of countries' connectivity which is also more important for the author's studies, has been introduced. Why the liner shipping is important for the economy and what the economic impacts of liner shipping connectivity are, have also been discussed.

Chapter III: The economic crisis and impacts on the shipping sector

Initially in this chapter the meaning of an economic crisis has been studied. Then a more comprehensive study on the recent global economic and financial crisis and its origin has been offered. Next, an evaluation of how the shipping industry is hit by the crisis and whether there are geographical or regional differences is presented. The author has also explained different consequences of the economic downturn in the shipping sector while discussing if current fluctuations in the shipping industry are created by the economic crisis or there are sequential consequences.

Chapter IV: Implications of the economic crisis for the liner shipping connectivity and the industry's responses

This chapter reveals the impacts of the economic crisis on the liner shipping connectivity in particular and presents the responses of the liner shipping companies to cope with the current situation. There exist such evidences as change in network structure, reduction of carrying capacity, decrease in the number of ships, increase in the number of demolished ships, increase in the number of idle ships, etc which are going to be checked in the available data on liner shipping connectivity from UNCTAD.

Chapter V: Conclusion

In this chapter the author has summarized the whole research, and presents the findings of her thesis, and suggests the possible areas for future research.

1.4 Literature Review

This section entails synopsis of some of the main literature the author has used for this research. She has only introduced the literature which is mainly considered as resources and the rest which cited in the text is listed in the bibliography.

- Blauwens G Baere P Voorde E, 2002, *Transport Economics*

In this book there are studies about the organization of the transport sector including the traffic and regulation, Economics of transport management including cost calculation, waiting time and routing and pricing and also the nature of supply and demand for transport service, equilibrium and market structure. In its last part it is also analyzing the demand for transport from both aggregate and disaggregates perspectives. This book gives a fundamental understanding of the transport sector which can be developed to different means of transport such as shipping.

- Brooks M, 2000, Sea *Change in Liner Shipping*

This book is examining the economic and strategic management literature to explore the theoretical keystones of structural options for growth that are available to liner firms and then applies one of these theories to liner companies to investigate the nature of the industry and provide a model of managerial decision making which includes consideration of those strategic options for growth. It also examines the key operational issues that face liner shipping companies and identifies successful operational strategies which give an understanding of both the theoretical literature and day to day realities faced by liner shipping industry.

- Grammenos C, 2002*, The Handbook of Maritime Economics and Business*

This is the book of shipping economics and maritime nexus where it is looked into the future of maritime economics and globalization in the maritime. There are also focuses on International seaborne trade, the patterns of International ocean trade, Economics of shipping market cycles, the economics of shipping freight markets and economics of shipping sectors.

In the part of Economics of shipping freight markets, Patrick Alderton and Merv Rowlinson discuss the trend of the changes in the technology, economic and commercial structure and cultural expectations of shipping freight markets.

In the chapter of Economics of the Markets for ships, Siri Pettersen Strandenes, Discusses different attributes of markets for ships and he explains how the available capacity for transport changes in different market behaviours. He also argues that the value of the ship is a significant factor for income expectations of the ship.

In the chapter of shipping market cycles, Martin Stopford discusses possible quick changes in the maritime industry which are caused by choices of owners. He defines what a ship cycle is and reviews the sequence of fluctuations in freight rates which have occurred in the past.

In the fifth part of the book there are some studies on liner shipping issues. In the chapter of Liner shipping: Modelling, competition and collusion, William Sjostrom explains the historical origins of liner shipping and continues with alternative models of agreements in the sector. He also refers to the pricing practices and contractions in the liner sector in the era of conferences. This part of the book is followed by a chapter focusing on impact of different regulations on liner shipping markets and then there is a study in the next chapter on the role of liner shipping cooperation in business strategy and the impact of the financial crisis on Korean liner shipping companies.

- Robinson R, 2005, Liner Shipping Strategy, *Network Structuring and Competitive Advantage: A Chain Systems Perspective*

In this chapter, Ross Robinson discusses about drivers which are making the competitive advantage for liner shipping sector. It talks about low profit records of liner shipping despite their violent growth. He is reminding in his paper that networks in liner shipping are objects of communal strategies and argues that networks do grow and also often decompose and

decomposition can be very fast, too. “It is not the network size per se that is important but the value delivered by the line that happens to be operating in a network or networks”. It also examines the importance of delivering value by the shipping lines and capturing value in order to guarantee the sustainability.

- Stopford M, 1997, *Maritime Economics*

In the chapter of Economic Organization of the Shipping Market, it has concentrated on the shipping market as a whole and then it has discussed market organization and the economic mechanisms which match a diverse fleet of merchant ships to an equally diverse but constant changing pattern of seaborne trade. In the same chapter it also discusses that because shipping is a service business, ship demand depends on several factors where starts from volume of trade and discusses how the commodity trades can be analyzed.

In the chapter of The Shipping Market Cycle, Stopford discusses the economic environment in which the shipping industry operates, starting by defining shipping risk as the risk that the investment in the hull of a merchant ship, including a return on the capital employed, is not recovered during a period of ownership. As per him, shipping risk can be taken by the shipper as industrial shipping or by the ship-owner as the shipping market risk. He discusses the market cycle as dominant to shipping risk. He identifies four stages for the episodic character of market cycles, a trough, a recovery, a peak and a collapse without having a firm rule about the length or timing of each stage.

In the chapter of Financing Ships and Shipping Companies, He discussed how the shipping industry finances its massive requirement for capital in a business which is volatile and historically has offered low returns.

As it explains the money for financing ships come from a pool of savings which are mainly held in three markets naming money market for short term debt, the capital market for long term debt and the stock market for equity. And there are four different financial structures that can be adopted for raising ship finance, equity, mezzanine finance, debt and leasing. The shipping industry has also experimented with raising equity through ship funds, KS partnerships and public offerings. And finally it concludes in the chapter that ship finance, like everything else in shipping moves with the times. Each phase in the industry history has its own character but the common theme which runs through each period is the shipping cycle.

- Talley W, 2009, *Port Economics*

It looks to the definition of the port where it explains a port is a place that provides for the transfer of cargo and passengers to and from vessels. Also it is an economic unit, a place that provides terminal services to transportation carriers and a node in a transportation network. A vessel's transportation network may be an origin-to-destination, a mainline-feeder, or a mainline-mainline network.

The benefits of a port to its region include direct regional, indirect regional, tertiary, and perpetuity benefits. Containerization has resulted in the redesign of ports.

Chapter II: Shipping and Connectivity

2.1 Overview of Shipping

History of shipping goes back to over 15000 years ago when a ship was no more than a piece of timber which was used to traverse the rivers. This business grew for thousands of years to transform to boats, peddles and till around 5000 BC to the formation of first sailing boats in Egypt. It was the time when ships could cross the border of rivers and sail in the seas. The process of growth continued on size of sailing ships till the beginning of 19th century when the introduction of steam ships opened a new era in the shipping history [34].

Shipping since its foundation has been the cheapest mean of transport and soon after its appearance attracted the demand for transportation of goods and passengers. After the Industrial Revolution, by shortening of the economic distances, and by the countries' understanding of the comparative advantages of one another in the production of goods and adding value by moving goods, the globalization of trade was announced and as a result the demand for cheaper transport modes has become superior and for the shipping being the cheapest among other modes it was a great start point for further and faster development.

Shipping has almost always been the backbone of the world trade and offers different types of services for different types of goods between different regions regardless of the origin-destination distance. Modern shipping industry is segmented into three main sectors; liner, bulk and specialized goods [42]; each has diverse attributes and economic organization of own but none is insulated. So it is feasible for the investors to be present at each and every segment at the same time and or even shift from one to another specially when there is an imbalance between the supply of service and the demand for transport.

Besides there are diverse users for each segment as each is specialized in a specific group of merchandise. Liner shipping which is nowadays mostly associated with the containerized goods has regular service and is more reliable in terms of sailing schedule and transit time. The routes and freights are mostly fixed. Users whom look for reliable and safe service schedule or who have small but more valuable goods that cannot fit in an entire vessel and need a better packaging for the cargo not to be damaged during the transport are interested on the liner services. In bulk shipping, unlike the regular services in the liner, there is no regularity unless there is a special type of contract between the shipper and the carrier (that is COA[1]). Another characteristic of bulk shipping is that the cargo should fit the entire ship, so this segment is mostly dedicated for bigger parcels which are of less value and there is no or less obligation for secured packaging to avoid damages. In addition bulk shipping has a perfectly competitive market in which comparable ships compete for the homogeneous goods. The third segment of shipping which is assigned to specialized goods refer to those goods which can benefit from specialized transport system such as refrigerated goods, chemicals, liquid gas, unit labour cargos and passengers and etc. There are diverse types of

[1] Contract of Affreightment (COA) is a long term contract for a specific amount of goods between specific origin and destination but the ship could be dissimilar for the different voyages

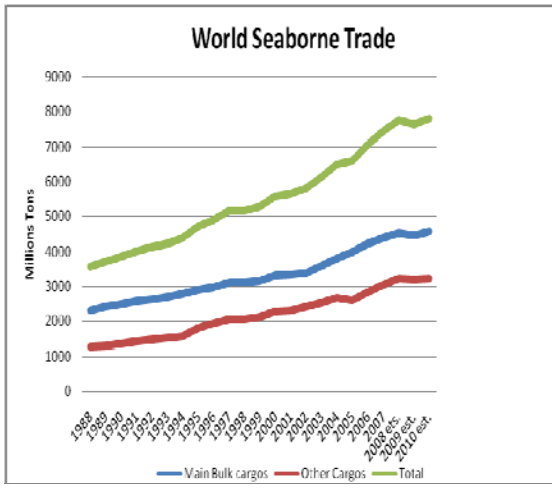
ships to carry this group of goods which are from gas tankers to refrigerated ships and containers to Ro-Ro and PCC to cruise and passenger ships and etc [42]. Each of the specialized transport type has its own characteristics, details of which can be found in various literatures but it is not the aim of this thesis to discuss them in specific.

The economic significance

As it can be observed from the statistics, shipping is one of the quickest industries from the growth rate point of view. Since 1950s the trend for seaborne trade was always upward sloping with the exceptions of the two main economic recessions of early 1970s and early 1980s. Figure 1 shows the trend of the seaborne trade from 1988 to 2007 with the estimation of 2008 to 2010 which has been made basis the data collected from Fernley's review of 2009.

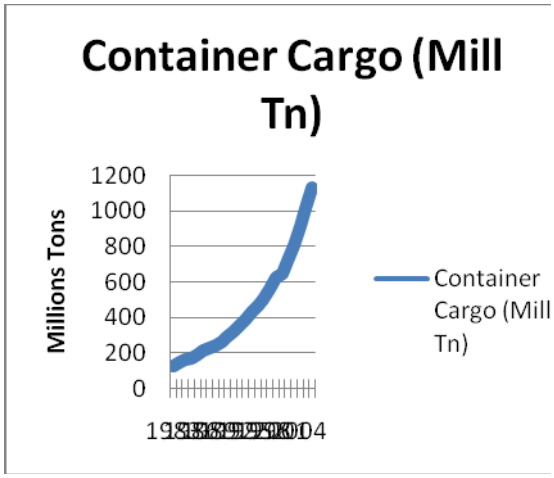
Growth in the liner shipping sector was even sharper that only the growth in container shipping from 1983 to 2006 was 10 per cent per annum on average while the growth of the world trade in the same period was 6.6 per cent for the value of manufactures exports and 4.8 per cent for the GDP and bulk cargos had a growth of almost 3 per cent (on average) [42]. Figure 2 illustrates the trend of the growth for containerized goods during 1983 to 2006 which is made basis the date collected from the textbook of Maritime Economics.

Figure 1-The World Seaborne Trade



Source : Author as per the data from Fearnley review 2009

Figure 2- Trend of the growth for containerized goods

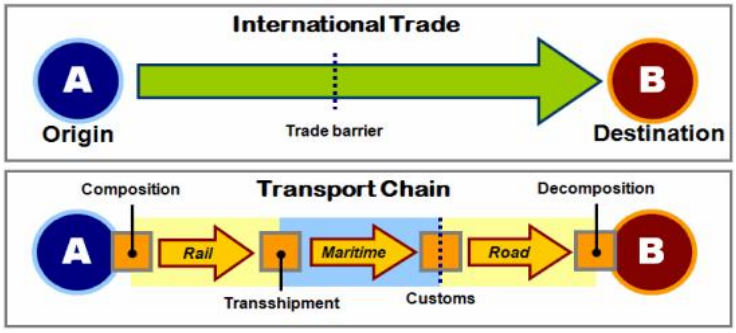


Source: Author as per the data from Stopford, 2009

Shipping is one of the most vital drivers to provide mobility of trade in the direction of internationalization and as a result has an extensive contribution to the national and international economy. By providing mobility of trade, shipping is adding value to the products transfering them from the originating country to the countries where it could be consumed in exchange of those countries' own production in which thry are relatively more

efficient in terms of labour, technology and etc[2]. Besides the globalization and using the comparative advatanges of the other countries, shipping is important in creating substantial direct, indirect and induced jobs. As it is shown in Figure 3, in transfering goods from country A to country B there are diverse intermediairies involved in each enourmus number of jobs either direct or indirec or induced are created in order to accomplish the key objective of moving raw materials to industry and finished goods to consumer. As per the published statistics, in the United Kingdom over 490,000 jobs which is equal to 1.7 per cent of all UK employment is created by the shipping sector. This figures were estimated to contribute £ 23.4 billion in the GDP or 1.7 per cent of the total UK GDP in 2007(Oxford Economics 2007). In the US in Washington states nearly 194,000 jobs (111,317 direct and 20,514 indirect and 62,128 induced jobs) are associated with the maritime activities of the port of Seattle. (Economic Impacts of port of Seattle, February 2009).

Figure 3- International Trade and Transport Chain



Source: Geography of Transport Systems 2009

In addition to the discussed indicators of the shipping sector, there are further components which underline the significance of the maritime transportation for the economy which are listed as follows [20]:

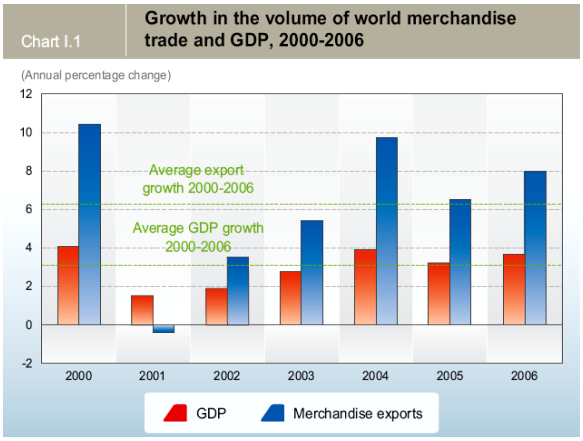
- Facilitation of the regional development
- Affecting the provincial decisions of firms
- Lessening the inventory cost (JIT and Make to Order) and rising the productivity and profit.

Gross Domestic Product (GDP) is an indicator for quantifying the world economic growth. Going over the statistics, it can be scrutinized that trade expands far faster than GDP. Among the trade industries, shipping grows even faster and among the shipping industry sectors, liner is the one which has the fastest growth rate (Hoffman) (Figure 1 and 2 already demonstrated this variation). Figure 4 illustrates the divergence in the growth rate for the volume of world merchandize trade and GDP from 2000 to 2006 which is a support of

[2] The concept of globalization and benefiting from comparative advantage in production in International Economy[4]

the significance of world merchandize trade for the economy. For the maritime industry being responsible for over 90 per cent of the world trade volume, the enormous involvement of the industry in economy is self illustrative.

Figure 4-Growth in the volume of world merchandise trade and the world GDP



Source: WTO

As per K. Talley, a port is an economic unit which provides transfer of cargo and passengers via vessels as well as a connecting node within the transport network where it provides terminal services to the transportation carriers [44]. A vessel's transportation network may be an origin-to-destination, a mainline-feeder, or a mainline-mainline network. The benefits of a port to its region include the direct regional, indirect regional, tertiary, and the perpetuity benefits. So port is one central place in the the maritime industry where exchange of services through different modes of transport occurs and so it is a key factor for the port to have good connections in order to provide a relible service in terms of time and price.

Containerization has resulted in the redesign of ports. Besides it created new investment regions and new factors for the port efficiency. As a result of containerization and the growth in the field it is now very important for ports to improve productivity by having a good network connection of liner services in order to minimize costs through competition and economies of scale and so attract more demand. As transport demand has a derived nature [1] and allows the producers to benefit from the geographical specialisation and the increased deivision of labour and the consumers to benefit from the lower prices and greater choices so it is essential to study the prospective factors such as the connectivity of the port which has direct impact on the demand for transport and so to improve it in order to benefit from more relible and low price services. Because of the importance of this concept for the maritime industry and the economy this research is aimed at analyzing the liner shipping connectivity.

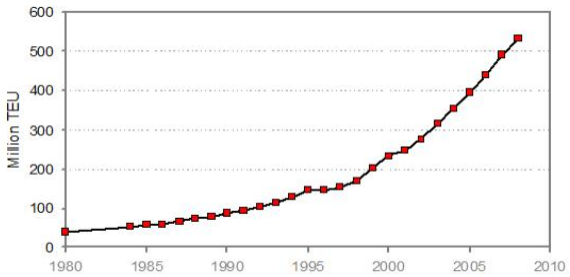
2.2 Liner Shipping

Liner shipping is one of the main segments within the modern shipping industry which was born in 1833 by the steamships operated between the Britain and British Empire [7]. Liner Shipping is a specific type of maritime service that has its own characteristics. It is on regular identified structure which means the route of the service, the schedules and the announced freight rates are on a fixed basis and predetermined. The development in the liner segment was so fast because the reliability of the service could easily attract the shippers and the owners/ carriers could hunt even very small parcels of goods. Liner shipping is a capital intensive sector in which fixed costs are very high though the owners/ operators, by keeping the marginal costs at the low levels, could expand the business quickly.

In 1956, by the innovative appearance of the containers, the world trade has changed revolutionarily. As a result now most of the liner companies are into the containerized business and the liner shipping is mostly assigned to the containerized shipping. Containerized shipping is operation of the fully cellular container ships on the specific routes for the specific prices on the specific schedules and with the specific amount of slots assigned to each node in the route. This development led to an abrupt growth in the transport trade and so a substantial growth in the contribution to the economy.

An overview of the statistics authenticates this purport as the container trade raised from total of 15 millions of TEUs in 1973 (CI Yearbook) to above 500 millions of TEUs in 2008 (Drewry) (Figure 5).

Figure 5-Container Traffic 1980-2008



Source: the Geography of transport systems originated from Drewry Shipping Consultants

One of the success factors in the liner shipping and in particular the containerized trade could be regarded as the enhancement in the vessel's productivity and the reduction of cargo handling times. The raise in the vessel's efficiency and the speedy growth of the containerized liner trade has more than doubled the capacity of the container ships over the past decade which is a notable improvement towards the economies of scale and the lower unit price. Containerized liner shipping is also thriving in terms of the saving time at port and saving in the labour expenses [20]. The consequential modernization and the privatization of terminals and equipments bypassed most of the bottlenecks causing inefficiencies in the cargo handling, and so, the containerized liner trade found its current economic dignity. As of 2009 the percentage share of the fully cellular container ships is 83.7 per cent of the total world fleet which is an impressing figure and self explanatory of the significance of the sector for the world economy (Table 1).

Now what is mostly concerned by the industry experts is to improve this economic and global integration through the expansion of service networks to ensure the pre-eminent

service coverage and the immense economies of scale. The expansion of network and developing service incorporation in a global scale is only achievable through the concept of connectivity which is the accessibility of service coverage in its most efficient level. The concept of connectivity is discussed in more detail in the next section.

Table 1-World fully cellular container fleet development 2000-2009

year (January 1st)	No. Of Ships	% share of World fleet	1000 TEU	% share of World fleet	TEU % change over previous period
2000	2437	8.3	4273	67.6	6.4
2001	2564	6.6	4674	68.7	9.4
2002	2726	7	5288	71.5	13.1
2003	2905	7.4	5893	73.3	11.4
2004	3036	7.7	6424	74.7	9
2005	3220	8.1	7169	76.5	11.6
2006	3514	8.5	8139	78.5	13.5
2007	3881	9.1	9465	80.7	16.3
2008	4259	9.6	10760	82.4	13.7
2009	4639	10.1	12147	**83.7**	12.9
Average growth in %					
2000-2009	7.4		12.3		
2005-2009	9.6		14.1		

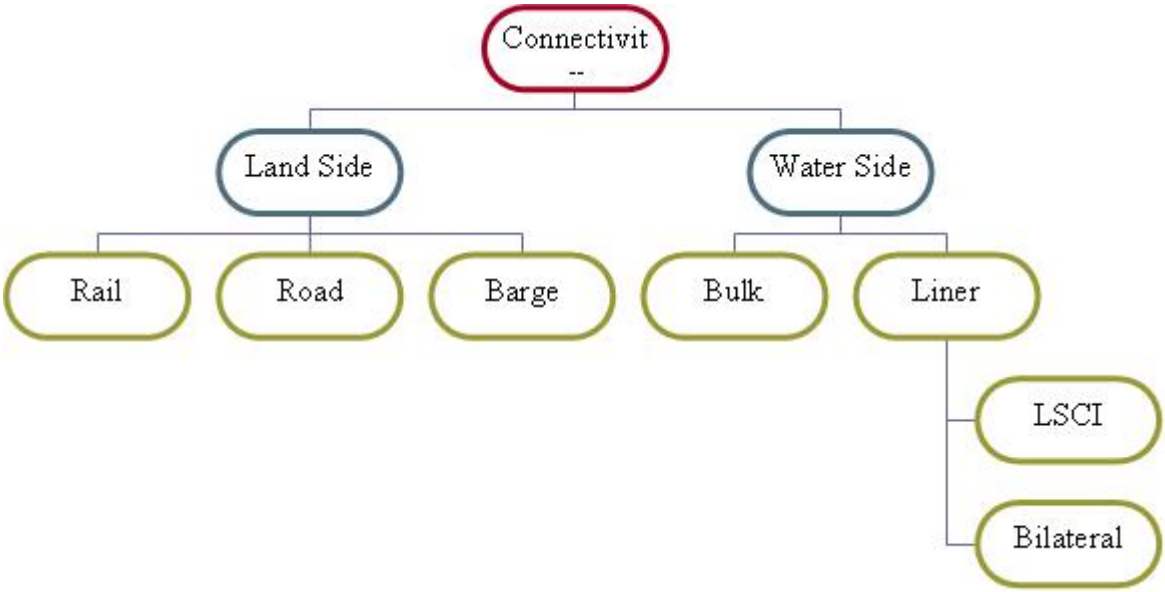
Source: ISL

2.3 Connectivity

Connectivity for countries and from an economic point of view is defined as the effective access of each country to the global markets. As in the shipping industry, ports are the connecting point of countries; in this research the connectivity concept is used for port as a substitute of the country.

For ports to be connected to the global markets there are many different factors to be analyzed but foremost is the significant concern about the ports' main edges. As each port has two major edges being the land-side and the water-side each with sole characteristic none can be neglected (Figure 6).

Figure 6 -Connectivity



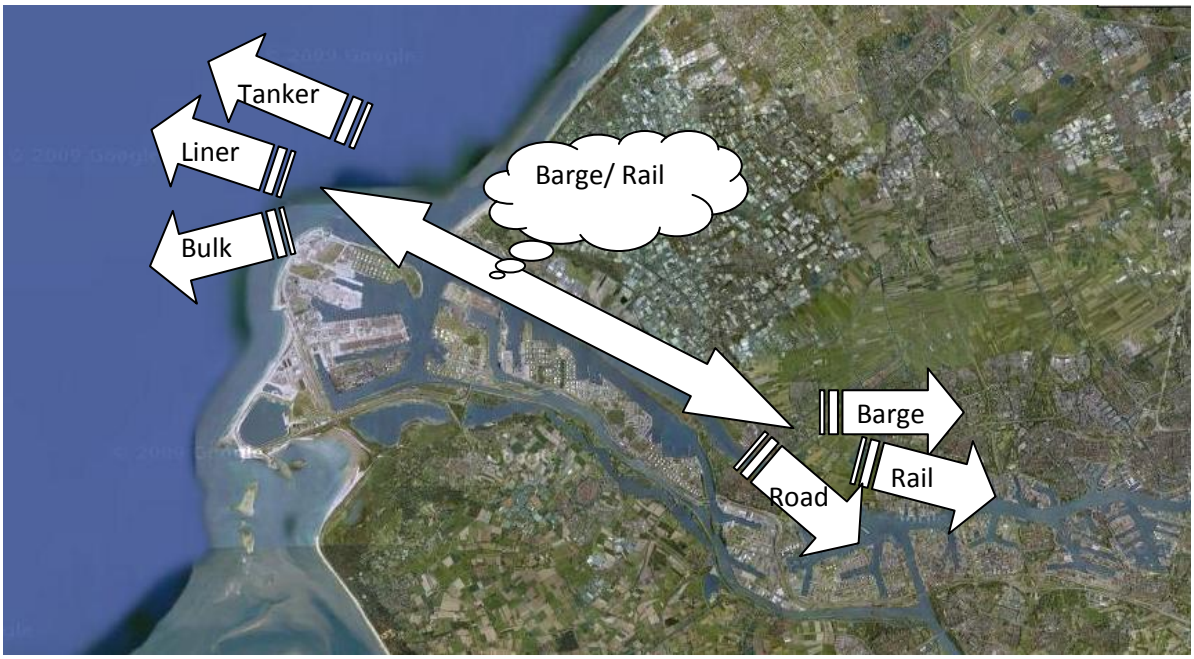
Source: Author

From the water-side, port can be connected to the global trade via the mean of the ship which could be in different types, from the passenger ships to the container ships to the RO-RO s to the bulk carriers to the tankers etc. Depending on the type of indicator (ship), there are different elements to measure the level of connectivity. From the land-side port can be connected to the global markets through the rail, road or barge (Figure 6). There is a large number of studies on the country and port connectivity each is emphasizing on the significance of the connectivity in productivity of the port. (Please also see the visual explanation of the connectivity concept as presented in the figure 7)

In this section the author follows the connectivity concept and discusses its basics followed by a brief explanation of the water side and land side connectivity in general and afterwards she looks into the liner shipping connectivity in details which is the main aim of this research.

To understand the concept of connectivity and its necessity from an economic point of view, first it is needed to know where it germinates from. There are various studies about the positive correlation between the maritime transport and the volume of merchandise trade. An increase in the volume of merchandise trade boosts the demand for the maritime transport. From the other hand the cost of transport has negative correlation with the volume of trade meaning the more reasonable transport cost would attract more demand or vice versa. These posits validates the significance of the reduction of transport cost for the development of economy, as lower transport cost directly links to more trade which itself is the concept of the economies of scale.

Figure 7-Satellite picture of the Port of Rotterdam, the possible Port Connections



Source: Author

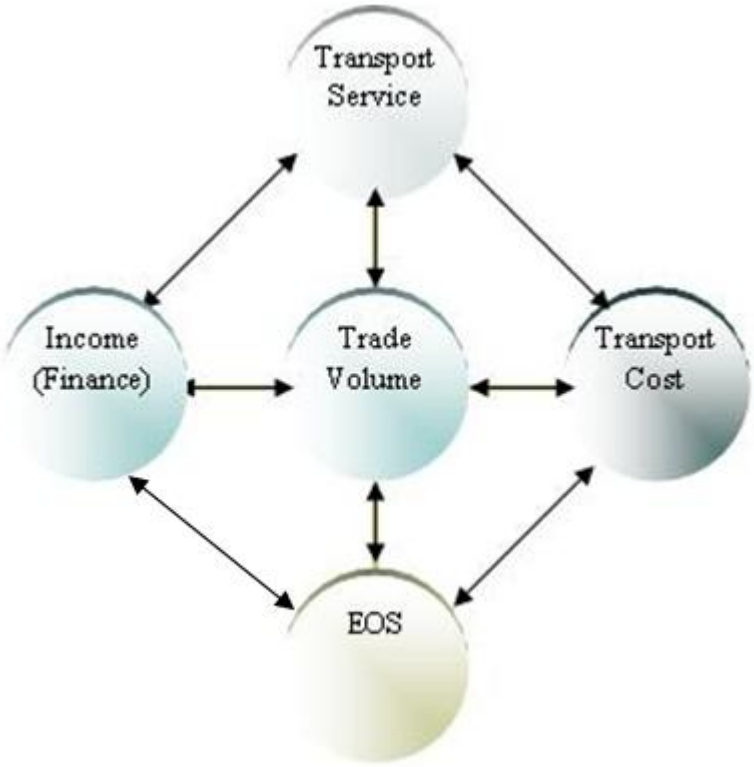
There are a number of factors influencing the transport cost some listed as follows [25]:

- *Distance*; positively correlated that is an increase in the distance would lead to the higher transport cost.
- *Imbalances*; for the regions with balanced legs the transport costs are more reasonable but the empty legs would drastically upscale the transport cost.
- *Type and value of the goods*; transport cost is considered as a percentage of the value of goods that is the more valuable goods would have heavier percentage for the transport cost. It is also connected to the type of the goods and special requirement for the carriage or the special security and insurance.
- *Quality of service*; the high-quality infrastructure leads to the efficient handling and productive operation which practically save the time and would lead to the reduction of the transport cost.
- *Competition*; the increase in the number of service providers leads to the perfect competition and so effectively downscales the transport cost.
- *Economies of scale*; refers to the size of carrier which means employing the bigger carriers reduces the unit cost efficiently.

Identifying the significant factors influence the transport cost from one hand and the negative correlation between the trade and transport cost from the other hand lead to examining the third important concept which is strongly correlated with both the transport cost and the trade volume which is the transport service itself. Transport service is linked to the transport cost for the reason that the improved and better service can shrink the transport

cost and from the other point of view the enhanced and supplementary service efficiently amplify the transport volume which boosts the income and so the transport service can be superiorly financed [21]. The diagram of figure 8 demonstrates the relations between the transport service, the transport cost and the trade volume as discussed above.

Figure 8- Inter-relation of connectivity, trade and the transport cost



Source: Author

As it can be observed from the above diagram, the trade volume can be affected by the quality of transport service up to a great extent and so enhancing the transport service would mean a vast economic promotion. The enhancement of transport service is achievable through improving the integration of the service in terms of both coverage and frequency which is the concept of connectivity.

Possible drivers towards the improved connectivity could be taking advantage of the ICT, EDI and automation.

2.3.1 Land Side Connectivity

Port is the connecting node in the transport network which is linking the vessel to the land side economy. For ports being a productive economic unit, it is vital to have good connections from the land side as an essential economic part of the sea trade. When the port receives the cargo through vessels from sea side, there should be reasonable provision for moving out the goods avoiding the congestion at port and preparing the space for the upcoming goods unless it is a pure transhipment port. An appropriate access to the global trade through the land side would mean the higher efficiency for the port as it can increase the port throughput. The possible connections of land side could be by means of the inter-modal links that are rail, road and barge. Hinterland links are essential factors for selection of the ports. As there is high integration into the port productivity though solving the capacity scarcity at hinterland connections has always been the experts' concern. A port can be marked as highly connected if it provides an efficient access to the global market through the inter-modality and the higher connectivity would mean the more reasonable transport costs, the quicker handling, the more options for users (and so the better attracted by users) and the higher income (direct and indirect).

There are variety of studies on the land side connections and the impacts of inter-modal transport on the integration of ports in the global economy and there are more potential areas for further research on the identification of the hinterland connectivity indicators and the improvement and measurement of it which is not the aim of this thesis and as the proper data in the field is not accessible for the author (due to shortage of time), she skips to go into details.

2.3.2 Water Side Connectivity

As discussed earlier, depending on the type of shipping service (Bulk, Container, etc.) different factors are used to define and measure the level of connectivity for the port being the connecting point between the shore and the sea. There are of course some common factors for all different types being the size of the ship, the amount of cargo or passenger to be shipped, the amount of time the vessel spends at sea as well as at port (transit time), the number of ships deployed, the frequency, etc. In this research, the water-side connectivity is divided into two main categories of liner and bulk. Liner connectivity being responsible for almost 50 per cent of the maritime trade is the main focus of this study where the author could find excellent information from database of the United Nations Conference on Trade and Development (UNCTAD) which is derived from the CI-online. In the forthcoming section the liner shipping connectivity, its economic impacts and the significant indicators to measure it are discussed in details.

2.4 Liner Shipping Connectivity

Liner shipping connectivity refers to the effective access of the users (shippers) to the global network of the liner services. That is the more direct services are available for the users the better the port is connected which directly affects the trade competitiveness, the transport cost and the geography of trade. As competition is a key factor in the reduction of transport cost [25] so the more liner companies are available at a port and the more services they offer is providing the better freight rate from the user point of view. The economies of scale are another important aspect in the reduction of costs that is the bigger is the vessel the more TEU carrying capacity and the lower unit costs are created.

The United Nations Conference on Trade and Developments secretariats introduced following components for quantifying the liner shipping connectivity (UNCTAD):

- *TEU deployment*; It refers to the total number of TEU carrying capacity is assigned for each country. It is indisputable that the more is the assigned carrying capacity for the country the better it can serve the shippers.

- *Fleet deployment*; It refers to the total number of ships deployed for each country. This indicator is very much related to the amount of trade for the country. That is countries with a large amount of sea trade would require more ships to be deployed in order to cover their regional demand.

- *Number of liner companies*; It refers to the number of liner companies which are active in the country. The number of liner companies can indicate the level of competition at ports. That is the more liner companies are providing service in a country more competition will be created and as a result better service with lower cost would be offered to the shippers.

- *Number of liner services*; In addition to the number of liner shipping companies which offer service in a country it is important that how many services and how frequent they offer service. As liner shipping's users are very much concerned about the reliability of service; the more services provided would mean the more frequent calls and more reliability for the shippers. More services can also provide more carrying capacity which is another advantage for the shippers and of course the countries with large size of sea trade.

- *Maximum ship size*; This indicator refers to the economies of scale and available port infrastructure. That is the larger is the ship, the smaller is the unit cost. It of course depends on many other factors as bigger ships would require the special port and terminal characteristics.

2.4.1 Country Connectivity and LSCI

Liner Shipping Connectivity Index was first introduced by the UNCTAD secretariats in 2004 (Transport Newsletter No. 27 published in the first quarter of 2005). The aim of the introduction of this index was to quantify and demonstrate the level of countries' connectivity to the global trade network on the basis of number of ships call the country and the number of companies provides services and the maximum ship size (i.e. the liner connectivity components as explained earlier) where only direct connections matter.

In order to calculate the country level of connectivity, the data collected from Containerization International for 162 countries for each year and indexed considering the first year of data (2004) being the base of index (100). In the appendix 1 there is the complete list of 162 countries for 2004 to 2009 and Table 2 presents the top ten countries in terms of LSCI ranking[3].

Table 2- Top ten countries in terms of LSCI ranking

Rank	Country	Ships	TEU	No. Of Companies	No. Of Services	Max Size	Index 09	Index 08	% Change
1	China	1446	6217754	85	1019	13800	132.47	140.27	-0.06
2	Hong Kong	1051	4719954	58	660	13800	104.47	110.62	-0.06
3	Singapore	937	3429884	78	690	13800	99.47	105.33	-0.06
4	Netherlands	734	2724864	96	430	13800	88.66	87.57	0.01
5	Korea, Rep.	702	2700620	67	565	13800	86.67	76.40	0.13
6	UK	710	2587739	85	392	13800	84.82	77.99	0.09
7	Germany	759	2852521	82	433	12508	84.30	89.26	-0.06
8	Belgium	708	2091467	93	368	13800	82.80	77.98	0.06
9	US	913	3123776	81	542	9200	82.43	82.45	0.00
10	Malaysia	704	2787258	66	464	12508	81.21	77.60	0.05

Source: Author, calculated basis the data derived from CI online

As it can be observed from the data, China with 6 percent decline in LSCI from 140.27 in 2008 to 132.47 in 2009 has still the first rank for the sixth consecutive year. Among the other 162 countries Paraguay, Serbia & Montenegro followed by Czech Republic had the highest decline in index from 100 percent for Paraguay (where no ships called during the period of June 2008 to June 2009) to 99 and 86 per cent for Serbia & Montenegro and Czech Republic respectively opposing to Iraq with the highest growth rate in the LSCI ranking of almost 3 times from 1.20 in 2008 to 5.11 in 2009 followed by Libya, Djibouti and Sudan with the growth rates of 76 and 72 per cent respectively (please see the appendix I for further details).

The top ten countries in terms of the number of ships deployed as shown in Table 3, are exactly the same top ten countries in terms of index ranking with slight changes in the order. Comparing the data with a year before, it can be observed that all of the top ten countries had decline in number of ships deployed with Hong Kong (China SAR HK) having

[3] LSCI 2009 constitutes of the data for the period of June 2008 to June 2009

the highest decline of 16 per cent from 1249 ships in 2008 to 1051 ships in 2009 and Netherlands the lowest decline (among the top ten) of 7 per cent from 791 ships in 2008 to 734 ships in 2009. Among all 162 countries again Serbia & Montenegro and Paraguay had the highest fall of 100 per cent that is no ships deployed for these countries from June 2008 to June 2009, there are 16 countries such as Belize, Bermuda, Kuwait, Cambodia, Somalia, Palau and South Africa which have no changes in the number of ships since the previous year and Sudan had the highest growth of 1.27 times from 11 ships deployed in 2008 to 25 ships deployed in 2009.

Table 3- Top ten countries in terms of number of ships deployed

	Country	2009	2008	% change
1	China	1,446	1,705	-0.15
2	China (SAR HK)	1,051	1,249	-0.16
3	Singapore	937	1,078	-0.13
4	United States	913	994	-0.08
5	Germany	759	872	-0.13
6	Netherlands	734	791	-0.07
7	United Kingdom	710	807	-0.12
8	Belgium	708	811	-0.13
9	Malaysia	704	827	-0.15
10	Korea, Rep.	702	770	-0.09

Source: Author, calculated as per the data derived from CI online

The other significant component of the LSCI is the number of TEU deployed. Table 4 presents the top ten countries of the world in terms of the number of TEU deployed. For this component the top ten countries are almost the same as the top ten countries with the highest LSCI ranking except for the Belgium which is substituted by Taiwan. There is also change in the ordering except for the China, Hong Kong and Singapore which are still staying at the first top three.

In comparison with the data from the previous year, among the top ten countries; Germany had the highest decline of 8 per cent from 6.5 million TEU in 2008 to 6.2 million TEU in 2009 and Korea had the highest growth of 6 per cent from 2.5 million TEU in 2008 to 2.7 million TEU in 2009. Among the other 162 countries the most significant upscale change in the number of TEU deployment is for Iraq growing from 896 TEU in 2008 to 3948 TEU in 2009. There are 11 countries without a change in the number of TEU deployment such as Sweden, Mexico, Czech Republic, Bermuda, Philippine and Kenya. The highest declines belong to Serbia & Montenegro and Paraguay with 100 per cent fall followed by Croatia with 84 per cent.

Table 4- Top ten countries in terms of the number of TEU deployed

Index	Country	2009	2008	% change
1	China	6,217,754	6,554,051	-0.05
2	China (SAR HK)	4,719,954	4,859,478	-0.03
3	Singapore	3,429,884	3,564,190	-0.04
4	United States	3,123,776	3,146,894	-0.01
5	Germany	2,852,521	3,088,491	-0.08
6	Malaysia	2,787,258	2,762,426	0.01
7	Netherlands	2,724,864	2,693,091	0.01
8	Korea, Rep.	2,700,620	2,557,565	0.06
9	United Kingdom	2,587,739	2,705,854	-0.04
10	Taiwan	2,220,369	2,200,448	0.01

Source: Author, calculated as per the data derived from CI online

In the top ten countries of the world in terms of having the highest number of liner companies calling their ports the Netherlands has the highest ranking with 96 companies providing service at the Dutch ports followed by the Belgium with 93 companies serving the Belgian ports. The top ten countries are the same countries with highest LSCI ranking except for the Hong Kong which is replaced by Spain though in a different order (Table 5).

Comparing the data with a year earlier, a downscale growth can be observed. All the top ten countries had decline in the number of companies providing service at their ports among which Germany recorded the highest reduction of 11 per cent from 92 companies in 2008 to 82 companies in 2009 followed by the Netherlands with 9 per cent reduction from 196 companies in 2008 to 96 companies in 2009. Among all 162 countries there are 72 countries with reduction in the number of serving companies. The main reason for this trend is the tendency in the direction of consolidation but the economic crisis may have impacts on this change as well.

Table 5-Top 10 countries of the world in terms of the number of liner companies

Index	country	2009	2008	% change
1	Netherlands	96	106	-0.09
2	Belgium	93	100	-0.07
3	China	85	88	-0.03
4	United Kingdom	85	87	-0.02
5	Germany	82	92	-0.11
6	United States	81	84	-0.04
7	Singapore	78	80	-0.03
8	Korea, Rep.	67	69	-0.03
9	Spain	67	72	-0.07
10	Malaysia	66	68	-0.03

Source: Author, calculated on the basis of data from CI online

Table 6 presents the top 10 countries of the world which had the highest number of liner services during June 2008 to June 2009 which are almost all the same top 10 countries in the LSCI ranking except for the Belgium which is replaced by Japan. China recorded the highest number of services in 2009 though it has 6 per cent decline comparing to the previous year. Even though most of the top ten countries show reduction in the number of services but overall 88 countries which means more than half of total 162 countries has either no changes or even increase in the number of services. Among the top ten countries Malaysia shows the highest decline of 11 per cent from 521 services in 2008 to 464 services in 2009 whereas Korea and the United States show one per cent increase from 559 in 2008 to 565 in 2009 and from 538 in 2008 to 542 in 2009 respectively. Among all 162 countries, Madagascar recorded the highest growth rate in the number of service from 7 services in 2008 to 15 services in 2009 (1.14 times more).

Table 6-Top 10 countries of the world in terms of the number of liner services

Index	Country	2009	2008	% change
1	China	1,019	1,079	-0.06
2	Singapore	690	736	-0.06
3	China (SAR HK)	660	723	-0.09
4	Korea, Rep.	565	559	0.01
5	United States	542	538	0.01
6	Japan	465	503	-0.08
7	Malaysia	464	521	-0.11
8	Germany	433	439	-0.01
9	Netherlands	430	423	0.02
10	United Kingdom	392	398	-0.02

Source: Author, calculated based on the data from CI online

In the top 10 countries in terms of the highest average ship size as shown in table 7, almost none of the top ten LSCI ranking are present except for the China, Hong Kong and Malaysia. In 2009 Oman stands at the first place with the average vessel size of 5184.61 followed by Hong Kong with an average ships size of 4490.92. All the top ten countries have an upscale trend in their average vessel size with Oman having the highest growth of 32 per cent from the average of 3931.83 in 2008 and Saudi Arabia the lowest growth of 7 per cent from the average size of 4164.28 in 2008 to 4444.99 in 2009. Among all 162 countries most of the countries had growth in the average vessel size and only 23 per cent (37 countries) had a slight decline in the growth of the average ship size. Iraq and Greenland recorded the highest growth comparing to a year earlier and after the Paraguay and Serbia & Montenegro, Croatia recorded the highest decline in the average ship size growth.

Table 7-Top 10 countries in terms of the highest average ship size

Index	Country	2009	2008	% Change
1	Oman	5,184.61	3,931.83	0.32
2	China (SAR HK)	4,490.92	3,890.69	0.15
3	Saudi Arabia	4,444.99	4,164.28	0.07
4	Canada	4,384.31	3,837.96	0.14
5	China	4,299.97	3,844.02	0.12
6	Romania	4,114.54	3,464.62	0.19
7	Egypt, Arab Rep.	4,059.10	3,552.39	0.14
8	United Arab Emirates	4,026.96	3,299.12	0.22
9	Taiwan, prov of China	4,000.66	3,613.22	0.11
10	Malaysia	3,959.17	3,340.30	0.19

Source: Author, calculated based on the data from CI online

2.4.2 Bilateral Connectivity

In addition to the LSCI, the UNCTAD secretariat also collected the data on the bilateral services and initiated the concept of bilateral connectivity in 2006 where the liner connections between the pairs of countries are scrutinized. The availability of the direct connections between each pair of countries is examined and then the shortest feasible links are estimated. That is, for those pair of countries that no direct service exists, it can be analyzed that how many transhipments are required and what would be the best (shortest) route. Bilateral connectivity not only determines the level of countries' incorporation into the global market but also establishes the level of integration of each country in the world liner service network. Intensity of the liner service in a country verifies the accessibility of the country in the global network and is validation for the countries' economy size.

There are some concepts introduced in the bilateral connectivity which are as follows [35][29]:

- *First order connection*: Refers to the direct links between the pairs of countries that is no transhipments involve

- *Second order connection*: Refers to the indirect links between the pairs of countries which include one transhipment

- *Third order connection*: Refers to the indirect links between the pairs of countries which include two transhipments

- *Nth order connection*: Refers to the indirect links between the pairs of countries which include three or more transhipments

In 2009, the connections between 26406 pairs of countries (163 countries in total) are checked among which 4401 direct connections exist between 158 countries by minimum one and maximum 78 carriers. That is 158 countries among all the 163 countries are directly linked to at least one other country. This number of connections is only 16.6 per cent of the total pairs of connections (26406) which means for the 84 per cent of links transhipments are required.

In comparison to the data of 2008, a decline of one per cent in the direct connections can be observed as the direct connections reduced from 4593 in 2008 to 4401 in 2009. Table 8 demonstrates the top ten countries of the world in terms of the number of direct connections.

Table 8-Top ten countries in terms of number of direct bilateral connections

Index	Country	Connections
1	United Kingdom	101
2	Belgium	97
3	Netherlands	95
4	France	91
5	Germany	90
6	United States	86
7	Italy	83
8	Hong Kong	81
9	Spain	81
10	China	80

Source: Author, Calculated on the basis of the data from CI online

Chapter III: The economic crisis: History and impacts on shipping

3.1 Historical origin

An economic crisis is a long term economic state branded by unemployment and low prices and leads to low levels of demand and consumption and as a result slump in trade and investment. The current economic crisis originated from The United States in 2007 and spread into Europe and Asia to form the current global crisis. The economic crisis roots back to the fall down of the bubble in the housing market of the United States which followed by the credit crunches and substantial capital injection into the financial markets. By the end of 2008 the crisis entered into a severe stage when the stock markets experienced a huge plunge which caused a considerable decline in the economic growth rate, instability in the exchange rates, squeeze in the demand and consumption followed by falling the industrial production and weakening of the international trade flows and growth of the unemployment rate [46]. In other words the amalgamation of the usual cyclical deceleration of the economy with the slump of house prices, the credit crunch and the financial crisis led to an enormous decline in the consumer demand and so dramatically slowed the investments, production and consumption. Statistical reports of countries with large economy validate the slowdown in their merchandise trade resulted by the economic downturn. (Tables 9 and 10)

Table 9-Merchandise Trade of selected regions: Quarterly Export Volume Growth

	2007				2008				2009
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
Major Seven	-0.5	1.0	2.5	0.2	2.7	-0.3	-0.5	-9.9	-13.6
Canada	2.5	-0.1	-2.5	-0.8	-2.2	-2.5	-0.3	-7.1	-9.8
France	-0.1	-0.1	1.4	-1.4	8.0	-5.5	3.2	-4.2	-7.6
Germany	-3.0	1.0	3.1	-0.8	4.6	-0.2	-3.0	-9.0	-13.0
Italy	-1.2	2.4	1.4	-3.3	1.4	0.3	-3.2	-8.9	-17.0
Japan	0.2	1.7	2.3	3.2	1.3	-1.3	-1.0	-19.3	-26.7
U K	-1.0	-0.7	0.2	0.0	3.5	-3.2	-0.1	-7.2	-8.3
U S	0.5	1.7	5.0	1.3	1.1	3.8	0.9	-9.2	-11.5
EU-15 Extra EU	-0.1	-0.8	2.2	0.2	4.5	-0.6	-2.4	-6.4	-13.0

Source: OECD

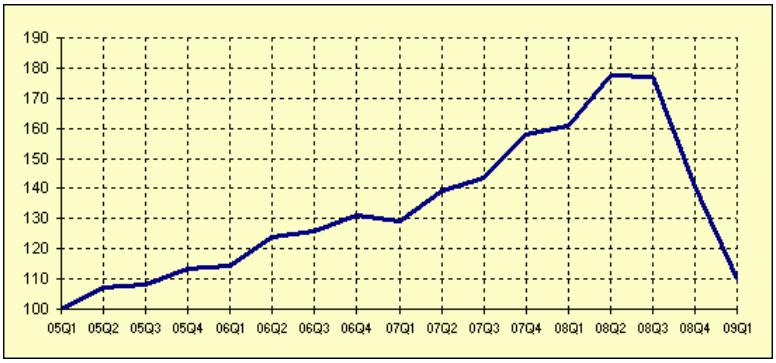
Table 10- Merchandise trade of selected regions: Quarterly import volume growth

	2007				2008				2009
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
Major Seven	1.6	-0.4	1.8	-0.5	0.6	-1.5	0.0	-5.7	-10.5
Canada	1.5	0.2	3.7	2.7	-1.5	-1.5	0.4	-7.2	-14.2
France	0.8	1.1	2.5	-1.5	3.7	0.3	2.3	-2.6	-5.2
Germany	5.7	-0.4	1.3	-1.0	4.6	-2.6	2.6	-6.1	-9.5
Italy	-0.9	0.5	4.3	-4.5	-2.8	-0.3	-0.2	-8.9	-11.0
Japan	-1.2	-1.2	0.1	3.0	-0.1	-0.7	-1.5	-4.6	-12.9
United Kingdom	-0.7	0.2	4.8	-0.8	-0.9	-1.8	-1.2	-7.8	-8.4
United States	2.0	-1.0	0.6	-0.7	-0.5	-1.8	-1.2	-5.3	-11.8
EU-15 Extra EU	1.9	-0.9	2.2	-0.7	1.0	-1.2	1.9	-7.1	-9.2

Source: OECD

Not only countries with large economy but also those with small integration in the global trade felt the hit. It was also broadcasted by the World Trade Organization in May 2009 that the World export examined 22 per cent decline in the first quarter of 2009 on a quarter-on-quarter basis which is equal to 31 per cent on year-on-year basis (Figure 9) which is self explanatory of the economic situation of the world after the unprecedented recession since WW II.

Figure 9 -Quarterly World Trade Growth Index 2005-2009



Source: WTO

Decline in the world trade growth resulted by the economic crisis as addressed by various organizations such as WTO, IMF, UNCTAD, OECD, etc. refers to the drop off in the merchandise trade which is strongly correlated with the trade services. Transport service is a major trade service that is harshly affected by the economic crisis and the decline of merchandise trade and investment. Shipping as the most popular mean of transport being responsible for 90 per cent of the volume of world merchandise trade was closest to the jeopardy and beaten severely in a shocking short period.

Next section is assigned to the impacts of the economic crisis on the shipping industry in general and the liner shipping sector in particular.

3.2 Impacts on shipping sector

3.2.1 General overview

Shipping market has a cyclical nature and cycles are considered as the fundamental factor in the economics of maritime trade. "An economy is deemed to be in the expansion stage of the economic cycle when gross domestic product (GDP) is rapidly increasing. During times of expansion, investors seek to purchase companies in technology, capital goods and basic energy. During times of contraction, investors will look to purchase companies such as utilities, financials and healthcare. …" (Investopedia.com). In shipping the situation is slightly the same. As it is defined by some experts a shipping cycle is a "consequence of market mechanism. The peaks and troughs in the cycle are signs that the market is adjusting supply to demand by regulating the cash flow" (Kirkaldy, 1913) [41]. That is when the demand for maritime transport is high the freights jump up and as a result

more investors are attracted to expand their investment and so more ships will be ordered. As the supply of additional capacity cannot be immediately after the order and takes two to three years for a ship to be delivered so there is a time between the demand and supply adjustment (inelasticity of supply) and so any change in the demand in this adjustment period (between order and delivery) may cause serious instabilities in the freight rates.

In the recent years shipping was going through a cycle-like situation which routes back to the mid 2006 when the freight rates fell even below base levels as reported by Clarkson the CCTI was at 91 by end 2006 but by beginning of 2007 it started to grow up steadily until it reached 116 by end of 2007. In mid 2008, when the shipping freight rates were experiencing its boom, the excess demand pushed the freight rates up and impressed the order book consequently. Investors who were looking to expand their investments ordered new tonnage and especially in the post-panamax size range. By the end of 2008 as a result of the global economic crisis which started in 2007 in the US and spread into the world economy rabidly, the world demand was declined dramatically. For the shipping sector being the major mode for transportation of merchandise goods the slump in demand created a big gap. From one side the capacity was growing with all new deliveries and on the other hand the shortage in demand pushed the freights down historically. This crisis caused a dramatic hit in the shipping as consumers and investors lost their confidence and so the financers. Investors who could no more get supports from the finance companies were failing to keep their commitments.
All in all expected cyclical nature of the shipping markets concurred with the economic crisis, the decline in demand, the dynamics of oil price, the financial crisis and the shortage of credit created the economic situation as harmful as it can be observed currently.

Official announcements from the shipping companies and ports verify this turmoil;

- *Maersk Line confirmed a loss of $ 555 million in the first quarter of 2009* **[30]**
- *CMA-CGM reported a sharp decline in profit in 2008 from $ 966 million to $ 124 million*
- *Hanjin shipping reported a net loss of $ 191 million in the first quarter and $ 325 million in the second quarter of 2009* (JOC)
- *NOL reported a loss of $ 149 million in last quarter of 2008 followed by $ 245 million loss in first quarter and $ 146 million in the second quarter of 2009* (JOC)
- "*Throughput in Port of Rotterdam bottoms out" reported by port of Rotterdam in July 2009; "In the first half of 2009, 185 million tonnes of goods were handled in the port of Rotterdam, 13.4% down on the same period of 2008. Exports fell by 4.6% to 54 million tonnes, imports by 16.6% to 131 million tonnes. ... Results for general cargo were 15.5% lower, at 57 million tonnes. ... All other categories of goods were way down: .... general cargo (-27%) and containers (-15%). Expressed in figures, container throughput fell by 15% to 4.6 million TEU (20-foot units)."* (www.portofrotterdam.com)

As reported by the Institute of Shipping Economist and Logistics (ISL) in the market review of July 2009, the development of cargo traffic and container traffic for almost all major world ports were negative in the first quarter of 2009. Table 11 provides a statistical evidence for this downbeat for some selected major ports.

Table 11 -- Development of selected World ports as of 1st Q 2009

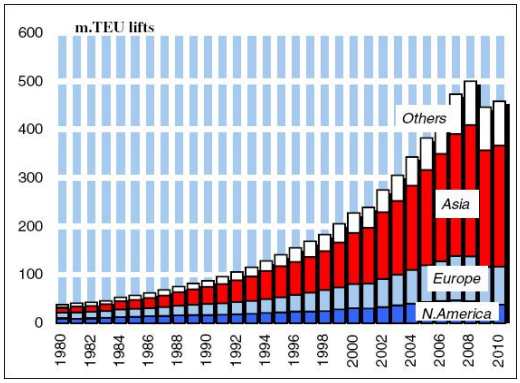
Port	2009 1st Q	Total cargo traffic		2009 1st Q	Total Container traffic	
	Unit 1000 t	% change over previous period	% change over previous year	Unit 1000 TEU	% change over previous period	% change over previous year
Hamburg	27315	-17.3	-21.7	1862	-16.9	-24.3
Rotterdam	94010	-10.8	-10.8	2252	-11.9	-16
Antwerp	37301	-17.1	-19.3	1737	-13.4	-16.3
Singapore	113296	-2.8	-13.8	6018	-13.6	-17.9
HongKong	52167	-14.9	-16.7	4552	-17.9	-21.5
Busan	47809	-11.1	-20.8	2690	-14	-19

Source of data: ISL

3.2.2 Focus on liner shipping

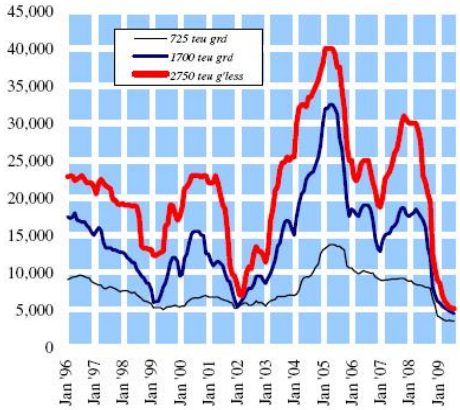
Liner shipping as the major transport mode for carrying manufactured goods hit severely by the economic downturn. Fluctuation of the prices has its direct brunt on the consumers and so the containerized shipping being the centre for the carriage of consumer goods experienced a huge breach in demand. For the transport demand having a derived nature and depending on the price, speed, reliability and security [41] any kind of fluctuations can create big shocks. Recent statistics verifies above posit as it can be observed that the projection of the trade growth have declined extensively and Clarkson's estimation of the main lane trade eastbound Transpacific in April 2009 shows 19.7 per cent fall in comparison to the previous month (CIM V11). In addition to the above evidences figure 10 and 11 illustrates the decline in demand for the containers as well as the immense downfall of the container time-charter rate respectively.

Figure 10-Container Demand



Source: Clarkson

Figure 11-Container time charter rate



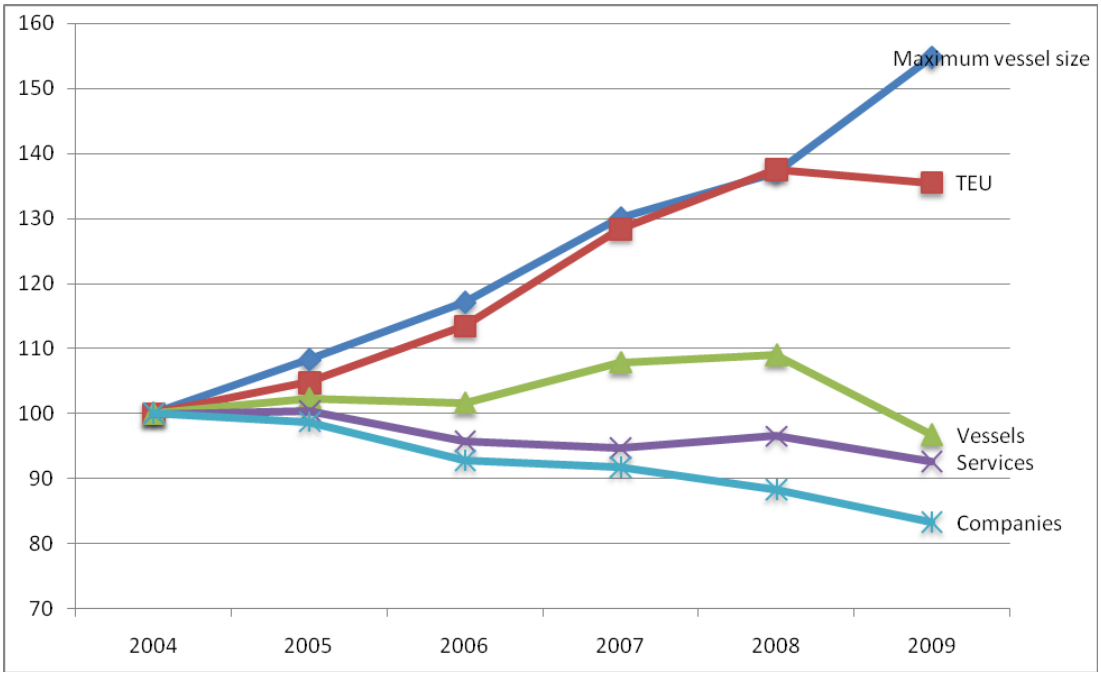
Source: Clarkson

Chapter IV: Implications of the economic crisis for liner shipping connectivity and the industry's response

4.1 Impacts of the economic crisis on the liner shipping connectivity

Liner shipping connectivity representing the amount of trade in the liner sector was not immune from the hit of the economic crisis. Almost all the components of the liner shipping connectivity (i.e. number of the TEU carrying capacity, number of the ships deployed, number of the shipping companies, etc.) experienced fall during July 2008 to July 2009 (CI online). Figure 12 illustrates the trend of the liner connectivity components from 2004 to 2009. In the following sub-sections the trend for each indicator will be analyzed and the possible reasons behind each trend will be discussed.

Figure 12-Trends in the liner shipping connectivity indicators



Source: UNCTAD Transport newsletter No.43

4.1.1 Maximum vessel size

The trend for the container ship size has almost always been upward sloping since the beginning of containerization in the 1960s. Table 12 demonstrates the permanent upscale trend of the container ships' size since its first generation.

Table 12-Size development of the fully cellular container ships

Generation	Year	TEU	Length (m)	Beam (m)	Draught (m)
1	1972	up to 1500	225	24.50	9.00
2	1980	up to 3000	275	27.50	10.00
3	1987	up to 4500	300	32.20	11.50
4	1997	up to 6600	320	40.00	14.30
5	1999	ca. 8300	347	42.60	14.50
6	2007	ca. 12500	398	56.40	16.00

Source: ISL 2009

As it is observable from the statistics the growth of fully cellular containerships is towards mega ships. The reason for this trend is that the containerized liner shipping is a super capital intensive industry and has very high fixed and unit costs. Liner companies tend to employ the bigger ships in order to reduce the unit cost and benefit from the economies of scale.

The same trend can be observed in the data for the liner shipping connectivity in which the maximum vessel size grown from 8238 TEU in 2004 to 13800 TEU in 2009. The growth in 2009 in specific is because of the adjoining of 72 containerships of over 6500 TEU (on average) to the fleet during the first six months of the year.

4.1.2 Number of TEU deployment

The TEU deployment's trend was upward growing since 2004 except for the last year (2009) that experienced a scale down. This indicator is strongly correlated with the demand for transport. As the demand dropped off following the economic crisis thereupon there was an increase in the empty slots and a considerable drop in the slot price. As a result the shipping companies were obliged to reduce the TEU deployment in order to keep the elasticity of supply. Possible reason behind this reduction could be the withdrawal of some ships or rerouting some services which will be analyzed later.

4.1.3 Number of vessels deployment

The growth for this indicator was more steady but still upward since 2004. The reason for the steady and slight growth rate for this component is because of the tendency towards the ULCVs, the economies of scale and the reduction of unit cost. Still the decline for the number of vessels deployed was more severe than the other indicators as its index decreased from 109.04 in 2008 to 96.79 in 2009 (UNCTAD). Possible reasons could be the withdrawals, reduction of the service frequency, etc which will be analyzed from the available data of UNCTAD in the next chapter.

4.1.4 Number of liner services

The flow for the number of liner services deployed was fluctuating since 2004. Possible reasons for this instability in the trend for the number of liner services, besides the fluctuating demand and the cost cutting strategies could be the M&A and the slot sharing agreements. For instance the decline in the number of services in 2005 could be because of the important takeover of the P&O Nedloyds by Maersk Line.

4.1.5 Number of liner companies

The number of liner companies is the one indicator which almost always had a downward sloping. The reason for this down scale tendency is the concept of mergers and acquisition and the development of alliances. So the decline in this indicator would not necessarily mean the reduction in capacity (supply) or the weakening of connectivity.

During the first half of 2009, almost 9 mergers and takeovers were recorded by DINAMAR though they are not very major but it can be observed that the trend of growth for the liner companies is still showing the tendency towards the consolidations and so reduction in the number of companies.

Reviewing the individual components' index in the LSCI, a positive answer to the hypothesis can be found. That is yes the liner connectivity was hit by the economic crisis but by checking different examples of the individual countries in the next section, the amount of this effect will be examined.

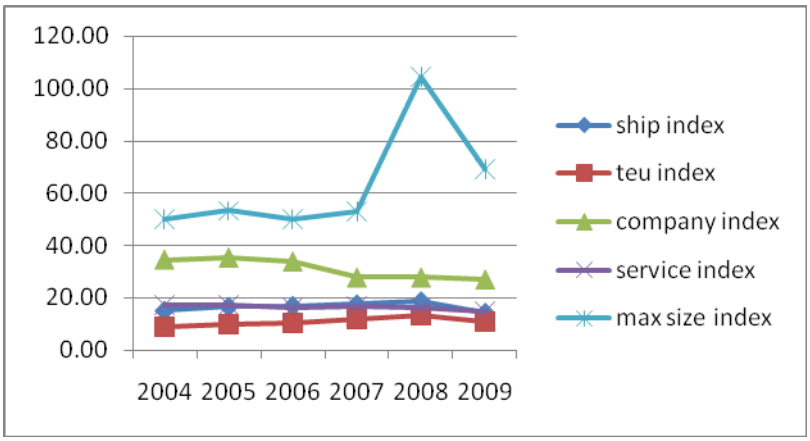
4.2 Selected countries

In this section some selected countries are in focus where each individual country's connectivity is analyzed and the findings are presented.

Australia

The trend of the connectivity's indicators for Australia is mostly firm except for the maximum ship size which had a boom in 2008 and dropped again in 2009. Other indicators such as the number of ships, number of TEU, number of companies providing service at Australian ports and the number of services had a stable trend over the past 6 years with a minor decline in 2009. The average ship size has an upward sloping trend since 2004 and had 6 per cent increase in 2009 from 2270.80 to 2416.97.

Figure 13- Trend of the LSCI indicators for Australia



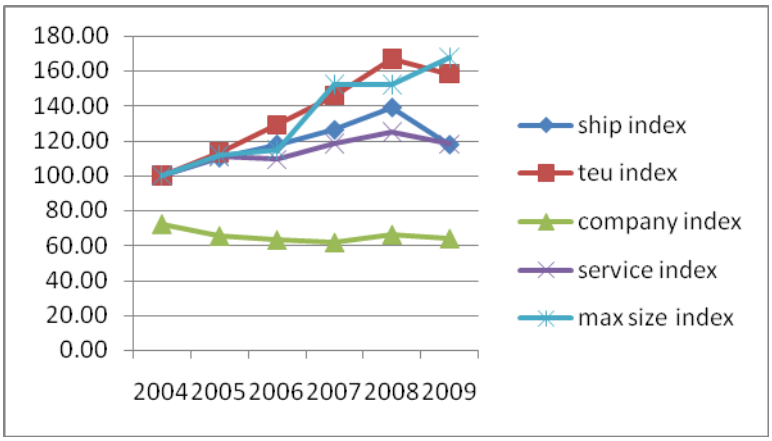
Source: Author

In the bilateral connections, although some of the connections terminated and some new connections added but there was no change in the number of first order connections for Australia. Australia has 43 first order connections (i.e. it is directly connected to 43 countries) that is only 27 per cent of the total possible connections which means for 73 per cent of the countries, goods originated from or destined to Australia need to be transhipped (2^{nd} or 3^{rd} order). The first order connections which are terminated in 2009 are Djibouti, Kiribati, Marshal Island, Mauritius and Saudi Arabia and instead the direct links to Antigua, Cambodia, Jamaica, Japan, the UAE and Viet Nam are added. Statistically, the connectivity of Australia neither in the bilateral level nor in the country level is weakened in 2009 as the bilateral indicators (the number of ships, TEU, companies, etc) did not have a decline and the drop for the LSCI indicators are just in the direction of the adjustment of supply and demand following the economic downturn.

China

In China, thanks to the growing economy and increase in the exports, almost all the indicators had upscale growth from 2004 till 2008 except for the number of companies which is towards the consolidation and the growth of this indicator for China was always steady. In 2009, number of the TEU assigned to the Chinese ports, number of the ships called China and number of the services show decline. Although China remains in the top rank in the LSCI ranking but the decline in the trade from and to China cannot be neglected. As per the LSCI data China experienced a reduction of 3 per cent in the LSCI as a whole and as it is shown in the Figure 14, the other indicators dropped noticeably. In the number of ships called the Chinese ports from July 2008 to July 2009 there is 15 per cent reduction which is a considerable down fall and means 259 ships less than a year earlier that is equal to 336297 TEU.

Figure 14- Trend of the LSCI indicators for China



Source: Author

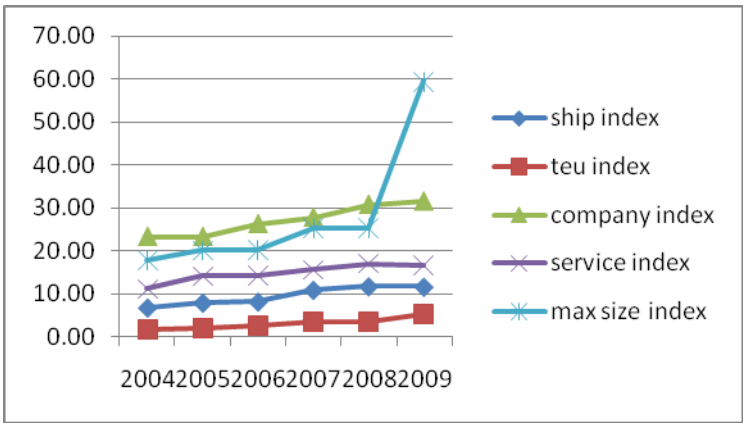
In the bilateral connectivity there are 80 first order links from China that is for 50 per cent of the countries there is a direct connection from China whereas comparing to the connections of last year it has 3 per cent decline which means 3 direct connections less than a year earlier. This reduction in the number of connections cannot be considered as a direct impact of the crisis as there may be changes in the network structure of service providers or change in the transport trade of those disconnected countries.

Viet Nam

The country connectivity data does not show any decline for Viet Nam as its overall LSCI grown 40 per cent in 2009 which improved the rank of Vietnam from 160 in 2004 and 50 in 2008 to 39 in 2009. This improvement validates the enhancement of Viet Nam's integration into the global network.

Exploiting the bilateral data for Viet Nam, it can be observed that there are 26 first order connections for Viet Nam that is 16 per cent of the possible connections. Even though this figure is not showing a very high level of connectivity for Viet Nam but the growth from 13 per cent in 2008 cannot be ignored.

Figure 15- Trend of the LSCI indicators for Viet Nam



Source: Author

As per the estimations of the CS (August 2009)[4], Viet Nam has one step improvement in the top one hundred ports of the world as its rank improved from 33 to 32 by 6.3 per cent increase in its throughput. From the figures and available statistics it can be concluded that the connectivity for Viet Nam was not negatively affected by the economic crisis and the country has its usual trend towards optimizing its connectivity integration but considering the time lag for the effects of the crisis on the developing economies, a slight decline in the country's connectivity is expected in 2010.

India

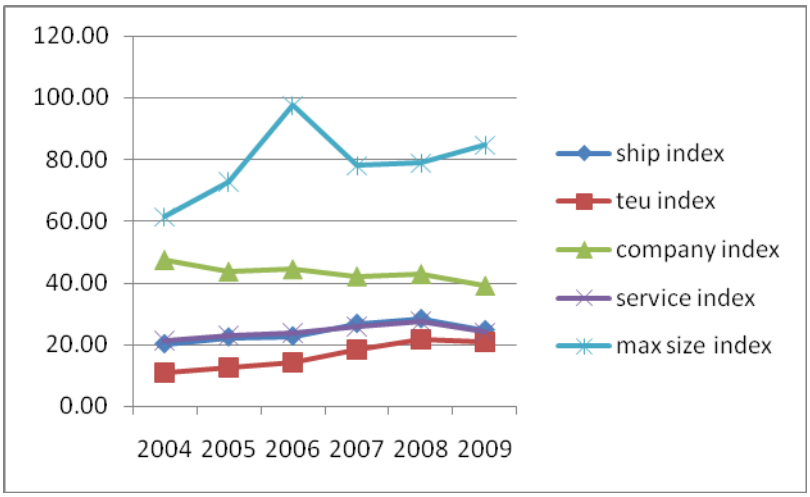
India is one of the exceptions among the developing economies which had a decline in its LSCI ranking in 2009. Although the decline in the index is only 2 per cent from 42.18 in 2008 to 40.97 in 2009 but it is observable from the indicators' trend (Figure 16) that there is a considerable decline in each component. As per the data, the number of ships called the Indian ports, the number of TEU assigned for India, the number of companies provided service for India and the number of services which include India in the route all had decline from 13 per cent for the number of ships to 3, 9 and 13 per cent for the other indicators respectively.

As per the bilateral data, India is connected to 54 countries directly as of 2009 which have a growth of 3 per cent in comparison to the connections of previous year. In 53 per cent of the links number of the companies providing service for the Indian ports declined notably. This figure is followed by 57 per cent of the connections in which there is a considerable decline in the number of ships called the Indian ports.

[4] CS TOP 100 Container Ports 2009, Produced by Cargo Systems

Considering all figures there are evidences of minor decline in the incorporation of India in the global liner connectivity.

Figure 16- Trend of the LSCI indicators for India



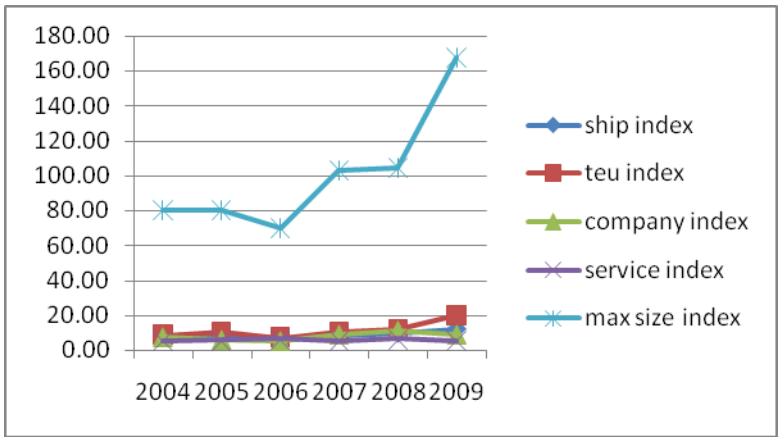
Source: Author

Oman

The year of 2009 was the time of considerable growth for the Oman's connectivity. Almost all the components related to the amount of trade show growth during 2009. In the LSCI ranking, the index for Oman shows 49 per cent increase which improved its rank from 29 in 2008 to 19 in 2009. In terms of individual indicators, Oman has massive growth in the number of ships called the ports of Oman, the number of TEU assigned to Oman and the maximum and average vessels' size. Although there is a decline in the number of companies providing service for the ports of Oman and the number of services as well but the increase in the throughput of the ports certifies the trend of growth for the country towards better connectivity. As it is reported by the CS 2009 the World ranking of Oman's port improved from 40 in 2008 to 38 in 2009 by 16.3 percent raise in the throughput.

Besides the growth in country level of connectivity, Oman has 12 per cent increase in the first order bilateral connectivity as in 2009 it is connected to 37 countries directly which is up from 33 in the previous year.

Figure 17- Trend of the LSCI indicators for Oman

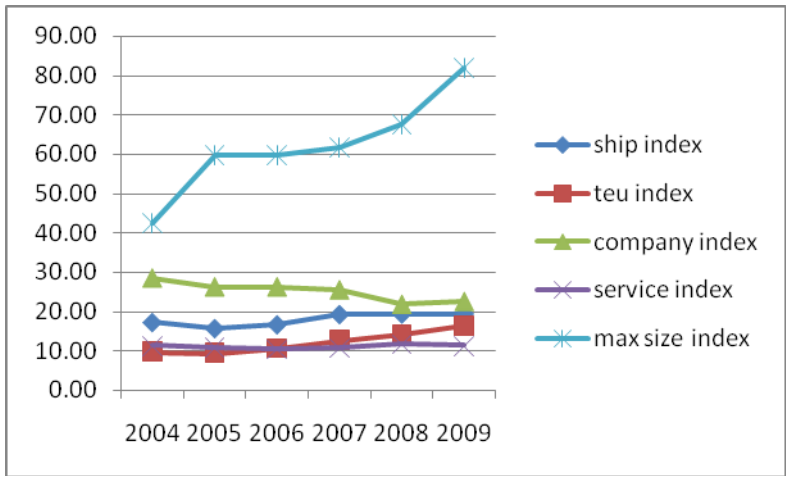


Source: Author

South Africa

In South Africa, there is 12 per cent growth in the country connectivity index where its ranking improved to 29 from 35 in 2008. In the individual indicators there are diverse trends. While there is no change in the number of ships called the South African ports, the average size shows a 16 per cent growth. From the other hand while the number of companies providing service in South Africa increased by 3 per cent, there is 3 per cent decline in the number of services which include South African ports in their routes. Besides all the fluctuations the number of TEU assigned to South Africa in 2009 has 16 per cent growth. Since the average and maximum ship size for this country has an upscale growth so the decline in the number of services cannot be considered as negative effect on the connectivity level and the growth in number of TEU is validation of this posit. The bilateral connectivity of South Africa has a minor decline of one per cent which is only one direct connection less than a year earlier but there still exists 51 first order connections for this country. As per the figures there are not serious negative impacts on the level of connectivity for South Africa.

Figure 18- Trend of the LSCI indicators for South Africa

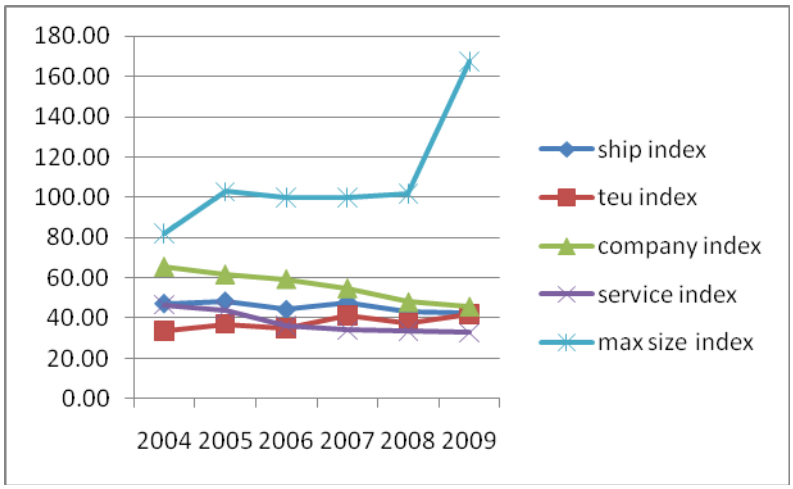


Source: Author

Italy

In the period of June 2008 to July 2009, there are fewer companies providing services at the Italian ports and as a result the number of services declined considerably. Number of the TEU is the only indicator which shows upscale growth else than the ship size. It can be construed that in response to the decline in the demand during the last 12 months, there are less number of companies who are providing services at the Italian ports and as a result there are fewer services assigned to the Italian port. These are followed by less number of ships but since the trend of growth for the ship size is toward the mega ships and the economies of scale, regardless of all declines in the other indicators, the number of TEU has a growth of 12 per cent comparing to the previous year. Considering the improvement of the overall LSCI for Italy which increased from 15 in 2008 to 12 in 2009 there is no evidence of weakness in the liner connectivity.

Figure 19- Trend of the LSCI indicators for Italy



Source: Author

In the bilateral connections of Italy, there is a considerable decline in the first order connections of Italy. In 2009, Italy is connected to 86 countries directly which is 52 per cent of the total possible links. Comparing to a year earlier these figure shows 7 per cent decrease as the number of direct links from Italy was 93 in 2008. Although there are 6 connections added this year but there are 13 connections terminated which are mostly the services with lower demand like the Georgia, Guam, New Zealand, Mauritania and Russia, etc. Although Italy had a decline of 7 per cent in its first order bilateral connections, its major connections does not have a serious decline and most major services remained with no change in the frequency.

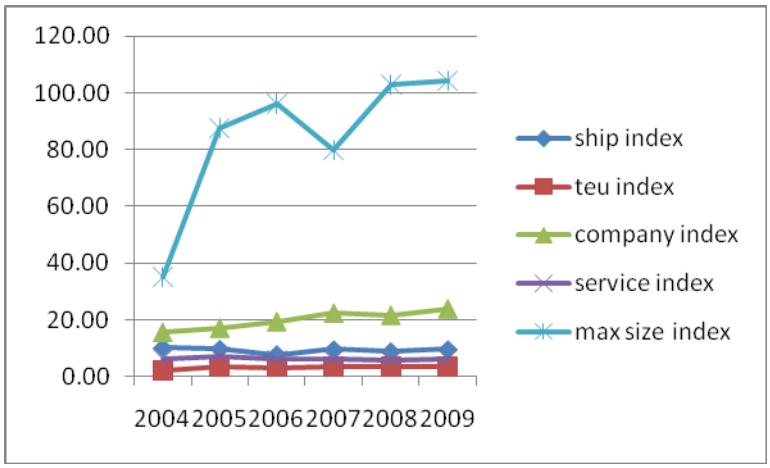
Sweden

In Sweden all the components of liner connectivity recorded growth for the past 12 month but the amount of growth differs from one indicator to another. The growth for the number of ships, number companies and number of services was more notable than the other two indicators. Number of TEU had less than one per cent growth which means the change in the number of TEU is not really considerable. Hence it can be construed that there are more number of the smaller ships employed in Sweden since the last year. The overall LSCI has 4 per cent growth in spite of the decline in the ranking. On the country level, the Sweden's connectivity is not harshly hit and the decline in the rank is related to the other countries integration in the global networks.

In the bilateral data, it can be observed that Sweden has 30 per cent increase in the number of first order connections which is a considerable amount of connections. Sweden is now connected to 39 countries directly. During 2009, there is no termination of the direct links from Sweden and only 9 additional connections are recorded.

Taking both the country connectivity and the bilateral connectivity into account, Sweden has shown an upscale growth towards better connectivity.

Figure 20- Trend of the LSCI indicators for Sweden

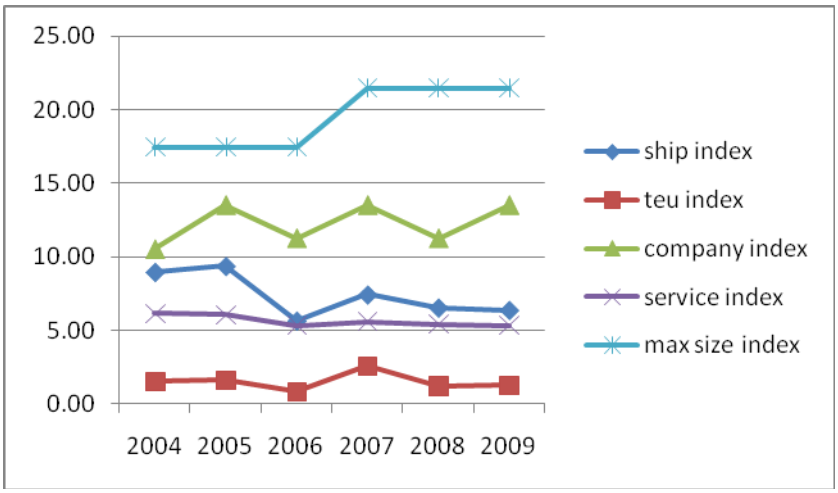


Source: Author

Finland

Finland is an exporting country for the high value goods and has a stable and steady trend for almost all of its connectivity indicators. The overall LSCI for Finland has 4 per cent growth in 2009, improving from 9.72 in 2008 to 10.15 in 2009. The unchanged rank of 82 is another evidence of the stability of trade and transport connectivity for this country. The growth in the number of companies while the number of services has been declined can be interpreted as increase in the slot sharing.

Figure 21- Trend of the LSCI indicators for Finland



Source: Author

Appraising the bilateral data for Finland, there is no downscale changes observable in the first order connections' structure. All the links remain stable and for some links such as

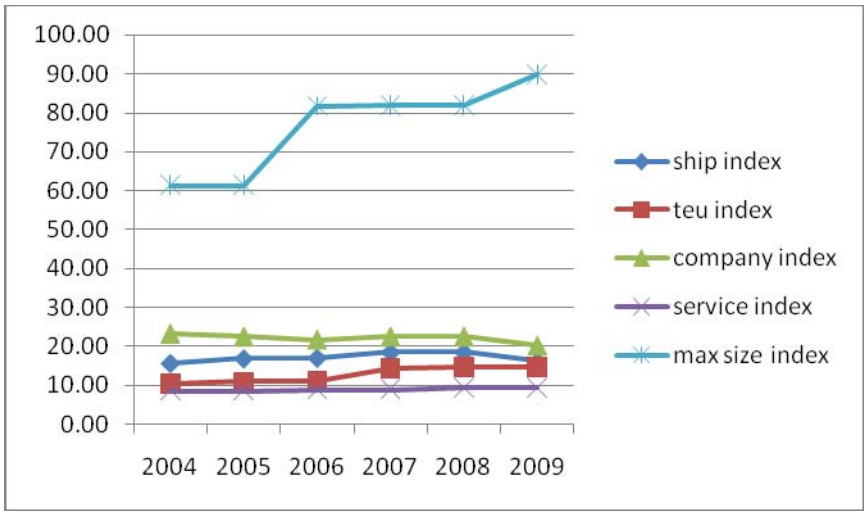
Netherlands, Belgium, Germany and Denmark the service improved significantly. From this improvement in the assigned services it can be construed that the amount of the oversupply is much more than the decline in the demand and as the growth in the capacity is keep continuing the impacts of the crisis cannot be felt in the statistics.

Mexico

In 2009, Mexico had 2 per cent increase in its overall LSCI from 31.17 in 2008 to 31.89 in 2009. For the individual indicators, the number of ships and the number of companies decreased considerably for 13 and 10 per cent respectively. The number of TEU deployment and number of services remained unchanged whereas the maximum and average ship size show an upscale growth. The explanation is that although the number of ships deployed had a notable decline but since there are bigger ships assigned to the services covering Mexico, the capacity did not change and the country connectivity had growth.

In the bilateral connectivity there is 4 per cent decline in the number of direct links but there is not major decline in the connectivity structure of country in terms of each individual component. The important additional connection is a first order connection to Hong Kong through which there are 11 companies providing service by a sum of almost 70 services which is the most significant positive change in the Mexican connectivity. Besides this, the growth in the ship size and the supply capacity compensates the other major hits of the economic crisis for Mexico.

Figure 22- Trend for the LSCI indicators for Mexico



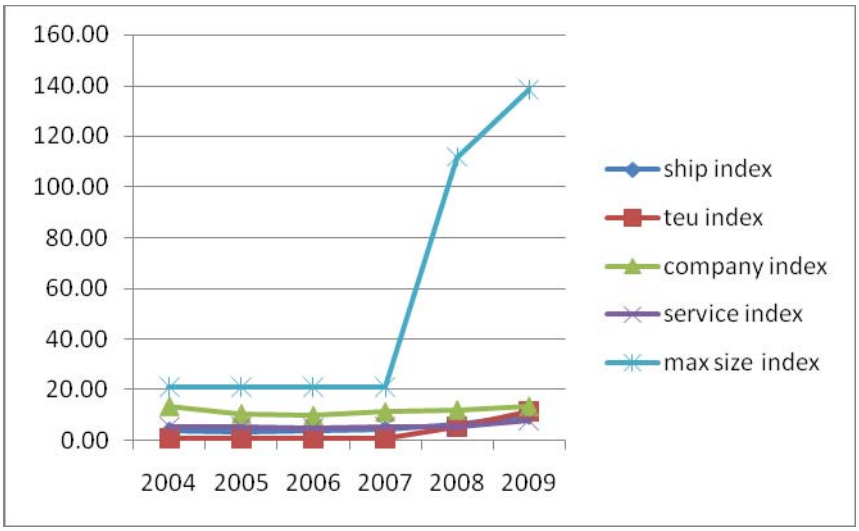
Source: Author

Morocco

Morocco is one exception in terms of its growth. In 2009 the overall LSCI for Morocco had a massive increase of 29 per cent. As a result of such a sharp growth the ranking of country connectivity improved to 23 from 33 in 2008. Also all the connectivity indicators had an enormous increase. Comparing the figures of 2009 with a year earlier, it can be observed that the number of ships assigned to the ports of Morocco increased by 60 per cent from 77 in 2008 to 123 in 2009 while the average ship size increased by 38 per cent from 2675 in 2008 to 3682 in 2009. Combining these two data it is expected that the number of TEU should have a huge increase. The statistical figures confirm this anticipation as 1.20 times more in the TEU deployment is recorded for Morocco for 2009.

In the bilateral connections also Morocco had an upscale growth. The country is now connected to 45 countries directly which is 28 per cent of the possible first order connections. This figure has a growth of 12 per cent in comparison to the previous year. Although there are two minor connections terminated in 2009 but added connections are more significant in terms of the number of services, among which the United Arab Emirates is the most important one with 26 services and almost 190 thousand TEU. All in all, the year 2009 was not a hard year for the connectivity development of Morocco. As a result of the port developments more capacity were assigned and more liner companies focused on the possible connections through this country.

Figure 23- Trend of the LSCI indicators for Morocco

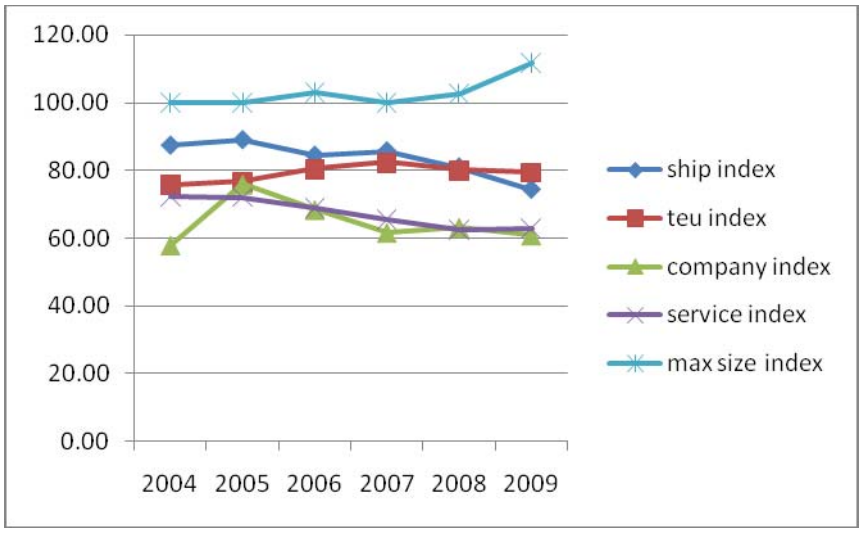


Source: Author

The United States

The United States had usually a stable business growth except since the hit of the economic crisis in 2007. Even though the overall LSCI of the United States remains unchanged in 2009, but almost all the indicators show decline for the third consecutive year.

Figure 24- Trend of the LSCI indicators for US



Source: Author

In terms of ranking, the United States experienced a down fall from 6 in 2008 to 9 in the current year. This is in spite of the fact that its overall LSCI did not change.

In the bilateral connectivity, as per the data from the CI online, the United States has first order connections to 90 countries which are 56 per cent of its possible direct connections. There is a minor decline of 4 per cent in this figure comparing to a year earlier. However the terminated connections are those which were provided by only one shipping company.

4.3 Industry's response

Liner shipping as the main and the most widespread mode of transport for moving finished goods to the final consumers felt the hit of the economic downturn severely. Because of the nature of liner shipping, having fixed itinerary and being obliged to "sail within the schedule whether full or not", there is undeniably massive loss to keep the frequency and sail with the unsold slots. As a result of the failure in revenue is creating more anxiety for the liner companies. For the containerized liner shipping which is indeed capital intensive the loss in the long run would be notable and the recovery may take longer. However there are a number of choices, some opted and experienced by few companies and some suggested by the industry experts as the rational move in order to minimize the losses and achieve the quickest recovery. The possible options are as follows:

- Changes in the structure of the liner service network
- Changes in the number of slots considering the decline in the carrying capacity
- Changes in the number of vessels (scraping the heavily polluting ones and replacing the mega carriers with the smaller tonnage in the low demand routes)
- Managing the capacity in order to improve the utilization rate (by changing the frequency or slow steaming…) and taking cost cutting strategies for increasing the utility and the load factor and decreasing the overhead
- Restraining the capacity growth, renegotiating the new building contracts, etc.

4.2.1 Network structure

Network is defined as a set of vertices and edges [49]. In the liner shipping services, the network consists of a set of nodes and arcs which are indicators for the ports of call and routes respectively. There is also an important concept for a sequence or cycle of routes which is a path. The network in the liner shipping services has its own characteristics. In the liner networks itinerary visit of nodes (ports of call) is possible that is a port can be met more than once in one path and the structure depends on the strategic network planning by the liner company which is indeed correlated with the demand for service. Another sole feature of the liner network is the frequency of the service; that is the structured path has its fixed itinerary schedule and reiterates over time.

For the network of liner shipping having fixed and frequent feature it means the deployment of carrying capacity is predetermined and so it is not flexible to the unexpected fluctuations in the demand which means the adjustment of supply to the demand besides the fixed structure would mean the necessity of making changes in the network structure.

Current economic situation upsetting the liner shipping service network created a considerable gap in the balance between the supply and demand. As a result the figures of unsold slots had an upward growing trend since the hit of the economic crisis meaning the end of 2008 and in contrary the tendency in the freight rates had a harsh downward sloping. For the liner companies not being able to cover the expenses, restructuring the service network would be a rational option to survive.

In restructuring the network, one possible choice is to reduce frequency of the service in order to sell more slots per call which is feasible by removing some iteration (for instance withdrawing one or more ships from the services which have the lower demand) or by prolonging the transit time in the course of slow steaming. Another possibility for making changes in the network structure would be bypassing some nodes which are of less or no demands at all. For this part, I will look into the regional bilateral connectivity data from the UNCTAD in order to investigate if there is any significant change in the service structure comparing the data of 2009 with the available data from 2006 and 2008.

4.2.2 Modifying the TEU deployment amount

The TEU deployment as explained earlier (please refer to the chapter II) is the allocation of the carrying capacity measured by the number of slots (TEU) which means the supply capacity assigned for each service. This component is indeed dependant on the demand. Although the demand for carrying goods in each service cannot exceed the number of TEU deployed for the service but if the demand is much less than the assigned capacity that means the vessel has to carry the unsold slots which in other words means not covering the unit costs. Long lasting fluctuations in the demand would have great loss for the liner companies in their revenue and so a consideration on the supply side is crucial.

The current economic downturn which caused a huge decline in the demand led to an enormous loss for the liner companies especially in the unsold slots. In order to adjust the supply with demand, one possible option for the liners is to reduce the number of TEU and so to minimize the number of unsold slots and accordingly the loss. Decreasing the number of deployed TEU is possible by switching to smaller ships or by combining the services. By employing the smaller ships, the number of available slots will be decreased and so the possible carrying capacity will be lessened while the frequency is maintained without change.

As per the data from the CI online almost 23 per cent of the countries show reduction in the average vessel size called their ports. It can be construed that those countries are opting to employ the smaller ships because of having lower demand. The Netherlands is one good example that had a decline of 4 per cent in the average vessel size from 1520.13 in 2008 to 1456.30 in 2009.

In the data of the number of liner services for each country (Table 6), it can be observed that in many countries the number of liner services was reduced which could be an evidence of the merging services by the liner companies in order to adjust the supply and demand.

Table 13- changes in the number of TEU deployed

Country	TEU	TEU	chane
China	6,554,051	6,217,754	-336,297
Sri Lanka	1,116,916	780,942	-335,974
Belgium	2,398,796	2,091,467	-307,329
Germany	3,088,491	2,852,521	-235,970
Turkey	607,188	423,978	-183,210
Saudi Arabia	1,478,320	1,324,606	-153,714
Mauritius	206,845	58,431	-148,414
Romania	342,997	197,498	-145,499
China (SAR HK)	4,859,478	4,719,954	-139,524
Singapore	3,564,190	3,429,884	-134,306

Source: Author's calculation based on the data from CI online

As it is recognizable from the Table 13 the changes in the strategies of the liner companies was unbeaten to reduce the TEU deployment to some extent as in 54 per cent of

the countries (88 countries) the number of TEU deployment had reduction during the July 2008 to July 2009.

4.2.3 Modifying the ship deployment amount

The number of ships deployed in each service is another indicator for measuring the capacity meaning the supply side. Therefore in order to adjust the supply and demand one possible option is to change the number of ships assigned to each service for the amount of demand from the service users. When the demand grows significantly the service providers tend to increase the capacity (supply). Increasing the capacity means increasing the number of vessels deployed or increasing the size for the same number of vessels. In the recent economic situation and following the serious and long-lasting decline in the demand the adjustment of the supply to demand and so the reduction of supply is a crucial move.

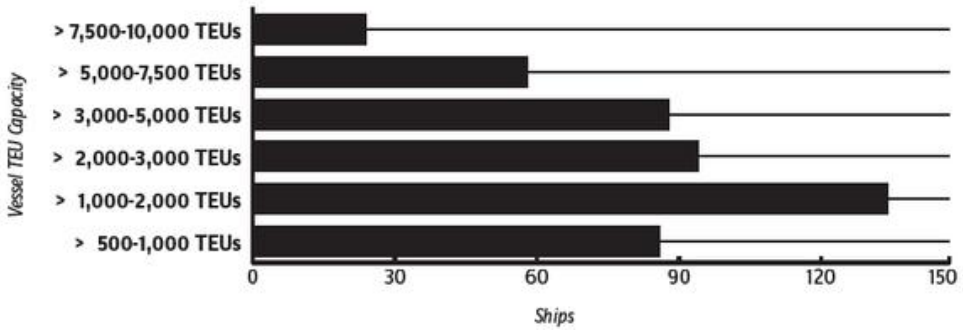
The questions for the liners are whether to withdraw or continue with slow steaming, which ships to withdraw; the older or the newer, the bigger or the smaller, and what to do with the withdrawals; to idle or to scrap.

Slow steaming in practice can save a considerable amount of the fuel consumption which is functional to cope with the oil price dynamics. It can also increase the transit time which could be helpful to deal with the surplus in the supply but it needs special considerations for the possible consequences of reducing speed. One important outcome of reducing speed and prolonging the transit time is losing the demand for carriage of the goods which need a fast delivery especially those of the perishable goods. Another important consideration is about the technical upshots of reducing speed and using engine with only a proportion of its power. Although there have been a considerable number of liners who took this action in response to the slump in the demand but it was not considered as the best option for many liner companies especially those with older ships in which the technical impacts of the slow steaming is more serious.

The option of withdrawal of the ships is recorded as the mostly preferred option by the liner companies but yet for some liner companies it is of the main concern whether to withdraw the older and relatively smaller ships or the newer but bigger ones. There are many different opinions concerning the withdrawals as some experts believe that only the old and heavily polluting ships should be withdrawn whereas the others believe some mega ships should be taken out from the service.

By reviewing the statistics it can be observed that there are much less number of the bigger ships which are taken out of the service but taking into account the total TEU capacity, even though the number of smaller ships are far more than the bigger ships but in terms of the TEU capacity reduction, idling bigger ships had more effects towards the adjustment of supply to the demand.

Figure 25 - Idle container ships by size



Source: AXS Alpha liner

There has been growth in the number of ships demolished or sold for scrapping during the last year which is demonstrating the consequences of the decisions made by the decision makers. For the option of demolition the environmental regulatory restrictions are of the most concern for the liner companies which is prohibiting them to some extent to opt for this choice. And the other issue is the age of the ships. As the containership fleet is relatively young it makes the owners to reconsider this option but in some cases when the companies are dealing with the upscale growing losses then it is an option to limit loss.
The data of the LSCI confirms this trend as the number of ships decreased for 118 countries during the July 2008 to July 2009 which means 73 per cent of the countries show a reduction in the number of vessels.

Table 14- Change in the number of ships

Country	2008	2009	number change
China	1,705	1,446	-259
Colombia	1,249	1,051	-198
Singapore	1,078	937	-141
Malaysia	827	704	-123
Ghana	872	759	-113
Belgium	811	708	-103
Sri Lanka	311	213	-98
United Kingdom	807	710	-97
United States	994	913	-81
Korea, Rep.	770	702	-68

Source: Author's calculation based on the data from CI online

Table 14 lists the countries that had the highest number of decrease in the ships called their ports.

4.2.4 Cost Cutting measures and the capacity management

Following the drop in the cargo growth and the decline in the demand, the liner companies experienced a huge loss on the revenue caused by the decline in the vessels' utilization factor. The liner companies who needed to decrease the overheads opted to take the cost cutting measures. This option is much related to compensating the monetary loss than the adjustment of the supply and demand. There have been two sets of actions taken by the liners in this category. One is to minimize the costs and decrease the overheads and the other is to manage the capacity in order to increase the load factor and utilization rate [30].

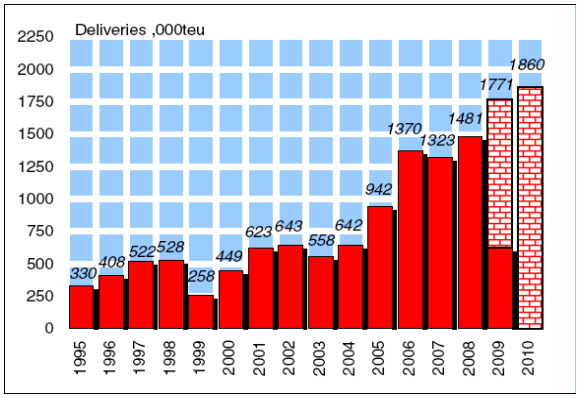
In order to cut the costs the liners initiated to cut the staffs which was followed by putting pressure on the terminals for decreasing the terminal handling charges (THC) and the other operation costs. The latter action was to spread the total loss and to share it with the operating firms.
In order to optimize the load factor that currently is on its very low levels, one of the options taken by the liners is to bypass the agents and forwarders by the direct booking and so saving some costs. The other very common measure is to use the pooling strategy in which the liner companies use the joint services for the same routes. An example of this strategy is the joint service of the Maersk line and CMA CGM in their Asia Mediterranean route. Another strategy is not to renew the charter vessels contracts in the period of the imbalance and oversupply which is of course not of interest of the charter owners.

4.2.5 Dealing with the overcapacity

Shipping boom of the recent years which had its peak in the mid 2008, when the freight rates had its highest historical level, resulted in a rapid growth in the order book and led to a massive surplus in the fleet capacity which was officially felt by the liner companies by the end 2008 after the shocking decline of the demand following the economic crisis.

Although no contractions for the new builds were recorded since the hit of the economic crisis by the end of 2008, still 0.64 millions of TEU delivery in the liner sector in total and 0.62 millions of TEU in the container ship was witnessed from the beginning of 2009 till end June and the projection is up to 1.77 millions of TEU containerships till the end of 2009 (Clarkson) (See Figure 26).

Figure 26-Containership delivery



Source: Clarkson

The figures for the percentage of growth in the balance of trade volume and the fleet capacity for the recent years (see Table 15) explain the notable imbalance and overcapacity which is the main reason for the slump of freight rates and the growth of idle ships (Table 16).

Table 15-Percentage growth in the balance of trade and fleet

Year	2006	2007	2008	2009
Trade Volume	11%	11%	5%	**-8%**
Fleet Capacity	14%	12%	11%	**12%**
Balance	**-2%**	**-1%**	**-6%**	**-20%**

Source: Clarkson

Table 16-Overview of idle containerships over 1000 TEU

Date	Number of Ships	TEU Capacity
05-Jan-09	210	550000
19-Jan-09	255	675000
02-Feb-09	303	800000
16-Feb-09	392	1100000
02-Mar-09	453	1300000
16-Mar-09	484	1410000
30-Mar-09	485	1420000
13-Apr-09	486	1310000
27-Apr-09	506	1340000
11-May-09	511	1310000
25-May-09	521	1300000
08-Jun-09	533	1320000
22-Jun-09	517	1240000

Source: Dynamar as per reports of AXS Alphaliner

Thus far in 2009, 145 containerships of totally over 0.6 million TEU have been adjoined the fleet and a constant surge of the new orders yet to come till end of the year. Table 17 illustrates the current capacity of the fleet and shows the expected capacity to adjoin.

Table 17-The existing fleet and the order book as of June 2009

Capacity range (TEU)	Existing fleet		Order Book		Orders per Existing
	Ships	TEU	Ships	TEU	Per cent
10000 and over	35	422200	176	2229900	528
7500-9999	223	1910300	94	816700	43
5000-7499	389	2356100	131	856100	36
4000-5099	571	2580900	219	979400	38
3000-3999	326	1109300	57	198200	18
2000-2999	730	1853300	77	200600	11
1000-1999	1272	1793800	160	228700	13
100-999	1168	727500	71	60400	8
Total	**4714**	**12753400**	**985**	**5570000**	**44**

Source: Dynamar as per the AXS Alphaliner report

In view of the declined demand generated by the economic crisis, dealing with the overcapacity would be possible only by means of restraining the flow of new builds and demolition of the heavily polluting old tonnage.

In the demolition market, containerized shipping recorded high activity levels so that the figures of the demolition for the first half of 2009 verify 0.12 millions of TEU of fully cellular ships which were sold for scraping. This amount is much higher than the total scraping of the whole 2008. The forecast for full 2009 is removal of 0.21 millions of TEU (Clarkson) from the fleet which suppose to be a considerable downward trend and should make a slowdown in the fleet capacity whereas comparing with the expected fresh tonnage arrivals (1.15 Million TEU, Clarkson projection forecast) which synthesized with the slump in the demand is an evidence of the continuous existing imbalance.

"Cancellation represents a cost for the ship-owner and the yard, but may result in a lower cost than the expected cost of going on with the investment after conditions have changed. Hence it opens up for correcting earlier decisions, when conditions in the transport market changes. This also contributes to a higher efficiency in the markets for ships by dampening potentially distorting effects of the fluctuations in demand for seaborne trade on the market for new vessels compared to what would be the situation if cancelling or conversions were not accepted" [43].

As per the above argument one possible option in direction of dealing with the overcapacity and surplus of supply side is considerations about the new building contracts. The investors who are no more supported by the banks and finance companies (following the credit crunches created by the economic crisis) and some even had to abandon the deposits, are reluctant to expand the fleet by receiving the fresh tonnage and tend to renegotiate the new orders with the yards in order to possibly delay or terminate the new building contracts minimizing their loss and controlling the market capacity. This option would sound rational from the investors' point of view but one should consider the loss for the yards and especially the green field yards[5] considering the growing number of smashed yards. Nevertheless there are a number of confirmed order cancellations mostly distressing deliveries in 2010 (Clarkson). Although the delay in deliveries may slacken the growth of the fleet and reduce to some extent the surplus in oversupply but it will undeniably spread the pressure of overcapacity in the future years.

4.4 Wrapping up

By analyzing the level of connectivity for the different countries from the different regions for the period of June 2008 to June 2009 when the economic crisis had its harsh impacts on the shipping sector, it can be observed that in a few examples like Paraguay and Serbia & Montenegro the connections to the sea transport are totally terminated which could possibly because of the development of the other transportation modes or having better access to the other trans modals. In some of the examples the number of liner companies providing services declined which has different reasons. For those countries where the decline in the number of liner companies is followed by the decline in the number of services and number of ships and TEU and the trade flow in general, it can be interpreted that the country is suffering from the consequences of the crisis. But in those examples where the number of companies decline but the number of services remained unchanged or even grew, it can be interpreted that the reduction in the number of companies is towards the consolidation or it can be as a result of the joint services and pooling strategies. Another possible reason behind the decline in the number of companies is the change in the port operations structure for example change in the operation charges which is making the liner companies unwilling to provide services for those ports.

The other indicator which is in some of the examples showing decline is the number of services. There are diverse fluctuations between the relationship of the number of companies and number of services. There have been couple of examples where the number of companies decreased but there is a considerable increase in the number of services which can be explained by the concept of mergers and acquisition and the trend towards consolidation. The Netherlands is a common example where the number of companies

[5] Green field yards concept refers to those small new yards which have their first contract to build a ship

declined for 10 per cent comparing with a year earlier. But in contrast there exist countries where the number of liner companies providing service has gone up but the number of services declined. An example for this trend is the South Africa where the number of companies increased for 3 per cent whereas the number of services declined for 4 per cent. In the case of South Africa, as the number of TEU and maximum and average ship size still show a considerable upscale growth, it can be interpreted that as a result of the employment of the bigger ships there are now less number of services required and so the frequency decreased. Italy is an example of decline in both the number of service and the number of liner companies where the growth in the TEU can only be explained by the growth in the ship size as the number of ships show a considerable decline as well.

All in all, analyzing the different examples and examining the impacts, the author returns to the hypothesis that there is the brunt of the economic crisis on the liner connectivity but because of the rapid growth in the capacity and the huge surplus in the supply, this hit on the connectivity looks slower and is not recognisable at the first sight unless digging into the figures and statistics and analyzing the different influencing factors.

Chapter V: Conclusion

5.1 Summary and concluding notes

The idea of this research formed following the questions such as: is the liner shipping connectivity of the countries important in their economic development, whether the economic fluctuations can affect the connectivity and whether the recent economic downturn had negative impacts on the liner shipping connectivity.

To search for the answers of the above questions, this research started from studying the shipping industry in general and its economic characteristics in particular. In the next stage of study the concentration shifted on the very particular segment of the shipping meaning the liner shipping where the specific features of this particular shipping sector was exploited from the literature. Following the highlighted growth of the liner shipping, the importance of the connectivity concept was underlined. At this stage the author tried to introduce a basic structure for the connectivity by dividing it into the water side and land side connectivity.

The liner shipping connectivity was introduced as a significant concept in the water side connectivity and its indicators as initiated by the UNCTAD where introduced in details.

The author initiated a comprehensive study on the economic crisis in general and the recent economic crisis of 2008-2009, its origins, its flow and its influences in particular. Then it was discussed how this economic crisis crossed into the shipping sector.

The research continued in the chapter IV where the major problems were analyzed in order to get the answer for the questions. In the first part of the chapter the trend of the liner shipping and the country level of connectivity i.e. the LSCI were examined and then the bilateral connections were scrutinized. The chapter also included the studies on the individual countries in order to get the conclusion on the impacts of the economic downturn on the countries' liner connectivity integration.

The sequence of studies for this research concludes with the following outcomes:

- It matters how a country is provided by the liner companies in terms of the number of services, the number of ships and the number of TEU deployed

- It matters how the country is connected to the other countries besides its accessibility within the liner network

- The countries' connectivity has positive correlation with the countries' economic growth and its integration in the global economy. The countries with a deeper incorporation in the shipping networks have higher integration in the global economy by means of the transportation of goods and adding value.

- The reliable and stable connections between the pair of countries can be slowed down in the period of high economic fluctuations but they will not be damaged or weakened when

there is a vast surplus in the supply side but considerations about controlling the fluctuations and minimizing the losses are essential.

- The current economic crisis had negative impacts on the shipping sector and created massive losses for the industry. As a result of the economic situation the countries liner connectivity is experiencing the fluctuations which are mostly in response to the adjustment of the supply and demand and minimizing the losses but the decline in level of connectivity which is correlated to the amount of supply was not as serious as the decline in the demand so as per the hypothesis it can be argued that the economic crisis hit the liner shipping connectivity but because of the overcapacity and the flow of the new ships coming into the fleet this negative impact cannot be felt very clearly.

5.2 Recommendation

From the results of this research and studying diverse countries' connectivity, it can be understood that the connectivity is a key concept in the globalization and improving the economic integration of the countries and as a result optimizing the connectivity for countries would result in a great economic enhancement.

However the problem is how to improve the countries' connectivity to ensure the highest achievable level of connectivity. It is also important to measure the connectivity for the land-locked countries. So there are possible areas of research on the countries' connectivity from both the land and water side considering the different modes of transport which can make different types of connections between the pairs of countries.

5.3 Relationship evaluation

The evaluation of the relationship between the thesis objectives and the report structure is presented in the table 18;

Table 18-Relationship between the thesis objectives and the report structure

Relationship between thesis Objectives and report structure					
Thesis Objectives	Chapter 1	Chapter 2	Chapter 3	Chapter 4	Chapter 5
Objective 1[6]	●	●	○		○
Objective 2[7]		●	○		○
Objective 3[8]			●	○	○
Objective 4[9]			○	●	●

●= strong relationship, ○= weaker relationship

[6] Objective 1: The economic Impacts of the shipping industry

[7] Objective 2: The economic Impacts of the liner shipping sector and the liner connectivity

[8] Objective 3: Impacts of the economic crisis on the shipping sector

[9] Objective 4: Impacts of the economic crisis on the liner shipping connectivity

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Appendices

Appendix I: The LSCI- 2004 to 2009

Country	2004	2005	2006	2007	2008	2009	Rank 2009	Change 2009/2008	Change 2009/2004
China	100.00	108.29	113.10	127.85	137.38	132.47	1	-4.91	32.47
Hong Kong	94.42	96.78	99.31	106.20	108.78	104.47	2	-4.30	10.05
Singapore	81.87	83.87	86.11	87.53	94.47	99.47	3	5.01	17.60
Netherlands	78.81	79.95	80.97	84.79	87.57	88.66	4	1.09	9.85
Korea, Rep.	68.68	73.03	71.92	77.19	76.40	86.67	5	10.28	18.00
United Kingdom	81.69	79.58	81.53	76.77	77.99	84.82	6	6.83	3.14
Germany	76.59	78.41	80.66	88.95	89.26	84.30	7	-4.96	7.71
Belgium	73.16	74.17	76.15	73.93	77.98	82.80	8	4.82	9.64
United States	83.30	87.62	85.80	83.68	82.45	82.43	9	-0.02	-0.87
Malaysia	62.83	64.97	69.20	81.58	77.60	81.21	10	3.61	18.38
Spain	54.44	58.16	62.29	71.26	67.67	70.22	11	2.56	15.78
Italy	58.13	62.20	58.11	58.84	55.87	69.97	12	14.10	11.84
France	67.34	70.00	67.78	64.84	66.24	67.01	13	0.77	-0.33
Japan	69.15	66.73	64.54	62.73	66.63	66.33	14	-0.30	-2.82
Taiwan	59.56	63.74	65.64	62.43	62.58	60.90	15	-1.67	1.34
UAE	38.06	39.22	46.70	48.21	48.80	60.45	16	11.65	22.40
Egypt, Arab Rep.	42.86	49.23	50.01	45.37	52.53	51.99	17	-0.55	9.12
Saudi Arabia	35.83	36.24	40.66	45.04	47.44	47.30	18	-0.14	11.47
Oman	23.33	23.64	20.28	28.96	30.42	45.32	19	14.90	21.98
Greece	30.22	29.07	31.29	30.70	27.14	41.91	20	14.77	11.68
Canada	39.67	39.81	36.32	34.40	34.28	41.34	21	7.06	1.68

Country	2004	2005	2006	2007	2008	2009	Rank 2009	Change 2009/2008	Change 2009/2004
India	34.14	36.88	42.90	40.47	42.18	40.97	22	-1.21	6.83
Morocco	9.39	8.68	8.54	9.02	29.79	38.40	23	8.61	29.02
Malta	27.53	25.70	30.32	29.53	29.92	37.71	24	7.78	10.17
Thailand	31.01	31.92	33.89	35.31	36.48	36.78	25	0.30	5.77
Sri Lanka	34.68	33.36	37.31	42.43	46.08	34.74	26	-11.34	0.06
Portugal	17.54	16.84	23.55	25.42	34.97	32.97	27	-2.00	15.43
Panama	32.05	29.12	27.61	30.53	30.45	32.66	28	2.21	0.60
South Africa	23.13	25.83	26.21	27.52	28.49	32.07	29	3.58	8.94
Turkey	25.60	27.09	27.09	32.60	35.64	31.98	30	-3.66	6.38
Mexico	25.29	25.49	29.78	30.98	31.17	31.89	31	0.73	6.60
Sweden	14.76	26.61	28.17	25.82	30.27	31.34	32	1.07	16.59
Brazil	25.83	31.49	31.61	31.64	30.87	31.08	33	0.21	5.25
Lebanon	10.57	12.53	25.57	30.01	28.92	29.55	34	0.63	18.98
Iran, Islamic Rep.	13.69	14.23	17.37	23.59	22.91	28.90	35	5.99	15.21
Australia	26.58	28.02	26.96	26.77	38.21	28.80	36	-9.40	2.22
Denmark	11.56	24.25	25.39	22.10	26.49	27.68	37	1.19	16.12
Pakistan	20.18	21.49	21.82	24.77	24.61	26.58	38	1.98	6.41
Vietnam	12.86	14.30	15.14	17.59	18.73	26.39	39	7.65	13.53
Argentina	20.09	24.95	25.58	25.63	25.70	25.99	40	0.29	5.90
Indonesia	25.88	28.84	25.84	26.27	24.85	25.68	41	0.83	-0.20
Jordan	11.00	13.42	12.98	16.46	16.37	23.71	42	7.34	12.71
Romania	12.02	15.37	17.61	22.47	26.35	23.34	43	-3.02	11.32
Colombia	18.61	19.20	20.49	29.13	21.64	23.18	44	1.54	4.56
Ukraine	11.18	10.81	14.88	16.73	23.62	22.81	45	-0.81	11.63

Country	2004	2005	2006	2007	2008	2009	Rank 2009	Change 2009/2008	Change 2009/2004
Uruguay	16.44	16.58	16.81	21.28	22.88	22.28	46	-0.60	5.84
Dominican Rep.	12.45	13.95	15.19	19.87	20.09	21.61	47	1.53	9.16
Russia	11.90	12.72	12.81	14.06	15.31	20.64	48	5.32	8.73
Venezuela, RB	18.22	19.90	18.62	20.26	20.46	20.43	49	-0.03	2.21
Nigeria	12.83	12.79	13.02	13.69	18.30	19.89	50	1.59	7.05
Slovenia	13.91	13.91	11.03	12.87	15.66	19.81	51	4.15	5.91
Jamaica	21.32	21.99	23.02	25.50	18.23	19.56	52	1.33	-1.76
Cote d'Ivoire	14.39	14.52	12.98	14.98	16.93	19.39	53	2.46	5.00
Ghana	12.48	12.64	13.80	14.99	18.13	19.33	54	1.21	6.86
Bahamas, The	17.49	15.70	16.19	16.45	16.35	19.26	55	2.91	1.77
Chile	15.48	15.53	16.10	17.49	17.42	18.84	56	1.42	3.36
Israel	20.37	20.06	20.44	21.42	19.83	18.65	57	-1.17	-1.71
Djibouti	6.76	7.59	7.36	10.45	10.43	17.98	58	7.56	11.22
Ecuador	11.84	12.92	14.17	14.30	13.16	17.09	59	3.93	5.25
Peru	14.79	14.95	16.33	16.90	17.38	16.96	60	-0.42	2.17
Philippines	15.45	15.87	16.48	18.42	30.26	15.90	61	-14.36	0.45
Trinidad &Tobago	13.18	10.61	11.18	13.72	12.88	15.88	62	3.01	2.70
Senegal	10.15	10.09	11.24	17.08	17.64	14.96	63	-2.67	4.81
Mauritius	13.13	12.26	11.53	17.17	17.43	14.76	64	-2.67	1.63
Guatemala	12.28	13.85	18.13	15.40	15.44	14.73	65	-0.71	2.45
Yemen, Rep.	19.21	10.18	9.39	14.28	14.44	14.61	66	0.17	-4.60
Costa Rica	12.59	11.12	15.08	15.34	12.78	14.61	67	1.83	2.02
Togo	10.19	10.62	11.09	10.63	12.56	14.42	68	1.86	4.23
Namibia	6.28	6.61	8.52	8.37	11.12	13.61	69	2.49	7.33

Country	2004	2005	2006	2007	2008	2009	Rank 2009	Change 2009/2008	Change 2009/2004
Benin	10.13	10.23	10.99	11.16	12.02	13.52	70	1.50	3.39
Cyprus	14.39	18.53	17.39	18.01	11.81	13.31	71	1.50	-1.08
Kenya	8.59	8.98	9.30	10.85	10.95	12.83	72	1.88	4.24
Cameroon	10.46	10.62	11.41	11.65	11.05	11.60	73	0.55	1.14
Congo, Rep.	8.29	9.10	9.12	9.61	11.80	11.37	74	-0.43	3.08
Angola	9.67	10.46	9.46	9.90	10.22	11.31	75	1.09	1.64
Syria	8.54	11.84	11.29	14.20	12.72	11.03	76	-1.70	2.49
Puerto Rico	14.82	15.23	14.68	15.96	15.62	10.92	77	-4.70	-3.90
Honduras	9.11	8.64	8.29	8.76	9.26	10.68	78	1.42	1.57
New Zealand	20.88	20.58	20.71	20.60	20.48	10.59	79	-9.89	-10.29
Nicaragua	4.75	5.25	8.05	7.89	8.91	10.58	80	1.68	5.83
El Salvador	6.30	7.32	8.07	7.90	8.67	10.34	81	1.67	4.04
Finland	9.45	10.16	8.58	10.70	9.72	10.15	82	0.43	0.70
Tanzania	8.10	8.59	8.71	10.58	10.46	9.54	83	-0.92	1.44
Libya	5.25	5.17	4.71	6.59	5.36	9.43	84	4.07	4.18
Mozambique	6.64	6.71	6.66	7.14	8.81	9.38	85	0.57	2.74
Sudan	6.95	6.19	5.67	5.66	5.38	9.28	86	3.89	2.33
Poland	7.28	7.53	7.50	7.86	9.32	9.21	87	-0.12	1.93
Gabon	8.78	8.76	8.72	8.57	8.93	9.16	88	0.23	0.38
Fiji	8.26	8.32	7.24	7.35	10.31	8.74	89	-1.57	0.48
New Caledonia	9.83	10.34	9.00	8.81	9.23	8.74	90	-0.49	-1.09
Madagascar	6.90	6.83	8.31	7.97	7.82	8.64	91	0.82	1.74
Netherlands Antilles	8.16	8.23	7.82	9.22	8.56	8.57	92	0.01	0.41

Country	2004	2005	2006	2007	2008	2009	Rank 2009	Change 2009/2008	Change 2009/2004
Guam	10.50	10.52	9.56	8.73	8.56	8.57	93	0.00	-1.93
Croatia	8.58	12.19	10.47	12.33	15.36	8.48	94	-6.88	-0.10
French Polynesia	10.46	11.14	8.91	8.60	9.01	8.39	95	-0.62	-2.07
Algeria	10.00	9.72	8.70	7.86	7.75	8.37	96	0.62	-1.63
Guinea	6.13	6.89	8.71	8.47	6.41	8.32	97	1.91	2.19
Lithuania	5.22	5.88	5.66	6.83	7.76	8.11	98	0.35	2.88
Bahrain	5.39	4.34	4.44	5.99	5.75	8.04	99	2.29	2.65
Norway	9.23	8.31	7.34	7.80	7.91	7.93	100	0.03	-1.30
Bangladesh	5.20	5.07	5.29	6.36	6.40	7.91	101	1.51	2.71
Ireland	8.78	9.66	8.18	8.85	7.64	7.60	102	-0.04	-1.18
Gambia, The	4.91	6.13	4.80	4.74	4.97	7.53	103	2.56	2.62
Mauritania	5.36	5.99	6.25	7.90	7.93	7.50	104	-0.44	2.14
Papua New Guinea	6.97	6.40	4.67	6.86	6.92	6.58	105	-0.34	-0.39
Kuwait	5.87	6.77	4.14	6.22	6.14	6.54	106	0.40	0.66
Tunisia	8.76	7.62	7.04	7.23	6.95	6.52	107	-0.43	-2.24
Cuba	6.78	6.51	6.43	6.71	6.12	5.92	108	-0.20	-0.86
Bulgaria	6.17	5.61	4.47	4.83	5.09	5.78	109	0.70	-0.38
Estonia	7.05	6.52	5.76	5.78	5.48	5.71	110	0.24	-1.34
Sierra Leone	5.84	6.50	5.12	5.08	4.74	5.56	111	0.83	-0.28
Liberia	5.29	5.95	4.55	4.50	4.25	5.49	112	1.23	0.20
Maldives	4.15	4.08	3.90	4.75	5.45	5.43	113	-0.02	1.28
Latvia	6.37	5.82	5.10	5.87	5.52	5.18	114	-0.34	-1.19
Cape Verde	1.90	2.28	2.76	2.45	3.63	5.13	115	1.50	3.23

Country	2004	2005	2006	2007	2008	2009	Rank 2009	Change 2009/2008	Change 2009/2004
Iraq	1.40	1.63	4.06	2.61	1.20	5.11	116	3.90	3.71
Comoros	6.07	5.84	5.39	5.51	5.15	5.00	117	-0.16	-1.08
Seychelles	4.88	4.93	5.27	5.29	4.49	4.90	118	0.40	0.01
Barbados	5.47	5.77	5.34	5.79	5.36	4.75	119	-0.61	-0.72
Iceland	4.72	4.88	4.75	4.72	4.72	4.73	120	0.01	0.01
Cambodia	3.89	3.25	2.93	3.25	3.47	4.67	121	1.20	0.78
Samoa	5.44	5.33	5.09	6.50	6.66	4.62	122	-2.04	-0.82
American Samoa	5.17	5.30	4.86	6.28	6.44	4.60	123	-1.84	-0.57
Haiti	4.91	3.43	2.91	2.87	3.44	4.40	124	0.95	-0.51
Guyana	4.54	4.37	4.60	4.51	4.36	4.34	125	-0.02	-0.20
St. Lucia	3.70	3.72	3.43	4.21	4.25	4.25	126	0.00	0.55
Vanuatu	3.92	4.48	4.41	4.34	4.36	4.22	127	-0.15	0.30
Faeroe Islands	4.22	4.40	4.43	4.45	4.20	4.20	128	0.00	-0.01
Suriname	4.77	4.16	3.90	4.29	4.26	4.16	129	-0.10	-0.60
Grenada	2.30	2.52	3.37	4.09	4.20	4.13	130	-0.07	1.83
St. Vincent &t. Grenad.	3.56	3.58	3.40	4.34	4.52	4.13	131	-0.40	0.57
Tonga	3.81	4.75	4.45	4.07	4.23	3.99	132	-0.24	0.18
Solomon Islands	3.62	4.29	3.97	4.13	4.16	3.96	133	-0.20	0.34
Brunei	3.91	3.46	3.26	3.70	3.68	3.94	134	0.26	0.03
Micronesia	2.80	2.87	1.94	3.13	3.85	3.85	135	0.00	1.05
Georgia	3.46	3.81	2.94	3.22	4.03	3.83	136	-0.20	0.37
Congo, Dem. Rep.	3.05	3.03	2.66	2.68	3.36	3.80	137	0.45	0.76
Palau	1.04	1.04	1.87	3.07	3.79	3.79	138	0.00	2.75

Country	2004	2005	2006	2007	2008	2009	Rank 2009	Change 2009/2008	Change 2009/2004
Myanmar	3.12	2.47	2.54	3.12	3.63	3.79	139	0.16	0.67
North. Mariana I.	2.17	2.20	1.85	2.86	3.76	3.76	140	0.00	1.59
Equatorial Guinea	4.04	3.87	3.76	3.36	3.86	3.73	141	-0.12	-0.31
Virgin Islands (U.S.)	1.77	3.00	3.22	3.76	3.81	3.70	142	-0.11	1.94
Guinea-Bissau	2.12	5.19	5.03	5.22	5.34	3.54	143	-1.80	1.42
Aruba	7.37	7.52	7.53	5.09	5.09	3.52	144	-1.57	-3.85
Eritrea	3.36	1.58	2.23	-	3.26	3.26	145	0.00	-0.10
St. Kitts and Nevis	5.49	5.32	5.59	6.16	6.19	3.08	146	-3.11	-2.41
Kiribati	3.06	3.28	3.05	3.06	3.06	2.85	147	-0.20	-0.21
Marshall Islands	3.49	3.68	3.26	3.06	3.06	2.85	148	-0.20	-0.63
Somalia	3.09	1.28	2.43	3.05	3.24	2.82	149	-0.42	-0.27
Switzerland	3.53	3.40	3.20	3.27	3.01	2.74	150	-0.27	-0.79
Dominica	2.33	2.51	2.33	2.40	2.31	2.73	151	0.41	0.40
Antigua and Barbuda	2.33	2.56	2.43	3.76	3.82	2.66	152	-1.16	0.33
Sao Tome and Principe	0.91	1.28	1.57	1.64	2.54	2.38	153	-0.16	1.47
Albania	0.40	0.40	0.40	2.28	1.98	2.30	154	0.31	1.89
Belize	2.19	2.59	2.62	2.61	2.32	2.30	155	-0.02	0.10
Greenland	2.32	2.32	2.27	2.27	2.36	2.27	156	-0.09	-0.04
Qatar	2.64	4.23	3.90	3.59	3.21	2.10	157	-1.12	-0.54
Cayman Islands	1.90	2.23	1.79	1.78	1.78	1.76	158	-0.02	-0.14
Bermuda	1.54	1.57	1.57	1.57	1.57	1.57	159	0.00	0.03
Czech Republic	0.44	0.44	0.44	0.44	3.20	0.44	160	-2.76	-0.00

Country	2004	2005	2006	2007	2008	2009	Rank 2009	Change 2009/2008	Change 2009/2004
Serbia & Montenegro	2.92	2.92	2.96	2.96	3.20	0.02	161	-3.18	-2.90
Paraguay	0.53	0.53	6.32	6.30	0.65	0.00	162	-0.65	-0.53

Source: UNCTAD, Transport Newsletter No. 43 2009

Appendix II: The First Order Bilateral Connectivity (Selected countries)

Australia

	Carriers	Ships	TEU	Max Size	Carriers	Ships	TEU	Max Size
American Samoa	2	2	1286	660	2	2	1286	660
Antigua &Barbuda	0	0	0	0	16	77	221261	4546
Belgium	2	23	73121	3534	1	13	45015	4056
Cambodia	0	0	0	0	17	76	220107	5680
Canada	3	9	12786	1837	3	8	11563	1831
China	22	54	111118	3424	20	55	163582	4546
Colombia	1	11	29797	2824	2	7	19768	2824
Djibouti	2	12	33390	2959	0	0	0	0
Egypt	4	37	102192	3534	2	12	33210	2824
Fiji	7	10	18004	2890	6	9	15420	2456
France	5	30	90300	2,824	5	31	91847	4056
Fch.Polynesia	5	10	20722	2456	5	10	20665	2456
Germany	6	36	109863	4132	2	12	33210	2824
Hong Kong	16	56	146459	8600	15	44	148879	4546
India	2	12	33390	2959	2	12	33210	2824
Indonesia	7	44	98164	3534	7	20	33509	3074
Italy	4	37	102192	3534	3	25	78225	4056
Jamaica	0	0	0	0	3	6	13622	2456
Japan	0	0	0	0	10	31	92266	4546
Kiribati	1	1	876	876	0	0	0	0
Korea, Rep.	13	31	86180	8600	17	42	122622	4546
Malaysia	14	52	138517	4367	12	47	141583	4546
Malta	2	12	33390	2959	2	12	33210	2824
Marshal Islands	1	1	876	876	0	0	0	0
Mauritius	3	26	76714	3534	0	0	0	0
Mexico	2	4	7136	1837	2	4	7043	1831
Nauru	1	1	122	122	1	1	270	270
Netherlands	5	29	72454	2959	5	31	91847	4056
New Caledonia	6	10	16320	2456	6	12	19377	2456
New Zealand	20	107	223679	4112	16	69	142913	4112
Panama	4	14	33910	2840	5	13	33390	2824
Papua New Guinea	5	22	22734	1841	5	19	19941	1841
Philippines	4	10	24658	8600	1	3	2232	744
Samoa	2	2	1286	660	2	2	1286	660
Saudi Arabia	3	26	76714	3534	0	0	0	0
Singapore	16	75	187987	4367	16	77	221261	4546
Solomon Is.	2	11	11094	1123	3	10	9331	1123
Spain	1	14	43324	3534	1	13	45015	4056
Sri Lanka	4	37	102192	3534	3	25	78225	4056
Taiwan	9	31	75260	4506	15	38	121505	4546

Thailand	2	12	11666	1123	2	9	8670	1123
Tonga	2	2	1286	660	2	2	1286	660
Tuvalu	1	1	512	512	1	1	512	512
UAE	0	0	0	0	1	13	45015	4056
UK	8	44	122'599	4'132	5	31	91847	4056
US	8	48	101191	2890	8	29	63107	2890
Vanuatu	3	10	9539	1123	4	8	7005	1123
Viet Nam	0	0	0	0	1	4	4492	1123

China

Importing Country	Carriers	Ships	TEU	Max Size	Carriers	Ships	TEU	Max Size
Angola	2	10	15920	2109	3	18	35118	2556
Argentina	11	54	170716	5560	15	61	234852	5905
Australia	22	54	111118	3424	20	55	163582	4546
Bahamas	1	9	43201	5060	1	11	64899	6742
Belgium	26	190	1010556	9449	19	152	1091461	13800
Benin	3	16	28396	2109	4	35	87999	3538
Brazil	15	70	179503	3534	15	61	234852	5905
Brunei Darussalam	1	3	1704	671	0	0	0	0
Cambodia	0	0	0	0	44	531	2612739	13800
Cameroon	1	8	13745	1716	2	12	24969	2556
Canada	22	137	571000	7024	17	133	749833	9200
Chile	9	54	122875	3091	9	46	135367	4294
Colombia	10	64	142022	3091	7	39	118216	4294
Congo	2	10	15920	2109	5	28	60636	2788
Costa Rica	6	39	77420	3091	3	11	28780	3398
Côte d'Ivoire	3	16	28396	2109	2	25	62481	3538
Croatia	2	6	17695	3500	0	0	0	0
Cyprus	1	6	16949	2987	0	0	0	0
Denmark	1	9	66045	7929	1	7	55728	8600
Djibouti	1	5	7506	1687	2	16	60663	5782
Dominican Rep.	0	0	0	0	3	8	33652	4300
Ecuador	6	45	106598	3091	3	18	60515	4294
Egypt, Arab Rep.	18	168	865900	9469	20	188	1097581	9200
El Salvador	4	19	32168	2452	3	11	28780	3398
Fiji	2	7	7761	1246	0	0	0	0
France	21	158	875923	9200	18	172	1209431	11400
Gabon	1	8	13745	1740	2	12	24969	2556
Germany	27	296	1662922	9449	20	250	1770152	12508
Ghana	3	20	35304	2474	7	31	77856	3538
Greece	8	61	228475	6742	1	9	73600	9200
Guam	1	4	10238	3220	2	10	26186	2824
Guatemala	8	65	142618	4158	4	19	49804	3398
Hong Kong	63	1088	4617614	12508	58	944	4522735	13800
India	18	71	201541	6750	21	78	241810	5888
Indonesia	9	30	56007	3187	12	38	70046	4253
Iran	9	46	152958	6742	12	43	178182	8468
Israel	5	45	182873	5040	4	31	151311	5608
Italy	21	145	753605	8400	21	156	886228	9200
Jamaica	7	41	151932	5040	6	31	140480	5060
Japan	51	481	1467611	8204	52	440	1642622	9200
Jordan	4	11	34787	3821	9	37	152469	6978
Kenya	0	0	0	0	2	7	10040	1932

Korea, Rep.	61	574	1914018	9200	28	579	2415752	9200
Lebanon	2	24	145143	8400	2	26	194011	9661
Madagascar	1	5	7107	1697	1	6	8108	1525
Malaysia	37	385	1539303	8750	20	432	2317094	12508
Malta	4	35	205236	8488	4	40	281515	11400
Mauritius	4	24	61661	3584	2	13	38489	5551
Mexico	13	86	205415	4713	12	82	293674	7403
Morocco	1	20	154674	9200	2	34	280224	11400
Mozambique	1	4	6405	1608	0	0	0	0
Netherlands	26	259	1501368	9449	18	241	1825720	13800
New Caledonia	1	4	4304	1202	0	0	0	0
New Zealand	1	8	8826	1308	6	11	22156	3091
Nicaragua	4	19	32168	2452	3	11	28780	3398
Nigeria	3	16	28396	2109	6	35	87527	3538
Oman	4	18	72643	5896	4	58	459636	13800
Pakistan	17	57	129597	3187	11	39	151638	5980
Panama	16	119	483753	5060	13	115	537243	7403
Papua New Guinea	2	5	4153	1123	2	6	8148	1841
Peru	9	55	118872	3091	7	36	95876	3398
Philippines	14	42	53060	1923	10	24	41821	2598
Portugal	0	0	0	0	1	9	79346	9200
Puerto Rico	2	8	27597	4300	0	0	0	0
Romania	6	33	116690	4444	9	36	187621	6978
Russian Federation	3	5	4241	1158	3	15	49163	4253
Samoa	1	3	3369	1123	0	0	0	0
Saudi Arabia	22	155	774094	8478	25	164	935661	9661
Singapore	50	514	1948345	9449	44	524	2582170	13800
Slovenia	2	6	17695	3500	2	8	52090	6712
South Africa	16	86	222080	3584	19	109	379186	5905
Spain	18	145	787968	9200	17	123	842698	13800
Sri Lanka	23	127	451450	7024	19	102	475629	7024
Sweden	1	9	66045	7929	1	7	55728	8600
Syria	1	6	16600	2825	0	0	0	0
Taiwan	45	496	1936339	8073	41	441	1983856	8750
Tanzania	0	0	0	0	2	7	10040	1932
Thailand	23	83	224778	6750	25	72	224447	8200
Togo	3	16	28396	2109	9	45	113045	3538
Trinidad	0	0	0	0	3	8	33652	4300
Turkey	8	33	94252	4444	10	45	261221	9200
Ukraine	3	15	51994	4444	8	26	145106	6978
UAE	26	161	674605	8488	26	147	902424	13800
UK	24	266	1571199	9449	18	202	1463158	13800
US	26	448	2070683	8468	27	423	2142915	9200
Uruguay	5	20	61966	3428	9	37	139508	5303
Vanuatu	1	3	3369	1123	0	0	0	0
Venezuela	0	0	0	0	3	8	33652	4300
Viet Nam	17	37	36053	1732	24	65	129128	4900
Yemen	4	11	24609	3430	4	31	81438	4250

Viet Nam

Importing Country	Carriers	Ships	TEU	Max size	Carriers	Ships	TEU	Max size
Australia	0	0	0	0	1	4	4492	1123
Belgium	0	0	0	0	1	10	18733	1888
Cambodia	2	5	3198	657	21	71	129394	4900
China	17	37	36053	1732	24	65	129128	4900
Fiji	1	4	4398	1246	0	0	0	0
Germany	1	4	2792	698	1	10	18733	1888
Hong Kong, China	23	68	69148	1860	27	79	142695	4900
India	2	2	2026	1094	3	3	3074	1094
Indonesia	7	23	22823	1404	7	29	39696	1888
Italy	0	0	0	0	1	10	18733	1888
Japan	10	25	32264	1700	12	36	75574	4900
Korea, Rep.	11	30	33433	1860	11	36	48866	1888
Kuwait	0	0	0	0	1	2	1189	670
Malaysia	13	30	31618	2084	16	30	54333	4900
New Caledonia	1	4	4398	1246	1	6	7374	1730
New Zealand	1	4	4398	1246	1	6	7374	1730
Papua New Guinea	1	6	6728	1123	1	4	4492	1123
Philippines	4	6	7246	1732	4	11	13157	1732
Russian Federation	1	1	490	490	1	1	490	490
Saudi Arabia	1	2	1189	670	1	2	1189	670
Singapore	20	51	50428	2084	20	70	127973	4900
Solomon Islands	1	6	6728	1123	1	4	4492	1123
Taiwan	12	39	42288	1706	15	35	66280	4900
Thailand	23	58	61082	1700	23	67	104794	4900
UAE	1	2	1189	670	1	2	1189	670
United States	0	0	0	0	5	24	80979	4900
Vanuatu	1	6	6728	1123	1	4	4492	1123

India

Importing Country	Carriers	Ships	TEU	Max Size	Carriers	Ships	TEU	Max Size
American Samoa	1	4	6624	1656	0	0	0	0
Angola	2	8	13524	1906	0	0	0	0
Australia	2	12	33390	2959	2	12	33210	2824
Bahrain	0	0	0	0	1	4	10153	2741
Bangladesh	2	6	3129	1054	2	3	1604	1030
Belgium	9	53	161655	6750	8	36	144294	6978
Benin	3	5	5258	1098	3	4	4367	1129
Brazil	2	7	14173	2556	2	5	9113	2007
Cambodia	0	0	0	0	33	119	282852	5888
Cameroon	0	0	0	0	1	8	14262	1900
Canada	2	8	15864	2310	0	0	0	0
China	18	71	201541	6750	21	78	241810	5888
Comoros	2	4	4431	1115	0	0	0	0
Congo	2	8	13524	1906	1	8	14262	1900
Côte d'Ivoire	2	8	13524	1906	1	8	14262	1900
Djibouti	4	18	41900	2959	4	13	22884	2741
Egypt, Arab Rep.	16	88	304338	6500	13	94	352829	5618
France	4	29	83963	4367	4	28	98827	4300
French Polynesia	1	4	6624	1656	0	0	0	0
Gabon	0	0	0	0	1	8	14262	1900
Germany	16	57	180657	6750	9	52	189363	6978
Ghana	5	13	18782	1906	4	12	18629	1900
Hong Kong, China	0	0	0	0	14	49	140210	5888
Indonesia	3	16	40014	2959	1	1	4253	4253
Iran	12	37	76614	3108	13	46	155918	6978
Israel	0	0	0	0	1	10	42515	4253
Italy	12	64	207286	6500	12	64	226978	6742
Japan	4	17	37510	5085	4	17	33900	3604
Jordan	1	3	5526	2026	4	29	116712	6978
Kenya	10	26	32783	2480	7	20	32897	3389
Korea, Rep.	12	30	73506	5085	11	40	125353	5888
Madagascar	0	0	0	0	2	4	6322	1638
Malaysia	34	146	348902	5754	29	102	267418	5888
Maldives	2	5	8361	1730	2	4	6570	1730
Malta	2	18	58310	4367	2	19	63190	4300
Mauritius	2	12	33390	2959	0	0	0	0
Morocco	0	0	0	0	1	6	33536	5618
Mozambique	2	4	4431	1115	2	4	6322	1638
Myanmar	1	3	890	382	1	3	890	382
Netherlands	9	37	123749	6420	6	39	159200	6978

New Zealand	2	12	33390	2959	0	0	0	0
Nigeria	5	13	18782	1906	4	12	18629	1900
Oman	7	42	170100	6500	9	64	262594	6978
Pakistan	25	107	268934	5085	28	101	301911	4506
Papua New Guinea	1	4	6624	1656	0	0	0	0
Romania	0	0	0	0	1	10	42515	4253
Russian Federation	0	0	0	0	1	10	42515	4253
Samoa	1	4	6624	1656	0	0	0	0
Saudi Arabia	21	106	320981	6500	21	85	274633	6978
Singapore	38	167	361250	5085	33	117	277590	5888
South Africa	8	25	34627	2556	9	25	43537	3389
Spain	9	34	125649	6420	6	54	256533	6978
Sri Lanka	34	129	321531	5060	27	102	283915	5888
Sudan	1	3	2127	712	3	13	21761	2219
Taiwan	5	20	41396	3428	6	16	31584	3494
Tanzania Rep. of	9	23	30656	2480	5	12	15832	1730
Thailand	9	17	32631	2954	3	10	17902	2900
Turkey	0	0	0	0	1	10	42515	4253
UAE	33	165	458948	6500	29	150	475639	6978
United Kingdom	17	35	140394	4713	7	50	214258	6978
United States	11	57	217618	5754	9	38	150062	5060
Viet Nam	2	2	2026	1094	3	3	3074	1094
Yemen	2	5	4950	1364	3	10	17358	2741

Oman

Importing Country	Carriers	Ships	TEU	Max Size	Carriers	Ships	TEU	Max Size
Bahrain	0	0	0	0	1	4	10153	2741
Belgium	3	7	39074	5896	3	27	215968	13800
Brazil	0	0	0	0	1	8	22484	2824
Canada	1	13	85800	6600	0	0	0	0
Cambodia	0	0	0	0	4	45	382150	13800
China	4	18	72643	5896	4	58	459636	13800
Comoros	1	3	4668	1608	0	0	0	0
Djibouti	1	1	1510	1510	3	8	16957	2741
Egypt, Arab Rep.	4	41	204559	6600	7	54	246931	8478
France	1	13	85800	6600	3	30	237067	8600
Germany	4	14	73046	5896	3	25	165292	8600
Hong Kong	6	40	249918	8600	4	58	459636	13800
India	7	42	170100	6500	9	64	262594	6978
Iran	2	3	2622	1054	2	8	49278	6978
Iraq	1	8	728	108	0	0	0	0
Italy	1	33	186544	6600	3	40	260616	8478
Japan	1	13	85800	6600	1	11	87484	8600
Jordan	3	10	45347	5060	3	26	112677	6978
Kenya	3	10	13967	1737	4	11	15286	1850
Korea, Rep.	0	0	0	0	1	10	82790	8468
Madagascar	1	3	4668	1608	1	3	5026	1713
Malaysia	4	27	127519	6600	2	20	154277	8600
Mauritius	1	3	4668	1608	1	3	5026	1713
Morocco	0	0	0	0	1	6	33536	5618
Namibia	0	0	0	0	1	8	22484	2824
Netherlands	5	14	103816	8600	3	36	296740	13800
Pakistan	6	24	63042	4306	5	22	58006	4306
Saudi Arabia	5	44	194128	6500	7	58	311034	8478
Seychelles	1	3	4668	1608	1	3	5026	1713
Singapore	8	43	210501	8600	4	47	372152	13800
South Africa	2	7	12015	2472	2	8	13257	2226
Spain	2	30	166217	6600	4	66	435134	13800
Sri Lanka	3	21	104415	6350	3	27	137811	6742
Sudan	1	3	2127	712	3	13	23252	2480
Taiwan	0	0	0	0	1	11	87484	8600
Tanzania	2	3	5110	1737	3	5	9475	2474
UAE	9	51	158198	6500	7	77	433436	13800
United Kingdom	1	7	33972	5047	6	51	402709	13800
United States	1	28	155502	6600	2	27	138155	6742
Yemen	1	1	1510	1510	2	6	13124	2480

South Africa

Importing Country	Carriers	Ships	TEU	Max Size	Carriers	Ships	TEU	Max Size
Angola	4	22	25651	1831	6	29	40385	2470
Argentina	0	0	0	0	13	54	210422	5905
Bahamas	3	9	22524	2754	0	0	0	0
Belgium	6	17	42515	4370	7	20	55427	6742
Benin	4	32	54014	2526	5	29	55540	2788
Brazil	9	54	162505	5560	13	62	227471	5905
Cambodia	0	0	0	0	16	112	339910	5905
Cameroon	2	16	19825	1808	2	12	15899	1808
Canada	1	1	728	728	0	0	0	0
China	16	86	222080	3584	19	109	379186	5905
Comoros	1	2	1529	931	2	3	3144	1716
Congo	2	11	12598	1831	3	20	37561	2788
Congo DR	1	5	2143	445	1	4	1894	519
Côte d'Ivoire	6	32	74530	3584	3	21	52269	4300
Djibouti	2	7	8574	1300	1	1	1118	1118
Egypt	1	3	2127	712	1	3	2127	712
Equatorial Guinea	1	5	2143	445	1	4	1894	519
France	6	18	51375	5060	6	14	49004	6742
Gabon	2	7	3433	645	1	4	1894	519
Germany	7	23	68964	4922	6	24	83467	6742
Ghana	10	58	110227	3584	9	43	95687	4300
Hong Kong	12	82	269874	5560	0	0	0	0
India	8	25	34627	2556	9	25	43537	3389
Iran	2	7	14173	2556	2	5	9113	2007
Italy	1	4	5200	1300	1	4	5200	1300
Japan	6	20	48810	4250	7	29	108559	5905
Jordan	1	4	5200	1300	1	4	5200	1300
Kenya	6	21	24683	2480	7	20	29468	3389
Korea, Rep.	9	30	68600	4250	11	49	149651	5905
Madagascar	2	10	19154	2526	3	9	13807	2470
Malaysia	14	82	246759	5560	13	95	305124	5905
Mauritius	6	38	116374	5089	3	15	43358	5551
Mexico	1	5	5554	1118	1	4	4542	1224
Mozambique	5	29	44484	2526	7	26	35835	2470
Namibia	5	25	42958	3584	7	37	66011	4300
Netherlands	6	18	43541	4922	5	14	39663	4931
Nigeria	11	62	111642	3584	10	42	87268	4300
Oman	2	7	12015	2472	2	8	13257	2226
Pakistan	2	10	14005	2480	3	9	17895	3389
Peru	1	2	3601	2051	0	0	0	0
Portugal	5	14	46175	5060	5	10	43804	6742
Saudi Arabia	4	14	20829	2556	4	12	16440	2007

Senegal	1	4	3896	1118	0	0	0	0
Seychelles	0	0	0	0	1	1	830	830
Singapore	16	111	303078	5560	16	112	343194	5905
Spain	2	10	11623	1908	2	10	11623	1908
Sri Lanka	3	10	17050	2051	2	12	26588	3389
Sudan	0	0	0	0	1	3	2127	712
Taiwan	6	15	42786	4224	5	18	47107	3586
Tanzania	3	16	20064	2480	4	10	10902	1704
Thailand	2	5	13289	2824	1	2	5112	2556
Togo	6	30	55599	2526	9	32	72527	2788
UAE	6	19	30638	2556	7	19	39548	3389
UK	6	17	60401	4922	6	20	76313	6742
United States	5	15	28806	2754	4	12	25701	3022
Uruguay	2	10	32351	4250	7	30	115078	5303

Italy

Importing Country	Carriers	Ships	TEU	Max size	Carriers	Ships	TEU	Max size
Albania	2	3	1080	578	0	0	0	0
Algeria	6	10	6486	1724	9	18	13736	1724
American Samoa	1	4	6624	1656	0	0	0	0
Angola	1	3	1315	518	1	3	1315	518
Argentina	6	17	60770	4860	2	8	44537	5926
Australia	4	37	102192	3534	3	25	78225	4056
Belgium	23	104	269108	6750	16	111	328980	7900
Benin	0	0	0	0	2	9	16007	2785
Brazil	7	25	81082	4860	2	8	44537	5926
Bulgaria	1	1	1090	1090	1	2	3133	1604
Cambodia	0	0	0	0	18	134	745407	13800
Cameroon	2	8	11797	1730	3	13	22712	2785
Canada	13	77	326919	6600	12	64	250679	7024
Chile	3	7	12098	1730	3	7	12100	1730
China	21	145	753605	8400	21	156	886228	9200
Colombia	7	24	34382	3026	7	25	36485	2410
Congo	0	0	0	0	1	4	6705	1730
Costa Rica	1	4	1764	485	1	4	1764	485
Côte d'Ivoire	3	10	15025	1730	4	14	24428	2785
Croatia	7	27	64723	5089	6	13	13179	2778
Cuba	2	6	9045	1728	2	4	6365	1700
Cyprus	7	30	33202	2562	7	34	48948	5060
Denmark	2	9	12806	2490	3	10	16254	2840
Djibouti	4	25	46808	2959	3	18	59523	5782
Dominican Rep	5	18	29858	3026	6	32	74208	5050
Ecuador	2	5	2824	1724	2	4	2524	1724
Egypt	31	205	747337	7024	31	179	736616	8478
Fiji	3	8	7060	1246	0	0	0	0
France	37	183	658049	8400	30	188	682484	8478
French Polynesia	1	4	6624	1656	0	0	0	0
Gabon	1	4	6705	1730	1	4	6705	1730
Gambia	0	0	0	0	1	2	1625	822
Georgia	1	2	1400	700	0	0	0	0
Germany	27	126	464538	8073	17	108	318296	7900
Ghana	3	10	15025	1730	2	5	6808	1716
Greece	15	72	129950	5060	8	63	128254	9200
Guam	2	8	17590	2824	0	0	0	0

Guatemala	3	14	23252	3026	3	13	21403	2410
Guinea	2	8	11797	1730	1	4	5092	1546
Hong Kong	19	124	700937	8400	19	137	825209	9200
India	12	64	207286	6500	12	64	226978	6742
Indonesia	5	47	124780	3586	1	10	18733	1888
Iran	1	3	5526	2026	2	9	20394	2478
Ireland	3	11	9389	1181	2	9	6972	972
Israel	7	42	94002	5060	9	51	137831	5608
Jamaica	1	14	69346	5060	1	14	69776	5060
Japan	5	40	201909	6600	3	32	144310	7024
Jordan	1	7	10726	2026	2	16	54054	5060
Kenya	1	4	5200	1300	1	4	5200	1300
Korea	10	54	249289	8400	15	82	465940	9200
Lebanon	12	42	62652	3586	9	46	177173	9200
Libya	8	16	9601	1145	8	29	30189	2478
Malaysia	15	96	489547	7024	11	71	408428	8478
Malta	15	55	135632	5782	17	68	197949	6638
Mauritania	1	8	20312	2602	0	0	0	0
Mauritius	3	26	76714	3534	0	0	0	0
Mexico	4	26	73190	5926	4	25	70404	5050
Montenegro	3	9	4509	962	2	7	3976	1284
Morocco	5	9	12667	1730	6	14	45831	5618
Mozambique	1	4	5200	1300	1	4	5200	1300
Netherlands	14	65	217690	8063	12	70	261956	7900
New Zealand	3	23	58868	2959	0	0	0	0
Nigeria	3	10	15025	1730	4	14	24428	2785
Norway	1	1	1724	1724	1	1	1724	1724
Oman	1	33	186544	6600	3	40	260616	8478
Pakistan	6	27	86050	4306	5	19	70073	4294
Panama	3	18	75952	5060	4	27	112205	5060
Papua New Guinea	1	4	6624	1656	0	0	0	0
Peru	3	7	12098	1730	3	7	12100	1730
Poland	2	11	4954	930	2	11	4954	930
Portugal	10	48	96080	5926	6	42	83298	5060
Puerto Rico	5	14	18080	1740	3	9	11176	1730
Romania	1	1	1090	1090	1	2	3133	1604
Russia	1	2	1400	700	0	0	0	0
Samoa	1	4	6624	1656	0	0	0	0
Sao Tome & Princ	1	3	1315	518	1	2	797	428
Saudi Arabia	21	146	604865	8400	20	146	753272	9200
Senegal	6	20	55731	4860	2	5	9342	4250

Singapore	18	106	487933	8400	18	134	723050	9200
Slovenia	8	31	74780	5089	9	26	77599	6712
South Africa	1	4	5200	1300	1	4	5200	1300
Spain	46	281	915938	8400	41	288	978024	8468
Sri Lanka	8	82	340767	7024	7	65	309224	7024
St. Kitts & Nevis	2	4	6606	1740	0	0	0	0
Sweden	4	20	17760	2496	5	21	21208	2840
Syria	8	31	48763	3586	7	21	26045	2603
Taiwan	10	64	359289	8063	10	59	350074	7900
Tanzania,	1	4	5200	1300	1	4	5200	1300
Thailand	3	18	67889	5888	3	19	70345	5888
Togo	1	4	6705	1730	2	9	16007	2785
Tunisia	8	11	6840	1181	8	17	10389	1139
Turkey	19	89	104512	2785	16	110	214507	9200
Ukraine	0	0	0	0	1	2	3133	1604
UAE	12	70	307849	8400	15	99	508910	9200
UK	17	104	308282	8063	15	116	407943	8063
United States	17	140	536917	6600	17	114	434553	7024
Uruguay	4	12	47792	4860	1	1	4250	4250
Venezuela	4	12	10556	1740	3	9	10431	1740
Viet Nam	0	0	0	0	1	10	18733	1888

Sweden

Importing Country	Carriers	Ships	TEU	Max size	Carriers	Ships	TEU	Max size
Belgium	9	55	54354	2908	10	55	113206	8600
Cambodia	0	0	0	0	1	7	55728	8600
Canada	0	0	0	0	1	5	14540	2908
China	1	9	66045	7929	1	7	55728	8600
Croatia	1	6	2692	930	1	6	2692	930
Cyprus	2	6	4064	753	2	6	4064	753
Denmark	10	41	93861	8478	11	47	93832	8600
Djibouti	0	0	0	0	1	6	2692	930
Egypt	1	5	3684	753	4	18	62054	8600
Estonia	2	3	605	366	2	5	1163	366
Finland	8	15	6980	868	9	34	24014	1638
France	2	4	74355	8478	4	21	62560	8600
Germany	13	75	123630	7929	15	72	122630	8600
Greece	2	9	12806	2496	1	5	3684	753
Hong Kong	0	0	0	0	1	7	55728	8600
Iceland	0	0	0	0	2	4	4730	1457
Ireland	2	7	3868	753	2	6	3776	753
Israel	0	0	0	0	2	6	4064	753
Italy	4	20	17760	2496	5	21	21208	2840
Japan	1	9	66756	8478	1	7	55728	8600
Latvia	3	4	972	509	3	5	2392	930
Lebanon	0	0	0	0	1	5	2262	512
Libya	1	5	2262	512	1	5	2262	512
Lithuania	4	8	6010	1133	2	3	1976	868
Malaysia	1	9	66756	8478	1	7	55728	6600
Malta	1	5	3684	753	1	5	3684	753
Montenegro	1	6	2692	930	1	6	2692	930
Netherlands	10	38	93125	8478	11	52	87750	8600
Norway	6	13	7250	1457	5	14	9142	1457
Poland	5	14	5870	930	5	14	6020	930
Portugal	5	14	5870	930	2	7	5051	753
Russia	3	5	3347	868	6	11	10338	1638
Singapore	1	9	66756	8478	1	7	55728	8600
Spain	3	12	5519	930	3	11	4754	930
Syria	0	0	0	0	1	5	2262	512
Taiwan	0	0	0	0	1	7	55728	8600
Turkey	3	10	13186	2496	4	11	16634	2840
UK	11	81	123263	7929	11	47	101005	8600
United States	1	5	14540	2908	1	5	14540	2908

Finland

Importing Country	Carriers	Ships	TEU	Max size	Carriers	Ships	TEU	Max size
Belgium	4	17	9111	1438	5	29	25503	1638
Cyprus	1	1	380	380	1	1	380	380
Denmark	3	9	7901	1768	4	22	14479	1421
Egypt	1	1	380	380	1	1	380	380
Estonia	5	13	7109	1438	5	13	5189	858
Germany	10	38	22466	1221	12	53	40039	1768
Israel	1	1	380	380	1	1	380	380
Latvia	3	8	7564	1438	1	2	543	366
Lithuania	3	8	6678	1638	3	8	7838	1768
Netherlands	5	11	6516	868	3	22	17298	1421
Norway	2	3	721	366	1	2	543	366
Poland	2	4	1265	431	2	3	969	431
Russia	3	13	13993	1768	4	10	11864	1768
Spain	1	4	1326	360	1	2	720	360
Sweden	8	15	6980	868	9	34	24014	1638
Turkey	1	1	380	380	1	1	380	380
UK	4	14	5005	767	4	8	2081	360

Mexico

Importing Country	Carriers	Ships	TEU	Max size	Carriers	Ships	TEU	Max size
Algeria	1	4	2186	608	1	4	2639	677
Argentina	2	6	24487	4253	2	5	20449	4253
Aruba	1	1	1550	1550	0	0	0	0
Australia	2	4	7136	1837	2	4	7043	1831
Bahamas	1	7	17196	2808	0	0	0	0
Belgium	5	15	56831	6732	6	20	68142	6732
Belize	1	3	583	340	1	3	734	340
Brazil	7	24	59798	4253	7	23	69665	4255
Canada	5	17	33412	3026	4	14	28838	2478
Cambodia	0	0	0	0	1	8	39934	5060
Chile	11	63	162142	3469	10	48	138831	4294
China	13	86	205415	4713	12	82	293674	7403
Colombia	16	86	190444	3469	11	65	178112	4294
Costa Rica	6	27	50309	2672	7	18	41548	3398
Côte d'Ivoire	1	3	2706	973	1	3	2706	973
Cuba	2	8	10773	1728	3	6	7496	1700
DominicanRep	13	54	119085	4253	12	51	141183	5050
Ecuador	3	17	42382	2800	3	18	60515	4294
Egypt	1	4	2639	677	1	4	2639	677
El Salvador	5	22	42963	2672	5	15	34286	3398
France	6	23	84466	6742	5	24	81321	6732
Fch Polynesia	2	4	7136	1837	0	0	0	0
Germany	5	15	56831	6732	5	18	67534	6732
Ghana	1	3	2706	973	1	3	2706	973
Greece	1	4	2639	677	1	4	2639	677
Guatemala	11	60	119820	3091	10	41	85323	3398
Haiti	1	3	2378	923	1	3	2378	923
Honduras	5	11	11945	1740	4	9	11889	2078
Hong Kong	0	0	0	0	11	70	253657	7403
Italy	4	26	73190	5926	4	25	70404	5050
Jamaica	5	13	31231	4050	6	16	45842	4300
Japan	9	70	190159	5047	8	48	177395	7403
Korea, Rep.	12	107	309769	6070	11	68	244127	7403
Libya	1	4	2639	677	1	4	2639	677
Malta	1	4	13064	3266	0	0	0	0
Netherlands	2	5	14100	3098	2	4	11023	3098
New Zealand	2	4	7136	1837	2	4	7043	1831
Nicaragua	4	20	40865	2672	4	12	30393	3398
Nigeria	1	3	2706	973	1	3	2706	973

Panama	9	52	163455	6070	8	39	147162	7403
Peru	11	48	112443	3091	9	39	99663	3398
Portugal	2	12	43402	5926	2	10	37648	5050
Puerto Rico	6	16	37678	4050	2	5	7063	2078
South Africa	1	5	5554	1118	1	4	4542	1224
Spain	5	29	76443	5926	5	27	71458	5050
Taiwan	9	59	151479	4050	7	40	122012	4300
Trinidad	1	7	17196	2808	3	9	37952	4300
Turkey	1	4	2639	677	1	4	2639	677
UK	4	17	65228	6732	3	14	56511	6732
United States	23	114	269744	6742	20	113	298303	6732
Venezuela, RB	12	40	79984	4050	8	32	90987	4300

Morocco

Importing Country	Carriers	Ships	TEU	Max size	Carriers	Ships	TEU	Max size
Algeria	2	3	2932	1724	2	2	2730	1724
Angola	0	0	0	0	1	4	4495	1129
Argentina	2	12	28570	4300	2	12	20024	2824
Belgium	7	22	18926	1740	8	47	177035	11400
Benin	0	0	0	0	3	9	18545	2602
Brazil	2	12	28570	4300	3	22	56088	4196
Cameroon	2	13	11893	1730	1	8	10453	1730
Canada	1	1	1724	1724	2	15	125924	9200
Chile	1	1	1724	1724	1	1	1724	1724
China	1	20	154674	9200	2	34	280224	11400
Congo	0	0	0	0	3	10	19497	2262
Côte d'Ivoire	2	13	11893	1730	3	24	41371	2602
Ecuador	1	1	1724	1724	1	1	1724	1724
Egypt	1	11	84118	9200	1	20	157736	9200
France	9	42	100277	9200	9	45	159741	11400
Gabon	1	8	10453	1730	3	14	23245	2262
Gambia	2	8	8454	1500	2	11	13348	1520
Germany	3	10	8709	1500	4	27	133215	11400
Ghana	2	13	11893	1730	3	12	20582	2602
Guinea	2	10	12955	1730	2	10	11633	1835
Hong Kong	1	10	77700	9200	2	34	280224	11400
India	0	0	0	0	1	6	33536	5618
Italy	5	9	12667	1730	6	14	45831	5618
Japan	1	9	70556	8600	1	14	124200	9200
Liberia	1	2	2204	1102	1	3	4352	1512
Malaysia	1	9	70556	8600	2	25	234630	11400
Malta	2	6	7913	1730	3	15	117135	11400
Mauritania	1	2	2204	1102	1	3	4352	1512
Netherlands	6	27	101494	8600	6	30	151918	11400
Nigeria	1	4	6705	1730	2	20	39187	2602
Norway	1	1	1724	1724	1	1	1724	1724
Oman	0	0	0	0	1	6	33536	5618
Panama	0	0	0	0	1	9	45594	5624
Peru	1	1	1724	1724	1	1	1724	1724
Portugal	3	7	5190	937	4	14	12428	1129
Saudi Arabia	1	11	84118	9200	3	16	86917	6402
Senegal	3	21	20347	1730	5	27	42907	2546
Sierra Leone	2	8	8454	1500	1	8	8996	1520
Singapore	1	11	84118	9200	4	19	159532	11400

Spain	12	29	43992	4300	15	66	230452	9200
Sri Lanka	1	11	84118	9200	0	0	0	0
Taiwan	1	11	84118	9200	0	0	0	0
Togo	1	4	6705	1730	4	10	20427	2546
UAE	0	0	0	0	2	26	189560	11400
UK	3	11	8543	1500	6	43	191070	11400
United States	1	1	1724	1724	3	24	171518	9200
Uruguay	2	12	28570	4300	2	10	33724	4196

United States

Importing Country	Carriers	Ships	TEU	Max size	Carriers	Ships	TEU	Max size
Algeria	2	5	3910	1724	2	5	4363	1724
American Samoa	3	6	8874	1656	2	2	2250	1128
Angola	2	7	4001	925	2	7	4118	925
Antigua and Barbuda	2	4	3388	1102	1	2	1317	660
Argentina	7	27	72064	4253	4	16	40615	4253
Aruba	4	11	11469	1550	2	8	7801	1118
Australia	8	48	101191	2890	8	29	63107	2890
Bahamas	7	45	124690	5060	8	58	215231	6742
Barbados	5	14	10544	1145	2	4	3452	1122
Belgium	21	112	395295	7024	19	90	277958	6732
Belize	2	5	1947	712	2	5	2098	712
Bermuda	3	3	1080	374	3	3	1080	374
Brazil	12	52	123931	4253	11	45	119652	4884
Cameroon	2	6	3193	925	2	7	4118	925
Canada	27	173	748023	6750	27	180	873588	10000
Cayman Islands	2	3	933	509	2	3	933	509
Chile	8	24	51955	3501	7	27	75440	5060
China	26	448	2070683	8468	27	423	2142915	9200
Colombia	16	65	120955	3501	16	68	155657	5060
Congo	1	2	1444	925	1	2	1850	925
Costa Rica	9	33	38146	2046	11	26	29732	2078
Côte d'Ivoire	2	3	2279	1000	1	3	2706	973
Cuba	1	4	2667	972	1	3	2673	974
Dominica	2	3	1317	519	2	3	1317	519
DominicanRep	15	63	124457	4253	11	53	113669	5050
Ecuador	9	24	25280	2764	9	24	24220	2764
Egypt	11	73	314682	6600	12	75	394205	9200
El Salvador	3	13	18088	1728	3	6	6870	1684
Equatorial Guinea	2	7	3712	925	2	7	4118	925
Fiji	3	6	15330	2890	3	6	13622	2456
France	17	96	378262	6742	18	90	354127	6732
Fch Polynesia	7	16	29596	2456	6	12	22915	2456
Gabon	2	6	3193	925	2	7	4118	925
Germany	25	143	556999	7024	23	126	432855	6732

Ghana	2	3	2488	1000	1	3	2706	973
Greece	2	30	115317	5060	1	4	2639	677
Grenada	3	12	10308	1118	3	11	10010	1118
Guam	2	10	26186	2824	2	10	26186	2824
Guatemala	13	51	56711	3026	12	44	48139	2410
Guyana	4	14	11628	1118	4	13	11327	1118
Haiti	3	6	2485	644	3	6	3112	1203
Honduras	10	31	30586	2046	10	32	34812	2078
Hong Kong	25	316	1508003	8238	25	301	1563625	10000
Iceland	2	3	1477	712	2	2	832	712
India	11	57	217618	5754	9	38	150062	5060
Indonesia	2	13	23321	1888	1	10	18733	1888
Israel	1	26	113131	5060	1	14	69776	5060
Italy	17	140	536917	6600	17	114	434553	7024
Jamaica	7	47	136753	5060	11	49	144372	5060
Japan	19	196	902662	8468	18	188	941245	9200
Jordan	0	0	0	0	1	9	43328	5060
Korea, Rep.	22	230	954558	8468	21	199	885658	10000
Lebanon	1	4	2186	608	0	0	0	0
Libya	1	4	2186	608	1	4	2639	677
Malaysia	7	42	244026	6600	8	56	347258	9200
Malta	3	9	27178	3266	2	5	24523	5085
Mexico	23	114	269744	6742	20	113	298303	6732
Montserrat	1	2	1021	519	1	2	1021	519
Morocco	1	1	1724	1724	3	24	171518	9200
Netherlands	20	95	321526	5060	22	96	359294	5608
New Caledonia	3	6	13586	2456	3	6	13622	2456
New Zealand	8	48	101191	2890	8	29	63107	2890
Nicaragua	3	15	17794	1728	3	7	4781	1613
Nigeria	3	8	4953	1000	3	10	6824	973
Norway	1	1	1724	1724	1	1	1724	1724
Oman	1	28	155502	6600	2	27	138155	6742
Pakistan	4	21	61996	4306	8	27	104934	4506
Panama	18	147	572375	5624	18	135	554601	5624
Papua New G	1	4	6624	1656	0	0	0	0
Peru	11	29	51130	3501	11	36	81323	5060
Portugal	4	19	69925	5926	2	14	58067	5060
Puerto Rico	10	30	52304	4050	7	24	27939	2078
Romania	1	12	43785	3840	0	0	0	0
Russia	1	8	4036	700	1	7	3303	700
Saint Lucia	4	13	11859	1118	4	13	12215	1118
St Vincent	4	14	12575	1145	3	10	10112	1122
Samoa	3	6	8874	1656	2	2	2460	1338
Saudi Arabia	10	56	229816	5888	10	44	202690	7024
Singapore	14	73	315494	6750	13	73	373727	8200

South Africa	5	15	28806	2754	4	12	25701	3022
Spain	11	103	418646	6600	11	106	502706	9200
Sri Lanka	14	64	300261	5888	9	50	274695	7024
St. KittsNevis	3	5	2637	660	3	5	2634	660
Suriname	3	11	9298	1118	3	10	8997	1118
Sweden	1	5	14540	2908	1	5	14540	2908
Syria	1	4	2186	608	0	0	0	0
Taiwan	20	180	884204	8063	19	173	889567	10000
Thailand	7	35	162987	6750	8	36	175886	8200
Trinidad	10	29	37973	2808	6	16	14653	1122
Turkey	3	20	50561	3840	2	8	7229	1155
Ukrain	1	12	43785	3840	0	0	0	0
UAE	9	38	153550	5754	10	48	206111	5624
UK	16	106	408638	6472	15	86	331862	6732
Uruguay	3	12	42707	3951	0	0	0	0
Venezuela	17	64	124621	4050	11	48	99235	4255
Viet Nam	0	0	0	0	5	24	80979	4900