University of Piraeus
Dept. of Maritime Studies
MSc in Shipping

International Shipping and World Trade

Supervising Professor: Merikas Andreas
Author: Tsaini Penelope

International Shipping
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Introduction

International Shipping and World Trade

Introduction

We live in a global society which is supported by a global economy, and that economy simply could not function the way it does if it were not for ships and the shipping industry. Shipping is truly the linchpin of the global economy: without shipping, intercontinental trade, the bulk transport of raw materials and the import/export of affordable food and manufactured goods would simply not be possible.

Shipping is perhaps the most international of all the world's great industries and one of the most dangerous. It has always been recognized that the best way of improving safety at sea is by developing international regulations that are followed by all shipping nations. Regulating the maritime industry to

promote safety and security and prevention of pollution from ships worldwide has been the function of the International Maritime Organization since its inception in 1959. Of all the sectors that make up the global transport infrastructure, shipping probably has the lowest public profile and the least representative public image. Its importance is not well known although not a single area of our life remains unaffected by it. The IMO Council at its 93rd session in November 2004 endorsed the proposal of Secretary-General Mr. Efthimios Mitropoulos that the theme for World Maritime Day 2005 would be "International Shipping - Carrier of World Trade". The theme was chosen to provide an ideal opportunity to draw attention to the vital role that shipping plays in underpinning the international economy and its significant contribution to international trade and the world economy as the most efficient, safe and environmentally friendly method of transporting goods around the globe. IMO's response to current environmental challenges was the theme chosen for 2007 and "IMO: 60 years in the service of shipping. for 2008. The latter was chosen as an appropriate way in which to celebrate the 60th anniversary of the adoption of the IMO Convention (1948) and the 50th anniversary of its entry into force (1958). Climate change: a challenge for IMO too! is the theme chosen for 2009.

Chapter One
Globalization and international trade

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Globalization and international trade

It may seem obvious to say that, today, we live in a global world, and it is certainly true that international trade among all the nations and regions of the world is nothing new. From the Phoenicians, through the Egyptians, the Greeks and the Carthaginians, the Chinese, the Vikings, the Omanis, the Spaniards, the Portuguese, the Italians, the British, the French, the Dutch, the Polynesians and Celts, the history of the world is a history of exploration, conquest and trade by sea.

But there is no doubt that we have now entered a new era of global interdependence from which there can be no turning back. In today's world, national boundaries offer little impediment to multi-national corporations: cars with far-eastern brands are not only sold but also assembled in Europe, while European brands are assembled and sold in North America; western energy companies invest millions of dollars in Asia and the Far-East and the strategy and investment decisions they make can affect millions of people all over the world.

The high-flyers of the business world can cross oceans in just hours, communicating by e-mail and telephone as they go. In the financial markets, brokers and traders have thrown off the constraints of time zones and distance and now access the world markets via computer. In the 21st century, industries such as computer software, media and fashion have no obvious geographical dimension and recognize no physical boundaries. In today's consumer world, the same brands are recognized, understood and valued all over the world.

The process of globalization and the factors that have enabled it to evolve were recognized by the Secretary-General of the United Nations, Mr. Kofi Annan, in 2000. He observed,

"Globalization has been made possible by the progressive dismantling of barriers to trade and capital mobility, fundamental technological advances, steadily declining costs of transport, communication and computing. Its integrative logic seems inexorable, its momentum irresistible.."

Looking back into history, we can trace the stages through which we have progressed to arrive at this new world order. There was a time when, for any given community, the most important raw materials, the most important products and the most important markets were essentially local. But, as interaction between communities grew, trade developed and regional specialties, often founded on the availability of particular raw materials or on saleable skill-sets that had been developed over time, began to emerge.

As the world became more developed, proximity to raw materials and to markets became the factors that, above all others, shaped the world's economy and, in particular, the major trade patterns and shipping routes. Eventually, the great seaborne trades became established:

- coal from Australia, Southern Africa and North America to Europe and the Far East
- grain from North and South America to Asia, Africa and the Far East
- iron ore from South America and Australia to Europe and the Far East
- oil from the Middle East, West Africa, South America and the Caribbean to Europe, North America and Asia

and now we must add to this list

- containerized goods from the People's Republic of China, Japan and South-east Asia to the consumer markets of the western world.

Global trade has permitted an enormous variety of resources to be widely accessible.

Figure 1: A Year of Global Shipping Routes Mapped by GPS[1]
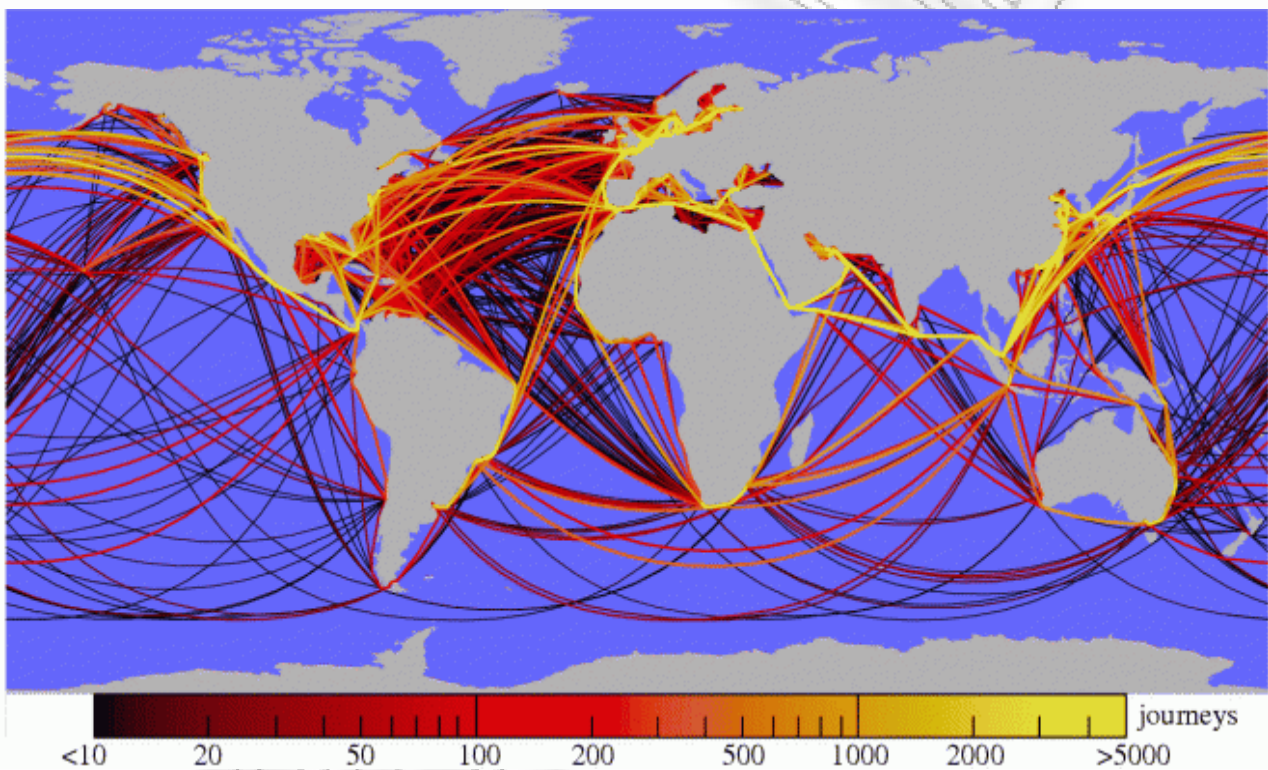
Scientists have come up with the first comprehensive map of global shipping routes based on actual itineraries. The team pieced together a year's worth of travel itineraries from 16,693 cargo ships using data from **_Lloyd's Register Fairplay_** and the **_Automatic Identification System,_** which tracks vessels using a VHF receiver and GPS.

A few hot spots logged the majority of journeys. The busiest port was the Panama Canal, followed by the Suez Canal and Shanghai.

"There is a strong similarity of statistical properties between shipping and aviation networks. But different ship types (e.g., container ships vs. bulk carriers or oil tankers) are characterized by

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[1] Source: "A year of global Shipping Routes mapped by GPS" by Thia Ghose, http://www.wired.com Citation: "The complex network of global cargo ship movements" Pablo Kaluza, Andrea Kölzsch, Michael T. Gastner and Bernd Blasius, J. Royal Society: Interface Image: Bernd Blasius

different movement patterns."
lead author Bernd Blasius, a mathematical modeler at Carl Von Ossietzky University, wrote in an e-mail.

Factoring in both the volume of ships and the number of other ports each is connected to, these are the top ports in the world:

1. Panama Canal
2. Suez Canal
3. Shanghai
4. Singapore
5. Antwerp
6. Piraeus
7. Terneuzen
8. Plaquemines
9. Houston
10. Ijmuiden
11. Santos
12. Tianjin
13. New York and New Jersey
14. Europoort
15. Hamburg
16. Le Havre
17. St Petersburg
18. Bremerhaven
19. Las Palmas
20. Barcelona

Today, international trade has evolved to the point where almost no nation can be fully self-sufficient. Every country is involved, at one level or another, in the process of selling what it produces and acquiring what it lacks: none can be dependent only on its domestic resources. Global trade has fostered an interdependency and inter-connectivity between peoples who would previously have considered themselves completely unconnected. The potential benefits are clear: growth can be accelerated and prosperity more widespread; skills and technology can be more evenly dispersed, and both individuals and countries can take advantage of previously unimagined economic opportunities.

Shipping has always provided the only really cost-effective method of bulk transport over any great distance, and the development of shipping and the establishment of a global system of trade have moved forward together, hand-in-hand. Those with access to natural resources; those with the ability to convert those resources into useful products for the good of mankind; and those with a requirement and the wherewithal to utilize and consume those end products are all joined by the common thread of shipping. The eternal triangle of producers, manufacturers and markets are brought together through shipping. This has always been the case and will remain so for the foreseeable future.

1.1. Shipping and the global economy

It is generally accepted that more than 90 % of global trade is carried by sea. Throughout the last century the shipping industry has seen a general trend of increases in total trade volume. Increasing industrialization and the liberalization of national economies have fuelled free trade and a growing demand for consumer products. Advances in technology have also made shipping an increasingly efficient and swift method of transport.

As with all industrial sectors, however, shipping is not immune to occasional economic downturns, a notable fall in trade occurred, for example, during the worldwide economic recession of the early 1980s.

However, although the growth in seaborne trade was tempered by the Asian financial crisis of the late 1990s, there was a healthy growth in maritime trade since 1993. The shipping industry is now feeling the effects of the slowdown in world trade and the reduced demand for shipping services. The industry faces problems created by the collapse of the global debt markets and the exit of many equity investors from shipping at a time when the order-book for new ships is at an all-time high and shipyard capacity has grown to an unprecedented level.

Two years ago, global trade was booming, fuelled by the phenomenal growth taking place in several rapidly-industrializing countries, most notably the People's Republic of China and India. Shipping was gaining full benefit from an upsurge in demand for the transport of all kinds of raw materials, components, finished goods, fuel and foodstuffs needed to feed a growing world's healthy appetite.

Money was relatively easy to come by and spending it was firmly in fashion. By and large, shipping was enjoying some of its most profitable results of modern times, if not of all time.

As the first decade of the 21st century draws to a close, the world now faces an uncertain and difficult future. Who, two years ago, could possibly have predicted the truly traumatic year, from an economic perspective hat 2008 turned out to be? The financial crisis that has, since the middle of 2008, beset the world has, by now, touched most people and few, if any, will be immune from its consequences in the current year. Shipping has already been bitten and markets, which saw VLCC rates drop from Worldscale W170 to W81 and the Baltic Dry Bulk Index plummet by more than 11,000 points from an all-time high of 11,793 in just a few months, have claimed their casualties and it seems unavoidable that more are bound to follow.

1.1.1. Overview of the effect of the economic crisis on the shipping industry

The demand for seaborne trade is closely linked to the economy therefore the demand for shipping is expected to be influenced by the current economic crisis. According to UNCTAD, an estimated 80% of the total trade volume is carried by sea which reached 8.02 billion tons in 2007 and translated into ton-miles, accounts for 32.9 billion of ton-miles. The fleet has been growing steadily over the years in number of ships and DWT enjoying a boom in shipping. Table 1 provides an overview of the development of the world fleet since 1980 in terms of number of vessels (ships of 100 gt and above), DWT, total deliveries, scrapping activities as well as seaborne trade volume. It also provides fleet activity in terms of ton-miles. As of the end of 2008, the effect of the economic crisis cannot be seen yet since the effect is lagged. The order book was still high at the end of December 2008, however there was more scrapping activities than in the previous year and as demand started to drop, an estimated 3.6% of the world fleet was laid up as a first reaction.

Table 1: Summary of world fleet development (1980-2008)

	1980	1990	2000	2005	2006	2007	2008*
Total Fleet (Nr)	73,832	78,336	87,546	92,105	94,936	97,504	99,741
Total Fleet (m.Dwt)	619.6	658.4	808.4	960.0	1,042.3	1,117.8	1,198.3
Total Active Fleet (m.Dwt)	n/a	594.7	790.0	952.8	1,032.2	1,105.7	1,155.5
Total Orderbook (m.DWT)	43.22	46.03	89.86	216.32	238.83	335.79	509.71
Total Deliveries (m.DWT)	24.12	20.67	45.04	69.25	75.13	79.38	90.70
Total Scrapping (m.DWT)	13.37	4.61	22.33	5.45	6.44	4.85	10.20
Total cargo demand (m.tons)	3,704	4,156	5,918	7,259	7,616	8,022	8,270
Total ton miles (billions)	16,777	17,121	23,693	27,570	31,447	32,932	33,950
Fleet productivity (ton miles.DWT)^	27,077	28,789	29,991	28,936	30,466	29,784	29,382
Estimated laid up	n/a	63.7	18.4	7.2	10.1	12.1	42.8
% of World fleet laid up	n/a	9.7%	2.3%	0.8%	1.0%	1.1%	3.6%

*Notes: * fleet productivity is calculated based on active fleet and not total fleet in terms of DWT, 2008 figures are partly estimates . Source: compiled based on data from UNCTAD and Clarksons,*

According to Stopford[2], ship economic cycles are determined by the continuous adjustment of demand and supply for the shipping service where demand is closely related to the world economy along other factors and supply by the supply of vessels, fleet productivity, shipbuilding and scrapping.

In simpler worlds, the freight rates will determine the equilibrium between supply and demand. This note will try to quantify the current situation and compare it to the end of December 07 and 08. Based on data from Clarksons and UNCTAD, Table 2 presents a summary of the development of the supply and demand side for shipping and presents three scenarios for 2009.

Table 2: Supply and Demand for shipping Dec 07-Apr 09

	End Dec-07	End Dec-08	As of April 09 and estimated scenarios for 2009		
Projected decrease in trade			6%	5%	4%
Total Fleet (m.DWT)	1,117.8	1,198.3	1,220.3	1,220.3	1,220.3
Total cargo carrying capacity (m.tons)	8,607	9,227	9,397	9,397	9,397
Total demand of seaborne trade (m.tons)	8,022	8,270	7,774	7,881	7,955
Total surplus converted into DWT (m.DWT)	76.0	124.3	210.8	196.8	187.3
% of Total Fleet	6.8%	10.4%	17.3%	16.1%	15.3%

Source: data from UNCTAD and Clarksons

Two approaches were used . one based on projected ton miles and the other based on converting demand of seaborne trade into DWT where a conversion factor from UNCTAD[3] is used based on the year 2007 (the conversion factor is 7.7 tons carried by DWT which is kept constant for the scenarios).

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[2] Stopford M, Maritime Economics, 3rd Edition, Routledge, New York, 2009

[3] UNCTAD, Review of Maritime Transport, 2008

The total fleet represents capacity is calculated and compared to total demand for seaborne trade. The surplus is then converted into DWT surplus for the fleet and the percentage to the total world fleet is given.

For the 2009 estimates, three scenarios in terms of projected decrease in demand is given . namely 6%, 5% and 4%. The World Bank projected a decrease in trade volume by 6.1% as presented in the first part of this paper. It should be noticed that the projections in Table 2 only represent a very high level and simplistic overview of the surplus in tonnage. It gives however an indication of the situation.

One can clearly see that the surplus in shipping will continue to widen and one can expect to see further cancellations of ships from the order book and a substantial amount of increase in scrapping or further tonnage being laid up in order to adjust the market and provide some recovery of freight rates.

The results confirm a recent analysis by Clarksons[4] for the dry bulk market where distress demolitions reached 7% of the fleet in 1978 and 13% in 1983. The current projection for 2010 is around 18% of the current fleet in terms of DWT. Table 3 projects 15% to 17% depending on trade development.

The expected decrease in shipping activities will ease the demand for seafarers, in particular the shortage of officers which is estimated to be 83,900 by 2012 by the 2008 Drewry Manpower Report[5] and which was one of the areas of emphasize for the IMO campaign to attract entrants to the shipping industry (November 2008). The estimate however assumes positive fleet growth which is unlikely in the current situation.

1.2. Growth in World seaborne trade

World seaborne trade figures i.e. the amount of goods actually loaded aboard ships have increased considerably since the 70's and in 2007, reached 8.02 billion tons of goods loaded, a volume increase of 4.8% over the previous year. During the past three decades, the annual growth rate was 3.1 %.

Strong demand for maritime transport services was fuelled by growth in the world economy and international merchandise trade. Despite rising energy prices and their potential implications for transport costs and trade and despite growing global risks and uncertainties from factors such as soaring non-oil commodity prices, the global credit crunch, a depreciation of the US dollar, and an unfolding food crisis, the world economy and trade have, so far, shown relative resilience. (Source: UNCTAD Review of Maritime Transport 2008).

Table 3: Development of World Seaborne Trade (selected years in million of tones)

Year	Oil	Main Bulks	Other Cargo	Dry	Total (all cargoes)
1970	1,442	448	676		2,566
1980	1,871	796	1,037		3,704
1990	1,755	968	1,285		4,008
2000	2,163	1,288	2,533		5,984
2006	2,595	1,876	3,181		7,652
2007	2,681	1,997	3,344		8,022

Main Bulks: Iron Ore, Grain, Coal, bauxite/alumina and phosphates

Source: UNCTAD Review of Maritime Transport 2008

[4] Stopford M, When will bulk shipping reach its breaking point, Shipping Intelligence Network, http://www.clarksons.net/markets/default.asp
[5] Precious Associates and DM Jupe Consulting, Annual Report Manning-2008, Drewry Publishing,   London, 2008

1.2.1 General Trends

Estimated data for 2009 indicate that world seaborne trade volumes fell by 4.5 % suggesting, as noted by some observers, that 2008 marked the end of the "super cycle". In 2009, total goods loaded amounted to 7.8 billion tons, down from 8.2 billion tons recorded in 2008 (tables 2.1 and 2.2).

Developing countries continued to account for the largest share of global seaborne trade (61.2 % of all goods loaded and 55.0 % of all goods unloaded), reflecting their growing resilience to economic setbacks and an increasingly leading role in driving global trade. Developed economies' shares of global goods loaded and unloaded were 32.4 % and 44.3 % respectively. Transition economies accounted for 6.4 % of goods loaded, and 0.8 % of goods unloaded.

Taken on a regional basis, Asia continues to dominate, with a share of 41 % of total goods loaded, followed in decreasing order by the Americas, Europe, Oceania and Africa. Since 2008, Oceania has overtaken Africa as the fourth loading region, which reflects, in particular the rise in iron ore and coal shipments from Australia.

Over the past four decades, developing economies have consistently loaded (exported) more international cargo than they have unloaded (imported). At the same time, the volume of cargo unloaded (imports) has been growing rapidly, catching up with the volume of goods loaded (exports). This development reflects – in particular – the evolution in the global production system which has seen production of manufactured products increasingly being outsourced to distant locations in developing countries, with a corresponding growth in intra-company trade – particularly trade in parts and components used as production inputs. Robust industrial growth in emerging developing countries and the associated demand for raw materials also have a role to play. Another factor is the income or wealth effect. Bigger incomes allow for the emergence of a middle class in developing countries, which drives changes in the scale and composition of consumer demand. This may involve increased demand for finished products and consumer goods, and more diversified and sophisticated food items.

As demand for maritime transport services derives from global economic growth and the need to carry international trade, shipping could not be sheltered from the contractions in the global GDP and merchandise trade. The following table reviews the main developments in seaborne trade in 2009, including by cargo type, and provides an outlook for 2010. It also considers a number of challenges that are facing the shipping industry and global seaborne trade.

Table 4 Exports and Imports by area

Country group	Year	Goods loaded (Exports)				Goods unloaded (Imports)			
		Total	Crude	Products	Dry cargo	Total	Crude	Products	Dry cargo
		Millions of tons							
World	2006	7 682.3	1 783.4	914.8	4 984.1	7 885.9	1 931.0	894.2	5 060.8
	2007	7 983.5	1 813.4	933.5	5 236.6	8 136.1	1 995.5	904.3	5 236.3
	2008	8 210.1	1 785.2	946.9	5 478.0	8 272.7	1 942.1	964.1	5 366.5
	2009	7 842.8	1 724.5	924.6	5 193.6	7 908.4	1 877.8	957.3	5 073.3
Developed economies	2006	2 460.5	132.9	336.4	1 991.3	4 164.7	1 282.0	535.5	2 347.2
	2007	2 608.9	135.1	363.0	2 110.8	3 990.5	1 246.0	524.0	2 220.5
	2008	2 708.5	129.0	394.3	2 185.1	4 007.9	1 251.1	523.8	2 233.0
	2009	2 540.1	118.6	355.0	2 066.5	3 499.8	1 149.8	529.4	1 820.6
Transition economies	2006	410.3	123.1	41.3	245.9	70.6	5.6	3.1	61.9
	2007	407.9	124.4	39.9	243.7	76.8	7.3	3.5	66.0

	Year								
	2008	431.5	138.2	36.7	256.6	89.3	6.3	3.8	79.2
	2009	501.8	151.3	41.6	309.0	60.5	6.1	3.0	51.4
Developing economies	2006	4 811.5	1 527.5	537.1	2 747.0	3 650.6	643.4	355.5	2 651.6
	2007	4 966.6	1 553.9	530.7	2 882.0	4 068.9	742.2	376.8	2 949.8
	2008	5 070.2	1 517.9	515.9	3 036.4	4 175.5	684.7	436.5	3 054.3
	2009	4 800.8	1 454.6	528.0	2 818.2	4 348.1	721.9	424.8	3 201.3
Africa	2006	704.0	353.8	86.0	264.2	357.4	41.0	39.9	276.5
	2007	708.9	362.5	81.8	264.6	375.9	45.5	45.0	285.3
	2008	741.9	379.2	83.5	279.3	366.1	44.8	44.2	277.0
	2009	682.1	335.0	82.8	264.4	365.6	43.7	42.7	279.2
Americas	2006	1 030.7	251.3	93.9	685.5	373.4	49.6	60.1	263.7
	2007	1 067.1	252.3	90.7	724.2	415.9	76.0	64.0	275.9
	2008	1 112.2	234.6	93.0	784.6	433.8	74.2	66.9	292.7
	2009	1 050.6	219.4	89.6	741.7	387.0	74.2	65.4	247.5
Asia	2006	3 073.1	921.2	357.0	1 794.8	2 906.8	552.7	248.8	2 105.3
	2007	3 187.1	938.1	358.1	1 890.8	3 263.6	620.7	260.8	2 382.1
	2008	3 211.8	902.7	339.3	1 969.9	3 361.9	565.6	318.3	2 477.9
	2009	3 061.7	898.7	355.5	1 807.5	3 582.4	604.1	313.1	2 665.2
Oceania	2006	3.8	1.2	0.1	2.5	12.9	0.0	6.7	6.2
	2007	3.5	0.9	0.1	2.5	13.5	0.0	7.0	6.5
	2008	4.2	1.5	0.1	2.6	13.8	0.0	7.1	6.7
	2009	6.3	1.5	0.2	4.6	13.1	0.0	3.6	9.5

					Percentage share %				
World	2006	100.0	23.2	11.9	64.9	100.0	24.5	11.3	64.2
	2007	100.0	22.7	11.7	65.6	100.0	24.5	11.1	64.4
	2008	100.0	21.7	11.5	66.7	100.0	23.5	11.7	64.9
	2009	100.0	22.0	11.8	66.2	100.0	23.7	12.1	64.2
Developed economies	2006	32.0	7.4	36.8	40.0	52.8	66.4	59.9	46.4
	2007	32.7	7.5	38.9	40.3	49.0	62.4	57.9	42.4
	2008	33.0	7.2	41.6	39.9	48.4	64.4	54.3	41.6
	2009	32.4	6.9	38.4	39.8	44.3	61.2	55.3	35.9
Transition economies	2006	5.3	6.9	4.5	4.9	0.9	0.3	0.3	1.2
	2007	5.1	6.9	4.3	4.7	0.9	0.4	0.4	1.3
	2008	5.3	7.7	3.9	4.7	1.1	0.3	0.4	1.5
	2009	6.4	8.8	4.5	5.9	0.8	0.3	0.3	1.0
Developing economies	2006	62.6	85.6	58.7	55.1	46.3	33.3	39.8	52.4
	2007	62.2	85.7	56.9	55.0	50.0	37.2	41.7	56.3
	2008	61.8	85.0	54.5	55.4	50.5	35.3	45.3	56.9
	2009	61.2	84.3	57.1	54.3	55.0	38.4	44.4	63.1

Africa	2006	9.2	19.8	9.4	5.3	4.5	2.1	4.5	5.5
	2007	8.9	20.0	8.8	5.1	4.6	2.3	5.0	5.4
	2008	9.0	21.2	8.8	5.1	4.4	2.3	4.6	5.2
	2009	8.7	19.4	9.0	5.1	4.6	2.3	4.5	5.5
Americas	2006	13.4	14.1	10.3	13.8	4.7	2.6	6.7	5.2
	2007	13.4	13.9	9.7	13.8	5.1	3.8	7.1	5.3
	2008	13.5	13.1	9.8	14.3	5.2	3.8	6.9	5.5
	2009	13.4	12.7	9.7	14.3	4.9	3.9	6.8	4.9
Asia	2006	40.0	51.7	39.0	36.0	36.9	28.6	27.8	41.6
	2007	39.9	51.7	38.4	36.1	40.1	31.1	28.8	45.5
	2008	39.1	50.6	35.8	36.0	40.6	29.1	33.0	46.2
	2009	39.0	52.1	38.5	34.8	45.3	32.2	32.7	52.5
Oceania	2006	0.0	0.1	0.0	0.0	0.2	0.0	0.7	0.1
	2007	0.0	0.1	0.0	0.0	0.2	0.0	0.8	0.1
	2008	0.1	0.1	0.0	0.0	0.2	0.0	0.7	0.1
	2009	0.1	0.1	0.0	0.1	0.2	0.0	0.4	0.2

Source: Compiled by the UNCTAD secretariat on the basis of data supplied by reporting countries and as published on the relevant government and port industry websites, and by specialist sources.

1.3 Seaborne trade by cargo type

1.3.1 Crude oil, petroleum products and gas

Since the recession took hold in the second half of 2008, energy demand has tapered off, starting in late 2008 and continuing during 2009. Consequently, world shipments of tanker trade volumes, including crude oil, petroleum products and liquefied natural gas (LNG) fell by 3.0 % in 2009. Total tanker cargoes loaded amounted to 2.65 billion tons, down from 2.73 billion tons loaded in 2008.

A. Crude oil shipments

In 2009, seaborne shipments of crude oil fell by an estimated 3.4 % to 1.72 billion tons. Major oil producers, including from the OPEC countries of Western Asia, were the largest loading areas for crude oil, together with the economies in transition, South and East Asia, Central Africa, South America's northern and eastern seaboards, North Africa, West Africa, and the Caribbean and Central America. The major unloading areas included North America, South and East Asia, Europe, Japan and South-East Asia. The strong growth in oil demand from China, India and Western Asia, and the resilient growth in Latin America, are being translated into proportionately growing shares of crude shipments being unloaded in those regions. With relatively high stocks of crude oil in developed economies and a depressed global demand for oil, major oil importers in advanced economies have recorded falls in their crude oil shipments and have reduced their import requirements.

After the exceptionally good times in the pre-2008 period, the tanker market faced difficult times in the first half of 2009. However, as the global outlook improved later in the year and optimism about future recovery took hold, conditions for the tanker trade improved. Cold weather in Northern Europe and China, coupled with an increasing propensity for low prices to prompt the use of tankers to store oil in anticipation of higher resale prices in the future, have helped support recovery in oil demand. As for supply, slippage and increased storage have helped to moderate the excess ship supply in 2009. Some 25 % of tanker capacity was not delivered to schedule in 2009 (to reduce supply), while as many as 34 very large crude carriers (VLCCs) were identified as having been used for storage. Global storage of crude oil in VLCCs was estimated to have reached at least 80 million barrels in early 2009[6].

Looking ahead, and the effect of the downturn notwithstanding, the crude oil trade is set to reverse the 2009 trend and resume growth in 2010, albeit at a slow pace and against a rapidly growing fleet. Although 2010 is expected to mark the end of the remaining single-hull tankers, even a scrapping of this entire capacity will not address the concerns about oversupply, as single-hull tankers have, in any case, been progressively less active. Additionally, increasing oil prices mean that the use of tankers for storage will decline, adding more ship tonnage capacity to the existing fleet. With the dry bulk sector also having suffered from the crisis, it makes much less sense to convert tankers into bulkers; in this context, achieving a balance between demand and supply will remain a major challenge.

Figure 2 Worldwide Oil producing countries

http://en.wikipedia.org/wiki/OPEC

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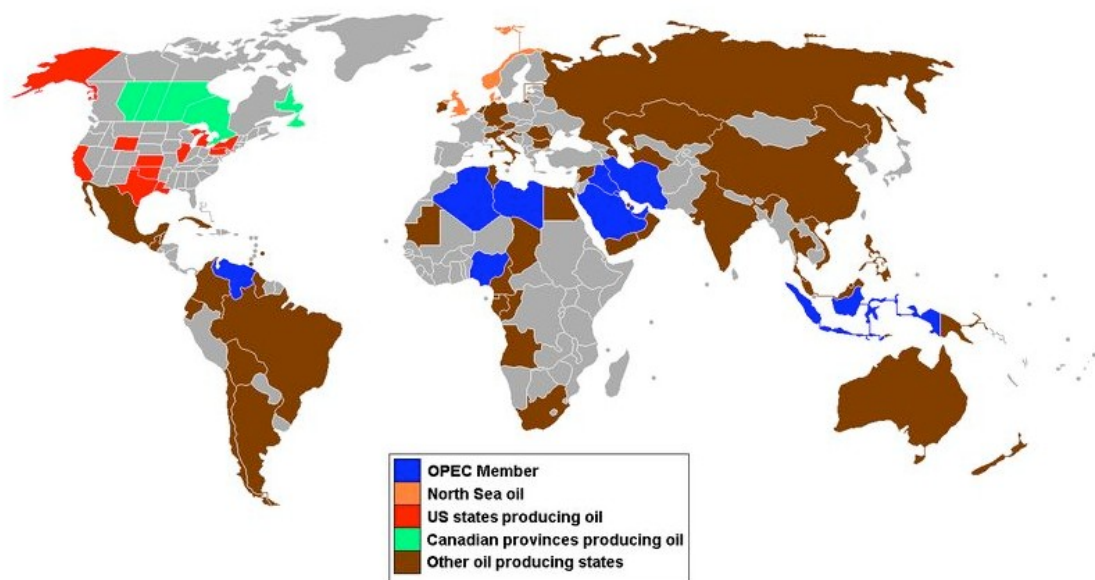
[6]   United States Energy Information Administration (2009). Current monthly energy chronology. February

B. Shipments of petroleum products

The year 2009 was also considered a poor year for the product tanker segment, as demand for petroleum products, in terms of scale, structure and geographical distribution, is also influenced by the wider global economic context. Demand for gasoline and diesel for cars declined, while demand for distillates and other products used for industrial purposes remained subdued. The depressed demand has led to a buildup of oil inventories, with significant volumes stored on tankers around the world. This was reflected in world shipments of petroleum products, which fell by 2.4 % to reach 924.6 million tons in 2009.

Developed regions accounted for 38.4 % of world petroleum products loaded, and 55.3 % of world petroleum products unloaded. Developing economies accounted for 57.1 % of world products loaded, and 44.4 % of world products unloaded. Economies in transition accounted for the balance. The outlook in 2010 for the petroleum products trade has improved with the improved global economic prospects and a projected growth in demand from non-OECD countries. Nevertheless, and as was the case for crude oil and the VLCC sector, this recovery is set against a significant product tanker capacity expansion.

C. Liquefied natural gas shipments

According to data from BP, the LNG trade grew by 7.2 % in 2009, taking the total volume of LNG shipped to 242.8 billion cubic meters (bcm). This contrasts with declining natural gas consumption and production levels, as well as diminishing shipments by pipeline. LNG imports into the United States increased by over 28 % in 2009, due to cold weather and to lower prices, which made gas compete with coal for power generation. Of particular note is the continuing growth in unconventional gas production in the United States. This represents a major turnaround from previous production declines, and calls into question whether large-scale imports will be needed by the United States. Imports into Europe are expected to slowly recover in 2010, with the United Kingdom becoming a net importer in 2009, importing 10.2 bcm of LNG.

The large LNG importers in Asia – namely Japan, the Republic of Korea, and Taiwan Province of China – also recorded a fall. This trend is expected to be reversed due to the economic recovery and the rise in industrial demand. China remains a smaller energy market compared to these large Asian importers.

However, given its projected growth path, China is expected to emerge as an important new import market, as illustrated by the recent Memorandum of Understanding signed between Qatar and China providing for additional long-term supplies of LNG to China.

On the supply side, the main global exporters of LNG were located in developing regions, with Qatar being the largest, followed, in descending order, by Malaysia, Indonesia, Algeria and Nigeria. The depressed economic situation in 2009 resulted in setbacks to a number of LNG projects, with many being delayed due to difficulties in securing financing. Although financing problems existed even before the crisis, more challenging economic times have exacerbated the problem. Nevertheless, global LNG production is expected to expand in 2010, driven mainly by Qatar. The trade will be further dependent on new LNG liquefaction projects expected to start up in 2010–2016, and the proliferation of projects intended to use floating storage and gasification units. While the general outlook for LNG shipping may be positive, it is still necessary, in the short term, to restore balance in the market. Like other tanker segments, the LNG sector is suffering from overcapacity too, with many ships reported to be idle in 2010.

1.3.2 Dry cargo shipments: major and minor dry bulks and other dry cargo

In 2009, dry cargo volumes, including dry bulks, container cargo and other dry cargoes, recorded their first drop since 1983 (by 5.2 %) and stood at about 5.2 billion tons. The share of dry cargo in the total volume of goods loaded has been growing over the years, and continues to account for the lion's share of the total (66.2 %).

A. Major dry bulks: iron ore, coal, grain, bauxite/alumina and phosphate rock

In 2009, trade in the five major bulks increased by 1.6 % to 2.1 billion tons. The main drag on growth in the major dry bulk volumes resulted from the severe contraction in the volumes of bauxite and alumina (23.2 %) and phosphate rock (38.7 %). This drop was more than offset by the growing volumes of two major dry bulks, namely iron ore and coal. In 2009, the world dry bulk trade continued to hold strong, due in particular to China's $ 586 billion stimulus package and massive infrastructure expenditure in support of domestic demand.

During the fourth quarter of 2008, the outlook for the dry bulk sector was looking bleak when the plummeting Baltic Exchange Dry Index (BDI) made the headlines. In tandem with the BDI, steel production – the main driver of dry bulk shipments – fell sharply in 2009 (by 8.0 %); this brought total output down to 1,219.7 million tons (compared to 1,326.5 million tons in 2008). At the same time, world demand for steel contracted by 6.7 % in 2009, with the total volume standing at 1,124.3 million tons[7]. Surprisingly, however, the dry bulk market, driven mainly by strong demand from China, did not perform as badly as expected, with volumes of iron ore – the key raw input material used for the production of steel – performing particularly well.

B. Iron ore shipments

Together with coking coal, iron ore is the main ingredient used in the production of steel. The major iron ore producers include Australia, Brazil, Canada, China, India, the Russian Federation, South Africa, Sweden and the United States. The key players in the sector continue to be Vale in Brazil, BHP Billiton, and Rio Tinto (Australia/United Kingdom). With the failure of an earlier attempt by BHP Billiton to take over Rio Tinto, a non-binding agreement was signed between the two companies in 2009. The joint venture represents a major collaboration within the global iron ore industry. Another important development relating to iron ore is the rapidly evolving pricing system, which will make the annually negotiated fixed contract prices less relevant in the future. Short-term quarterly benchmark prices are introducing a more dynamic pricing system and are replacing the annual contracts which prevailed for over 40 years.

The world's iron ore shipments were estimated at 907 million tons in 2009, an increase of 8.6 % over 2008. Major exporters included Australia, Brazil, India and South Africa, while smaller exporters included Canada, Mauritania, Peru and Sweden.

Together, Australia and Brazil accounted for about 70.0 % of world iron ore exports; Australia remained the world's largest exporter with 362.4 million tons (an increase of more than 17.0 % compared to 2008). Exports from Brazil amounted to 266.0 million tons, a drop of 5.6 % measured against 2008.

Surging iron ore imports into Asia more than offset the falling imports in other regions, and they help to explain the resilience shown by the dry bulk market in 2009. The engine of growth was China, whose iron ore imports increased dramatically (by 40.1 % over 2008), owing in particular to the Chinese Government's fiscal stimulus package, which boosted domestic demand for steel at a time when the export market was depressed. This was reflected in robust growth in China's steel production, which expanded by 13.5 % to reach around 568 million tons, and which allowed China to remain the world's leading steel producer. Other major importers included Japan (24.8 % less than in 2008), Western Europe (38.2 % less than in 2008) and the Republic of Korea (14.6 % less than in 2008). With the exception of Egypt, India, the Islamic Republic of Iran, and Qatar, all other smaller importers, such as Taiwan Province of China and Pakistan, reduced their iron ore imports.

Looking ahead, global iron ore trade volumes are expected to expand by 7.9 % in 2010. While China's exceptional performance in 2009 is not expected to be repeated in 2010, China will, nevertheless, continue to power growth in the global iron ore trade. As China continues to actively invest in overseas ventures in Africa, Australia and South America to provide raw materials to its growing economy, demand for bulkers and trade flow patterns are likely be affected, including

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[7]   World Steel Association. World steel short range outlook. 12 October 2009 and 4 October 2010.

through potential increases in distances travelled and ton-miles.

C. Coal shipments

In 2009, the volume of coal shipments (thermal and coking) totaled 805 million tons, a volume equivalent to the 2008 level (799 million tons). Thermal coal exports increased by around 2.1 % and reached 590.0 million tons (73.3 % of world coal shipments). Shipments of coking coal, which is also used in steel production, fell by 2.7 % to 215 million tons. Together, Australia and Indonesia accounted for 62.2 % of the world's thermal coal shipments, with Indonesia remaining the world's leading exporter. Indonesia increased its thermal coal exports by a solid 16.8 % to reach 233.5 million tons, while Australia increased its thermal coal exports by around 7.1 %. Other major thermal coal exporters in 2009 included China, Colombia, the Russian Federation, South Africa and the Bolivarian Republic of Venezuela.

Table 5:   Major Coal Importers and Exporters in 2009

Importers		Exporters	
Japan	22 %	Australia	34 %
Europe	21 %	Indonesia	29 %
Republic of Korea	12 %	Russian Federation	8 %
China	11 %	South Africa	8 %
India	9 %	Colombia	8 %
Taiwan Province of China	7 %	United States of America	4 %
Brazil	2 %	Canada	3 %
Malaysia	2 %	China	2 %
Thailand	2 %	Others	5 %
United States of America	2 %		

As regards coking or metallurgical coal used in steel production, Australia remained the world's largest exporter, with a total of 138 million tons – a marginal increase of about 1.0 % over 2008. Australia is well positioned to increase its share of global trade, given the number of mine expansions for coking coal scheduled to be developed over the next five years. These expansion plans suggest a firm commitment both by mines and by infrastructure operators and owners to support the long-term growth of Australia's export coking coal industry. To benefit from the significant export opportunities associated with these expansion plans, a number of major port infrastructure projects are scheduled for the next decade, too. Other lesser exporters, such as Canada, China and the United States, have reduced their export volumes.
The main destinations for both types of coal exports (thermal and coking) are Europe and Japan, which together accounted for 42.7 % of the world's coal imports in 2009. However, over recent years, coal exporters have increasingly focused on Asia. For example, Colombia has started to ship cargo to the Pacific region. South Africa is also looking to intensify its coal exports to Asia. In 2009, India overtook the Netherlands and became the first export market for South Africa's coal. The growth in exports to China, Taiwan Province of China, and India was matched by a reduction in exports from South Africa to Europe and the United States. As noted above, an interesting development in 2009 was the impressive surge of coal imports into China. The total volumes of coking coal imports increased about tenfold, while thermal coal imports almost quadrupled, as the

Government closed many domestic mines considered to be unsafe and as international coal prices became more attractive. Growing domestic energy requirements and low international coal prices have prompted China and other Asian countries, including India, to increase their imports. The surge in coal exports from Australia to China caused port congestion and shipping delays, and increased freight rates.

These emerging trends, affecting the direction of coal shipments as well as their scale, are likely to shape the demand for bulk carriers and to alter bulk trade flows. World coal shipments are forecast to increase in 2010, with thermal coal volumes expected to increase at a slower rate than coking coal. An issue to monitor is the pricing system, which is rapidly evolving. Differential pricing is gaining ground, and an increasing share of sales is being priced on quarterly terms rather than annual benchmarks.

D. Grain shipments

For the calendar year 2009, world grain shipments are estimated to have fallen by 2.2 % to 316 million tons, with wheat and coarse grains accounting for about 75.0 % of the shipments. The global financial and economic crisis and the subsequent recession have badly hit demand for imported grain in several key importing regions, such as Asia. The use of wheat has been growing at a modest rate in some developing countries (e.g. India), and relatively lower market prices and ample supplies compared to recent years have supported the food demand for wheat. However, the use of wheat and maize for animal feed has declined in many countries, along with the drop in demand for meat. Industrial use of maize and wheat, mainly to produce starch and ethanol, has also been subdued, due to the less favorable economic situation. With the recovery under way, however, the consumption of wheat and maize for industrial purposes is expected to grow. In some countries (e.g. in the European Union), reduced import demand has also reflected the improved weather conditions and better crop yields.

For the crop year 2009/10, volumes of wheat exports are expected to fall at a faster rate than coarse grains (8.7 % as compared with 1.7 %). Wheat exports from the world's five largest exporters (Argentina, Australia, Canada, the European Union and the United States) are expected to fall by 12.4 %. With a prolonged period of drought – considered to be the worst for 70 years – having a detrimental impact on its crop yields, Argentina is projected to record the sharpest drop in wheat exports (47.0 %). The five large exporters are expected to maintain their export volumes of coarse grains (with a marginal fall of less than 1 %). Exports from the European Union are expected to record the largest drop (49.0 %). In the United States, the April 2010 oil spill in the Gulf of Mexico and the difficulty of containing the oil slick caused concerns for the country's grain exporters, as over 50.0 % of all grains exports from United States are shipped from the mouth of the Mississippi.

The drop in grain trade volumes is broad-based, spanning all regions (fig. 1.4 (d)). For example, grain import volumes (for the crop year 2009/10) are expected to fall in the Islamic Republic of Iran (50.3 %), the European Union (31.7 %), the Commonwealth of the Independent States (19.7 %), Morocco (19.6 %), Algeria (19.3 %), Tunisia (17.9 %), the Philippines (13.9 %), Cuba (12.5 %) and Thailand (11.8 %). Despite the projected declines, there are reports of wheat imports picking up in some countries, including China and India, owing to lower prices. A fall in grain trade volumes will impact upon the demand for handymax31 ships, which, in addition to servicing the steel product trade, are the main grain carriers. The handymax fleet is growing, with shipping supply outpacing growth in demand. In the medium to longer term, developments and policy measures taken in some countries are also likely to reshape the demand for maritime transport services, where increased grain imports/exports in some parts of the world are likely to be offset by decreased grain imports/exports elsewhere. Examples of such measures include the efforts to preserve water supplies in Saudi Arabia, which implies the end of production of irrigated wheat, and increased imports. By contrast, Algeria is planning to cut its wheat imports by at least two thirds until 2014, and to boost domestic production.

From the perspective of developing countries – especially the most vulnerable countries and the LDCs – the grain trade is of particular importance, given their heavy reliance on food imports. The vulnerability of these countries to developments in the agricultural sector in general, and in the grain segment in particular, is further emphasized by the two recent major crises facing the world. The food crisis and the financial crisis and economic downturn constitute major setbacks to efforts aimed at enhancing food security and alleviating poverty, including in the LDCs. In spite of the expansion in the global production of grains recorded over the past decade, the growth in the world's population, with its associated needs, and, more recently, the sharp increase in the use of grains for biofuels and other industrial purposes, have the potential to usher in greater challenges. These may include supply shortages, ever-increasing food prices, malnourishment and poverty. Although lower than at their peak levels of 2008, and despite the effects of the economic downturn, food prices are still high by recent historical levels. In addition to the market volatility, due, among other things, to weather related risks and their impact on production and supply levels, other emerging concerns – for example, climate-related impacts such as droughts, floods and water salination – are compounding the challenge.

E. Bauxite/alumina and phosphate rock

In 2009, world trade in bauxite and alumina fell sharply, by 23.2 %, and totaled 66.0 million tons. With Europe, North America and Japan being the main importers, the rapid contraction reflected, in particular, the effect of the crisis on the industrial production of those economies. The major loading areas for bauxite included Africa, the Americas, Asia and Australia. Australia was also a major exporter of alumina, accounting for about half of world exports, while Jamaica contributed a growing share.

Rock phosphate volumes declined sharply, too, from 31 million tons in 2008 to 19 million tons in 2009 – a severe drop of 38.7 %. This, in part, reflected the depressed demand in the United States, the main importer. The falling demand was due, in particular, to reduced grain production and demand for fertilizers, and to the impact of tighter credit on the sale of farm inputs such as fertilizers[8]. Phosphate rock volumes are expected to pick up in 2010, partly reflecting the expected expansion in production capacity. Plans are under way for the expansion of existing operations, for example in Brazil, China, Egypt, Finland, Morocco, the Russian Federation and Tunisia; while new mines are scheduled to open in 2010/11 in Australia, Namibia, Peru and Saudi Arabia. Any such expansion will likely affect supply and demand, as well as trade flows and the pattern of the minor bulk trade, and by extension, the handysize shipping market.

F. Dry cargo: minor bulks

In 2009, the minor bulk trades (manufactures, agribulks, metals and minerals) were badly hit by the economic downturn and fell by 12.6 % compared to 2008, down to 851 million tons. Manufactures accounted for the biggest share of the total minor dry bulks (44.6 %), followed by metals and minerals (27.7 %) and agribulks (27.5 %). The largest decline (19.0 %) was suffered by goods directly associated with the construction industry, namely metals and minerals, including coke, pig iron, scrap, manganese ore and cement. Trade volumes of manufactures, namely steel and forest products – also linked to the construction and housing sector – fell by 13.8 %. In contrast, agribulks suffered a relatively milder contraction – a 2.9 % fall as compared with 2008. With the onset of the global recovery in world output, minor bulk volumes are expected to expand by a strong 10.0 % in 2010, with trade in manufactures, metals and minerals rising sharply.

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[8]   Macqueen J (2009). Major to minor. *Lloyd's Shipping Economist*. Volume 31. October.

1.4 Seaborne Trade Outlook

1.4.1 Supply and demand

The recovery on the demand side is a welcome development for shipping. Global GDP and international seaborne trade are expected to further recover, with developing economies, and China in particular, charting the course. Other fast-growing Asian countries, including India and Indonesia, are adding further speed. Projections by Clarkson Research Services Limited indicate that global seaborne trade (i.e. goods loaded) is expected to reverse the trend of 2009 and to grow by 5.0 % by the end of 2010.

For shipping, a recovery on the demand side is not sufficient to fully emerge. An important factor influencing the outlook is the demand and supply imbalance and its implications for shipping companies, freight markets and shipyards. Significant fleet expansion, prompted by the promise of an extended boom period, is a major concern. The shipping industry is facing large-scale orders for ships, with a contract value, however, no longer consistent with the pre-crisis asset values, given the fall in ship prices. At the same time, shipowners and shipyards are still confronted with financing and cash flow difficulties. With falling trade volumes in 2009, and with growth in the supply of ships expected to outpace growth in the demand for ships, prospects remain difficult and uncertain for the shipping industry. Delaying and cancelling ship deliveries and orders, renegotiating contracts, laying-up and idling ships, and accelerating scrapping have helped to reduce the gap, and to some extent, manage the imbalance.

A strong and sustained growth in global trade, as well as measures to reduce ship supply capacity – including an exceptional increase in scrapping and very low levels of ship deliveries – are vital.

1.4.2. Oil Prices

Oil prices[9] increased from $89.9 per barrel in January 2008 to $133 pb in July, and then again fell more than 70.0 % to $39.7 in December 2008. By mid-2009, growth in oil prices had gained speed, reaching $71.4 pb in August and $73.0 pb in December. During the first quarter of 2010, oil prices rose further, to $82 pb in April.

The Organization of Petroleum Exporting Countries OPEC, reports that low oil prices in particular have reduced producers' profitability and the cash flows for oil-producing companies, which, in turn, limits the prospects for investing in oil supply expansion projects, including non-conventional oil supply. Energy companies are reported to have reduced the drilling of oil and gas wells, and to have cut back spending on refineries, pipelines and power stations. For example, the number of oil and natural gas rigs operating in the United States is reported to have fallen from 1,992 rigs on 7 November 2008 to 999 rigs in the week of 22 May 2009. Many ongoing projects have been slowed, while some planned projects have been postponed or cancelled. Since October 2008, over 20 planned large-scale upstream oil and gas projects, involving around 2.0 million barrels per day (mbpd) of oil production capacity, have been deferred indefinitely or cancelled, with most of these projects involving oil sands in Canada. geological constraints could undermine energy security. Views about the sustainability of oil vary, with some observers maintaining that oil is running out and becoming increasingly more difficult and costly to extract. The debate over a potential "peak oil" is gaining momentum, with the IEA warning that "the world is heading for a catastrophic energy crunch that could cripple a global economic recovery as most of the major oil fields in the world have passed their peak production."[10]

As far as shipping is concerned, these considerations are extremely important, both for maritime transport service providers and for trade. Oil dominates the global energy mix, supplying 95.0 % of the energy that fuels world transport. In common with other modes of transport, shipping relies

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[9] United States Energy Information Administration. Weekly all-country spot price FOB weighted by estimated export volumes.
[10] International Energy Agency (2009). *World Energy Outlook 2009*. See also: Connor S (2009). Warning: oil supplies are running out fast, catastrophic shortfalls threaten economic recovery. *The Independent.* 3 August; and Tanaka N (2009). 2009–2010: non-OPEC oil production and biofuels will decline. *Shipping and Finance*. August.

heavily on oil for propulsion, and is not yet in a position to effectively adopt energy substitutes. The trends that have been observed indicate that higher oil prices are immediately translated into higher fuel costs. Reflecting a period of rising oil prices, bunker prices (Rotterdam 380 (cSt)) averaged $234 per ton in 2005, $293 per ton in 2006, $345 per ton in 2007 and $472 per ton in 2008. Similarly, the rapid fall in oil prices in 2009 resulted in a drop of 25.0 % in the 2009 average bunker price (Rotterdam 380 cSt). This positive correlation could have serious financial implications for shipping companies and for their bottom lines, since fuel costs have been shown to account for up to 60.0 % of the total operating costs of a shipping company (depending on the type of ship and service)[11]. By extension, rising operating costs for shipowners entail a potential rise in transport costs paid by maritime transport users, namely shippers and trade.

All things told, in addition to shipping demand and supply considerations and the importance of narrowing the imbalance between the relevant growth rates, the maritime industry and international seaborne trade are facing many challenges. More specifically, the connection between energy security, oil and fuel prices, and transport costs – as well as the climate change challenge – are emerging as increasingly important considerations that need to be taken into account by shipping.

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[11] World Shipping Council (2008). Record fuel prices place stress on ocean shipping. 2 May. Available at http://www.worldshipping.org/pdf/WSC_fuel_statement_final.pdf.

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Chapter Two
World Trading Fleet

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World Trading Fleet

In January 2010, there were 102,194 commercial ships in service, with a combined tonnage of 1,276,137 thousand dwt (table 2.1). Oil tankers accounted for 450 million dwt (35.3 %) and dry bulk carriers for 457 million dwt (35.8 %), representing annual increases of 7.6 and 9.1 % respectively.

Container ships reached 169 million dwt – an increase of 4.5 % over 2009 – while the fleet of general cargo ships declined during 2009, reaching 108 million dwt in January 2010, corresponding to just 8.5 % of the fleet. Among other vessel types, the tonnage of liquefied gas carriers continued to grow, reaching 41 million dwt. This was an increase of almost 12 % over 2008, in which deliveries had already reached a historic high.

Table 6   World fleet size by vessel types, 2009–2010 (thousands of dwt)

Types	2009	2010	% change
Oil Tankers	418 266	450 053	7.6
Bulk carriers	418 356	456 623	9.1
General cargo ships	108 881	108 232	-0.6
Container ships	161 919	169 158	4.5
Other types of ships	84 895	92 072	8.5
Liquefied gas carriers	36 341	40 664	11.9
Chemical tankers	8 141	7 354	-9.7
Offshore supply	22 567	24 673	9.3
Ferries and passenger ships	6 083	6 152	1.1
Other/ n.a.	11 762	13 229	12.5
World total	1 192 317	1 276 137	7.0

Table 7   The 35 countries and territories with the largest controlled fleets (dwt), as of January 2010

Country or territory of ownership [b]	Number of vessels			Deadweight tonnage				
	National flag[c]	Foreign flag	Total	National flag[c]	Foreign flag	Total	Foreign flag as a percentage of total	Total as a percentage of world total, 1 Jan. 2010
Greece	741	2 409	3 150	58 478 197	127 616 965	186 095 162	69	15.96
Japan	720	3 031	3 751	14 443 324	168 876 356	183 319 680	92	15.73
China	2 024	1 609	3 633	41 026 075	63 426 314	104 452 389	61	8.96
Germany	458	3 169	3 627	16 926 387	86 969 282	103 895 669	84	8.91
Republic of Korea	775	425	1 200	18 865 348	26 017 970	44 883 318	58	3.85
United States	920	945	1 865	21 529 559	19 761 196	41 290 755	48	3.54
Norway	820	1 148	1 968	14 102 299	26 416 491	40 518 790	65	3.48
China, Hong Kong	350	330	680	21 225 179	13 216 692	34 441 871	38	2.95
Denmark	360	580	940	12 937 381	20 261 040	33 198 421	61	2.85
Singapore	598	387	985	17 377 216	15 232 228	32 609 444	47	2.80
China, Taiwan Province of	92	545	637	3 769 436	25 721 242	29 490 678	87	2.53
United Kingdom	357	437	794	8 948 902	17 262 720	26 211 622	66	2.25
Italy	608	236	844	15 277 538	7 176 463	22 454 001	32	1.93
Russian Federation	1 472	515	1 987	5 860 326	13 571 242	19 431 568	70	1.67
Canada	210	223	433	2 303 767	15 980 908	18 284 675	87	1.57
Bermuda	0	180	180	0	17 192 696	17 192 696	100	1.47
India	443	66	509	14 280 882	2 885 687	17 166 569	17	1.47
Turkey	558	664	1 222	7 139 310	9 629 658	16 768 968	57	1.44
Iran (Islamic Republic of)	74	91	165	853 008	12 839 807	13 692 815	94	1.17
Saudi Arabia	74	98	172	1 740 908	11 464 923	13 205 831	87	1.13
Belgium	85	149	234	5 581 132	6 966 887	12 548 019	56	1.08
Malaysia	380	100	480	8 783 140	3 655 990	12 439 130	29	1.07
United Arab Emirates	63	354	417	698 818	8 525 258	9 224 076	92	0.79
Indonesia	778	90	868	7 069 985	1 868 730	8 938 715	21	0.77
Cyprus	129	206	335	3 542 642	5 339 340	8 881 982	60	0.76
Netherlands	528	272	800	4 828 515	3 989 203	8 817 718	45	0.76
Brazil	128	33	161	2 272 241	5 463 966	7 736 207	71	0.66
France	180	224	404	2 994 852	4 390 712	7 385 564	59	0.63
Sweden	136	217	353	1 453 082	5 570 298	7 023 380	79	0.60
Viet Nam	460	84	544	4 560 855	2 230 992	6 791 847	33	0.58
Kuwait	39	47	86	3 835 639	2 767 625	6 603 264	42	0.57
Spain	173	231	404	1 405 579	3 839 347	5 244 926	73	0.45
Isle of Man	2	30	32	4 968	4 817 656	4 822 624	100	0.41
Switzerland	35	122	157	1 023 109	2 925 288	3 948 397	74	0.34
Thailand	298	45	343	3 007 664	785 892	3 793 556	21	0.33
Total (35 countries)	15 068	19 292	34 360	348 147 263	764 657 064	1112 804 327	69	95.46
World total	17 279	21 133	38 412	368 251 867	797 468 296	1165 720 163	68	100.00

Source: Compiled by the UNCTAD secretariat, on the basis of data supplied by IHS Fairplay.
Vessels of 100 gross tons and above.

2.1 Leading Fleets

In January 2010, the 35 largest flags of registration accounted for 93.23 % of the world fleet – a further increase from the 92.9 % share of one year earlier. The largest flag of registration continues to be Panama, with 289 million dwt 22.6 % of the world fleet), followed by Liberia (142 million dwt; 11.1 %), the Marshall Islands (6.1 %), Hong Kong, China (5.8 %), Greece (5.3 %) and the Bahamas (5.02 %). Together, these top 5 registries accounted for 51 % of the world's deadweight tonnage, and the top 10 registries accounted for 71.3 % – both figures showing increases over the previous year.

As regards the number of ships, the largest fleets are flagged in Panama (8,100 vessels of 100 GT and above), the United States (6,546), Japan (6,221), Indonesia (5,205), China (4,064) and the Russian Federation (3,465). Except for Panama, these fleets include a large number of general cargo and other smaller vessels that are employed in coastal, inter-island and inland waterway cabotage services.

The flag of Indonesia recorded the highest percentage growth, mostly due to nationally owned vessels that had previously been registered under foreign flags that moved back to the national registry in 2009. In January 2010, only 20.9 % of Indonesian controlled tonnage was using a foreign flag, down from 29.4 % one year earlier.

The top 10 major open and international registries in 2010 comprised the same flags as in 2009. They increased their combined market share by a further 0.32 percentage points between 1 January 2009 and 1 January 2010 to reach 55.44 % (table 2.8). The 10 major open and international registries have their highest shares among dry bulk carriers (61.3 %) and oil tankers (55.5 %). Among the remaining registries, which include national registries and smaller open registries, the share of developed countries decreased by 0.34 percentage points during 2009 to reach 17.9 % in January 2010, while developing countries kept their share approximately stable at 25.2 %. Developed countries' fleets have their highest shares among container ships (26.3 %), while developing countries provide   their flag most often to general cargo vessels (35.6 % of the world fleet in this vessel category).Among the developing regions, Asia has by far the largest share, with 22.4 % of the world fleet, followed by Latin America and the Caribbean, with 1.8 %.

The following section examines in greater detail the links between vessel ownership and registration for the 10 major open and international registries and the 35 major countries and territories of ownership.

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Table 8   Top 35 Flags of Registration

Flag of registration	Number of vessels	Share of world total, vessels	Deadweight tonnage, 1 000 dwt	Share of world total, dwt	Cumulated share, dwt	Average vessel size, dwt	Dwt growth 2010/2009, percentage
Panama	8 100	7.93	288 758	22.63	22.63	35 649	5.40
Liberia	2 456	2.40	142 121	11.14	33.76	57 867	12.80
Marshall Islands	1 376	1.35	77 827	6.10	39.86	56 561	13.70
China, Hong Kong	1 529	1.50	74 513	5.84	45.70	48 733	16.10
Greece	1 517	1.48	67 629	5.30	51.00	44 581	7.29
Bahamas	1 426	1.40	64 109	5.02	56.03	44 957	3.38
Singapore	2 563	2.51	61 660	4.83	60.86	24 058	1.42
Malta	1 613	1.58	56 156	4.40	65.26	34 815	10.84
China	4 064	3.98	45 157	3.54	68.80	11 112	12.90
Cyprus	1 026	1.00	31 305	2.45	71.25	30 512	-0.26
Republic of Korea	3 009	2.94	20 819	1.63	72.88	6 919	-7.88
Norway (NIS)	560	0.55	18 648	1.46	74.34	33 300	-8.24
United Kingdom	1 697	1.66	17 758	1.39	75.73	10 464	11.33
Japan	6 221	6.09	17 707	1.39	77.12	2 846	14.86
Germany	948	0.93	17 570	1.38	78.50	18 534	-2.11
Italy	1 635	1.60	17 276	1.35	79.85	10 566	19.84
Isle of Man	363	0.36	16 711	1.31	81.16	46 036	15.12
India	1 349	1.32	14 970	1.17	82.33	11 097	-2.16
Denmark (DIS)	490	0.48	13 500	1.06	83.39	27 551	8.18
Antigua and Barbuda	1 237	1.21	13 034	1.02	84.41	10 536	4.65
United States	6 546	6.41	12 792	1.00	85.42	1 954	7.40
Indonesia	5 205	5.09	10 471	0.82	86.24	2 012	49.04
Malaysia	1 344	1.32	10 225	0.80	87.04	7 608	8.88
Bermuda	155	0.15	10 107	0.79	87.83	65 204	-1.86
France (FIS)	165	0.16	8 330	0.65	88.48	50 487	16.61
Turkey	1 344	1.32	7 878	0.62	89.10	5 862	5.37
Saint Vincent and the Grenadines	1 043	1.02	7 329	0.57	89.67	7 027	-0.96
Russian Federation	3 465	3.39	7 283	0.57	90.24	2 102	2.00
Netherlands	1 332	1.30	7 252	0.57	90.81	5 445	6.42
Philippines	1 823	1.78	7 033	0.55	91.36	3 858	4.19
Belgium	246	0.24	6 575	0.52	91.88	26 728	-0.85
Viet Nam	1 415	1.38	5 415	0.42	92.30	3 827	16.14
Cayman Islands	150	0.15	3 961	0.31	92.61	26 404	-8.19
China, Taiwan Province of	641	0.63	3 944	0.31	92.92	6 153	-7.11
Kuwait	209	0.20	3 856	0.30	93.23	18 451	-0.23
Total top 35 flags of registration	68 262	66.80	1 189 679	93.23	93.23	17 428	7.44
World total	102 194	100.00	1 276 137	100.00	100.00	12 487	7.03

Source: Compiled by the UNCTAD secretariat, on the basis of data supplied by IHS Fairplay.

2.1.1. Top 20 controlled fleets

Based on total deadweight tonnage controlled by parent companies located in these countries and territories. Figures in brackets represent percentage of world fleet. (Source: Based on the UNCTAD Review of Maritime Transport 2008. (Data as of 1 January 2008, compiled by the UNCTAD secretariat on the basis of data supplied by Lloyd's Register Fairplay)

1. Greece (16.81%)
2. Japan (15.58%)
3. Germany (9.07%)
4. People's Republic of China (8.18%)
5. Norway (4.51%)
6. United States (3.84%).
7. Republic of Korea (3.63%
8. Hong Kong, China (3.22%).
9. Singapore (2.76%)
10. Denmark (2.64%)
11. Taiwan, China (2.52%)
12. United Kingdom (2.50%)
13. Canada (1.81%)
14. Russian Federation (1.74%)
15. Italy (1.71%)
16. India (1.55%)
17. Turkey (1.27%
18. Saudi Arabia (1.25%)
19. Belgium (1.17%)
20. Malaysia (1.08%)

2.1.2 Major liner shipping operators

The container ship fleet is operated by liner shipping companies. These companies may not necessarily own the vessels, but they operate them to provide regular containerized shipping services. In January 2010, the top 10 liner companies operated 50.2 % of the container ship fleet, a slight decrease from the 51.2 % in January 2009 (table 2.4). During the downturn in demand, the major operators tended to reduce their chartered-in tonnage by returning vessels to owners.

Table 9   Top 20 ranked operators of Container Ships as of January 2010

Ranking	Operator	Country/ territory	Number of vessels	Average vessel size	TEU	Share of world total, TEU	Cumulated share, TEU	Percentage of growth in TEU over 1 Jan. 2009
1	Maersk Line	Denmark	427	4 090	1 746 639	11.7%	11.7%	0.3%
2	MSC	Switzerland	394	3 827	1 507 843	10.1%	21.8%	-0.2%
3	CMA CGM Group	France	289	3 269	944 690	6.3%	28.1%	9.2%
4	Evergreen Line	China, Taiwan Province of	167	3 549	592 732	4.0%	32.0%	-5.9%
5	APL	Singapore	129	4 068	524 710	3.5%	35.6%	11.4%
6	COSCON	Singapore	143	3 468	495 936	3.3%	38.9%	0.9%
7	Hapag-Lloyd Group	Germany	116	4 053	470 171	3.1%	42.0%	-5.3%
8	CSCL	China	120	3 809	457 126	3.1%	45.1%	5.9%
9	Hanjin	Republic of Korea	89	4 495	400 033	2.7%	47.8%	9.4%
10	NYK	Japan	77	4 670	359 608	2.4%	50.2%	0.4%
11	MOL	Japan	90	3 871	348 353	2.3%	52.5%	-10.0%
12	K Line	Japan	89	3 655	325 280	2.2%	54.7%	5.1%
13	Yang Ming	China, Taiwan Province of	80	3 966	317 304	2.1%	56.8%	-0.1%
14	OOCL	China, Hong Kong	63	4 609	290 350	1.9%	58.7%	-20.3%
15	Hamburg Sud	Germany	88	3 226	283 897	1.9%	60.6%	10.7%
16	HMM	Republic of Korea	53	4 905	259 941	1.7%	62.4%	0.5%
17	Zim	Israel	64	3 371	215 726	1.4%	63.8%	-14.3%
18	CSAV	Chile	66	2 968	195 884	1.3%	65.1%	38.0%
19	UASC	Kuwait	45	3 924	176 578	1.2%	66.3%	13.6%
20	PIL	Singapore	84	2 071	173 989	1.2%	67.5%	17.6%
Total top 20 carriers			2 673	3 774	10 086 790	67.5%	67.5%	1.4%
Others			6 862	709	4 864 981	32.5%	32.5%	8.6%
World container ship fleet			9 535	1 568	14 951 771	100.0%	100.0%	3.6%

In the first place there is Maersk Line with a total of 427 vessels maintaining its position by growing a 0.3% compared to 2009. In the second place, we have MSC with a total of 394 vessels slightly decreasing a 0.2% compared to 2009. CMA CGM group has taken the third place with a total of 289 vessels and big increase since 2009 at the rate of 9.2%. The top 20 liner companies remained unchanged from the previous year, with 11 companies from developing economies and 9 from developed economies. Asian economies dominated the list, with 14 companies from that region. One of the top 20 carriers is from Latin America. Five are from Europe, including the top three liner companies, which are headquartered in Denmark, Switzerland and France.

2.2 Overview of Ship Types

A. Bulk carriers

Bulk carriers are often called the workhorses of the international shipping fleet. They can be thought of as simple, relatively unsophisticated but nevertheless highly efficient vessels that typically transport commodities such as grain, coal and mineral ores. If tankers provide the fuel that powers the modern economy, bulk carriers are responsible for moving the raw materials that are its lifeblood.
In terms of size, the world's bulk carrier fleet has three categories; ships of up to 50,000 dwt are known as "handy-sized"; ships of 50,000 to 80,000 dwt are known as Panamax. (being the largest ships able to transit the Panama Canal) and ships of more than 80,000 dwt are known as Capesize Bulk Carriers embrace a number of variations . single or double hull, with or without their own cargo-handling equipment . but all are characterized by the huge hatch covers that can be rolled or lifted away to reveal to cavernous holds beneath.

Table 10   (deadweight tones) No. in World fleet

	Size (in Dwt)	No (in world fleet)
Handies	10 - 49,999 dwt	3212
Panamax	50 - 79,999 dwt	1453
Capesize	80,000+ dwt	796

Source: Intercargo

Because of the nature of the cargoes they carry . often heavy, high-density commodities . accidents involving bulk carriers have sometimes resulted in considerable loss of life. There is, for example, a special chapter on bulk carrier safety in the Safety of Life at Sea Convention **(SOLAS)**, covering such topics as damage stability, structural strength, surveys and loading.

Table 11   Bulk Carriers Fleet by size, in mill Dwt

Start	10-69,999	70-119,999	120-199,999	200,000+	Total
1994	55.2	49.7	32.8	128.9	266.6
1995	55.4	50.7	32.8	126.8	265.7
1996	55,6	51.7	32.4	125.5	265.2
1997	56.6	52.7	32.8	127.8	269.9
1998	57.7	54.3	33.7	128.5	274.2
1999	59	57.1	35.3	128.5	279.9
2000	61.3	59.9	35.2	127,9	284.2
2001	61.8	60.9	36.2	132.3	291.1
2002	62.7	60.3	34.1	127.6	284.7
2003	63.5	62.8	35.3	127,4	288.9
2004	65.2	68.9	37.7	128.1	299.9
2005	68.2	74.6	39.9	134.1	316.8
2006	72.9	82.5	43.4	142.1	340.9
2007	79	88.7	46.6	146.3	360.5
2008	85.7	96.3	48.9	150,2	381.1
2009	94.1	102.9	48.7	156.2	401.9
2010	107.2	108.1	60.5	156.4	432.2

| 2011 | 110 | 115.8 | 63.8 | 161.4 | 451 |

Table 12   New Orders in Bulk Carriers by size in mill Dwt

	10-59,999	60-79,999	80,000+	Total
1994	5.4	3,0	8.4	16.8
1995	5.1	4.7	7.9	17.7
1996	4.8	5.5	2.4	12.7
1997	4.4	6.5	7,0	17.9
1998	2.3	4,6	3.5	10.4
1999	4.4	9.4	4.7	18.5
2000	6.5	3.7	4.3	14.5
2001	3.5	2.2	3,0	8.7
2002	7.7	4.8	9.4	21.9
2003	7.7	7.7	12.6	27.9
2004	9.5	4.5	14.8	28.8
2005	6,0	1.8	9,0	16.8
2006	14.6	2.3	22.2	39,0
2007	38.6	7.1	115.9	161.6
2008	31.7	5.1	54.6	91.4
2009	11.8	3.4	18.4	33.6
2010	21.1	6.3	56,0	83.5

Table 13   Bulk Carriers sold for Scrapping in mill Dwt

	10-59,999	60-79,999	80,000+	Total
1994	1,2	0,9	1,9	4,0
1995	0,6	0,4	1,3	2,3
1996	2,3	2,5	3,3	8,1
1997	2,8	1,5	3,2	7,5
1998	3,9	3,3	4,4	11,6
1999	2,6	2,5	3,8	8,9
2000	2,3	0,7	1,0	4,0
2001	3,4	1,8	1,8	7,0
2002	3,3	1,5	1,0	5,8
2003	2,4	0,5	0,6	3,4
2004	0,6	0,1	0,1	0,8
2005	0,6	0,2	0,2	1,1
2006	1,1	0,6	0,5	2,2
2007	0,5	0,1	0,1	0,7
2008	1,8	1,2	1,5	4,6
2009	6,3	1,8	1,6	9,8
2010	2,7	0,4	2,9	5,9

Table 14   Second Hand prices for 5 year old Bulk Carriers in mill $

Start	Handymax	Panamax	Capesize	Others	Total
1994	18,0	20,0	34,0	130.6	649.4
1995	20,0	20,8	32,0	134.8	656.3
1996	21,0	22,0	28,0	140.9	668.1
1997	19,0	19,0	25,0	149.1	686.3
1998	18,5	20,5	30,0	155.3	707.1
1999	13,0	14,0	23,5	160.9	717.3
2000	16,0	17,5	28,0	166.7	731,0
2001	15,5	16,0	27,0	169.3	749,0
2002	12,2	13,4	22,0	174.7	760.6
2003	14,8	16,5	27,5	181.2	777.7
2004	20,5	27,5	45,0	189.6	804.9
2005	31,0	38,0	64,0	200.5	849.6
2006	25,5	29,0	55,0	213.3	907.6
2007	40,5	45,5	80,0	232.5	969.4
2008	73,0	88,0	138,0	254.2	1.040,8
2009	26,5	30,0	49,0	278.3	1.117,1
2010	28,0	34,0	55,0	300	1.213,3
2011	31,5	37,5	52,0	315.1	1.303,7

B. Tankers

Tankers make up the second largest category. There are many different types of tanker, ranging from those carrying crude oil, through those built to transport various refined hydrocarbon products, to highly specialized ships that carry liquefied petroleum gas and natural gas. There are even tankers designed to carry cargoes such as fresh water, wine or orange juice. In size terms, the heyday of the tanker was the early 1970s, when the so-called Ultra-Large Crude Carriers (ULCCs), capable of lifting more than half a million tones of cargo, sailed the oceans. After the oil crisis of the 70s, tanker owners became a little more modest in their ambitions and, since then, most large modern tankers are in the 200-300,000 tonnage range. These are still massive vessels and enormously expensive to build, but today's high price of oil means they can pay for themselves in a relatively short period of time.

The world's largest ship today is a 564,765 dwt tanker with an interesting and varied history. She was built in 1976 and having undergone some work to increase her load-carrying capacity, was finally floated two years later and named **Seawise Giant**. At first, she operated in the Gulf of Mexico and the

Caribbean Sea, but was then used for exporting oil from Iran during the Iran-Iraq War. In 1986, she was attacked but not sunk in the Strait of Hormuz and at the end of the war in 1989 she was repaired and renamed **Happy Giant**. In 1991, she was renamed again, this time to **Jahre Viking.**

In March 2004, the ship was sold and sent by its new owner to be refitted as a floating storage and offloading unit. There, she was given her current name, **Knock Nevis** and she is operated in the Al Shaheen oilfield in the waters of Qatar.

An increase in demand for LNG carriers reflect concern for global warming; traditionally, these vessels have been propelled by steam turbines but marine engine builders are now offering diesel-electric propulsion as an alternative for such ships: the breakthrough initially coming as a result of the evolution

of the medium speed dual-fuel engine, which allows this cargo gas to be used as a part-

replacement for heavy oil.

Perhaps more typical of the kind of large crude oil carrier being built today is the *Irene SL,* also built in Japan in 2004. Selected as one of the Naval Architect's 50, Significant Ships. of 2004, *Irene SL* has design deadweight of just under 300,000 dwt, a double-hull construction and is capable of handling three different grades of oil simultaneously in her 15 cargo tanks. Her cargo and ballast control systems, including the operation of pumps, valves are all computerized. For safety, inert gas is pumped into the cargo tanks when they are empty and, to comply with the most recent requirements on emissions, the ship is fitted with a scrubber system to clean the exhaust gas.

Table 15   Tankers fleet by size in mill Dwt

Start	10-69,999	70-119,999	120-199,999	200,000+	Total
1994	55.2	49.7	32.8	128.9	266.6
1995	55.4	50.7	32.8	126,8	265.7
1996	55.6	51.7	32.4	125.5	265.2
1997	56.6	52.7	32.8	127.8	269.9
1998	57.7	54.3	33.7	128.5	274.2
1999	59,0	57.1	35.3	128.5	279.9
2000	61.3	59.9	35.2	127.9	284.2
2001	61.8	60.9	36.2	132.3	291.1
2002	62.7	60.3	34.1	127.6	284.7
2003	63.5	62.8	35.3	127.4	288.9
2004	65.2	68.9	37.7	128.1	299.9
2005	68.2	74.6	39.9	134.1	316.8
2006	72.9	82.5	43.4	142.1	340.9
2007	79,0	88.7	46.6	146.3	360.5
2008	85.7	96.3	48.9	150.2	381.1
2009	94.1	102.9	48.7	156.2	401.9
2010	107.2	108.1	60.5	156.4	432.2
2011	110,0	115.8	63.8	161.4	451,0

Table 16   New Orders of Tankers by size in mill Dwt

	10-69,999	70-119,999	120-199,999	200,000+	Total
1994	2,0	1.9	1.7	7.8	13.4
1995	1.3	2.2	1.9	0.8	6.2
1996	1.6	4.3	2.3	5.3	13.5
1997	4,0	6.2	4.8	14.5	29.5
1998	1.8	3.7	2.5	10.8	18.8
1999	2.4	1.9	3.2	8.8	16.3
2000	4.4	6.2	5.8	19.3	35.7

2001	5.8	10.2	3,3	7.6	26.9
2002	5.8	6.8	2.8	3.9	19.3
2003	10	15.2	8.7	15.5	49.3
2004	7.8	10.9	4.5	13,0	36.2
2005	7,0	5.8	1.1	11,0	24.9
2006	16.2	21.6	13.3	30.3	81.5
2007	15.4	13.5	8.3	15,0	52.2
2008	6.3	5.3	5.8	32.8	50.1
2009	1.4	0.6	3.3	5,8	11.1
2010	2.1	6.8	11.3	19,9	40.1

Table 17   Tankers sold for Scrapping by size in mill Dwt

	10-69,999	70-119,999	120-199,999	200,000+	Total
1994	0,6	1,3	1,3	8,6	11,8
1995	0,9	0,5	1,4	7,8	10,6
1996	1,0	0,6	1,1	4,1	6,8
1997	0,3	0,7	0,4	2,0	3,4
1998	0,5	0,7	1,6	4,2	7,0
1999	0,6	2,6	2,9	10,3	16,4
2000	2,0	1,7	2,6	7,1	13,4
2001	1,2	1,9	3,7	8,3	15,1
2002	2,5	1,8	1,8	11,7	17,8
2003	3,5	3,5	1,8	9,0	17,8
2004	2,8	2,6	1,3	1,5	8,2
2005	1,9	1,5	0,4	0,0	3,8
2006	2,0	1,2	0,0	0,0	3,2
2007	2,6	0,7	0,2	0,0	3,5
2008	1,8	0,8	0,2	1,3	4,0
2009	3,0	1,3	1,1	2,4	7,7
2010	5,3	1,8	1,4	3,4	11,9

Table 18   Second Hand Prices for 5 year old Tankers in mill $

Start	MR Product	Aframax	Suezmax	VLCC
1994	20,0	31,0	32,0	55,0
1995	21,0	30,0	33,0	53,0
1996	24,0	31,0	36,0	54,0
1997	24,0	32,0	38,0	60,0
1998	25,0	37,0	42,0	65,0
1999	16,0	26,0	36,0	47,0
2000	19,0	24,0	35,5	53,0
2001	25,5	41,0	49,0	70,0

2002	20,5	31,0	38,0	60,5
2003	21,0	28,0	37,0	52,0
2004	28,0	38,0	48,0	72,0
2005	39,0	56,0	71,5	106,0
2006	45,0	61,5	75,0	113,5
2007	45,0	64,0	81,0	118,0
2008	50,0	68,0	93,0	136,0
2009	38,0	53,0	71,0	102,0
2010	25,0	40,0	56,0	82,0
2011	27,0	40,0	58,0	85,0

C. General Cargo Ships

Although general cargo ships are still the largest single category, the trend among new ships is more and more in favor of specialization, although it could be argued that handy-sized, geared bulk carriers and versatile medium-sized containerships, of which some have the ability to accommodate several different box sizes as well as palletized cargo are the natural successors of the old general cargo vessels.

D. Passenger ships

Passenger ships come next in the world fleet league table. There are two basic categories: which can be summed up as "fun" or "function". In the latter category are those which are designed to move people and, often, vehicles on regular itineraries from one place to another as quickly and cheaply as possible (i.e. ferries) and, in the former, those which the passengers see as a leisure destination in their own right (i.e. cruise ships). In both categories, the size, sophistication and the sheer number of passengers that can be carried have reached mind-boggling proportions. Because of their individuality, as well as their resonance with the great ocean liners of a bygone era, these ships tend to be the best known and most recognized among the general public at large.

One of the finest modern examples is the *Queen Mary II* , built in France for Carnival Corp.'s Cunard in 2004. **QM2** is the largest, longest, tallest, widest ocean liner ever and has cost an estimated $800 million dollars. She incorporates all the very latest international standards with regard to safety,
security and environmental protection, offering her passengers an unparalleled opportunity to experience the wonders of ocean travel in the finest style. The *Independence of the Sea* which was built in Turku (Finland) and started work in Southampton in April 2008 is bigger at 340m and able to carry 4,375 passengers and more than 1,000 crew. It will be surpassed in 2009 by the *Project Genesis*, a £ 700 million vessel which will be able to carry 5,400 guests.

With ships such as this, it is little wonder that, over the past ten or fifteen years, the cruise and passenger sector has become one of the industry's most vibrant sectors and is now a major force within shipping, both in terms of technological development and commercial success.

E. Container ships

But the one sector which can be said to have transformed the face of shipping, certainly in the latter half of the 20th century, is that of container shipping. Unheard of before the 1960s, the container is now ubiquitous and is the standard unit of cargo for just about every form of manufactured item on the planet (there are exceptions: cars, for example, are transported in

special ships designed solely for the purpose).

Today's giant containerships typically operate between purpose-built ports served by massive cranes that can load and unload containers at astonishing rates. Containership operators can offer fixed sailing schedules with tight delivery margins and these ships are now an integral part of the modern, multimodal transport and logistics industry.

The largest containership is the **M/S Emma Maersk**, built by Odense Steel Shipyard. The ship which was delivered to Maersk in 2006 measures 397x56m and is able to carry 11,000 20-ft. containers. The **MSC Daniela** built in 2008 by Samsung Shipbuilding & Heavy Industries Co. Ltd for the Mediterranean Shipping Company is the size of an aircraft carrier; Daniela completed its maiden run packed with 13,800 containers each big enough to contain the contents of a three-bedroom house.

STX Shipbuilding of the Republic of Korea reported in May 2008 that it had completed the design of a 22,000teu containership that at 450 meters in length would be the longest ship to ply the oceans. Two alternative versions have been designed, one with a single propeller and the other with twin propellers. Compared to Emma Maersk, the world's largest existing containership, the new design represents a 50% increase in capacity and some 50 meters extra in length.

By the beginning of 2008 there were 4,276 ships with a total capacity of 10.76 million TEUs. This represents an increase of 9.5 7% in the number of ships and an increase of 14.2% in TEU capacity over the previous year. (Source: UNCTAD Review of Maritime Transport 2008, p.32). (TEU -*Twenty-foot Equivalent Units: standardized unit for measuring container capacity on ships*)

At a time when the global economy is slowing, throughput statistics for the World Top 100 Container Ports show a very buoyant industry with an increase of over 45 million TEU in 2007. The total volume handled at those 100 top ports was just over 404.3 million TEU. Drewry Shipping Consultants. figure for total global container port throughput for 2007 is 494.4m TEUs. This means that the top 100 ports account for 82% of the world total, while the balance of 18% was handled by 500 or so smaller ports.

(Source: Cargo Systems . Top 100 Container Ports 2008- August 2008). See also Global Top 15 Container Lines .

F. Fishing vessels

The world totals for fish catching vessels amounts to 22,358 ships with a GT of 9,760,738 and an average age of 27 years. Other fishing vessels (fish carriers, support vessels etc.) amount to 1,258 with a GT of 1,557,802 and an average of 24 years. *Source: Lloyds Register/Fairplay. World Fleet Statistics 2008, Table 2K p 54*
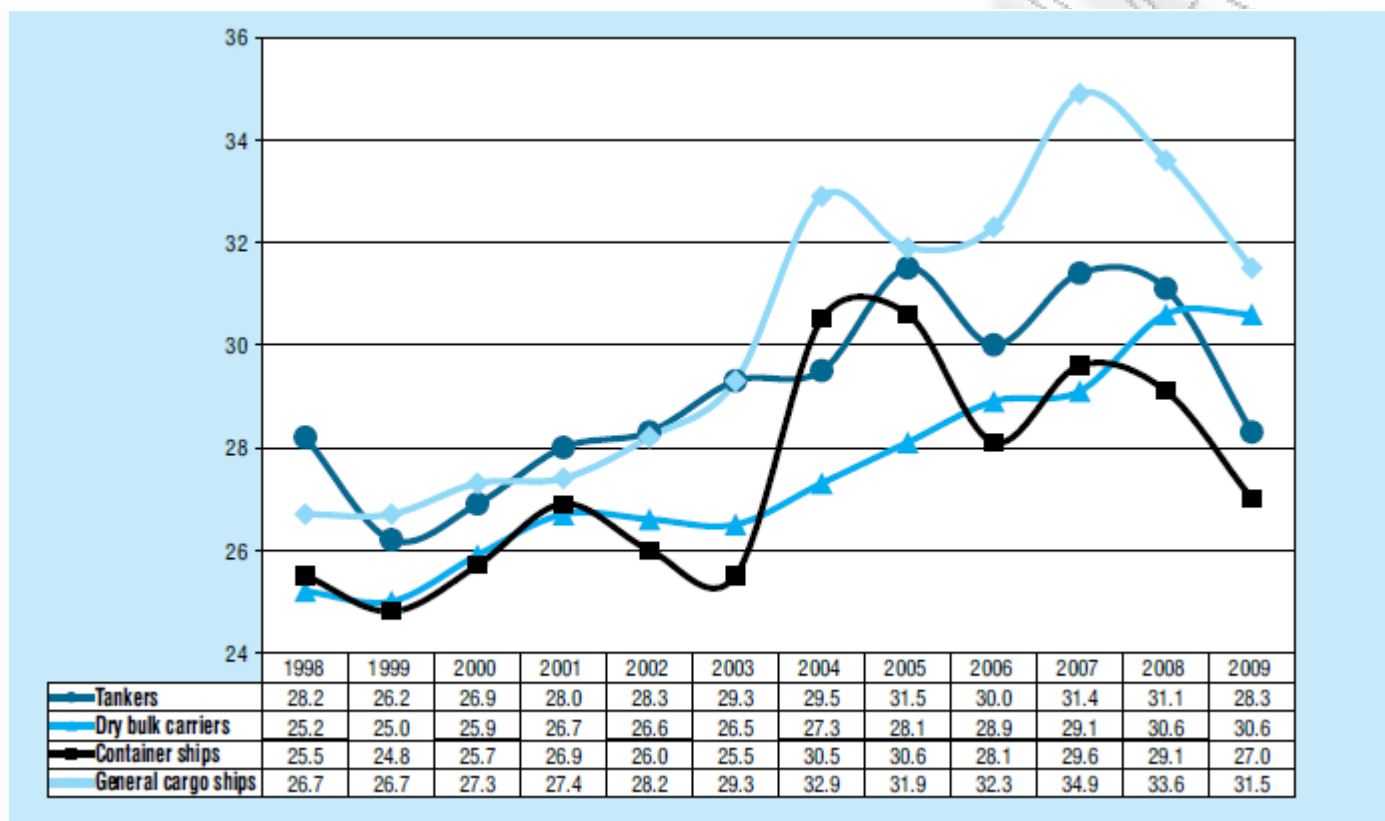
2.3 The Demolition Market

At the beginning of 2009, there were 99,741 commercial vessels of 100 GT and above. During the year, 3,658 new vessels were delivered (+3.7 % of the existing fleet at the beginning of the year, in terms of vessel numbers), while 1,205 ships were withdrawn and mostly demolished (a reduction of 1.2 % from the existing fleet). The resulting fleet total in January 2010 amounted to 102,194 ships (+2.5 % compared to January 2009).10

The market for ship demolition – also called scrapping for recycling – is far more volatile than the market for shipbuilding, as ships can be sold for demolition at short notice. In periods when freight and charter rates are high, shipowners are very reluctant to withdraw any ships from the market, while in times of low demand for maritime transport, owners are much more inclined to sell their ships to scrap yards. The disadvantage of selling in times of low demand is that prices for scrap metal are very low. Between mid-2008 and early 2009, the price for scrap metal had fallen from around $650 per light displacement ton (ldt) to just $200. Since then, the price has recovered, reaching about $400 in March 2010.

During the economic downturn in 2008 and 2009, however, the share of tonnage being demolished increased, and the average age of the fleet therefore decreased, as well as the age profiles and

share of broken-up tonnage

Table 19 Average age of scrapped ships by type, 1998-2009 (in years)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Tankers	28.2	26.2	26.9	28.0	28.3	29.3	29.5	31.5	30.0	31.4	31.1	28.3
Dry bulk carriers	25.2	25.0	25.9	26.7	26.6	26.5	27.3	28.1	28.9	29.1	30.6	30.6
Container ships	25.5	24.8	25.7	26.9	26.0	25.5	30.5	30.6	28.1	29.6	29.1	27.0
General cargo ships	26.7	26.7	27.3	27.4	28.2	29.3	32.9	31.9	32.3	34.9	33.6	31.5

Source: Compiled by the UNCTAD secretariat, on the basis of data from the Shipping Statistics and Market Review produced by the Institute of Shipping Economics and Logistics.

2.4 Tonnage on Order

As only a few new orders were placed in 2009 and shipyards slowed down the delivery of existing orders, the overall picture regarding the global order book has not changed much in recent months The tonnage on order as at 31 December 2009 consisted of 258.3 million dwt of dry bulk carriers (54.5 % of the total world deadweight tonnage on order), 109.3 million dwt of oil tankers (23.1 %), 15 million dwt of general cargo vessels (3.2 %), 53.9 million dwt of container ships (11.4 %) and 37.4 million dwt of other vessel types (7.9 %). The total tonnage on order stood at 9,222 vessels, with a combined capacity of 474 million dwt.

Table 20   World Tonnage on Order, 2000 – 2009 (in thousands of dwt)

Beginning of month	Tankers			Bulk carriers			General cargo ships		
	1 000 dwt	Ships	Average vessel size, dwt	1 000 dwt	Ships	Average vessel size, dwt	1 000 dwt	Ships	Average vessel size, dwt
December 2000	40 328	284	142 001	31 208	486	64 214	3 966	446	8 892
March 2001	44 361	319	139 061	27 221	439	62 007	3 963	441	8 986
June 2001	45 123	339	133 105	26 103	400	65 258	4 154	419	9 914
September 2001	48 386	381	126 998	21 944	337	65 115	3 967	393	10 094
December 2001	51 894	399	130 060	22 184	353	62 845	3 826	372	10 286
March 2002	47 836	404	118 405	19 027	300	63 425	3 758	357	10 525
June 2002	49 564	425	116 622	18 132	283	64 069	3 932	353	11 139
September 2002	47 774	431	110 845	18 869	283	66 676	3 979	369	10 782
December 2002	47 591	488	97 523	28 641	391	73 251	2 832	257	11 018
March 2003	50 284	515	97 639	32 019	441	72 605	2 958	263	11 249
June 2003	55 771	540	103 279	33 408	455	73 425	2 592	250	10 368
September 2003	57 856	580	99 752	41 499	575	72 172	2 841	269	10 562
December 2003	61 123	631	96 867	46 732	640	73 019	3 068	295	10 400
March 2004	62 096	615	100 969	48 761	671	72 670	3 021	312	9 683
June 2004	66 652	649	102 699	50 545	696	72 623	2 838	317	8 954
September 2004	66 969	661	101 314	52 768	703	75 061	2 921	323	9 043
December 2004	71 563	701	102 087	62 051	796	77 953	3 306	370	8 935
March 2005	68 667	679	101 129	63 404	792	80 055	3 312	388	8 536
June 2005	70 520	686	102 799	65 326	801	81 556	4 079	456	8 945
September 2005	68 741	693	99 193	63 495	788	80 578	4 777	521	9 170
December 2005	70 847	724	97 855	66 614	805	82 750	5 088	584	8 712
March 2006	83 385	791	105 417	63 829	784	81 415	5 798	634	9 145
June 2006	93 277	887	105 160	69 055	859	80 390	7 370	683	10 791
September 2006	106 912	987	108 321	73 226	898	81 543	7 602	715	10 632
December 2006	118 008	1 078	109 470	79 364	988	80 328	8 004	737	10 860
March 2007	120 819	1 113	108 553	100 256	1 204	83 269	9 561	843	11 342
June 2007	122 429	1 107	110 595	143 795	1 657	86 781	10 782	885	12 184
September 2007	124 758	1 149	108 580	183 574	2 137	85 903	12 042	956	12 597
December 2007	124 845	1 134	110 093	221 808	2 573	86 206	13 360	1 035	12 908
March 2008	128 128	1 139	112 492	243 600	2 804	86 876	15 097	1 195	12 633
June 2008	142 333	1 202	118 413	262 452	3 009	87 222	15 911	1 255	12 678
September 2008	151 423	1 245	121 625	288 959	3 316	87 141	16 787	1 332	12 603
December 2008	140 504	1 154	121 754	292 837	3 347	87 492	17 849	1 374	12 991
March 2009	130 777	1 088	120 200	289 763	3 303	87 727	17 439	1 363	12 795
June 2009	119 709	986	121 409	280 102	3 194	87 696	16 684	1 296	12 874
September 2009	114 460	934	122 548	269 558	3 050	88 380	16 354	1 264	12 939
December 2009	109 310	884	123 654	258 343	2 918	88 534	15 018	1 179	12 738
Percentage of total, December 2009	23.1	9.6		54.5	31.6		3.2	12.8	

Figure 3   World Tonnage on Order
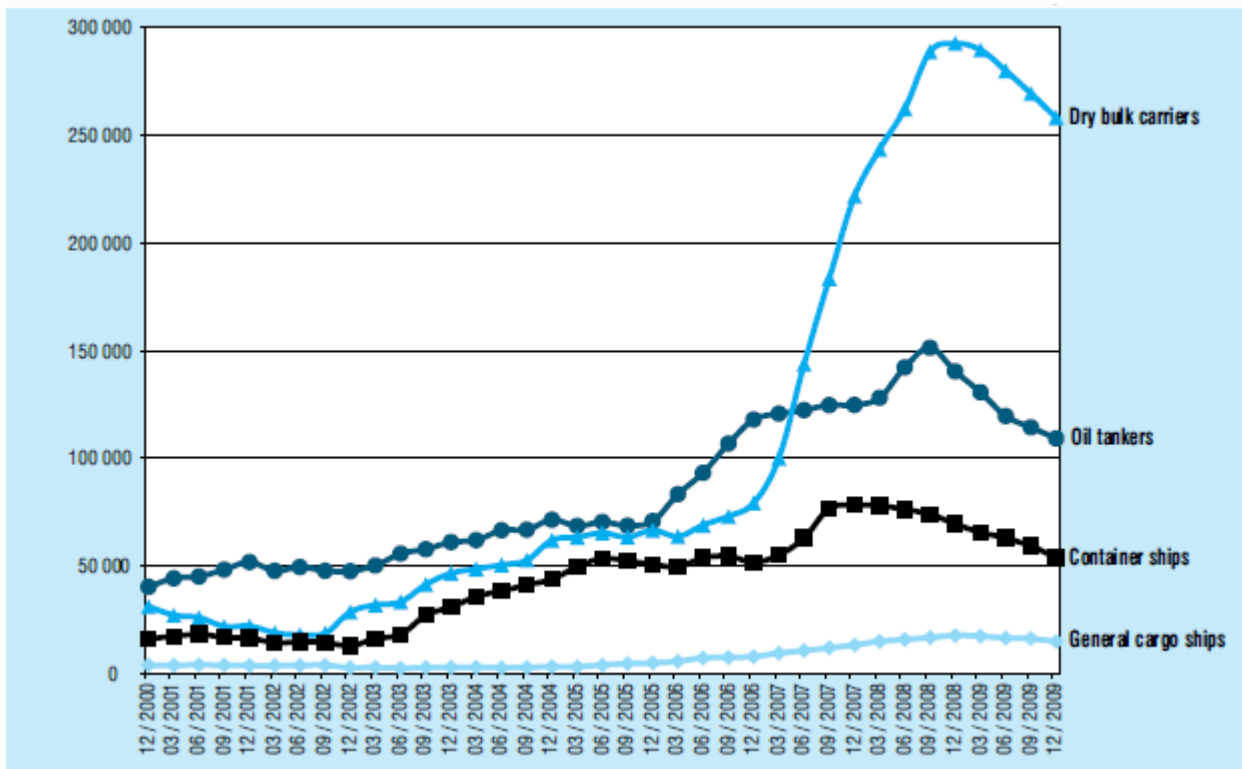
Source: Clarksons

2.5 Prices of New Buildings and Second Hand

On account of overcapacity, prices for both new and second-hand ships continued to fall in 2008 and 2009 and in early 2010 (tables 2.13 and 2.14). Average newbuilding prices for dry bulk vessels went down by between 24 and 29 % between 2008 and 2009, container ships were sold 19 to 33 % cheaper in 2009 compared to 2008, and oil tanker prices fell by between 23 and 26 %.

In the case of second-hand ships, the decline was even more dramatic. Average prices for 10-year-old dry bulk vessels decreased by between 45 and 61 % between 2008 and 2009, 10-year-old container ships were between 47 and 69 % cheaper in 2009 than in 2008, and oil tanker prices declined by between 38 and 42 %. On average, over the eight periods covered in tables 2.13 and 2.14, second-hand vessel prices were 50 % more volatile than newbuilding prices (i.e. the statistical variance was 50 % higher), because secondhand prices are market-driven whereas newbuilding prices are driven by the cost of shipbuilding.

The most expensive new ships continue to be LNG carriers, which in March 2010 typically cost $210 million, followed by large container ships, which typically sold for $105 million. New small dry bulk carriers, in turn, were on sale for around $25 million.

Shipping can benefit from important economies of scale. While a 12,000 TEU ship carries almost twice as many containers as a 6,500 TEU ship, its price is only about 42 % higher. By the same token, a 170,000 dwt Capesize dry bulk carrier is only 63 % more expensive than a 75,000 dwt Panamax, although it is 127 % larger in size. A very large crude carrier (VLCC) is almost twice as big as a Suezmax tanker, yet its price is only 57 % higher.

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Table 21 New Building Prices 2003- 2010, (average annuals in mil $)

Type and size of vessel	2003	2004	2005	2006	2007	2008	2009	March 2010	Percentage change 2009/2008
Dry bulk - Handysize, 30,000 dwt	16	19	21	22	33	38	29	25	-23.7
Dry bulk - Panamax, 75,000 dwt	23	32	35	36	47	54	39	35	-27.8
Dry bulk - Capesize, 170,000 dwt	38	55	62	62	84	97	69	57	-28.9
Container - geared, 500 TEU	13	18	18	16	16	21	14	10	-33.3
Container - gearless, 6,500 TEU	67	86	101	98	97	108	87	74	-19.4
Container - gearless, 12,000 TEU	n.a.	n.a.	n.a.	n.a.	154	164	114	105	-30.5
Oil tanker - Handy, 50,000 dwt	28	35	42	47	50	52	40	34	-23.1
Oil tanker - Suezmax, 160,000 dwt	47	60	73	76	85	94	70	63	-25.5
Oil tanker - VLCC, 300,000 dwt	67	91	119	125	136	153	116	99	-24.2
Chemical tanker - 12,000 dwt	12	16	18	21	33	34	33	30	-2.9
LPG carrier - 15,000 m3	28	36	45	49	51	52	46	40	-11.5
LNG carrier - 160,000 m3	153	173	205	217	237	222	226	210	1.8

Source: Clarksons

Table 22 Second Hand Prices for 5-year old ships for 2000-2008 (in mil $)

Type and size of vessel [a]	2003	2004	2005	2006	2007	2008	2009	March 2010	Percentage change 2009/2008
Dry bulk - Handysize, 28,000 dwt, 10 years old	10	15	20	20	28	31	17	20	-45.2
Dry bulk - Panamax, 75,000 dwt, 5 years old	20	35	40	39	83	70	31	36	-55.7
Dry bulk - Capesize, 150,000 dwt, 10 years old	23	41	32	49	75	82	32	35	-61.0
Container - geared, 500 TEU, 10 years old	5	7	11	10	9	13	4	4	-69.2
Container - geared, 2,500 TEU, 10 years old	20	29	39	41	24	36	18	15	-50.0
Container - geared, 3,500 TEU, 10 years old	25	34	43	44	43	45	24	18	-46.7
Oil tanker - Handy, 45,000 dwt, 5 years old	25	35	44	47	40	51	30	26	-41.2
Oil tanker - Suezmax, 150,000 dwt, 5 years old	43	60	72	76	87	95	59	59	-37.9
Oil tanker - VLCC, 300,000 dwt, 5 years old	60	91	113	116	124	145	84	80	-42.1
Chemical tanker - 12,000 dwt, 10 years old	9	11	12	14	23	23	20	17	-13.0
LPG carrier - 15,000 m3, 10 years old	21	23	30	39	40	39	39	25	0.0

Source: Clarksons

2.6 Comparison of Fleets and World Trade

In 2009, China overtook Germany as the second largest trading nation (measured in United States dollars, imports plus exports), accounting for 8.83 % of world trade. China has also overtaken Germany as the third-largest owner of shipping tonnage, with 8.96 % of dwt in January 2010 (see chapter 2). It is arguable whether or not these two developments are linked. Both countries are important traders in manufactured goods, and both countries have large-scale shipowners, but the fleets of these shipowners do not only carry German or Chinese exports and imports, indeed they mostly carry trade between third countries.

The world's largest trader continues to be the United States, which generated 10.65 % of world

trade in 2009 while owning only 3.54 % of world tonnage; 1.0 % of the world's cargo carrying tonnage used the flag of the United States. Japan is the fourth-largest trading nation (4.53 %), and the country has an even more important share in the controlled fleet (15.73 %), but only a minor proportion of its controlled fleet flies the national flag.

France, Italy, the Netherlands and the United Kingdom each account for a similar share of world trade (between 3.2 and 4.2 % each), however their shares in the control or registration of ships vary widely: 2.9 % of the world's tonnage is registered in the United Kingdom (including the Isle of Man) compared to only 0.57 % registered in the Netherlands, and owners from the United Kingdom control 2.7 % of the world's tonnage compared to only 0.63 % controlled by owners from France. Two Latin American countries are among the major trading nations, namely Mexico and Brazil, with a 1.9 and 1.15 % share of world trade respectively. Of these two countries, only Brazil figures among the major shipowning countries. Mexico trades mostly by land with its northern neighbors, which may be one of the explanations for why, historically, it has had a relatively smaller nationally owned fleet.

Table 23 Maritime Engagement of 25 Trading Nations, 2009-2010

Country/territory	Percentage share of world merchandise trade, in terms of value			Percentage share of world fleet (flag), in terms of dwt			Percentage share of world fleet (ownership), in terms of dwt		
	2008	2009	Change, in percentage points	1 Jan. 2009	1 Jan. 2010	Change, in percentage points	1 Jan. 2009	1 Jan. 2010	Change, in percentage points
United States	10.68	10.65	-0.04	1.00	1.00	-0.00	3.62	3.54	-0.07
China	7.91	8.83	0.92	3.35	3.54	0.18	8.40	8.96	0.56
Germany	8.22	8.18	-0.04	1.51	1.38	-0.13	9.50	8.91	-0.59
Japan	4.78	4.53	-0.25	1.29	1.39	0.09	15.68	15.73	0.04
France	4.04	4.10	0.06	0.66	0.69	0.03	0.59	0.63	0.04
Netherlands	3.72	3.76	0.04	0.57	0.57	-0.00	0.76	0.76	-0.00
United Kingdom	3.36	3.32	-0.04	2.73	2.89	0.16	2.80	2.66	-0.14
Italy	3.37	3.25	-0.12	1.21	1.35	0.14	1.79	1.93	0.14
Belgium	2.91	2.88	-0.04	0.56	0.52	-0.04	1.22	1.08	-0.14
Republic of Korea	2.64	2.74	0.09	1.90	1.63	-0.26	4.22	3.85	-0.37
China, Hong Kong	2.32	2.66	0.35	5.38	5.84	0.46	3.05	2.95	-0.10
Canada	2.70	2.58	-0.11	0.29	0.27	-0.02	1.55	1.57	0.01
Singapore	2.03	2.06	0.03	5.10	4.83	-0.27	2.55	2.80	0.24
Russian Federation	2.61	2.06	-0.55	0.60	0.57	-0.03	1.66	1.67	0.01
Spain	2.06	2.02	-0.05	0.23	0.20	-0.03	0.40	0.45	0.05
Mexico	1.85	1.90	0.05	0.14	0.14	0.00	..	..	..
India	1.45	1.61	0.16	1.28	1.17	-0.11	1.56	1.47	-0.09
China, Taiwan Province of	1.53	1.51	-0.02	0.36	0.31	-0.05	2.70	2.53	-0.17
Switzerland	1.19	1.31	0.13	0.08	0.08	-0.00	0.35	0.34	-0.01
Australia	1.19	1.28	0.08	0.18	0.17	-0.01	..	..	..
Saudi Arabia	1.27	1.27	0.00	0.14	0.18	0.04	1.35	1.13	-0.22
Thailand	1.08	1.15	0.07	0.35	0.29	-0.06	0.37	0.33	-0.04
Brazil	1.14	1.15	0.01	0.29	0.27	-0.02	0.43	0.66	0.24
Malaysia	1.15	1.13	-0.03	0.79	0.80	0.01	1.05	1.07	0.02
Poland	1.15	1.12	-0.03	0.01	0.01	-0.00	..	..	..
Total	76.37	77.05	0.68	30.00	30.09	0.09	65.58	65.01	-0.57

Source: Compiled by the UNCTAD secretariat, on the basis of data supplied by the UNCTAD Handbook of Statistics (trade) and IHS Fairplay (fleet registration and ownership).

Chapter Three
Freight Rates Market and Causable Regression

Chapter Three
Freight Rates Market and Causable Regression

Freight Rates by definition are the amount of money that the carrier (e.g. shipowner or charterer or vessel operator) charges for transporting cargo. Freight rates can be obtained through an agent or a shipbroker. In some cases, such as in the liner sector, notice of freight rates has traditionally been published in newspapers. Today, the internet is the preferred medium. Some shipbrokers also calculate, maintain and publish indices together with historical data to give an indication of how the market is performing. Each segment of the market (e.g. tanker, bulk, containers etc.) has it own characteristics and is influenced by different factors. In the bulk cargo market, vessels are usually chartered for a specific period of time or for a particular voyage. Rates for time charters will be different from voyage charters, with the former more focused on the long-term trend. In general, freight rates are affected by the supply of vessels and by the demand for the goods being carried. Thus, transport services are a derived demand. The number of competitors, the availability of alternative transport modes, and short-term fluctuations in demand and supply will also have an effect on prices.

3.1 The Dry Bulk Market

The dry bulk market, which collapsed spectacularly at the end of 2008, improved in 2009. The Baltic Exchange Dry Index (BDI), which measures freight rates for dry bulk transported by sea, started in 2009 at 773 points and ended the year at 3,005 points. In 2008, the peak of 11,771 points was reached on 21 May, and the low of 663 points occurred on 5 December. In 2009, the high point of the year was in November, with the BDI reaching 4,661 points. Rates maintained most of their 2009 gains, fluctuating in the 2,500 to 4,500 point range for the first half of 2010. The current world fleet of dry bulk carriers amounts to approximately 457 million dwt, with a further 258.3 million, or 54 % of the fleet, on order. The following sections describe some of the recent developments in each of the five main bulk trades.

In January 2009, the average earnings for a modern Capesize were $22,000 per day, and by December 2009, the monthly average had risen to $42,000 per day. Comparing year on year, the average daily hire rate in 2009 equated to $35,300 per day, as opposed to $116,175 per day in 2008. While 2009 may have been a disappointment for shipowners when compared to 2008, it was, however, a more stable year that did not offer the exceptional highs and lows that some vessels experienced in 2008 with rates surpassing $300,000 per day only to later dip well below $10,000 per day. The declining earnings market naturally affected the price of vessels. A five-year-old Capesize vessel cost, on average, $123.2 million in 2008, and $47.3 million in 2009. By February 2010, the price had lifted slightly, to $52 million.

On the Time Charter side, estimates of rates for 12-month period charters (prompt delivery) rose steadily during 2009, albeit on the back of the significant declines experienced towards the end of 2008. Capesize ships of 200,000 dwt aged five years fetched $19,700 per day at the start of 2009 (against $125,000 for the same period in 2008) and had doubled by the end of the year. Freight

rates for Capesize ships of 170,000 dwt aged five years started at $18,500 per day in January 2009, down from $57,000 in January 2008, and ended 2009 at $34,500 per day. The best-performing sector, however, was Panamax vessels of 75,000 dwt aged between one and five years, which experienced a 143 per cent increase in rates for the period from December 2008 to December 2009. Freight rates for Handymax ships of 28,000 dwt aged 10 years increased from $6,500 per day in January 2009 to $13,500 per day by December 2009.

From a voyage basis point of view, Iron ore freight rates from Brazil to China started 2009 at $13.90 per ton – a significant decline from the $64.05 per ton the previous year. The turmoil in prices can be seen by comparing the rate for May 2008, which was $101.80 per ton, with the rate for December 2008, when it was a mere $8.35 per ton. The year 2009 revealed some recovery in prices, with June witnessing a rate of $43.45 per ton. By early 2010, the rate had slipped back to the mid twenties, as concern grew about the ability of the world economy to bounce back from the global economic downturn, and about the increasing stockpile of iron ore in Chinese ports and refineries.

Figure 24 Baltic Exchange Dry Index 2008-2010, index Base year 1985 1000 units

Source Baltic Exchange

3.2 Simple Regression Analysis

A. Description of Coal as a traded commodity

Coal is referred to as a dark brown to black, organic and combustible rock made of mainly carbon, hydrogen and oxygen, which is extracted from under the ground through mining. This graphite like

sedimentary material is used as fuel and is primary source of energy on earth. Coal is formed under the earth's crust from the plants and animal remains that got fossilized with the time. That is why in other words it is also defined as the altered remains of prehistoric vegetation that has been consolidated and transformed with consistent effect of heat and pressure over million of years. Coal also played an important role in industrial revolution and most of the world's electricity is produced using coal only.

Coal is a fossil fuel that is used for combustion and producing heat and light. Currently, it is the prime source of electricity produced through out the world. Though coals lead is being shaken by the emergence of oil in the scenario but around 40% of the electricity is still being produced using coal. The solid fuel can be converted into gaseous or liquid form of fuel such as coal gas, gasoline or diesel. Also coke is derived from coal that is used producing coal tar, ammonia, light oils etc. the fuel is credited with the initialization of the great Industrial revolution in the 18th century.

It is estimated that there are 909 billion tons of proven coal reserves in around 70 countries of the world. The largest coal reserves are in United States of America followed by Russia and China. But China leaves the above two countries behind in the context of production. The world production of coal hovers around 400 million tons and due to the current rising trend in the production it is estimated to reach 7 billion tons by 2030. Asia has a share of around 56% in the total consumption of coal in the world, china being the topmost consumer of coal in the world. Most of the coal is utilized in the place of its production only. The developing countries are the major source of demand for coal, as they need higher quantities to keep the development process continued.

Figure 4 Major Inter-Regional Coal Trade Flows (2002-2030 in mill tonnes)

Source: http://www.infomine.com/publications/docs/WorldCoalInst2005.pdf

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Table 25 Top Ten Coal consuming countries and their consumption (mill tonnes)

China	1728
USA	1004.9
India	430.4
Germany	252.5
Russia	240.5
Japan	183.4
South Africa	173.7
Poland	144.1
Australia	132.7
South Korea	80.3
	4143.5

Source: Intercargo (2006)

Most of the coal reaches the world markets through the modes of shipping and sea. Transportation of coal forms the major cost of the cost of the coal. Majority of the countries fulfill their domestic demand through imports of coals.

Table 26 Top Ten Coal importing countries in the world

Japan	179.8
South Korea	178.4
Taiwan	57.8
Germany	41
United Kingdom	51
Russia	26.5
Canada	25.1
Spain	23.7
Italy	23.3
France	22.7
	629.3

Source: Intercargo (2006)

Table 27   Proved Recoverable Coal Reserves (as of end 2006 in mill tonnes)

Country	Bituminous & anthracite	SubBituminous & lignite	TOTAL	Share
United States	111,338	135,305	246,643	22.51
Russia	49,088	107,922	157,010	14.33
China	62,200	52,300	114,500	10.45
India	90,085	2,360	92,445	8.44

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	Country				
	Australia	38,600	39,900	78,500	7.17
	South Africa	48,750	0	48,750	4.44
	Ukraine	16,274	17,879	34,153	3.12
	Kazakhstan	28,151	3,128	31,279	2.86
	Poland	14,000	0	14,000	1.28
	Brazil	0	10,113	10,113	0.92
	Germany	183	6,556	6,739	0.62
	Colombia	6,230	381	6,611	0.6
	Canada	3,471	3,107	6,578	0.6
	Czech Republic	2,094	3,458	5,552	0.5
	Indonesia	740	4,228	4,968	0.45
	Turkey	278	3,908	4,186	0.38
	Greece	0	3,900	3,900	0.36
	Hungary	198	3,159	3,357	0.3
	Bangladesh	2.9		2,900	0.26
	Pakistan[64]	1	1,981	1,982	0.22
	Bulgaria	4	2,183	2,187	0.2
	Serbia	200	1,800	2,000	0.18
	Thailand	0	1,354	1,354	0.12
	Mexico	860	351	1,211	0.11
	North Korea	300	300	600	0.05
	New Zealand	33	538	571	0.052
	Spain	200	330	530	0.05
	Zimbabwe	502	0	502	0.05
	Romania	22	472	494	0.05
	Venezuela	479	0	479	0.04
	All others	4,691	24,111	28,802	2.63
	TOTAL	**478,771**	**430.29**	**909,064**	**100**

Table 28   Major Coal Exporters (in mill tonnes)

	Country	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**Share**
	Australia	238.1	247.6	255.0	255.0	268.5	278.0	25.6%
	Indonesia	107.8	131.4	142.0	192.2	221.9	228.2	21.0%
	Russia	41.0	55.7	98.6	103.4	112.2	115.4	10.6%
	USA	43.0	48.0	51.7	51.2	60.6	83.5	7.7%
	Colombia	50.4	56.4	59.2	68.3	74.5	81.5	7.5%
	China	103.4	95.5	93.1	85.6	75.4	68.8	6.3%
	South Africa	78.7	74.9	78.8	75.8	72.6	68.2	6.3%
	Canada	27.7	28.8	31.2	31.2	33.4	36.5	3.4%
	Total	**713.9**	**764.0**	**936.0**	**1,000.6**	**1,073.4**	**1,087.3**	**100%**

B. History

Coal as mentioned earlier, is the altered form of prehistoric vegetation transformed under severe heat and pressure under the earth's crust. All this matter is believed to have started decomposing in a period ranging from 360 to 290 million years ago, which is known as the first coal age, the

Carboniferous period. As a consequence of all the heat and pressure that affected the prehistoric vegetation for million of years under the earth's crust, it got converted into fossil fuel.

It first came into the notice of human beings in China where it was used in the process of smelting copper and casting coins in around 1000 BC according to some historians. But the earliest ever reference regarding coal was made by Aristotle in around 350 BC who called it as a charcoal like rock. At that time, coal had limited number of uses and was only used for mining purposes. But with time, and development of technology, the new and improved uses of coal were discovered. It took a long time for coal to gain its current reputation. In the 18th and 19th century, during the time of industrial revolution, the demand for coal started to rise. The most important invention in the pages of history, invention of steam engine in 1769, could not have been possible without coal. The concept of electricity generation from coal developed in 19th century when it was used to produce gas for the gaslights in many cities. This concept spread all around the globe and the time wasn't too far when the first practical coal electric generating station was set up in New York in 1882, developed by Thomas Edison.

Recently in around 1960s, oil took over the lead from coal as the source of primary energy but still coal plays an important role contributing to around 23% of the total energy needs of the world.

C. Central Appalachian Coal

The major commodity exchange where the future contracts of coal are traded is the New York Mercantile Exchange(NYMEX).

U.S. coal exports, chiefly Central Appalachian bituminous, make up a significant percentage of the world export market and are a relevant factor in world coal prices. Because coal is a bulk commodity, transportation is an important aspect of its price and availability. In response to dramatic changes in both electric and coal industry practices, the New York Mercantile Exchange (NYMEX) after conferring with coal producers and consumers, sought and received regulatory approval to offer coal futures and options contracts. On July 12, 2001, NYMEX began trading Central Appalachian Coal futures under the CAPP symbol.

In 1996, the New York Mercantile Exchange (NYMEX) began providing companies in the electric power industry with secure and reliable risk management tools by creating a series of electricity futures contracts fashioned to meet the particular regional needs and practices of the power industry. The buying and selling of these futures contracts and the related options contracts have given the industry a much-needed price reference and risk management tool. In the restructured electric power industry, where annual sales nationally are over $250 billion, and price increases can no longer be passed along to customers, the pricing of resources used to generate electricity becomes more important.

Since coal is now the largest single power generating fuel in the United States, the once relatively sedate cash markets for coal have become more volatile and very strong market forces. Thus, electric utilities are no longer eager to enter into long-term coal supply contracts that once were the industry norm. Instead, there is now a preference for short-term and more price-flexible contracts that rely more on cash market purchases as power producers try to reduce their inventory holding levels.

Coal futures provide the electric power industry with another set of risk management options, as well as offer the coal industry new and necessary risk management tools:

- Coal producers can sell futures contracts to lock in a specific sales price for a specific volume of the coal they intend to produce in coming months.
- Electric utilities can buy coal futures to hedge against rising prices for their base load fuel.
- Power marketers can mitigate their generation price risk and hedge with electricity futures to control their delivery price risk.

- Non-utility industrial coal users, such as steel mills, can use futures to lock in their own coal supply costs.
- International coal trading companies can use futures to hedge their export or import prices.
- Power generating companies that use both coal and natural gas to produce electricity can use coal futures in conjunction with natural gas futures to offset seasonal cost variations and to take advantage of the "spark spread" the differential between the cost of the two fuels and the relative value of the electricity generated by each of the two fuels.

Figure 5 NYMEX Capp Futures Near-Month Contract Final Settlement Price History

Data for: 2004-2010
Release Date: January 10, 2011
Next Release Date: January 2012

NYMEX Central Appalachian Coal Futures Near-Month Contract Final Settlement Price History
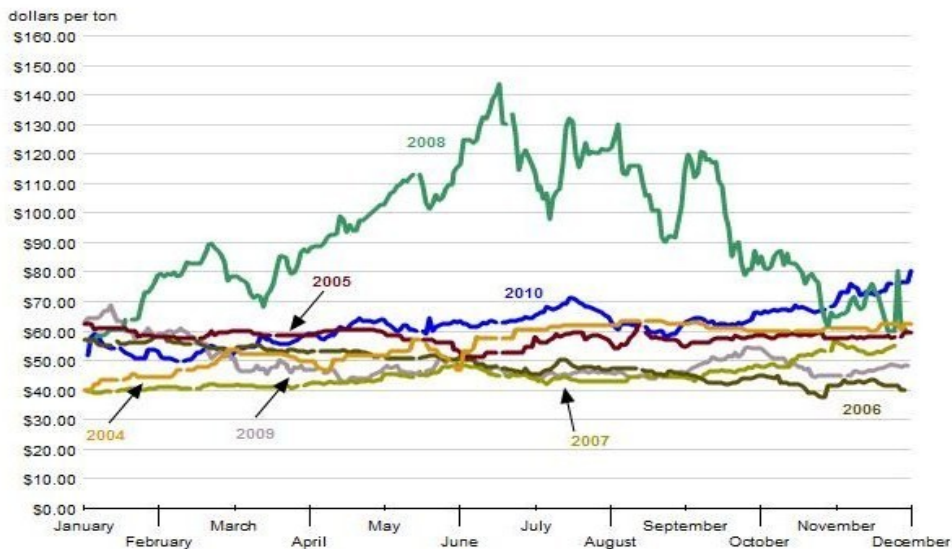
Data as of 12/31/2010
Note: No data available for Western PRB and Eastern CSX prior to 6/30/09.

Source: New York Mercantile Exchange

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Graph 1 Capp Prices 3D Line (Chronological Data used for Simple Regression Analysis)

Capp prices
3D Sequential Graph
workbook 1 10v*125c
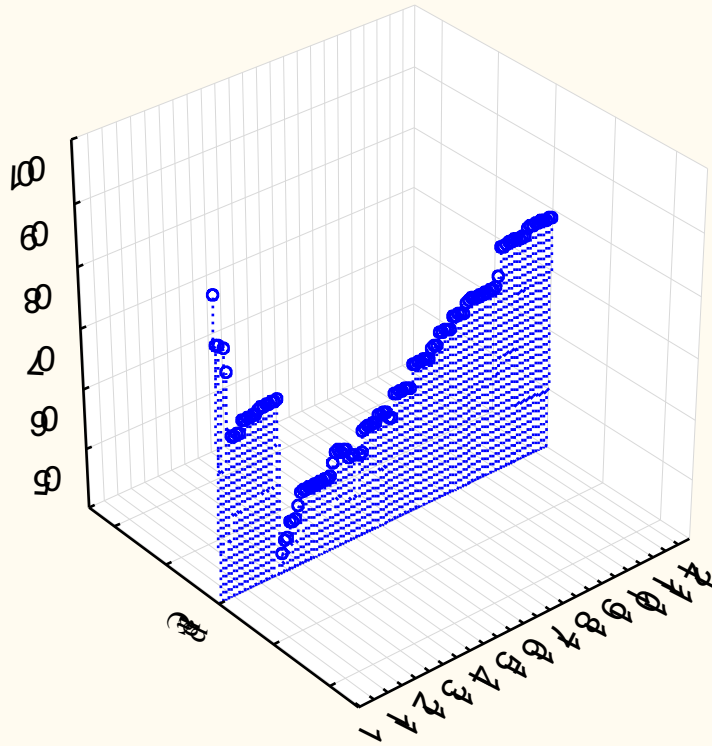
Graph 2 BCI Prices 3D Line (Chronological Data used for Simple Regression Analysis)

3D Sequential Graph
workbook 1 10v*125c
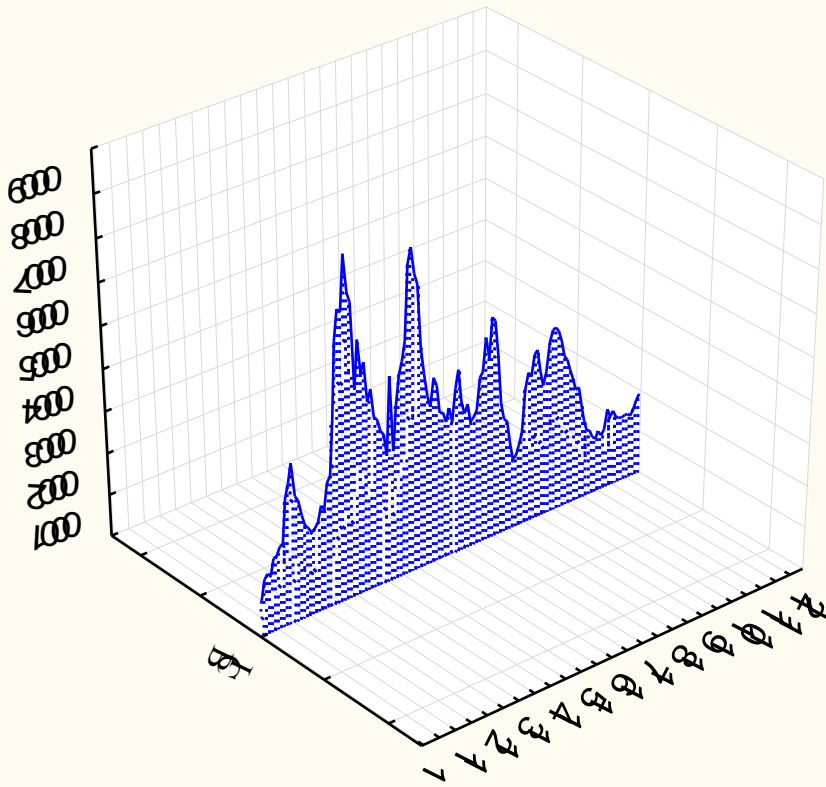
Graph 3 BCI Prices Line (Chronological Data used for Simple Regression Analysis)

Line Plot of BCI
workbook 1 10v*125c
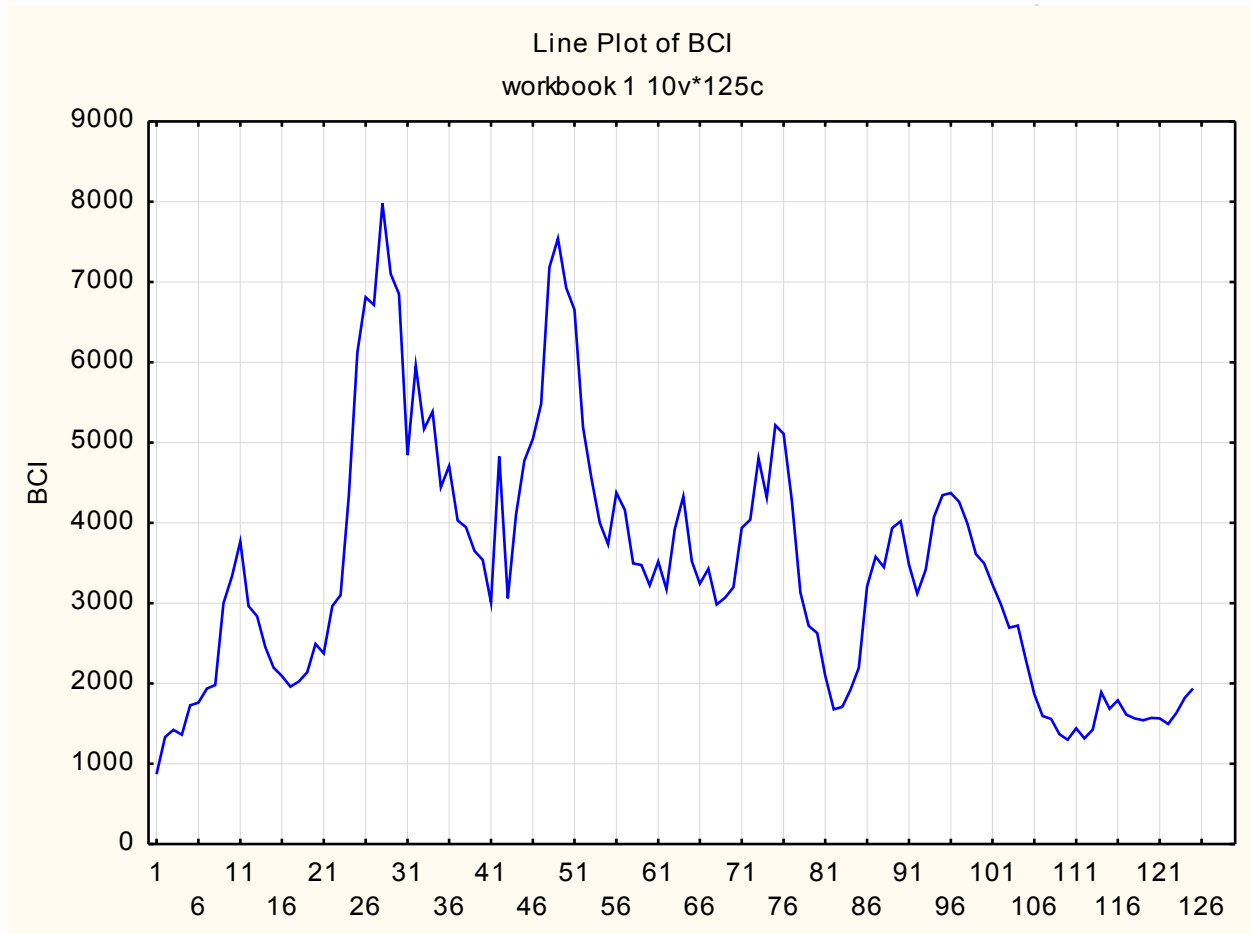
3.3 Causable Regression Analysis between BCI and Coal Prices

Linear regression is a method of finding the linear equation that comes closest to fitting a collection of data points. Simple linear regression is the most commonly used method. More specifically, when conducting simple linear regression analysis we use the values from an existing data set of measurements of two variables X and Y, to develop a model that predicts the values of the dependent variable Y for given values of X.

$Y = m X + b$

where

m = Slope

b = Intercept

For the purpose of this paper we would like to test the hypothesis that Capp prices affect – and if so to what extent – the BCI prices. Thus:

Independent variable X: Capp
Dependent variable Y : BCI

Table 29 BCI and Capp prices (Chronological Data used for Simple Regression Analysis)

N Observations	Date	BCI (Y)	Capp (X)
1	12/05/08	871.00	89.8
2	12/12/08	1,331.00	81.55
3	12/19/08	1,423.00	81.55
4	01/02/09	1,361.00	80.85
5	01/09/09	1,728.00	76.8
6	01/16/09	1,760.00	66.45
7	01/23/09	1,939.00	66.45
8	01/30/09	1,981.00	66.45
9	02/06/09	2,999.00	66.45
10	02/13/09	3,335.00	68.2
11	02/20/09	3,768.00	68.2
12	02/27/09	2,963.00	68.2
13	03/06/09	2,839.00	68.2
14	03/13/09	2,454.00	68.2
15	03/20/09	2,197.00	68.2
16	03/27/09	2,092.00	68.95
17	04/03/09	1,962.00	68.95
18	04/10/09	2,024.00	68.95
19	04/17/09	2,140.00	68.95
20	04/24/09	2,494.00	68.95
21	05/01/09	2,376.00	68.95
22	05/08/09	2,963.00	68.95
23	05/15/09	3,100.00	68.95
24	05/22/09	4,343.00	43.5
25	05/29/09	6,125.00	45.5
26	06/05/09	6,812.00	45.5
27	06/12/09	6,715.00	48
28	06/19/09	7,980.00	48
29	06/26/09	7,100.00	48
30	07/02/09	6,848.00	50.05
31	07/10/09	4,844.00	52.3
32	07/17/09	5,957.00	52.3
33	07/24/09	5,170.00	52.3
34	07/31/09	5,385.00	52.3
35	08/07/09	4,444.00	52.3

36	08/14/09	4,708.00	52.3
37	08/21/09	4,030.00	52.3
38	08/28/09	3,946.00	52.3
39	09/04/09	3,651.00	52.3
40	09/11/09	3,539.00	52.3
41	09/18/09	3,008.00	52.3
42	09/25/09	4,827.00	52.3
43	10/02/09	3,060.00	54.3
44	10/09/09	4,107.00	56.15
45	10/23/09	4,774.00	56.15
46	10/30/09	5,047.00	55.65
47	11/06/09	5,481.00	55.65
48	11/13/09	7,183.00	55.65
49	11/20/09	7,542.00	54.15
50	11/25/09	6,928.00	54.15
51	12/04/09	6,655.00	54.15
52	12/11/09	5,193.00	54.15
53	12/18/09	4,566.00	54.15
54	12/31/09	4,000.00	57.4
55	01/08/10	3,733.00	57.95
56	01/15/10	4,375.00	57.95
57	01/22/10	4,161.00	57.95
58	01/29/10	3,494.00	57.95
59	02/05/10	3,474.00	57.95
60	02/12/10	3,224.00	58.95
61	02/19/10	3,517.00	58.95
62	02/26/10	3,174.00	58.95
63	03/05/10	3,923.00	58.95
64	03/12/10	4,328.00	57.65
65	03/19/10	3,522.00	57.65
66	03/26/10	3,244.00	61.15
67	04/01/10	3,429.00	61.15
68	04/09/10	2,984.00	61.15
69	04/16/10	3,071.00	61.15
70	04/23/10	3,200.00	61.15
71	04/30/10	3,936.00	61.15
72	05/07/10	4,041.00	61.15
73	05/14/10	4,804.00	64.6

74	05/21/10	4,317.00	64.6
75	05/28/10	5,217.00	64.6
76	06/04/10	5,110.00	64.6
77	06/11/10	4,276.00	64.6
78	06/18/10	3,134.00	64.6
79	06/25/10	2,717.00	64.6
80	07/02/10	2,627.00	66.05
81	07/09/10	2,102.00	66.05
82	07/16/10	1,676.00	66.05
83	07/23/10	1,708.00	67.85
84	07/30/10	1,922.00	67.85
85	08/06/10	2,194.00	67.85
86	08/13/10	3,210.00	67.85
87	08/20/10	3,578.00	67.85
88	08/27/10	3,449.00	69.5
89	09/03/10	3,937.00	69.5
90	09/10/10	4,019.00	69.5
91	09/17/10	3,481.00	69.5
92	09/24/10	3,121.00	69.5
93	10/01/10	3,419.00	71
94	10/08/10	4,076.00	71
95	10/15/10	4,345.00	71.25
96	10/22/10	4,373.00	71.15
97	10/29/10	4,262.00	71.15
98	11/05/10	3,994.00	71.15
99	11/12/10	3,612.00	71.15
100	11/19/10	3,496.00	71.15
101	11/26/10	3,233.00	71.15
102	10/03/10	2,983.00	71.15
103	12/10/10	2,694.00	71.15
104	12/17/10	2,723.00	71.15
105	12/31/10	2,285.00	72.75
106	01/07/11	1,865.00	77.4
107	01/14/11	1,595.00	77.4
108	01/21/11	1,556.00	77.7
109	01/28/11	1,368.00	77.7
110	02/04/11	1,299.00	77.7
111	02/18/11	1,442.00	77.7

112	02/25/11	1,315.00	77.7
113	03/04/11	1,427.00	77.7
114	03/11/11	1,891.00	77.7
115	03/18/11	1,687.00	77.7
116	04/01/11	1,792.00	78.85
117	04/08/11	1,612.00	78.85
118	04/15/11	1,564.00	78.85
119	04/22/11	1,542.00	78.85
120	04/29/11	1,570.00	78.85
121	05/06/11	1,566.00	78.85
122	05/13/11	1,494.00	78.85
123	05/20/11	1,633.00	78.85
124	05/27/11	1,821.00	78.85
125	06/03/11	1,939.00	78,85

After running a simple regression analysis we have the following output:

The Regression Equation is:

Y = 128,018 X + 11748,867

Slope, m = 128,018
Intercept, b = 11748,867

R-squared = 63,8 %

Given the above results we could state that R-squared is quite satisfactory as it literally shows that BCI values affect the prices of the Central Appalachian Coal 63,8%. Furthermore, it is a quite safe projection margin especially when dealing with both shipping and trading industry which are influenced by quite a few factors. Having said that, one can project the Capp prices for the coming week and suddenly a strike by port workers or a natural disaster in a certain importing or exporting area can occur and the actual prices will be significantly differented than the expected ones. Nevertheless, this equation shows that there is a quite steady relationship between the prices of the Bci and Capp.

Graph 4 Scatterplot BCI against Capp

Scatterplot of BCI against Capp

workbook 1 10v*125c

BCI = 11748,8676-128,0185*x
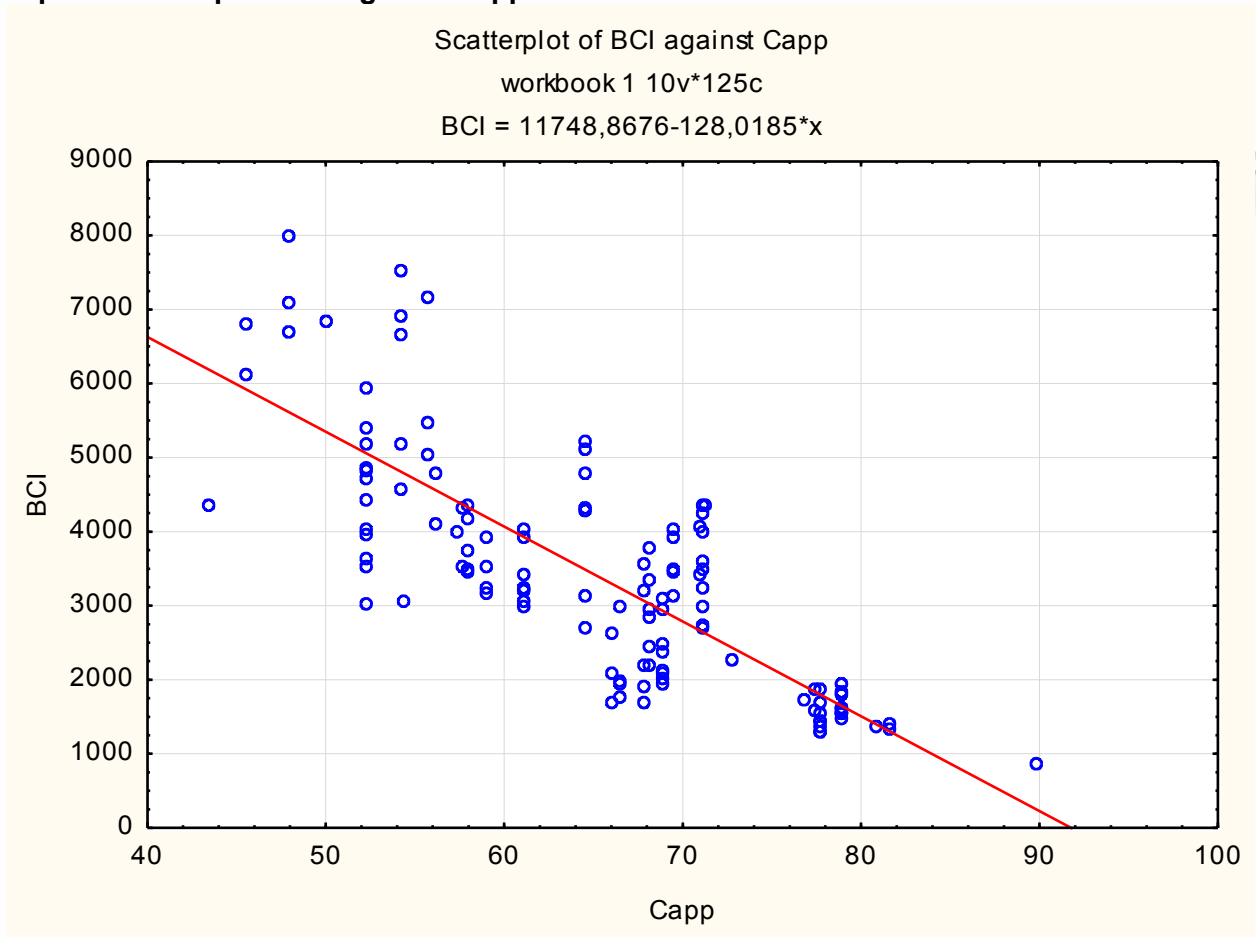
Graph 5 Scatterplot BCI against Capp with Elipse at 95% range

Scatterplot of BCI against Capp

workbook 1 10v*125c

BCI = 11748,8676-128,0185*x

Capp:BCI: y = 11748,8676 - 128,0185*x; r^2 = 0,6377
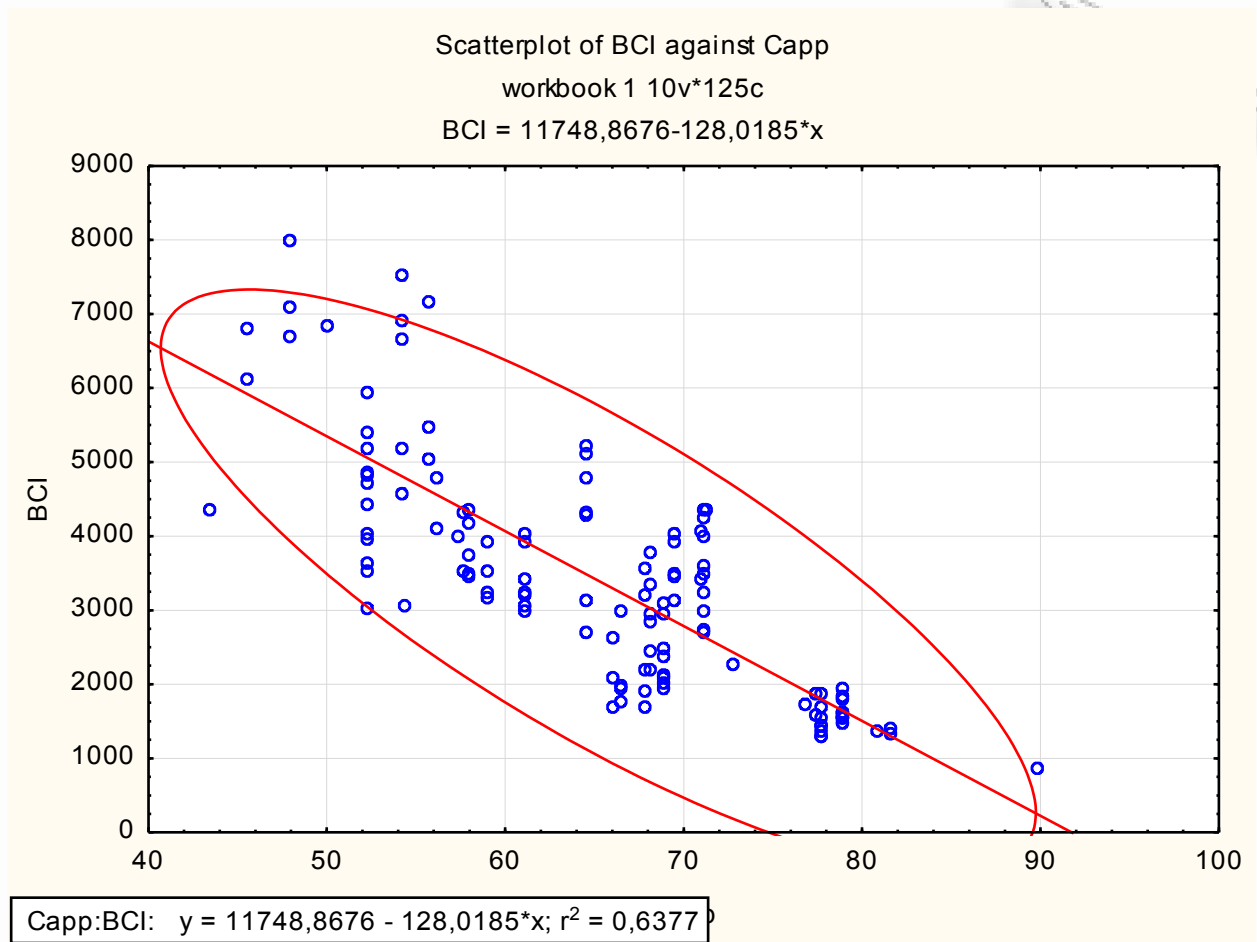
Graph 6 Scatterplot BCI against Capp with Polar Coordinate System

Scatterplot of BCI against Capp

workbook 1 10v*125c

BCI = 11748,8676-128,0185*x

Capp:BCI: y = 11748,8676 - 128,0185*x; r^2 = 0,6377
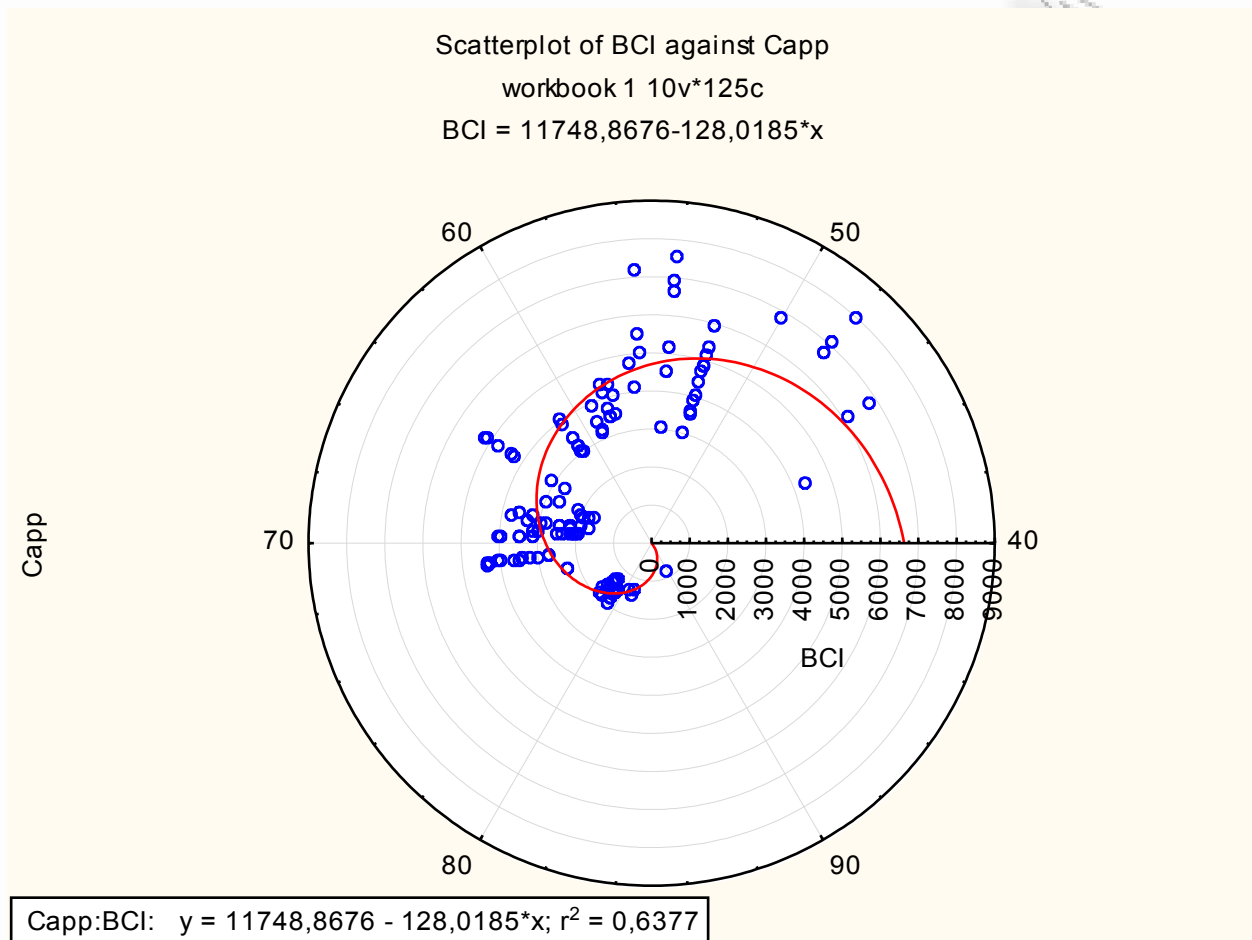
3.4 Simple Regression Analysis between BCI and Capesize deadweight capacity

In Shipping its widely known and perceived that the deadweight carrying capacity of the vessels plays a significant role to the freight market. At this stage, we will try here to test a second variable: the Capesize deadweight capacity. For this purpose, we take the maximum deadweight values of the Capesize existing fleet plus the new deliveries at each given time. Thus we have:

Independent variable X: CD
Dependent variable Y : BCI

Table 30 BCI and CD prices (Chronological Data used for Simple Regression Analysis)

N observations	Date	BCI (Y)	CD(X)
1	12/05/08	871	130.0
2	12/12/08	1,331.00	131.5
3	12/19/08	1,423.00	131.5
4	01/02/09	1,361.00	143.0
5	01/09/09	1,728.00	143.0
6	01/16/09	1,760.00	143.0
7	01/23/09	1,939.00	143.0
8	01/30/09	1,981.00	143.3
9	02/06/09	2,999.00	143.3
10	02/13/09	3,335.00	143.3
11	02/20/09	3,768.00	143.3
12	02/27/09	2,963.00	145.8
13	03/06/09	2,839.00	145.8
14	03/13/09	2,454.00	145.8
15	03/20/09	2,197.00	145.8
16	03/27/09	2,092.00	147.6
17	04/03/09	1,962.00	147.6
18	04/10/09	2,024.00	147.6
19	04/17/09	2,140.00	147.6
20	04/24/09	2,494.00	148.9
21	05/01/09	2,376.00	148.9
22	05/08/09	2,963.00	148.9
23	05/15/09	3,100.00	148.9
24	05/22/09	4,343.00	148.9
25	05/29/09	6,125.00	150.4
26	06/05/09	6,812.00	150.4
27	06/12/09	6,715.00	150.4
28	06/19/09	7,980.00	150.4
29	06/26/09	7,100.00	153.0
30	07/02/09	6,848.00	153.0
31	07/10/09	4,844.00	153.0
32	07/17/09	5,957.00	153.0
33	07/24/09	5,170.00	153.0
34	07/31/09	5,385.00	155.6

35	08/07/09	4,444.00	155.6
36	08/14/09	4,708.00	155.6
37	08/21/09	4,030.00	155.6
38	08/28/09	3,946.00	158.2
39	09/04/09	3,651.00	158.2
40	09/11/09	3,539.00	158.2
41	09/18/09	3,008.00	158.2
42	09/25/09	4,827.00	161.2
43	10/02/09	3,060.00	161.2
44	10/09/09	4,107.00	161.2
45	10/23/09	4,774.00	161.2
46	10/30/09	5,047.00	164.4
47	11/06/09	5,481.00	164.4
48	11/13/09	7,183.00	164.4
49	11/20/09	7,542.00	164.4
50	11/25/09	6,928.00	166.8
51	12/04/09	6,655.00	166.8
52	12/11/09	5,193.00	166.8
53	12/18/09	4,566.00	166.8
54	12/31/09	4,000.00	166.8
55	01/08/10	3,733.00	169.9
56	01/15/10	4,375.00	169.9
57	01/22/10	4,161.00	169.9
58	01/29/10	3,494.00	172.1
59	02/05/10	3,474.00	172.1
60	02/12/10	3,224.00	172.1
61	02/19/10	3,517.00	172.1
62	02/26/10	3,174.00	174.8
63	03/05/10	3,923.00	174.8
64	03/12/10	4,328.00	174.8
65	03/19/10	3,522.00	174.8
66	03/26/10	3,244.00	178.6
67	04/01/10	3,429.00	178.6
68	04/09/10	2,984.00	178.6
69	04/16/10	3,071.00	178.6
70	04/23/10	3,200.00	178.6
71	04/30/10	3,936.00	178.6
72	05/07/10	4,041.00	178.6

73	05/14/10	4,804.00	181.5
74	05/21/10	4,317.00	181.5
75	05/28/10	5,217.00	181.5
76	06/04/10	5,110.00	184.0
77	06/11/10	4,276.00	184.0
78	06/18/10	3,134.00	184.0
79	06/25/10	2,717.00	184.0
80	07/02/10	2,627.00	184.0
81	07/09/10	2,102.00	184.0
82	07/16/10	1,676.00	184.0
83	07/23/10	1,708.00	184.0
84	07/30/10	1,922.00	184.0
85	08/06/10	2,194.00	184.0
86	08/13/10	3,210.00	191.0
87	08/20/10	3,578.00	191.0
88	08/27/10	3,449.00	191.0
89	09/03/10	3,937.00	191.0
90	09/10/10	4,019.00	191.0
91	09/17/10	3,481.00	191.0
92	09/24/10	3,121.00	191.0
93	10/01/10	3,419.00	191.0
94	10/08/10	4,076.00	191.0
95	10/15/10	4,345.00	191.0
96	10/22/10	4,373.00	191.0
97	10/29/10	4,262.00	191.0
98	11/05/10	3,994.00	191.0
99	11/12/10	3,612.00	191.0
100	11/19/10	3,496.00	191.0
101	11/26/10	3,233.00	199.0
102	10/03/10	2,983.00	199.0
103	12/10/10	2,694.00	199.0
104	12/17/10	2,723.00	199.0
105	12/31/10	2,285.00	199.0
106	01/07/11	1,865.00	199.0
107	01/14/11	1,595.00	208.2
108	01/21/11	1,556.00	208.2
109	01/28/11	1,368.00	208.2
110	02/04/11	1,299.00	208.2

111	02/18/11	1,442.00	208.2
112	02/25/11	1,315.00	208.2
113	03/04/11	1,427.00	208.2
114	03/11/11	1,891.00	208.2
115	03/18/11	1,687.00	208.2
116	04/01/11	1,792.00	208.2
117	04/08/11	1,612.00	215.0
118	04/15/11	1,564.00	215.0
119	04/22/11	1,542.00	215.0
120	04/29/11	1,570.00	215.0
121	05/06/11	1,566.00	215.0
122	05/13/11	1,494.00	215.0
123	05/20/11	1,633.00	215.0
124	05/27/11	1,821.00	215.0
125	06/03/11	1,939.00	215.0

After running a simple regression analysis we have the following output:

The Regression Equation is:

$Y = -22,352 X + 7294,631$

Slope, m = -22,352
Intercept, b = 7294,631

R-squared = 10,97 %

The value of the R-squared tells us that deadweight capacity can explain the BCI prices for a further 10,97 %. This is a low percentage but it still explains almost 1/3 of the remaining 36,2%.

Graph 7 Scatterplot BCI against CD

Scatterplot of BCI against CD

workbook 1 10v*125c

$BCI = 7294,6314 - 22,3519 \cdot x$

CD:BCI: $y = 7294,6314 - 22,3519 \cdot x$; $r^2 = 0,1098$ CD

Graph 8 Scatterplot BCI against CD with Elipse at 95% range

Scatterplot of BCI against CD

workbook 1 10v*125c

BCI = 7294,6314-22,3519*x

CD:BCI: y = 7294,6314 - 22,3519*x; r^2 = 0,1098
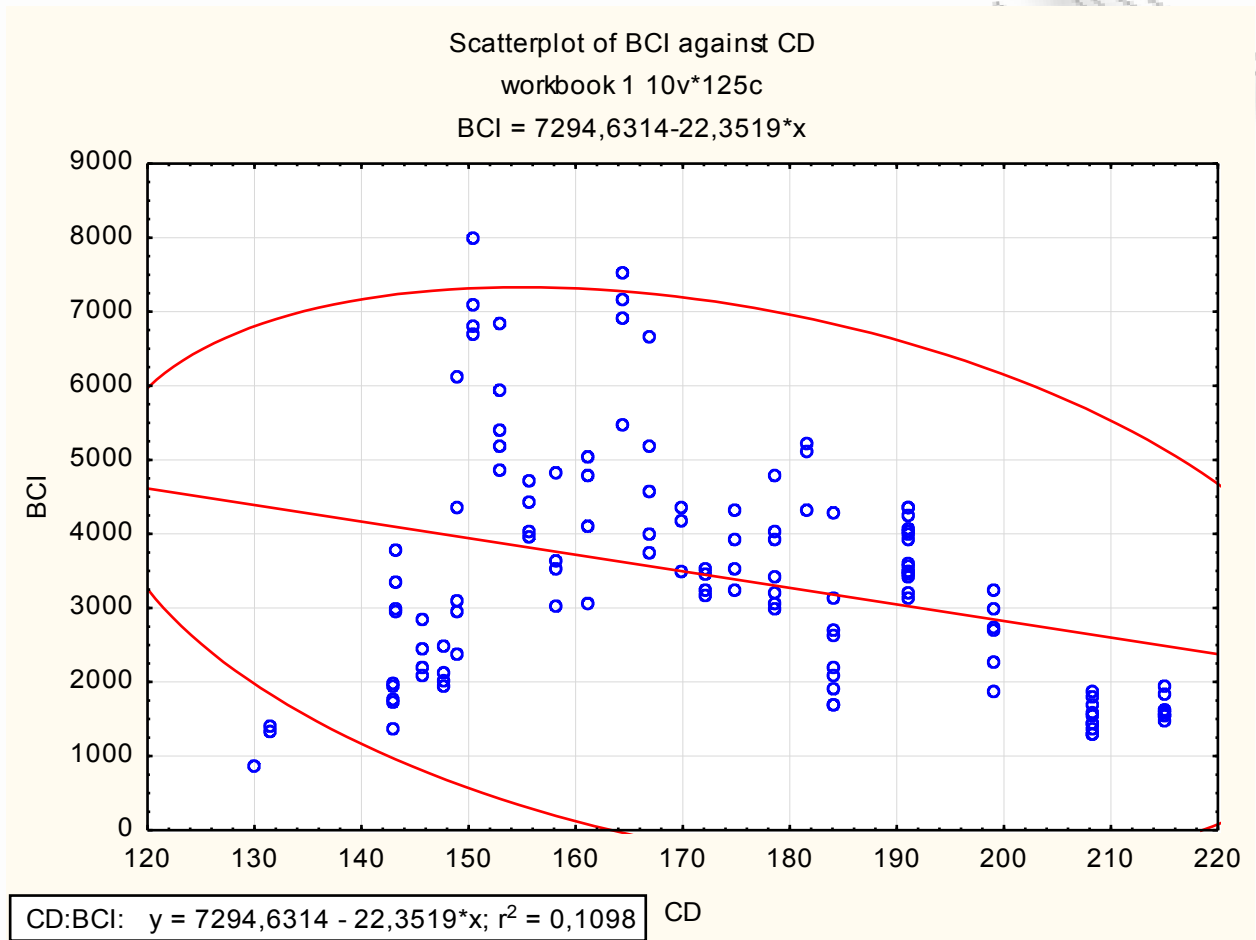
Graph 9 Scatterplot BCI against CD with Polar Coordinate System

Scatterplot of BCI against CD

workbook 1 10v*125c

BCI = 7294,6314-22,3519*x

CD:BCI: y = 7294,6314 - 22,3519*x; r^2 = 0,1098
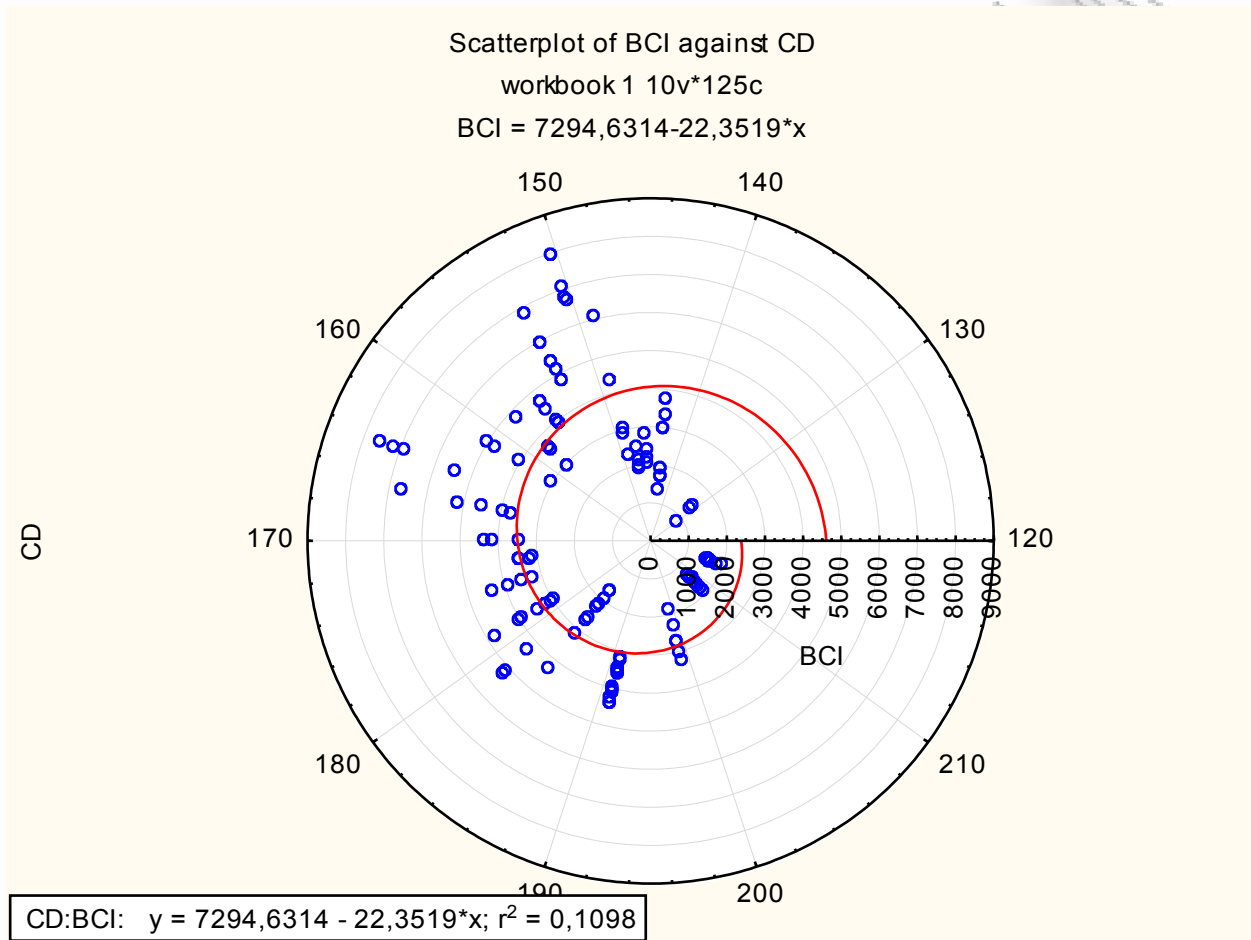
3.5 Simple Regression Analysis between BCI and reported Capesize deadweight capacity

Given the above results, we decide to take our research one step further and test the BCI agains another variable. For this reason we have collected data of the capesize deadweight that actually engaged its carrying capacity in trading coal or ore. These data have been gathered through official reports so we call our variable reported capesize deadweight. Thus we have:

Independent variable X: BCI
Dependent variable Y : CDR

Table 31 BCI and CDR prices (Chronological Data used for Simple Regression Analysis)

N observations	Date	BCI (Y)	CDR (X)
1	12/05/08	871	100.0
2	12/12/08	1,331.00	80.0

3	12/19/08	1,423.00	100.0
4	01/02/09	1,361.00	120.0
5	01/09/09	1,728.00	110.0
6	01/16/09	1,760.00	90.0
7	01/23/09	1,939.00	90.0
8	01/30/09	1,981.00	88.0
9	02/06/09	2,999.00	133.0
10	02/13/09	3,335.00	143.0
11	02/20/09	3,768.00	145.0
12	02/27/09	2,963.00	120.0
13	03/06/09	2,839.00	125.0
14	03/13/09	2,454.00	140.0
15	03/20/09	2,197.00	125.0
16	03/27/09	2,092.00	120.0
17	04/03/09	1,962.00	120.0
18	04/10/09	2,024.00	120.0
19	04/17/09	2,140.00	115.0
20	04/24/09	2,494.00	130.0
21	05/01/09	2,376.00	120.0
22	05/08/09	2,963.00	130.0
23	05/15/09	3,100.00	120.0
24	05/22/09	4,343.00	150.0
25	05/29/09	6,125.00	150.0
26	06/05/09	6,812.00	150.0
27	06/12/09	6,715.00	150.0
28	06/19/09	7,980.00	150.0
29	06/26/09	7,100.00	140.0
30	07/02/09	6,848.00	130.0
31	07/10/09	4,844.00	135.0
32	07/17/09	5,957.00	150.0
33	07/24/09	5,170.00	140.0
34	07/31/09	5,385.00	145.0
35	08/07/09	4,444.00	145.0
36	08/14/09	4,708.00	153.0
37	08/21/09	4,030.00	153.0
38	08/28/09	3,946.00	152.0
39	09/04/09	3,651.00	140.0
40	09/11/09	3,539.00	130.0

41	09/18/09	3,008.00	110.0
42	09/25/09	4,827.00	100.0
43	10/02/09	3,060.00	100.0
44	10/09/09	4,107.00	130.0
45	10/23/09	4,774.00	150.0
46	10/30/09	5,047.00	160.0
47	11/06/09	5,481.00	160.0
48	11/13/09	7,183.00	160.0
49	11/20/09	7,542.00	164.0
50	11/25/09	6,928.00	150.0
51	12/04/09	6,655.00	145.0
52	12/11/09	5,193.00	130.0
53	12/18/09	4,566.00	132.0
54	12/31/09	4,000.00	110.0
55	01/08/10	3,733.00	100.0
56	01/15/10	4,375.00	120.0
57	01/22/10	4,161.00	111.0
58	01/29/10	3,494.00	130.0
59	02/05/10	3,474.00	150.0
60	02/12/10	3,224.00	160.0
61	02/19/10	3,517.00	172.0
62	02/26/10	3,174.00	160.0
63	03/05/10	3,923.00	150.0
64	03/12/10	4,328.00	140.0
65	03/19/10	3,522.00	110.0
66	03/26/10	3244	170.0
67	04/01/10	3,429.00	174.0
68	04/09/10	2,984.00	177.0
69	04/16/10	3,071.00	165.0
70	04/23/10	3,200.00	160.0
71	04/30/10	3,936.00	161.0
72	05/07/10	4,041.00	161.0
73	05/14/10	4,804.00	162.0
74	05/21/10	4,317.00	165.0
75	05/28/10	5,217.00	170.0
76	06/04/10	5,110.00	175.0
77	06/11/10	4,276.00	170.0
78	06/18/10	3,134.00	160.0

79	06/25/10	2,717.00	165.0
80	07/02/10	2,627.00	165.0
81	07/09/10	2,102.00	164.0
82	07/16/10	1,676.00	164.0
83	07/23/10	1,708.00	180.0
84	07/30/10	1,922.00	165.0
85	08/06/10	2,194.00	161.0
86	08/13/10	3,210.00	155.0
87	08/20/10	3,578.00	150.0
88	08/27/10	3,449.00	170.0
89	09/03/10	3,937.00	175.0
90	09/10/10	4,019.00	180.0
91	09/17/10	3,481.00	165.0
92	09/24/10	3,121.00	166.0
93	10/01/10	3,419.00	166.0
94	10/08/10	4,076.00	166.0
95	10/15/10	4,345.00	175.0
96	10/22/10	4,373.00	178.0
97	10/29/10	4,262.00	150.0
98	11/05/10	3,994.00	155.0
99	11/12/10	3,612.00	156.0
100	11/19/10	3,496.00	140.0
101	11/26/10	3,233.00	155.0
102	10/03/10	2,983.00	160.0
103	12/10/10	2,694.00	165.0
104	12/17/10	2,723.00	175.0
105	12/31/10	2,285.00	150.0
106	01/07/11	1,865.00	165.0
107	01/14/11	1,595.00	135.0
108	01/21/11	1,556.00	140.0
109	01/28/11	1,368.00	145.0
110	02/04/11	1,299.00	140.0
111	02/18/11	1,442.00	130.0
112	02/25/11	1,315.00	128.0
113	03/04/11	1,427.00	120.0
114	03/11/11	1,891.00	120.0
115	03/18/11	1,687.00	115.0
116	04/01/11	1,792.00	100.0

117	04/08/11	1,612.00	100.0
118	04/15/11	1,564.00	100.0
119	04/22/11	1,542.00	100.0
120	04/29/11	1,570.00	105.0
121	05/06/11	1,566.00	110.0
122	05/13/11	1,494.00	115.0
123	05/20/11	1,633.00	100.0
124	05/27/11	1,821.00	130.0
125	06/03/11	1,939.00	110.0

After running a simple regression analysis we have the following output:

The Regression Equation is:

Y = -121,103 + 25,084 X

Slope, m =   25,084
Intercept, b = - 121,103

R-squared = 15,49 %

The value of the R-squared tells us that deadweight capacity can explain the BCI prices for a further 15,49 %. This is a low percentage but it still explains almost more than half of the remaining 25,23 %.

Graph 10 Scatterplot BCI against CDR

Scatterplot of BCI against CDR
workbook 1 10v*125c
BCI = -121,1033+25,0845*x

CDR:BCI: y = -121,1033 + 25,0845*x; r^2 = 0,1549
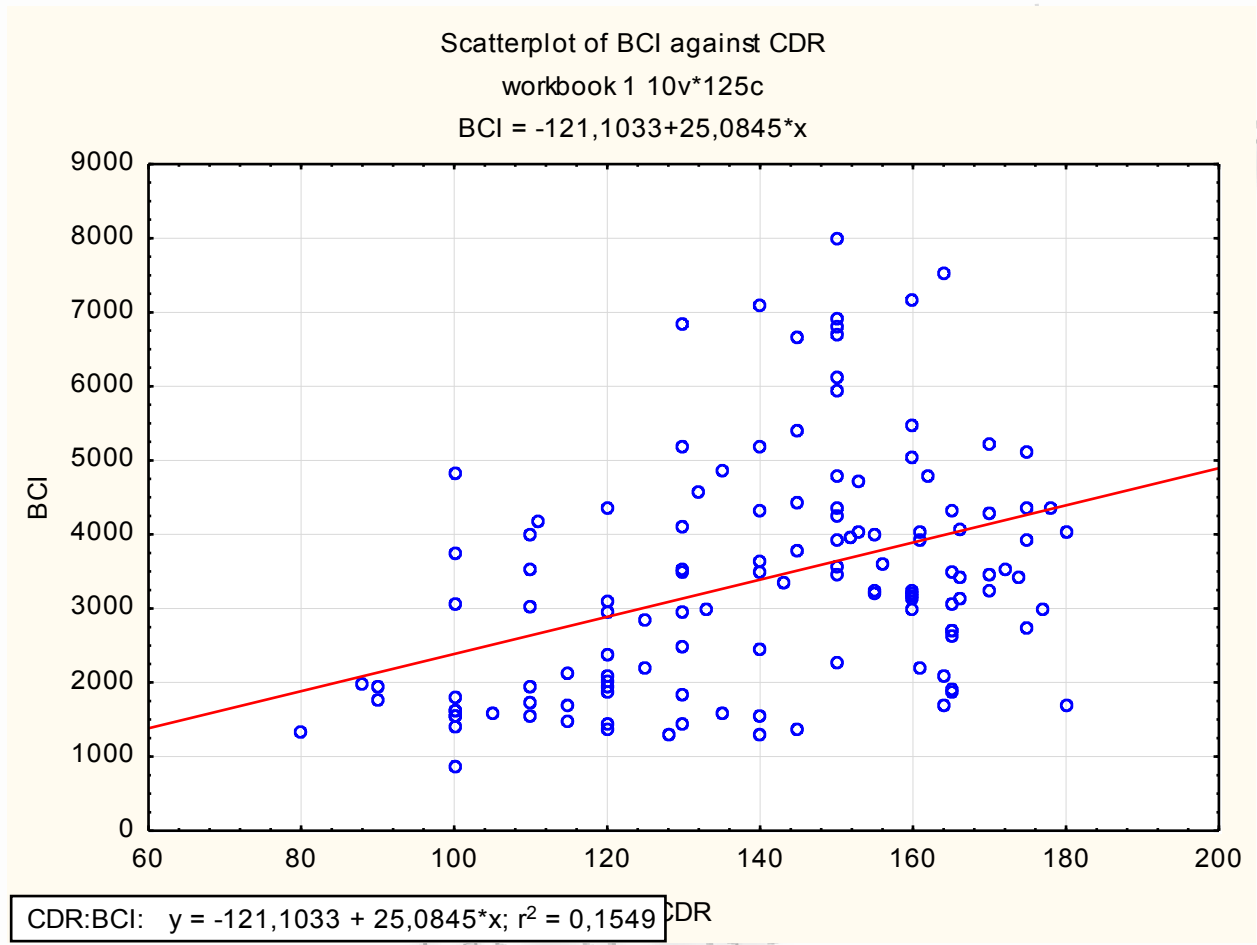
Graph 11 Scatterplot BCI against CD with Elipse at 95% range

Scatterplot of BCI against CDR

workbook 1 10v*125c

$BCI = -121,1033 + 25,0845*x$

CDR:BCI: $y = -121,1033 + 25,0845*x$; $r^2 = 0,1549$
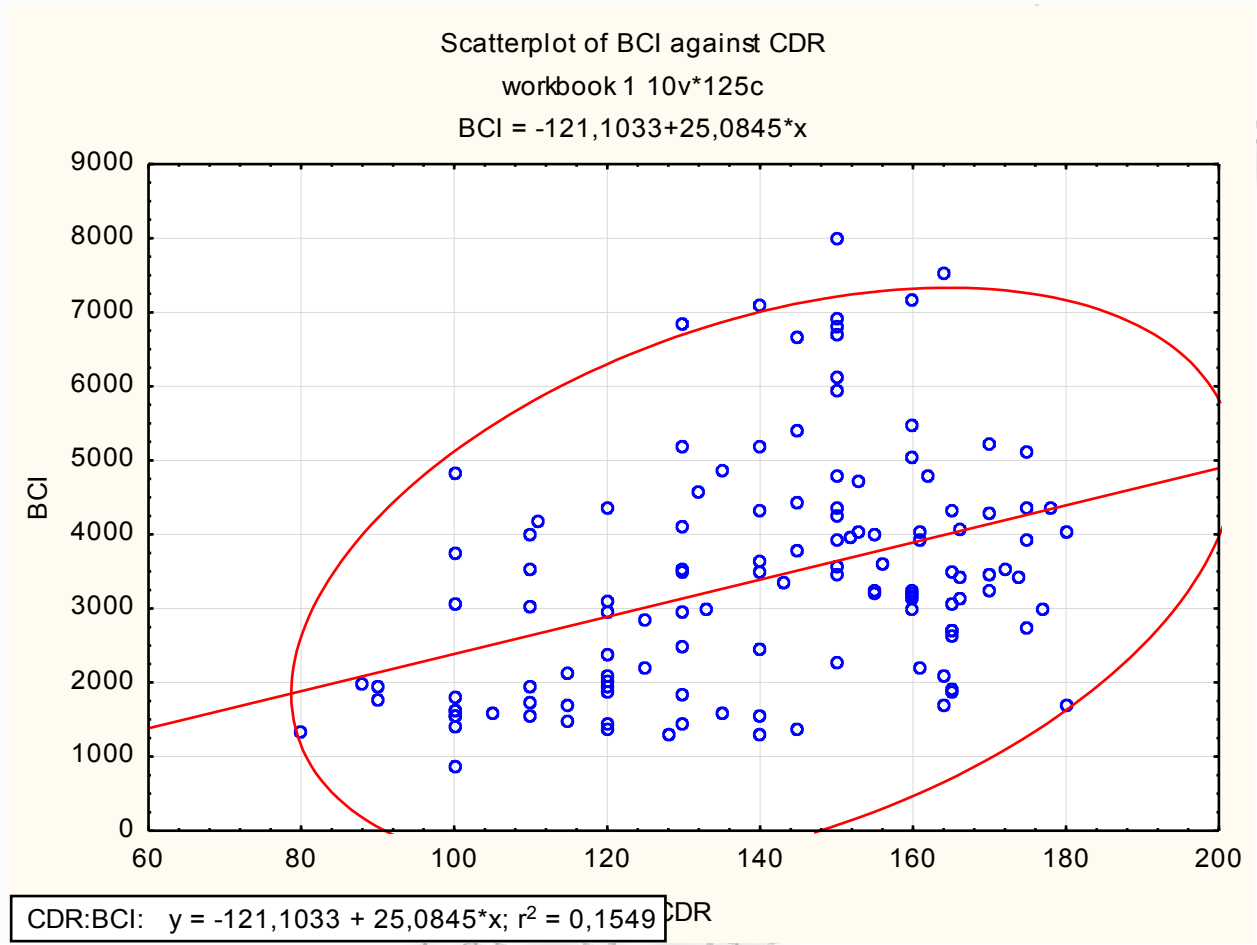
Graph 12 Scatterplot BCI against CD with Polar Coordinate System

Scatterplot of BCI against CDR

workbook 1 10v*125c

BCI = -121,1033+25,0845*x

CDR:BCI: y = -121,1033 + 25,0845*x; r^2 = 0,1549
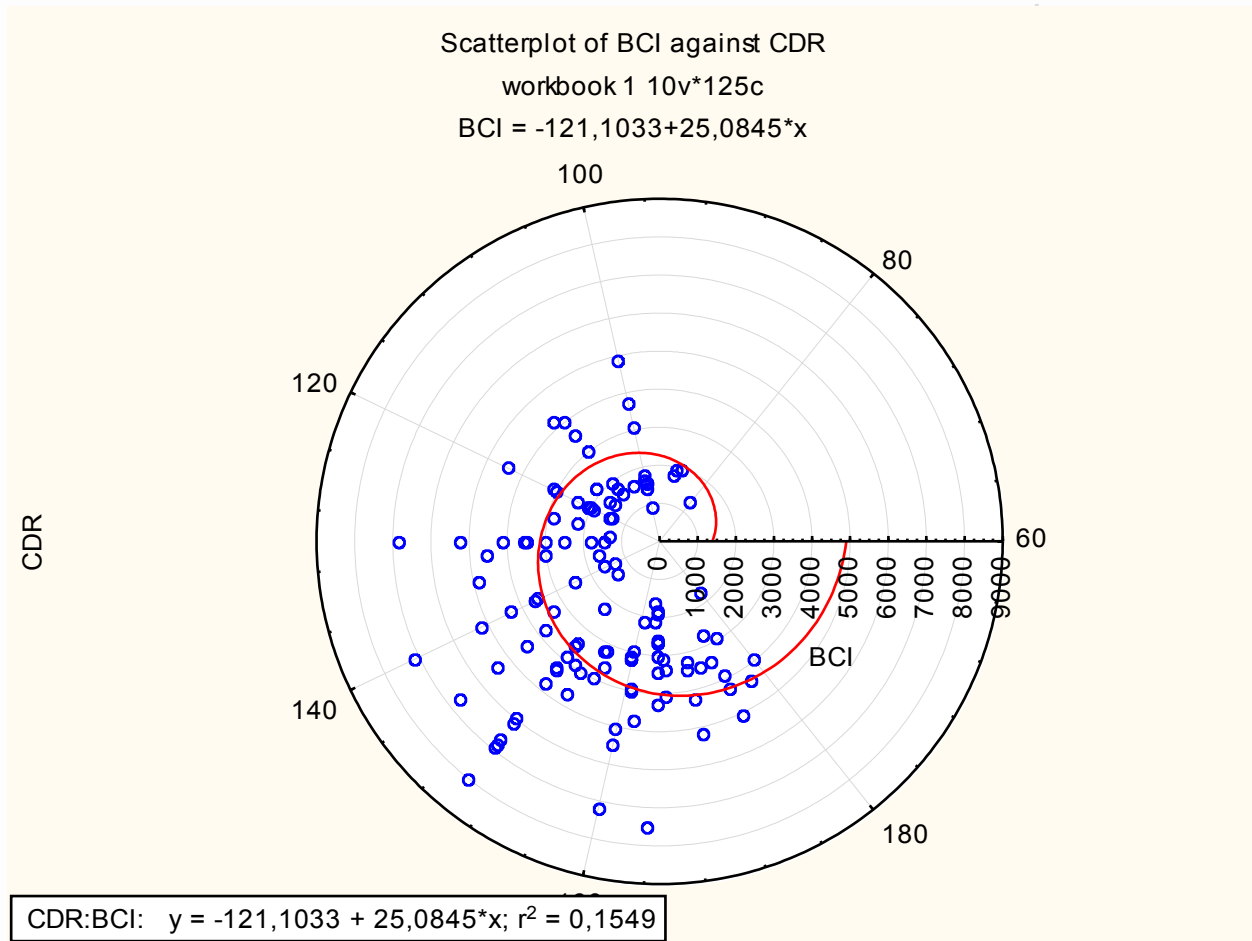
3.6 The Tanker Market

2009 was a particularly bleak year for tanker freight rates. Rates started the year in a gentle decline which continued until the middle of the year, after which they began to curve upwards. By the end of the year, tanker freight rates were at much the same level as at the beginning of the year. For most other sectors, freight rates were more positive, and the end of-year data showed signs of a possible recovery in the global economy. In general, freight rates in all trading routes declined.

Table 32 Monthly Tanker Freight Indices (WorldScale) 2008-2010

2008	Lloyd's Shipping Economist					Baltic Tanker	
	>200	120–200	70–120	25–70	Clean	Dirty Index	Clean Index
October	99	149	165	263	239	1 508	1 367
November	67	121	124	175	198	1 246	1 039
December	71	139	191	206	182	1 124	880
Average	79	136	160	215	206	1 293	1 095
2009							
January	54	84	100	125	130	849	623
February	44	65	84	95	126	597	600
March	33	90	82	120	105	626	543
April	29	52	67	105	72	524	371
May	30	58	66	90	103	476	424
June	43	63	102	112	98	482	479
July	36	50	66	100	94	623	463
August	35	52	67	91	96	474	467
September	..	..	..	..	..	487	442
October	41	62	76	96	89	557	515
November	47	78	81	100	94	588	439
December	53	77	111	121	124	671	528
Average	40	66	82	105	103	580	491
2010							
January	82	120	133	185	189	1 024	817
February	75	94	117	187	175	1 047	884
March	77	100	128	159	159	889	761
April	83	105	122	168	151	949	703
May	74	118	150	169	144	995	730
June	84	105	115	150	138	938	669

Source: UNCTAD secretariat, based upon information in Lloyd's Shipping Economist (a trade journal that specializes in maritimerelated market data and reports),

The tanker period charter gives a good indication of how cargo owners and shipowners perceive the market for over the next few years. When rates are low, charterers prefer long charters, and shipowners the opposite. When rates are high, shipowners prefer long charters, and charterers the opposite. In 2009, total chartering activity increased by just over a million dwt, to 28.064 million dwt. March 2009 was the month of least activity, with less than 1 million dwt being chartered, while June was the most active chartering period, with 4.864 million dwt chartered.

About 34 % of total chartering activity in 2009 was made up of long-term charters of 24 months or more, down from 36 % in 2008 and 46 % in 2007. This shows that charterers and shipowners are less inclined to engaging in longer contracts, a sign that the market is at a low point. The next most active sector for time chartering was for the period of less than six months (27 %), and then for the

period of between one and two years (25 %). Estimated tanker one-year time charter rates for a five-year-old ship of 280,000 dwt went from $55,000 per day in January 2009 to $29,300 per day by November 2009. There was little change at the beginning of 2010, with February's rate standing at $31,700 per day.

In summary, the global financial crisis has brought severe disruption to the tanker market, as reduced demand for transport services has combined with the increased supply of newly built vessels and pushed freight rates even lower. In June 2010, one tanker owner signaled its intention to reduce the speed of its vessels from 16.5 knots to 11 knots.21 Slow steaming avoids the need to enter ships into a more permanent lay-up position which can be costly to position and maintain, and to restart when conditions improve.

3.7 Container Market

German shipowners dominate global liner capacity, with Hamburg brokers controlling about 75 per cent of the container ship charter tonnage. Their ships, in many cases, are chartered by the large liner companies, which, together with their own fleets of vessels, operate an extended service (see chapter two for more details on liner shipping companies).

For example, CMA CGM's fleet consisted of about 67 per cent chartered-in tonnage in 2009, and APL's percentage was 71 per cent, while the average for the top 20 liner companies in 2009 was around 48.5 per cent.36 Since 1998, the Hamburg Shipbrokers' Association (VHSS) has published the Hamburg Index, which provides a market analysis of container ship time charter rates of a minimum duration of three months. Table 4.4 shows the average yearly rates since the year 2000, a well as monthly charter rates for container ships for 2009, as published by VHSS. More recently, VHSS has launched a new index called the New ConTex, which is a daily charter rate index of fixtures complied by a panel of international brokers.37 The index consists of six different container vessel types, and is depicted in figure 4.4 as a combined rate. The index shows the dramatic decline in container charter rates from the middle of 2008 to April 2009, when it leveled off, before embarking on an upward trajectory at the start of 2010. While charter rates for 2010 have rebounded from the 75 per cent declines seen in 2009, rates are at only around half their 2008 levels. The signs of recovery mentioned in chapter 1 can be seen in this index. Given this rise in the index, and the increased supply of new container vessels delivered in 2009 (see chapter 2), the outlook for liner shipping in 2010 and 2011 looks positive. The real test is whether the increased freight rates are a result of increased demand, or are a consequence of the tightening of supply by carriers.

Average yearly charter rates for all of the 10 vessel types shown in table 4.4 fell in 2009; prices for vessels of between 2,000 and 2,299 Tea's declined by 72.9 per cent compared to 2008, and vessels of between 1,600 and 1,999 Tea's declined by 71.3 per cent. Geared/ gearless vessels of between 200 and 299 TEU's proved to be the most resilient container vessel type, although average charter rates for 2009 were at only half of their 2008 average. One possible explanation may be that these vessels tend to be employed in areas where competition for container traffic is weak.

3.7.1 Freight rates on main routes

Below tables show the all-inclusive freight rates on the three main containerized routes (Pacific, Asia–Europe, and transatlantic). In 2009, freight rates continued a downward path that had begun in the fourth quarter of 2008. In early 2009, some container shipping lines lowered their Asia–Europe freight rates to zero and shippers paid only surcharges as a contribution to the carriers' operating costs. An improvement was first seen on the Asia–Europe route in the third quarter of 2009, and then on the other routes in the last quarter. Figures published by the European Liner Affairs Association show that container volumes on the Asia–Europe trade fell by around 14.8 per cent over the course of 2009. A year-on-year comparison between 2009 and 2008 shows that for each quarter rates were lower, except for United States–Asia in the first quarter and United States–

Europe in the first half.

In fact, the United States–Europe route proved to be the sturdiest over 2009, while rates from Asia to the United States suffered the biggest falls. Liner shippers attempted to push freight rates up, by slow steaming and by laying up vessels. The sailing time from some northern European ports to Asia increased to a record high of over 40 days.38 This helped push base freight rates from Asia to Europe from $600 in October 2009 to $900–$1000 by the end of the year.

3.7.2 Container leasing

Unlike other maritime transport sectors, where the unit of carriage is included in the packaged product (e.g. a pallet of rice), container cargo also creates a derived demand for containers, about 40 per cent of which are leased from dedicated container leasing companies (lessors). Container leasing rates fell sharply at the end of 2008, and continued to decline throughout 2009. At the start of 2009, the daily hire rate for a five-year option on a standard TEU was $0.65 and by the end of the year this had declined to $0.62. The daily rate for a forty-foot equivalent unit (FEU) high-cube unit experienced a similar decline, starting the year at $1.10 and falling to $1.05 by the fourth quarter.

The average cash investment return in 2009 remained at 11.5 per cent for standard twenty-foot containers and 12.5 per cent for forty-foot high-cube units. Demand for rental equipment gradually improved over 2009, perhaps helped by the credit crisis as bank lending constraints placed a greater emphasis on the need for companies to curtail spending.

The world container fleet, comprising 10.2 million TEUs owned by lessors and 16.9 million TEUs owned by sea carriers, contracted in 2009 by more than 5 per cent compared to its 2008 level, registering 27.1 million TEUs in 2009.

In summary, 2009 was a bleak year for freight rates in the tanker, major dry bulk and liner sectors. The deepening of the global financial crisis severely affected demand for all types of commodities and goods. All sectors experienced a tumultuous year, with freight rates for many ships at around one quarter of the previous year's rates. Although some signs of recovery were seen towards the end of 2009, freight rates for 2010 and beyond remain uncertain as doubts surround the ability of industry and governments to sustain a recovery on the back of excess tonnage ordered at the peak of the market. Shipowners adopted a number of measures that included slow steaming, vessel lay-ups and ship demolition to combat the decline in demand and to turn their fortunes around. The ship demolition market also collapsed in 2009. The sum offered to shipowners for demolishing ships remained low, with the price of steel in the Far East at around $185 per light displacement ton (ldt) in March 2009, compared to more than $700 in the previous year. However, rates gently climbed to $400 in early 2010. Demolition rates in South Asia (Pakistan and India) tended to hover at approximately $20–$60 more per ldt than those in the Far East. Reduced demand, increased supply and unfavourable demolition prices, coupled with the operational losses incurred in 2009 and 2010 by many shipowners, may mean that consolidation in the shipping industry could be forthcoming in 2011.

Table 33   Container Ship Time Charter Rates (dollars per 14-ton slot/day)

Ship type (TEUs)	Yearly averages										
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Gearless											
200–299	15.7	15.7	16.9	19.6	25.0	31.7	26.7	27.2	26.0	12.5	11.5
300–500	14.5	14.7	15.1	17.5	21.7	28.3	21.7	22.3	20.0	8.8	9.0
Geared/Gearless											
2 000–2 299	10.7	8.0	4.9	9.8	13.8	16.4	10.5	11.7	10.0	2.7	3.6
2 300–3 400[a]			6.0	9.3	13.2	13.0	10.2	10.7	10.7	4.9	4.7
Geared/Gearless											
200–299	17.8	17.8	17.0	18.9	27.0	35.4	28.0	29.8	32.1	16.7	16.9
300–500	14.6	14.9	13.4	15.6	22.2	28.8	22.0	21.3	21.4	9.8	10.2
600–799[a]			9.3	12.3	19.6	23.7	16.6	16.1	15.6	6.6	7.7
700–999[c]			9.1	12.1	18.4	22.0	16.7	16.9	15.4	6.0	7.2
800–999[d]										4.9	6.3
1 000–1 260	11.9	8.8	6.9	11.6	19.1	22.6	14.3	13.7	12.2	4.0	4.8
1 261–1 350[e]										3.7	4.3
1 600–1 999	10.4	8.0	5.7	10.0	16.1	15.8	11.8	12.8	10.8	3.1	4.0

Ship type (TEUs)	Monthly averages for 2009											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Gearless												
200–299	15.5	12.5	13.2	11.8	10.6	13.5	13.5	10.7	12.0	11.8	10.9	13.5
300–500	10.9	9.6	9.1	8.5	8.9	8.8	8.8	8.1	8.9	8.1	7.8	8.6
Geared/Gearless												
2 000–2 299	4.6	3.2	3.2	2.4	2.4	2.5	2.5	2.5	2.5	2.3	2.1	2.1
2 300–3 400[a]	9.5	9.5	2.8	2.6	2.5	2.3						
Geared/Gearless												
200–299	20.8	18.2	17.2	17.2	15.7	15.3	16.9	15.6	16.8	14.0	15.6	16.6
300–500	12.5	10.7	9.4	9.5	8.7	11.0	10.0	9.8	10.0	8.8	8.9	8.6
600–799[a]	12.1	7.2	6.2	6.3	6.2	6.4	5.6	6.0	5.7	5.6	6.0	5.8
700–799[c]	7.5	6.9	5.9	6.0	6.0	5.9	5.7	6.0	5.8	5.7	5.5	5.5
800–999[d]												
1 000–1 260	5.0	4.9	4.5	4.1	3.8	3.8	3.7	3.7	3.7	3.7	3.8	3.6
1 261–1 350[e]												
1 600–1 999	4.7	3.7	3.5	3.2	2.8	2.8	2.7	2.6	2.7	2.6	2.6	3.1

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Ship type	Monthly averages for 2010					
(TEUs)	Jan	Feb	Mar	Apr	May	Jun
Gearless						
200–299	10.44	11.72	12.95	10.39	12.68	11.90
300–500	9.07	8.13	8.30	8.45	9.25	9.63
Geared/Gearless						
2 000–2 299	2.63	2.42	2.50	2.79	3.15	5.17
2 300–3 400[a]	2.08	2.57	2.95	5.19	5.49	7.16
Geared/Gearless						
200–299	16.61	15.24	15.63	15.63	17.38	20.23
300–500	8.78	9.42	9.69	11.58	9.65	9.84
600–799[b]	6.07	5.91	7.41	6.23	7.22	8.54
700–999[c]	6.66	6.21	6.26	6.64	6.91	8.24
800–999[d]	6.38	6.05	5.22	5.30	6.10	6.99
1 000–1 260	3.97	3.78	4.03	4.27	4.84	6.19
1 261–1 350[e]	3.32	3.43	3.57	3.76	4.16	5.30
1 600–1 999	2.96	3.31	3.02	4.49	3.40	4.99

Source: Compiled by the UNCTAD secretariat, from the Hamburg Index produced by the Hamburg Shipbrokers' Association, available at http://www.vhss.de; and from Shipping Statistics and Market Review

Figure 6   2007-2010 (indices base 1.000 , October 2007)
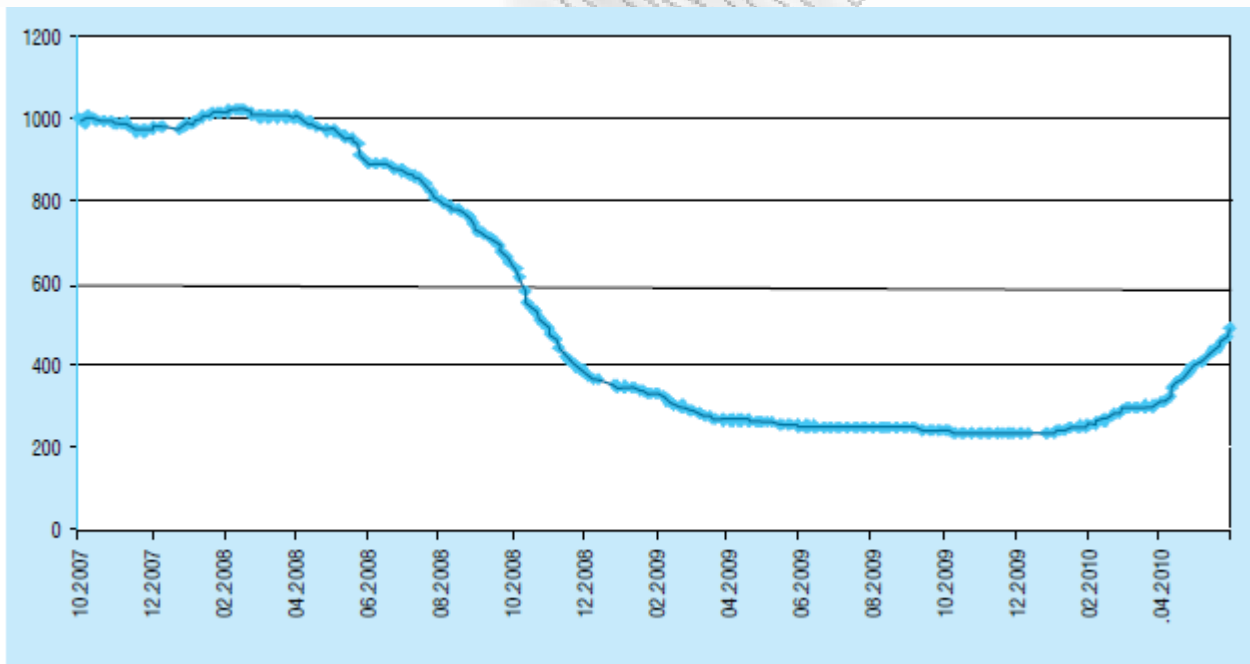
Source: *Compiled by the UNCTAD secretariat, using the ConTex Index produced by the Hamburg Shipbrokers' Association which is available at http://www.vhss.de.*