A report on dry bulk shipping

Shipping is indubitably one of the fascinating industries in the world. It requires vast knowledge and skill to cop up with the day to day operations because of the complexity of the industry and its dependence on world economics. Dry Bulk ships carry dry cargoes in bulk from one port to another and can be categorised into handysize, handymax, panamax, capesize, and very large bulk and ore carriers according to their sizes. The performance of the bulk shipping market depends on the demand for and supply of bulk shipping services, as well as the characteristics of the market structure. The importance of shipping cycle in case of dry bulk carrier is that they plays a vital part in the economics of shipping industry by managing the investment risk in an industry , where there is large uncertainty about the future (Stopford, 2009)

Section 1

Literature Review

One of the major aspects affecting the future of dry bulk shipping is the quality and the safety perspective. Nominal freight differentiation between ‘ quality’ and ‘ other’ tonnage has been observed occasionally and much services has been paid to promoting the need for younger and safer ships (Tamvakis and Thanopoulou, 2000) Another factor that can influence maritime flows of dry bulk commodity is seasonality patterns . Spot rates for bigger vessels shows higher seasonal variations compared to smaller vessels, although differences in seasonal fluctuations between sectors are removed as the contract duration increases. (Kavussanos and Alizadeh, 2001)

Investing in shipping industry has an entirely new aspect by the introduction of private equity and the development of a hedging strategy, now this can be treated as a portfolio optimization problem. The freight futures provide a comparatively novel medium for hedging risk in dry bulk shipping markets. New uprising financial strategies in dry bulk shipping in future can revolutionize the entire market.(Cullinane, 1995)

Duration analysis done by Bijwaard G. E and Knapp. S provides an insight to the effectiveness of prolonging ship lives and the empirical data solidifies the idea about the life span of dry bulk carrier. Life span is an important aspect in predicting the ship cycle(Bijwaard and Knapp, 2009)Scrapping of ship is done at a particular time and this is done when the ship is retired from the current use or when shipping cycle demands it. Gain and losses after the scrapping of a ship . entirely depends on the market condition. Demand of Dry bulk shipping is always related to the scrapping industry.(Knapp, 2008)

The Government is proposing that the UK’s CO2 emissions should fall by at least 80% by 2050 . Release of exhaust gases and particles from oceangoing ships is an important and growing provider to the total emissions from the transportation sector. New strategies like slow steam, alternate fuel and new logistic approach like jumbo ore carriers etc will be used in future to make the shipping sector more eco friendly(Eyring et al, 2010)

Research Hypothesis

Marine flow of dry bulk goods in 2050 will be largely influenced on numerous factors and the background study done above concretes this statement. From the background study done above following hypothesis are made.

The changing investment strategy like private equity and development of hedging strategy in world’s dry bulk shipping can promote the ship owners to invest in new ships and it can also attract new ship owners to the industry . If the scrapping doesn’t goes in proportion with the production , it could affect the supply and demand of dry bulk goods and there would be frequent interference of shipping cycle

The design, tonnage and operation of dry bulks ships in 2050 can vary a lot from the present. Carriers like jumbo ore carriers and trend to containerisation can be the future of dry bulk shipping . Seasonality and size issues at present might be totally vanished in the future.

Developed countries like United Kingdom are concentrating more on environmental issues caused by shipping industries and UK’s target to reduce CO2 emission by 80% in 2050 can have great influence in marine transportation of dry bulk commodities. This is mainly because in future government may bring controls to ships having co2 emission more than 80% which can result in restricting ships entering into UK ports. Now this can lead to change in the flow of dry bulk goods in and out of UK.

Both the demand for shipping services and shipping rates in 2050 will be positively related to the shipping cycle.

Section 2

Data Analysis

Origin of the data used in this research was mainly collected from Thomson Reuters Datastream, OECD. stat, Shipping Intelligence Network by Clarksons

Research and United Nations Statistics Division. The other data source used in this research is Lloyd’s Shipping Economist

The Shipping Intelligence Network according to Clarkson’s Research is one of the top on line commercial shipping database and almost all related data required for this research like Baltic Freight Index and the fleet size were collected from this source. Data required for shipping cycle are collected from Thomson Reuters DataStream which is according to their webpage the largest financial database in the world. Some data were also collected from OECD(Organisation for Economic Co-operation and Development) and United Nations Statistics Division

The data for the supply and demand are accessible from a centralised table called “ Supply and Demand Data” in Lloyd’s economist. The data required for supply and demand of dry bulk carrier were collected from those tables for the current analysis of the bulk carrier market

The time series that were taken from Lloyd’s shipping are stated below

Total demand and supply of bulk carrier fleet in million DWT

Total size of bulk carrier fleet adapting slow steaming strategy

Total number of bulk carrier’s order book in million DWT

The number of bulk carrier’s order book should be taken serious as there is an interval of two years from the order to the delivery. The data for supply and surplus of the fleet following slow steam strategy is either laid up or in-active are calculated in tons of dead weight

To analyse the dry bulk shipping cycle it is useful to study how the key variables in this market have developed over time. It is very difficult to find the accurate measures of cycles , representing the demand for shipping service and hence it not easy to find a relationship between dry bulk shipping and shipping cycle in general . To measure the freight rates in dry bulk shipping BFI(Baltic Freight Index) can be used (Glen and Rogers1997)

Even though the BFI (Baltic Freight Index) ceased to exist when Baltic Exchange Dry Index was introduced, till today it has been calculated and reported by Clarksons Research Shelley (2003),

As demonstrated in the Figure some striking changes are recorded in the freight rates of dry bulk shipping in recent years. The BFI reached at its maximum level in October 2007, followed by a dramatic fall in 2008. Figure(b) shows that the volatility of the freight rates have increased significantly after 2002-03

If a Comparison is done between figure 1 and figure 2 some similarities can be observed like increased freight rates in 2003-04 are matched by increasing total bulker sales and similarly the vice versa in the year 2005 and 2008 and hence a co-relation between freight rate and bulker sales can analysed from the above figures. Figures also expose a trend in increased volatility in total bulker sales during the period 2003-2008. c(Clarkson, 2010)

The augmented volatility in current years point towards that the fleet is almost equal to the current capacity limit. During the high capacity period, demand shocks have a great impact on freight rates. This can be a logical

explanation of the hugely increased freight rates in the recent periods of boom in the world economy

GDP for OECD, USA, Japan and China can be used to determine shipping cycles. The GDP of OECD is used as a alternative variable for world production, while the GDP of the US, Japan, and China represents the economic activity and demand for shipping services in three very important countries in world trade.(OECD, 2010)

The figures are based on data from the Shipping Intelligence Network by Clarksons Research and Thomson Reuters DataStream

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All quarterly variables, the GDP of OECD, USA, Japan, and China from OECD stat helped us in finding that, these variables are non-stationary, as is the relevant time series for the Baltic Freight Index. The BFI from Clarkson led to the conclusion that all the shipping cycle are co related with the BFI. The sources that are used in this research gave us a larger perspective of the research objective and found out that, identifying the shipping cycle is a difficult process because there is much less previous researches done on this topic.

Section 3

Demand and Supply Model for Dry Bulk shipping

In present day there are number of models which have been developed to forecast and explain freight rate by examining the factors influencing the demand and supply of the respective services.. Tinbergen(1934) model is

considered to be one of the oldest econometric application.(Beenstock and Vergottis, 1993). In new models the basic concept and idea are similar but the models have become more sophisticated by the application of new techniques .

In 1980 a model was developed and presented in Strandenes and Wergeland which was named as NORBULK model. This model is considered to be one of the important econometric technique in predicting the freight rate in dry bulk shipping. The NORBULK model is based on the assumption that the demand for transportation of dry bulk commodities is determined by the freight rates, the trade patterns, and variables reflecting the macroeconomic situation

A Graphical illustration of NORBULK model is shown above. From the illustration it is clear that demand and supply of dry shipping services are assumed to be influenced by the freight rate and at the same time equilibrium freight rates reflect the demand and supply of the shipping services. The model also explains the fact that macro economic conditions (the product capacity and cycle situation)influence the trade of bulk commodities which can alter the demand for transportation of dry bulk commodity. The speciality of NORBULK model from other models is that the other models are concentrated on major bulk commodities separately. The relation between trade and aggregated macroeconomic condition is one of the distinct features of NORBULK model.

Supply part of the NORBULK model accounts for the size of the fleet, the fuel price, and the freight rates. The shape of the supply curve in a specific market reflects the relationship between the freight rate and the supply of

shipping services, while, for instance, changes in the size of the fleet cause shifts in the supply curve.

A characteristic shape of a supply curve in dry bulk shipping

Ton miles is the measurement for supply and demand in sea transport and this is equal to the average haul multiplied by the tonnage of cargo (Strandenes and Wergeland, 1980)

Shipping cycles are not cyclical or regular and hence in true world shipping predicting the shipping cycle are a loose sequence of up and downs and hence predictions in ship cycle is always a tough task. According to Cufley “ it is totally impossible to predict when the market will move upwards or fall. NORBULK is an example of a model based on the assumption that demand is inversely related to the freight rate. The relationship was estimated to be very inelastic, however. Still, Strandenes and Wergeland (1980) argue that it is potentially important to account for the price elasticity in both supply and demand.

There are 10 variables in the demand and supply model which affect the demand for shipping and the supply of ships for the carriage of goods. The variable in the demand for ships are: The world economy, seaborne commodity trades, average haul, political event and transport cost. The variables for supply of ships are: World fleet, fleet productivity, ship building productions, scrapping and losses and freight rates.(Stopford, 2010). Difficulty of analysing the above variables is daunting. The world economy is complex and sometimes we have to wait for years for the availability of the detailed statistics for accurate evaluation . Many of the variables mentioned

above are highly un predictable and hence the forecasting must be considered as a process to clarify the risk rather than creating certainty. Working of NORBULK model is not focused on a particular commodity and it gives a general result which can be applicable to all the dry bulk carriers. New developed models used in dry bulk shipping concentrates more on a specific commodity and there is always possibility that when modelling a particular commodity bulk carrier new models might be more accurate than NORBULK model. Assumptions made in developing the model sometimes can be far away from the reality and this can always result in wrong forecasting or prediction.

Conclusion:

It is always interesting to follow the future development of the dry bulk shipping market. In our opinion to understand the basic forces controlling the development of freight rates and shipping volume both econometric and theoretical analysis are very significant . On analysing the economic market we were able to understand the relations that are believed to exist between factors. We were also able to discover that the reason for shipping cycles to exist are the inelasticity of supply in shipping market which disables supply to meet the demand in the short run.

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