“Dry Cargo Charter Market with Reference to Coal “

Project Report submitted in partial fulfilment of the requirement for the award of degree of

Master of Business Administration

(International Transportation and Logistics Management)

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DECLARATION

I, **Vikash Kumar (Reg. No. 2003305039),** student of School of Maritime Management, Indian Maritime University – Chennai Campus, hereby declare that this project report titled **Dry Cargo Charter Market with reference to Coal** submitted in partial fulfilment of the requirement for the degree of **Master of Business Administration in International Transportation and Logistics Management** is my original work carried under the guidance of my project guide. It has not formed the basis for the award of any Degree/Diploma of any University/Institution. The information submitted is true and original to the best of my knowledge.

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Date:

CERTIFICATE

School of Maritime Management

Indian Maritime University, Chennai.

This is to certify that the project report entitled "**Dry Cargo Charter Market with reference to Coal.**", submitted to the School of Maritime Management, Indian Maritime University, Chennai Campus., in partial fulfilment for the award of the degree of Master of Business Administration in International Transportation and Logistics Management, is a record of work carried out entirely by **Vikash Kumar, Reg. No. 2003305039**.

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Contents

LIST OF ABBREVIATIONS

BDI : Baltic Dry index

BFI : Baltic freight index

BIFFEX : Baltic Freight Future index

COA : Contract of Affreightment

COMBI : Combined Carriers

DWT : Deadweight

GDP : Gross Domestic Product

OB : Ore/Bulk

OBO : Ore/Bulk/Oil

OECD : Organisation For Economic Co-operation and Development

CHAPTER – 1

INTRODUCTION

1.1 Introduction

Dry bulk market refers to the movement of significant commodities carried in bulk: – the so-called major bulks (such as iron ore, coal, grain), together with ships carrying steel products (coils, plates and rods), lumber or log and other commodities classified as the minor bulks. Other cargo ships include OBO's (ore/bulk/ ore carriers or Combination Carriers), which are vessels able to trade alternatively dry and wet cargoes.

The importance of the dry cargo industry is crucial. Without it, global trade and industry could not exist. The international steel industry, for example, could not function without an efficient and cost-effective maritime industry transporting the raw materials – coal and iron ore, as well as the means to ship the finished product around the world. At average home, the unseen links with the dry cargo industry are clearly noticed. Toasting a piece of bread involves metal components in the toaster – manufacturing processes using ores and aluminium, grain used in the bread and coal-generated electricity providing the power.

The weight for dry bulk is measured in an industry convention known as tons of deadweight (dwt). Some of the industry's larger transportation vessels can carry mega tonnes (MT) of deadweight. This industry weight measurement convention developed over time because of the unpackaged nature of the commodities being transported.

The transport of dry bulk commodities is highly regulated due to the effects that an in-transport accident can have on the environment. Since these commodities are unpackaged, a spill puts them right into the environment and renders them extremely difficult to clean up, leading to the destruction of the environment and possible endangerment of people and wildlife.

The Baltic Dry Index (BDI) is probably the most common index used to measure changes in the cost to transport various dry bulk commodities around the world. Calculated by the London-based Baltic Exchange, it is a composite of the Capesize, Panamax, and Supermax

averages. BDI is derived by contacting various shipping brokers to assess price levels for various routes, products to transport, and times to delivery.

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Type of Dry Bulk Commodities: -

Dry bulk commodities are usually divided into two categories: major bulks and minor bulks. Some examples of major dry bulk commodities include iron ore, coal, and grain. These major bulks account for nearly two-thirds of global dry bulk trade. Minor bulks include steel products, sugars, cement, and cover the remaining one-third of global dry bulk trade.

Coal, along with iron ore, is one of the most traded dry bulk commodities by volume in the world. Countries most involved in the import of coal for their primary energy and electricity needs are India, China, and Japan.[2] Grain is another major cargo in terms of seaborne dry bulk trade and accounts for a chunk of the total dry bulk trade worldwide.

1.2 Literature Review

As a part of research process, it is necessary to undertake a literature review which represents the previous researches in related to dry bulk market. Source of literature being review in the paper involves book and journal, which access through library, electronic database together with internet search engine.

In spite of the dry bulk shipping important, research papers on dry bulk market rates are scarce.

As the freight charge of dry bulk cargo holds a major share of supply chain cost it is important for supply chain participants to understand the determining factors of the bulk freight market. Shen and Lo(2012) investigate the short term and long term causality realationship between the Baltic dry index and gross domestic product of the BRIC (Brazil, Russia, India and China) Countries by applying the equilibrium analysis and granger’s casuality test. Their research confirms the existence of short term and long term equilibrium relationships between BDI and

GDP in the ease of China. Also , no significant casualities were found between the BDI and the GDP of Brazil , Russia and China. Jing et analyse the characteristics of volatility in dry bulk market freight rates of different vessel sizes by applying EGARCH models on a sample of daily returns of freight rate indices collected for a period 1999- 2005. The authors noticed that the shocks will not decrease but have the tendency to strengthen . Moreover , external shocks on the market have a different influence on volatility in different types of vessel due to their distinct flexibility. They have also investigated the asymmetric impact between past innovations and current volality , noticing that the asymmetric chacaraters are distinct for current volatility , noticing that the asymmetric characters are are distinct for different vessel size segments and different market conditions due to the different flexibility and different commodity transport on different routes. Merikas et al.. apply copula selection based on goodness of forecast criteria. Also , they have used a homogenous dataset in terms of copula structural shifts absence. According to the research results , dry bulk time charter rates weekly returns exhibit symmetric distribution. The analysis performed in this paper is useful for portfolio optimization.

The global economic crisis has strongly affected the international shipping industry . In this context , the freight rates for the dry bulk market have sharply decreased. Li et al (2009) investigate the features of the dry bulk market taking in consideration the market deterioting conditions. The authors analyse the demand and the supply ,providing predictions and suggestions for dry bulk shipping companies to help them face risks . According to their research , the demand is shrinking ,while the supply is affected by aggravated financial situation of carriers.

Guo et al. (2009) examine the international dry bulk freight rates during 2003-2008 by applying qualitative analysis on the composting factors of the dry bulk shipping market. Moreover , they investigate the features of mutual action of the world dry bulk demand and supply by applying structural equation model . The research results highlight the fact that , from the perspective of demand and supply , the dry bulk fleet supply market is of a greater impact for freight transport , making the international dry bulk cargo transport market a seller”s market.

The study is focused on various aspects of dry cargo market wherein we have studied the volatility in dry cargo charter market and various aspects of it with reference to import of coal inindia from Indonesia and south Africa has been analysed. Various difficulties have been identified during the study and the situation occurred due to those difficulties have been

mentioned.The possible solutions has been discussed and analysed with the available sources , summary and conclusion has been mentioned on the basis of analysis.

1.3 Objectives of the study

The goal is to gain a better understanding of the many aspects of dry cargo chartering. The following are the key goals:

a) To study the dry cargo charter market's volatility

b) To study the roles of shipping pools in the dry bulk market.

b) To study coal imports into India from Indonesia and China.

1.4 Scope and limitation of study

a) The study's major focus is on the dry cargo charter sector.

b) The research is limited to coal imports from Indonesia , China into India.

c) Historical data was the primary source of information, and several market information channels, including published journals, were used to obtain sufficient data.

d) Data collection is only a secondary source.

1.5 Methodology

Secondary data was obtained from various sources and procedures were used to achieve the study's aims. The data was gathered primarily from internet sources such as Lloyd's List and Tradewinds. The information gathered from various sources was analysed and shown using statistical tools such as pie charts, graphs, and tables.

The main research methodology used in this paper is economic analysis, with estimates based on historical data for each segment of the dry bulk market.

1.6 Chapterization :-

The entire research work consists of four chapters . The first chapter on introduction brings out the importance of research study and states its objectives , scope and limitation of the study, methodology and review of literature.

Chapter 2 is focused on to study the volatility of dry cargo charter market wherein the dry cargo charter market has been introduced and the historical data has been collected and analysed. It gives an insight on import of coal in india from Indonesia, China & south Africa has been introduced. Historical data has been collected and analysed pertaining to the the freight and prices of coal. Based on the analysis a conclusion is drawn.

Chapter 3 explains difficulties in the dry bulk shipping industry which leads to the need of shipping pools and the rationale of shipping pool has been broadly discussed and based on that the conclusion has been mentioned .

Summary and conclusions of the research has been presented in chapter 4 followed by references.

CHAPTER - 2

VOLATILITY OF DRY CARGO CHARTER MARKET

2.1 The Dry Bulk Market

The dry bulk freight business had a turbulent year in 2021, with rising worldwide demand for vital raw materials driving up rates across the board.

This comes as the Covid-19 outbreak and a succession of extreme weather events in Asia and North America continue to cause havoc.

Following the initial shock of the Covid-19 pandemic, the global economic recovery and subsequent rebound in the dry bulk market has seen freight rates hit decade-highs this year, backed up by strict Covid-19 protocols at various ports – particularly in China – that have created significant supply chain bottlenecks.

Furthermore, the market has had to deal with a series of severe weather events that have added to port congestion and disrupted terminal operations.

The devastation wrought by Hurricane Ida's landing on New Orleans and the US Gulf Coast at the end of August disrupted grain loading operations severely, forcing China, the world's top soybean importer, to move its demand focus to other areas, such as the US Pacific Northwest and Brazil.

Similarly, a succession of major hurricanes hit Asia in the second half of the year, the biggest of which was Super Hurricane Chanthu, which forced the temporary closure of China's two largest ports in early September.

Along with the disruption to shipping routes, shifting demand for dry bulk commodities, notably from China, has altered sentiment in dry bulk freight markets.

There, strict regulations were established.

In recent months, the outlook for iron ore demand has been complicated by a drop in Chinese steel production as a result of Beijing's pledge to limit steel output to below 1 billion mt by 2021, as well as the ongoing plight of Evergrande and the deepening liquidity crisis in the Chinese property sector.

Meanwhile, Chinese coal imports have boosted dry bulk rates in recent months; but, rising domestic supply is expected to constrain demand for imported volumes in the months ahead.

Prices peaked in late October, according to Agricensus data, with the crucial US Gulf to Northeast Asia route jumping to $89.05 per tonne before declining to $67.25 per tonne by the week of December 3 - a pattern seen on most other routes examined.

2.1.1 Outlook for 2022

Despite the steep drop in dry bulk freight prices since the beginning of October, most analysts believe that rates will remain above pre-pandemic levels in 2022, with supply constraints projected to be a long-term characteristic of the market.

Strong demand for dry bulk commodities including iron ore, coal, and grains is likely to drive up charter rates in 2022, while vessel congestion in China and the Pacific Basin is expected to continue to be a major driver of the market.

Meanwhile, despite expectations of high demand, the residual effects of the Covid-19 outbreak, the possibility of new restrictions, and a slower-than-expected economic recovery could weigh on dry bulk freight rates.

Furthermore, changes in the International Maritime Organization (IMO) or EU emissions laws may have an impact on the cost structures or earnings capacity of some vessel segments, which could be passed on to the market.

According to market participants, the dramatic reduction in dry bulk freight rates since the beginning of October is only a corrective pullback from recent highs, with prices projected to remain above pre-pandemic levels in 2022.

While global supply chains were severely disrupted in 2021, demand for dry bulk commodities changed this year as well, owing in part to events in China.

Despite the disruptions on major shipping routes, demand for dry bulk commodities like grains, iron ore, and coal has continued to rise in accordance with the continuous increase in global economic growth.

2.2 Dry Bulk Market Characteristics

2.2.1 Cyclical Market

Most market participants are aware that the bulk shipping sector follows a cyclical trend. Between 1896 and 1995, there were twelve dry freight cycles, demonstrating the market's tremendous ups and downs. Although each full completion cycle differs from the others in terms of duration, fluctuation between the highest and lowest points, and length of individual steps, the majority of cycles have four stages: trough, recovery, peak, and collapse. Every stage has almost the same qualities. Table 2.1 summarises the characteristics of the various stages.

Table 2.1 Characteristics of Market Cycles

Stages	Supply and demand	Freight level	Shipowners Performance	Tonnage Supply decision
Trough	Shipowners strive to limit fleet productivity to conserve fuel and postpone arrival due to excess shipping capacity.	The least efficient ships are in lay-up, and freight rates are falling due to operational costs.	Net cash flow is negative. Shipowners who are short on funds try to sell their vessels for a low price.	On the market for demolition
Recovery	Balance the load with less lay-up tonnage.	Freight prices have increased in excess of operational costs, although the increasing trend remains questionable.	Increased Cash Flow	Second-hand prices have improved.

Peak and plateau	Only untradable tonnages are laid up, and supply and demand are in close balance.	Freight charges are sometimes two or three times the cost of operations.	Shipowners are becoming increasingly liquid.	A rise in second-hand prices over 'book value' The order book for shipbuilding is growing.
Collapse	When supply exceeds demand, ships slow down, and the least appealing ships must wait for cargo.	Freight rates are falling, and market patterns are causing slight fluctuations.	Liquidity is still high.	Beginning to lower the new order

2.2.2 Market of high risks and low return

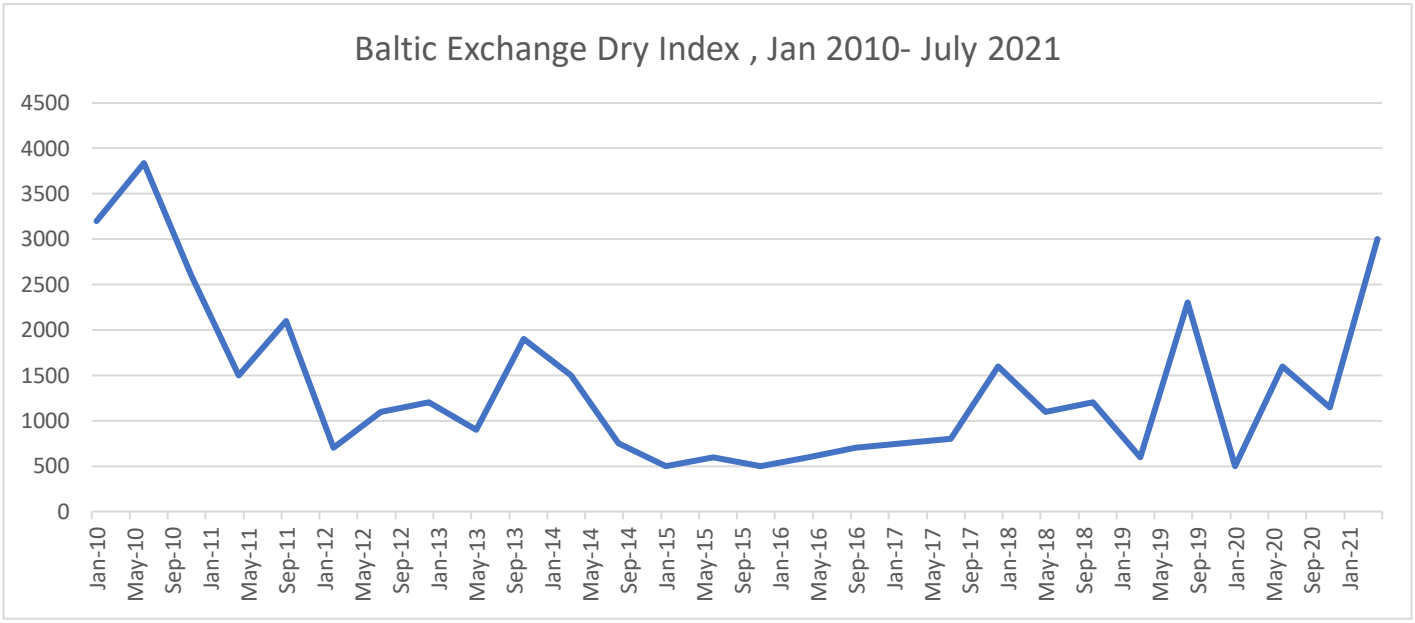
No one ever makes money in this market. Some of them are never profitable at all. Money earned during the peak of the market is typically wiped out by bad years. Only a few owners of specticulars with 'Special sense' are likely to be successful chevaliers. Dry freight shipping has a poorer long-term return on capital than other investment alternatives. In the long run, freight market earnings are lower than other investment alternatives. In recent decades, freight market earnings have rarely been able to meet the needs of new construction projects.

Shipowners must feed their new fleets with the profits earned from their older, less expensive boats.

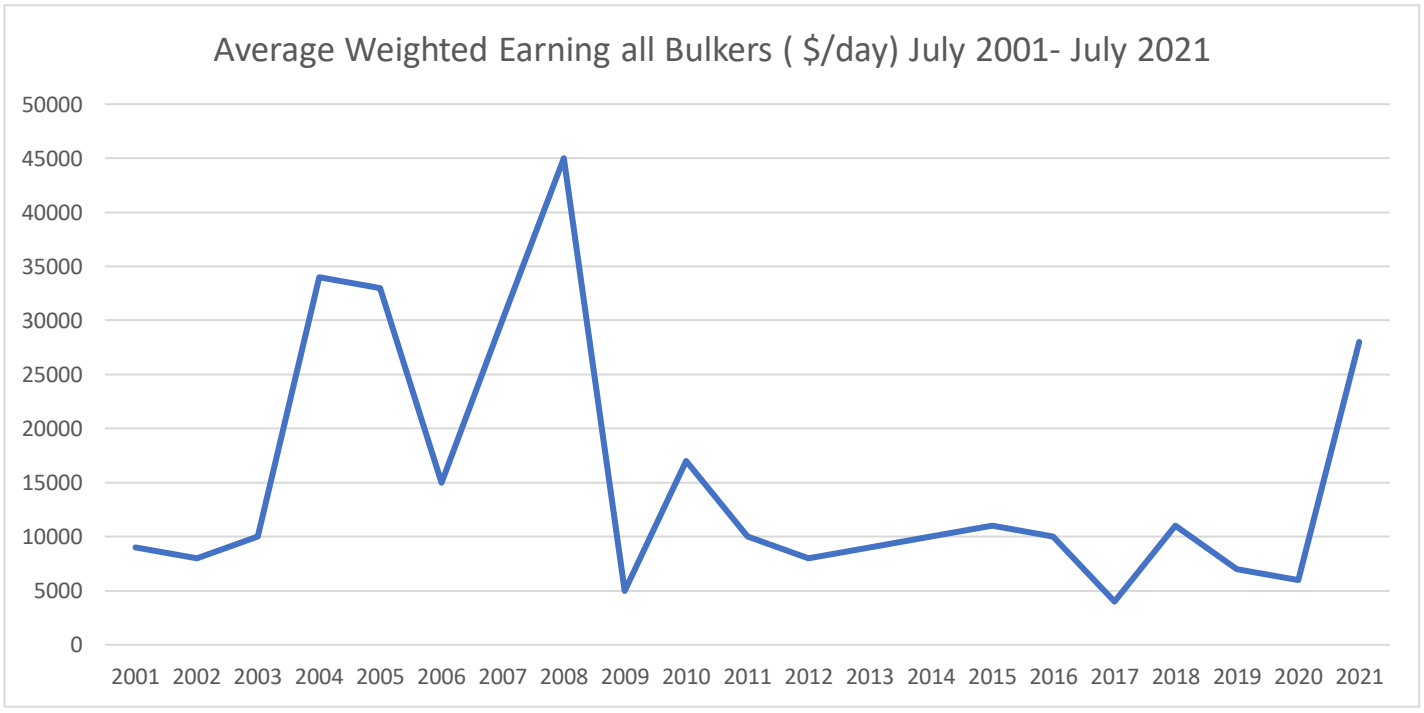
The ROI of the maritime sector and the UK are compared in Table 2.2.

2.3 Dry Bulk Freight Rates

The dry bulk market freight rates faced another challenge despite a strong start and great expectations for a favourable impetus carried over from 2013. Despite a strong start and high expectations for a positive impetus carried over from 2013, dry bulk market freight rates experienced another difficult year in 2014, affected by the surplus capacity that still exists and the uncertainty in demand estimates. Bulk carrier earnings decreased 5% from 2013 to $ 9881 per day on average. The high level of earnings put financial strain on owners, leading to the bankruptcy of some businesses (Clarksons Research, 2015b). The Baltic dry exchange index fell to a low of 796 as an overall sign of the sustained decline in dry bulk earnings. Capesize earnings averaged $ 13309 per day in 2014, down 15% from 2013. This was despite significantly faster growth in iron ore commerce and slower growth in coal trade (due to decreased coal imports into China), with average earnings falling 5% to $ 6260 per day and as low as $ 2137 per day in June 2014. Supramax average earnings declined by 12% to $ 10819 per day in June 2014, then fell to $ 5905 per day in August before rising for the rest of the year to $ 8769 per day. The ban on unprocessed bauxite and nickel ore exports by Indonesia resulted in a poor supramax market in the far east. Dry bulk market rates will remain stable in 2015 beyond.



Source : UNCTAD , based on data from Clarkson Shipping Intelligence Network



Source : UNCTAD , Based on data from Clarkson shipping intelligence Network

The demand shock from the COVID-19 epidemic put downward pressure on an oversupplied market in the first half of 2020, resulting in a decline in dry bulk shipping freight rates. In contrast, demand for dry bulk cargo, mainly iron ore and grain into China, increased in the second half. This, combined with slower expansion in the active fleet, pushed freight prices upward. The Baltic Exchange Dry Index, which gauges the cost of shipping different raw

materials like coal, iron ore, cement, grain, and fertiliser, reflected this (figure 3.5). This was just 461 points in February 2020, but by July 2021, it had risen to 3,257 points.

Because to continued high demand, fewer new vessel deliveries, and greater scrapping activity, freight rates were high through the first half of 2021. Delays induced by port congestion also had an impact on rates. The number of vessels stranded in ports increased from 4% of the fleet in the fourth quarter of 2020 to 5% in the first quarter of 2021. This was mostly owing to increased iron ore and grain exports from Brazil, which resulted in the blocking of up to 100 Capesize and Panamax boats in Brazilian ports in February and March 2021. (Danish Ship Finance, 2021). Carriers benefited from the strength of the dry bulk market. The average monthly wages in May 2020of all bulkers were $4,894/day, but by June 2021 they were $27,275/day – the highest rates in a decade.

Dry bulk demand is expected to expand in the future, but capacity remains manageable, thus rates are anticipated to remain high. The orderbook represents just about 6% of current fleet capacity, the lowest level in three decades (Clarksons Research, 2021b). Demand growth, notably from China, will drive future freight prices, but the market will also be influenced by the ongoing energy transition and changes in fuel mix choices. However, high freight rates may encourage newbuild orders, causing supply capacity to surpass demand in the medium term.

C. TANKER FREIGHT RATES DIP TO THE LOWEST LEVELS EVER

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Baltic Dry Index Weighed by Dip in Smaller Vessels

The Baltic Exchange's dry bulk sea freight index fell on Tuesday, snapping a seven-session winning streak, as losses in the panamax and supramax segments outweighed an increase in capesize prices.

The entire index declined 38 points to 2,689 points, which includes rates for capesize, panamax, supramax, and handysize shipping boats.

At 2,946 points, the panamax index was down 146 points.

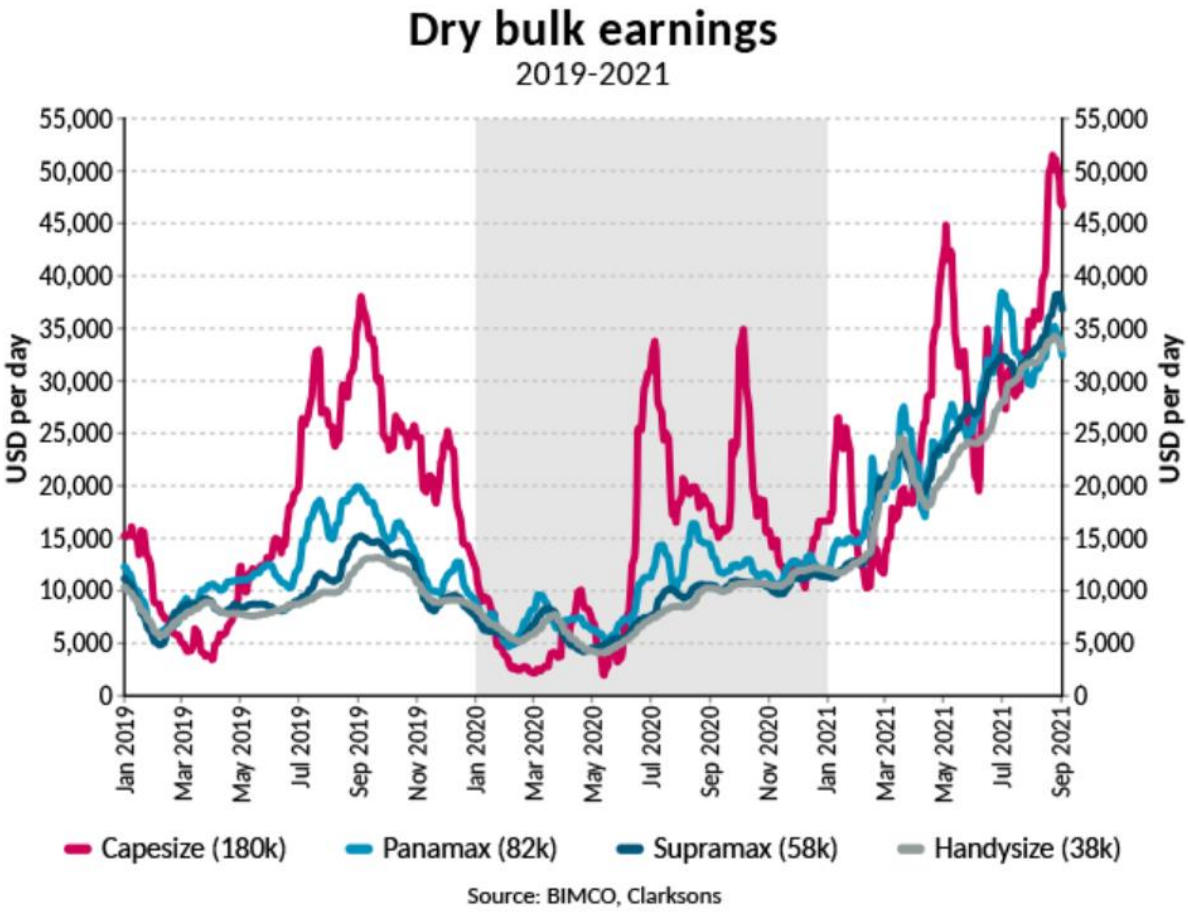
The average daily earnings for panamaxes, which typically transport 60,000 to 70,000 tonnes of coal or grain, fell $1,314 to $26,512.

The capesize index increased by 37 points to 2,823.

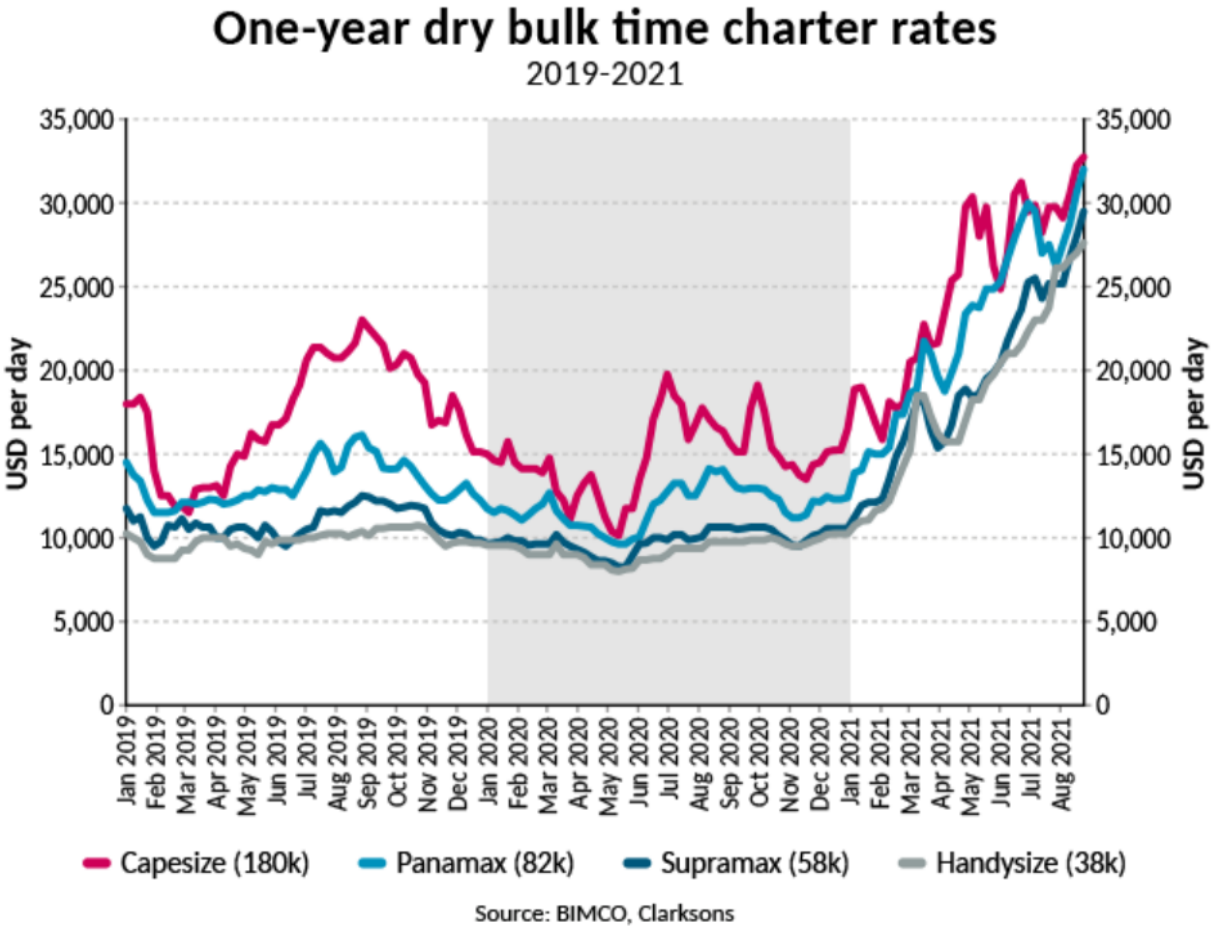
Capesize ships, which often transport 150,000-tonne cargoes like iron ore and coal, had their average daily profits rise $312 to $23,413.

Supramax index fell 33 points to 2,901 points.

Demand drivers and freight rates



The dry bulk shipping business is having another good year, with average earnings continuing to outperform profits recorded in previous years. Capesizes, as is customary, are in the forefront, with recent earnings exceeding USD 50,000 a day. Handysize and Supramax ships have seen a considerably more constant and stable increase. On 3 September, average profits increased to USD 33,087 and USD 36,832 per day, respectively. A Panamax ship could expect to make USD 32,445 per day on the same day.



Time charter rates demonstrate the market's current strength, with charterers paying double, if not 2.5 times, as much at the end of August as they would at the beginning of 2021. At the start of the year, a one-year time charter on a Capesize ship would have paid owners USD 16,500 per day. By the 27th of August, the total had risen to USD 32,750. Supramax ships have seen the most growth, with one-year time charter prices growing by 179.3% to USD 29,500 per day since the beginning of the year.

2.4 Shipping Pools in Dry Bulk Market

Difficulties of the Shipping Industry

The shipping industry is an important aspect of the transportation and supply chain industries. Shipping expedites the movement of goods across geolocations, propelling the economy forward. Ships carry a vast amount of goods compared to other forms of transportation, providing significant cost savings.

Depending on the cargo, the shipping sector serves to three markets: dry bulk, containers, and oil tankers. Dry bulk shipping is the transportation of bulk goods such as iron ore, coal, grain, sugar, salt, cement, and steel. Coils, plates, and rods, as well as lumber and other minor bulks Break bulk freight refers to items that are larger than a container. Wood, steel rollers, and wind turbine parts are examples of break bulk freight. Reefer containers transport refrigerated payloads such as meats, fruits, vegetables, dairy products, chemicals, and pharmaceuticals in the container segment. Oil tankers deliver crude oil and related products, as the name implies. The majority of commercial ships operate on a time-charter basis. Passenger ships, such as ferries and cruise ships, operate on a voyage-by-voyage basis. The transportation cost is determined by the overall product size, cargo cost per cubic metre, and weight per metric tonne.

Challenges

The COVID-19 situation has had a significant impact on the shipping industry, which has nearly ground to a halt. The financial performance of all international shipping companies has been impacted by restrictions on the movement of goods and persons, with a major drop in demand for items and their transportation in the supply chain. On both the supply and demand sides, the COVID-19 epidemic has created massive disruption in logistics systems. Factory closures and a lack of manpower to load and unload cargo, as well as drivers to operate vehicles, have put a stop to trade and efficient port operations. Globally, volume has decreased by more than 15% and is expected to continue to decline due to port congestion and rising costs The COVID-19 situation has had a significant impact on the shipping industry, which has nearly ground to a halt. The financial performance of all international shipping companies has been impacted by restrictions on the movement of goods and persons, with a major drop in demand for items and their transportation in the supply chain. On both the supply and demand sides, the COVID-19 epidemic has created massive disruption in logistics systems. Factory closures and a lack of manpower to load and unload cargo, as well as drivers to operate vehicles, have put a stop to trade and efficient port operations. Globally, volume has decreased

by more than 15% and is expected to continue to decline due to port congestion and rising costs.

The Way Forward

For berthing, larger ships necessitate deeper and broader docks, as well as stronger and larger cranes. Increased automation via autonomous material handling robots minimises human reliance and manual errors while also increasing productivity and reliability. Energy efficiency, recycling, sustainability, and carbon disclosure will be critical measurements for ports as environmental rules become more broad and strict.

Finally, 3D printing is becoming increasingly important for transportation companies in terms of cost reduction, efficiency, and sustainability. Digital inventory and on-demand localised marine part production are becoming increasingly important. The use of blockchain to track transportation conditions will aid in maintaining expected temperature and humidity levels. With the temperature-controlled Internet of Lights, advancements in cold-chain systems are gaining a lot of traction (ambient outside temperature-based optimization). Continuous monitoring and predictive analytics for evaluating total reefer cargo health, as well as real-time notifications, help increase shipping efficiency and reliability while saving money.

Counter measures to the Difficulties :

A more strategic examination of shipping segments will be conducted, the dynamics will be examined, and possible countermeasures to overcome these challenges will be found.

The shipping sector is not a static one. Innovations in shipping have always been the driving factor behind development in the past. The majority of innovations start with commodity shipping categories. Some changes occurred as a result of low bulk markets, while others occurred because bulk operators wanted to try something new.

When an innovation proves to be successful, the developers will get access to a lucrative shipping industry. However, this will draw in more players to the game. Through a process of duplicating the new notion and the new concept, as well as over-contracting. The large profit margins in the business will quickly dwindle, and the specialty shipping market will soon become a commodity market.

A consolidation procedure is required to sustain profitability. Most small firms will depart this industry as a result of mergers, acquisitions, and pooling agreements. As a result, significant

operators who choose to stay in the specialty market or shift to the contract or commodity shipping sector have a lot of room. For these reasons, most bulk shipping pools are formed.

Mr. Heidenreich, chairman of top panamax tanker pool star tankers, stated in 1999 to Lloyd's List that the liner business has a strong return on capital and a fairly orderly market after years of consolidation. That is not the case with tankers, even in the organised chemical tankers. We'd like to have 30-40% of the market, and one or two other pools could emerge, bringing our total market share to 80-85%. The market would then be in order.

Advantages of shipping pools

The following are the key advantages of shipping pools:-

1. Attracting affreightment contracts

2. Reducing risks

3. Improve scheduling efficiency and flexibility

4. Resource sharing and technical expertise

5. Cost-cutting and economies of scale

6. Speculation activity

7. Ship financing

The disadvantage of shipping Pools

Not all shipowners are on board with the idea of pooling. In truth, individual shipowners still control the bulk shipping industry. In 1995, the top 20 tanker shipping corporations accounted for only 36.5 percent of the worldwide tanker fleet by deadweight and 10.2 percent by ship numbers (Lloyd's world shipowning groups 1995). This fact plainly suggested that pooling systems must have some constraints. The following are some of the disadvantages:

1. The dread of losing the identity of the shipowner

2. The decision-making process

3. Inequitable profit distribution

4. Commitment through time

5. Loss of market presence and expertise

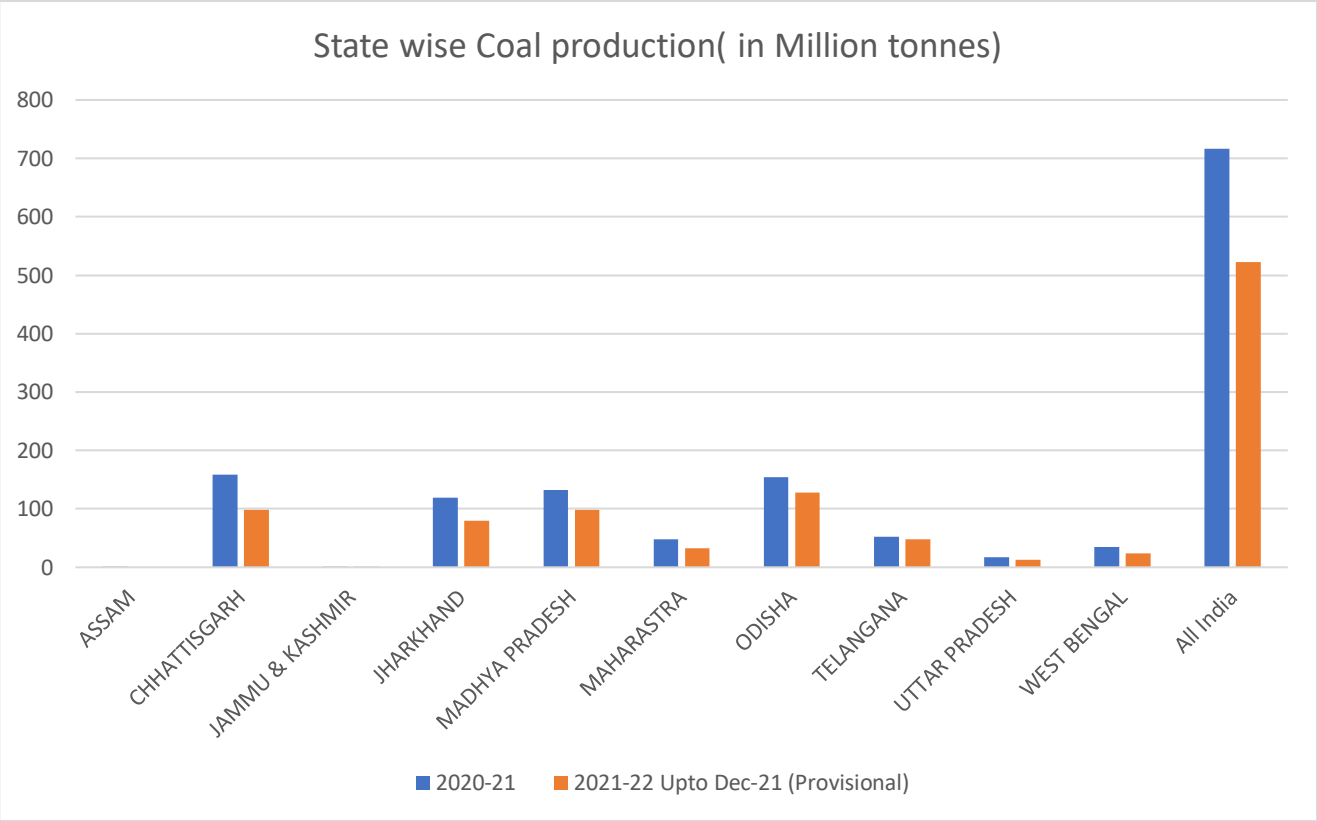
6. Cultural distinctions

Chapter - 3

IMPORT OF COAL IN INDIA FROM SOUTH AFRICA, INDONESIA AND CHINA

3.1 Status of coal in India

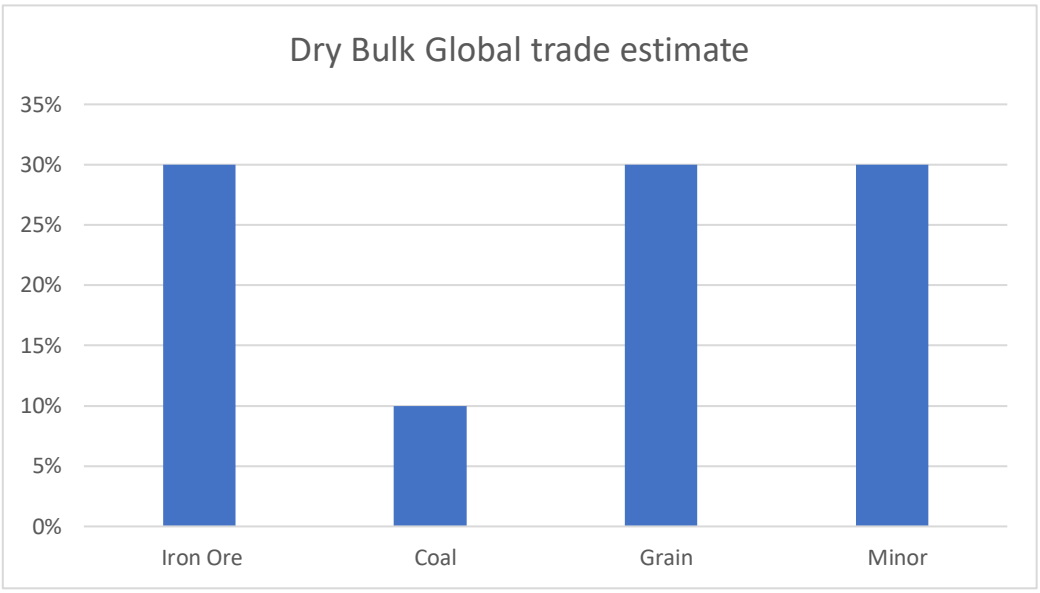
Commercial coal mining in India dates back over 220 years, beginning in 1774 in the Raniganj coalfield on the western bank of the Damodar River by M/s Summer and Healthy of East India Company. As of 1.4.2022, a total of 777.31 MT of geological coal resources have been calculated in the country.



Source : Ministry of Coal , GOI

3.2 The Dry Bulk Shipping Industry

One of the three major sub-industries of maritime transportation is dry bulk shipping. It carries dry bulks. Major and minor dry bulks can be separated from these dry bulks. Major bulks, which include iron ore, coal, and grain, make up the largest group of dry bulk cargoes. Steel products, forest products, bauxite or aluminium, cement, and fertilisers make up minor bulks.



Source : Statista.com

The series covers key suppliers of various commodities in the seaborne market, economic and industry fundamentals that affect the dry bulk shipping business, and some essential features of dry bulk shipping businesses that investors should be aware of before investing in these companies.

Vessel Class

Different classes of vessels are used depending on the volume, trade routes, and geographical restrictions of ports.

Capesize and panamax

Capesize vessels (capacity ranges from 110, 000 to 119,999 dwt) are utilised in the world's major ports, usually to deliver iron ore or coal over long distances. Panamax vessels (60000 to 79999 dwt) transport coal, iron ore, grains, and minor bulk to a lesser extent. Panamax ships can pass through the Panama Canal, making them more adaptable in terms of access to different trade routes than larger ships. The majority of these ships are 'gearless,' which implies they lack cargo handling machinery.

Smaller Vessels

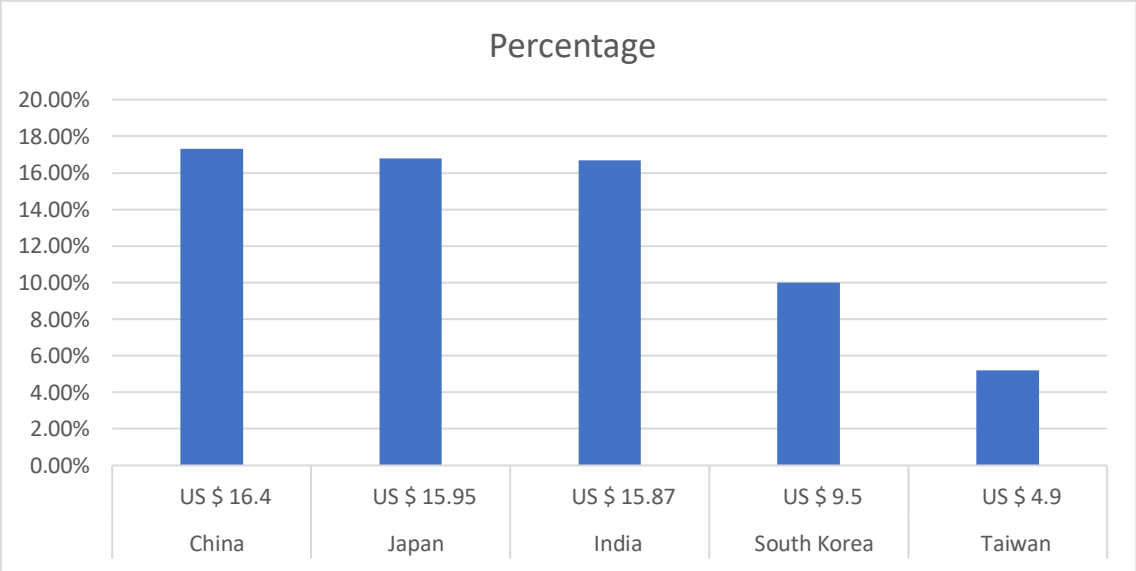
Handymax or supramax vessels (40000 to 59999 dwt capacity) transport grains and minor bulks on a growing number of worldwide trade routes. Supramax vessels, which are a subclass of handymax vessels, typically have a dwt of 50000 to 59000. The supramax class, unlike panamax vessels, provides cargo loading and unloading flexibility using onboard cranes.

3.3 Global seaborne coal trade

Another big type of dry bulks delivered by dry bulk transporters is coal (a fossil fuel). It accounts for around 30% of total dry mass. The raw material has been widely used to generate heat and power throughout history, as well as for industrial uses such as metal processing. Thermal coal is used to generate energy and for industrial uses such as metal processing. Thermal coal is used to generate power, whereas coking coal (metallurgical coal) is utilised in industrial processes.

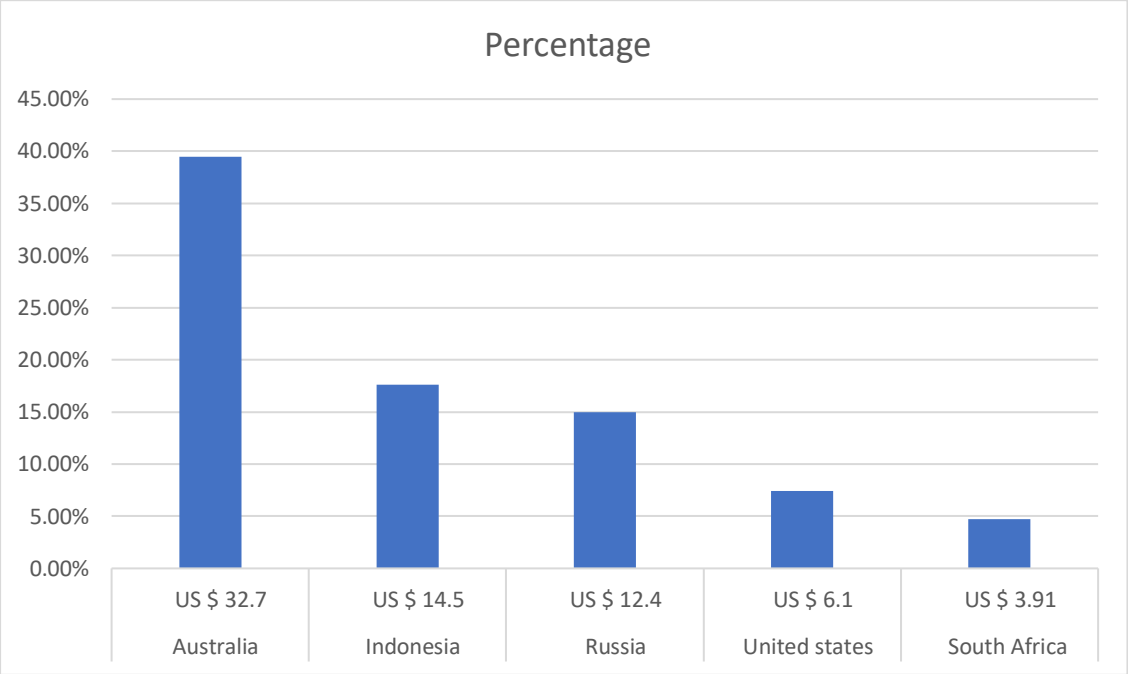
Status of Coal importer and exporter :

Coal Importers :-



Source : Worldstopexports.com

Coal Exporters :-



Source : worldstopexports.com

Coal's importance and its production effort

On our world, coal can be found practically everywhere. However, not all coal unearthed can be mined. Where coal is produced is influenced by factors such as reserves (depth, quality, and quantity), infrastructure, technology, and government laws. This is significant because the location of future production will affect demand for dry bulk vessels trading in the most abundant of all fossil fuels (oil and natural gas). According to the US Energy Information Administration, up a lesser percentage of total world consumption - about 16 percent in 2010. However, global coal consumption is substantially more in metric tonnes than iron ore usage, making coal equally essential.

Key Suppliers

Australia, the United States, India, Indonesia, Russia, and South Africa are the world's top coal producers now. According to the "International Energy Outlook study," the top five producers' share of global output is expected to rise from 67 percent in 2010 to 81 percent in 2021. China and India are two of the top three producers, but their domestic supply is insufficient to meet their annual need. As a result, they must rely on large exporting countries such as Australia, Indonesia, and Russia to meet the demand.

Major Importers

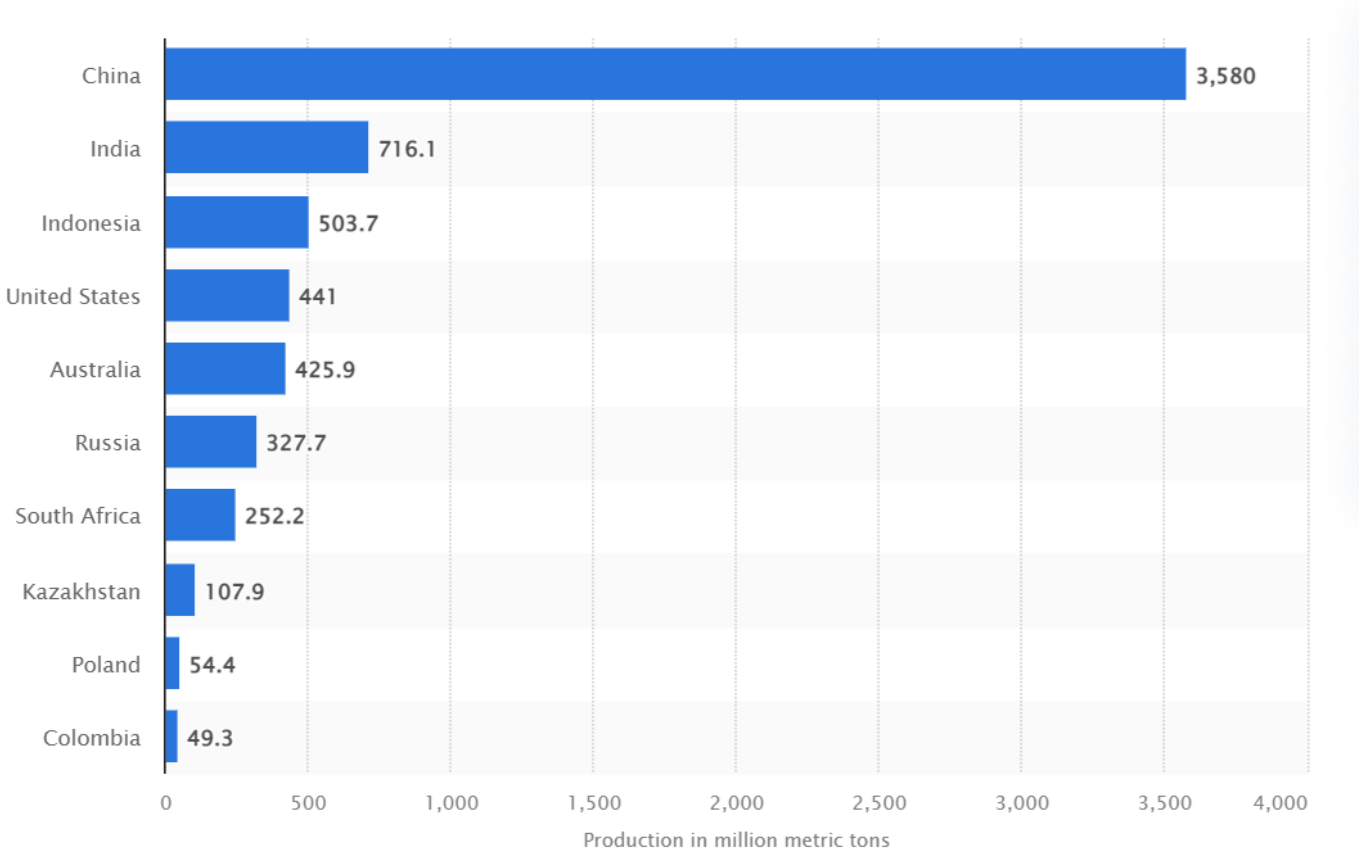
Unlike iron ore, the percentage of top coal importers is more evenly split among nations such as China, South Korea, India, Japan, and European Union countries. Nonetheless, we must not overlook China's importance as the world's greatest consumer. Furthermore, even a minor shift in the balance of home production and consumption can have a significant impact on global trade volume. Other major importers, however, continue to play a significant role in the dry bulk trade.

3.4 Coal Production

Status of Coal Production

Unlike iron ore, the percentage of top coal importers is more evenly split among nations such as China, South Korea, India, Japan, and European Union countries. Nonetheless, we must not overlook China's importance as the world's greatest consumer. Furthermore, even a minor shift in the balance of home production and consumption can have a significant impact on global trade volume. Other major importers, however, continue to play a significant role in the dry bulk trade.

Top Coal Producers in 2021 :-



Source : Statista.com

3.5 Coal in Indonesia :-

Since 2000, Indonesia has progressed from a minor player in the global coal industry to a large exporter and user of the fuel. While much of the world is turning away from coal due to its involvement in global warming and water and air pollution, Indonesia's government is taking steps to further entrench the country's coal production and consumption, making it difficult for alternative energy sources to acquire market share. The importance of coal to Indonesia's economy and energy independence is emphasised by coal proponents in the government, particularly lawmakers who possess stakes in coal companies.

In just over two decades, Indonesia has progressed from a minor player in the global coal industry to a big coal user and producer. Indonesia's laws are increasingly tying future economic growth to fossil fuels, even as investors and important export markets move away from them.

"Indonesia is one of the biggest roadblocks for people who want to lessen the world's reliance on coal," said Isabella Suarez, a Southeast Asia expert with the Centre for Research on Energy and Clean Air. "Incentives are in place to keep dirty coal cheap, and that is unlikely to change very soon."

Since 2010, Indonesia has added 22.7 GW of coal-fired power capacity, making it third in the world behind India and China. As a result, coal now generates over 60% of the country's electricity, a figure that has steadily risen since 2010.

Despite the consequences of the COVID-19 outbreak, which caused coal demand to plummet in early 2020 as Asia's electricity generation plummeted, the increasing trend continues. Domestic demand fell 14 million tonnes short of estimates, while the benchmark export coal price dropped to a five-year low, pushing miners to cut capacity by 50 million tonnes. In 2020, bids for coal-fired power plants were cancelled in Vietnam, India, the Philippines, and Bangladesh.

The year 2021 has begun with unrestrained confidence for Indonesia's coal sector. Prices are rising, exports are improving, and there is less fear of corruption investigations or clean energy competition. In reality, under planned laws, coal might be deemed a clean energy source, with PLN attempting to expand coal-firing with biomass.

On the islands of Sumatra, Java, Kalimantan, Sulawesi, and Papua, there are numerous smaller pockets of coal reserves, however the three largest locations of Indonesian coal resources are:-

1. South Sumatra
2. South Kalimantan
3. East Kalimantan

Source : Statista.com

Indonesian Production , Exports , Consumption , & Price of Coal :-

Indonesian coal is highly fragmented, with only a few significant producers and several small enterprises having coal mine concessions (mainly in Sumatra and Kalimantan).

Since the early 1990s, when coal mining was opened to foreign investment, Indonesia has seen a major increase in coal output, exports, and local coal sales. In the home, coal is still used rarely. In Indonesia, coal exports account for 70 to 80 percent of total output, with the rest sold on the domestic market.

Factors that contribute to increased coal production and export in Indonesia include:

The most major energy source is coal. Coal-fired power plants produce at least 27% of total worldwide energy output and more than 39% of all electricity due to its abundance, relative ease and low cost of mining, and fewer infrastructure requirements compared to other

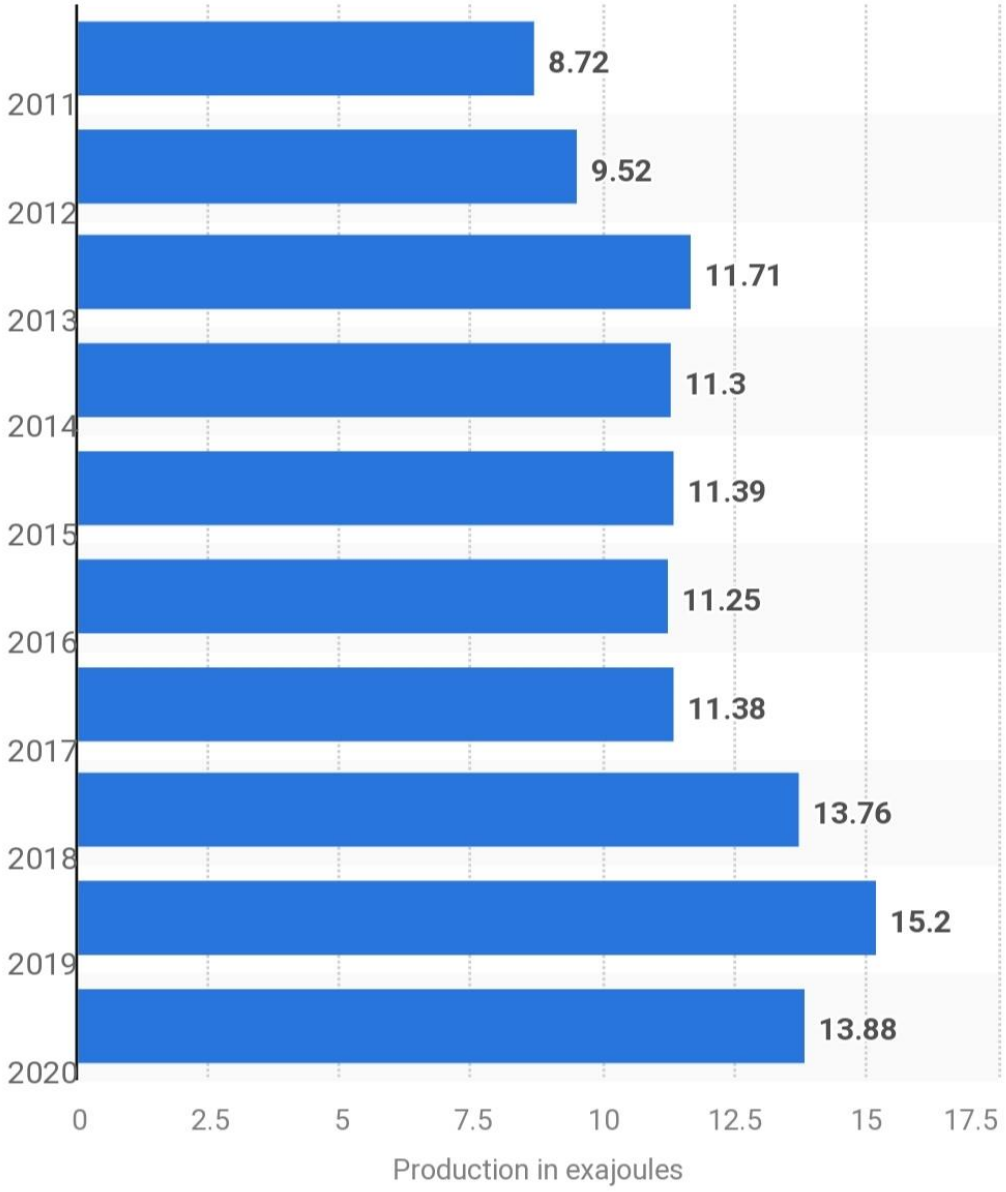


Fig: Coal production in Indonesia from 2011 to 2020

Source: statista.com

Indonesia's perfect geographic location in relation to the large expanding markets of China and India. The demand for low-quality coal in these two countries has surged, and numerous new coal-fired power plants have been erected to meet the need.

Indonesia has numerous resources of medium and low-quality coal. These types of coal are reasonably priced on the global market (partly due to Indonesia labour wages).

Indonesian coal is mostly exported to China, India, and South Korea. Coal accounts for approximately 85% of all mining revenues in Indonesia, making it a substantial source of money for the government.

3.6 South African Coal :

Coal dominates South Africa's indigenous energy resource base. Coal is the most frequently utilised primary fuel worldwide, accounting for around 36% of total fuel use in global electricity production. Coal provides about 77 percent of South Africa's basic energy needs. Due to the scarcity of acceptable alternatives to coal as an energy source, this is unlikely to change dramatically in the next two decades. Many of the resources may be exploited at exceptionally low prices, resulting in the growth of a substantial coal-mining sector.

In addition to coal's widespread use in the domestic sector,

South Africa exports roughly 28 percent of its output, primarily through the Richards Bay Coal Terminal, making it the world's fourth-largest coal exporter.

South African coal comes from collieries ranging in size from the world's largest to small-scale producers. Operating collieries climbed to 64 in 2004 as a result of new entrants. A small number of large-scale producers offer coal mostly to electric power and synthetic fuel companies.

The output is concentrated in large mines, with 11 mines producing 70% of the total. South African coal is among the cheapest in the world for local electricity production. Every year, more than 65 million tonnes of coal discards are produced as a result of coal beneficiation, mainly for export.

About 21% of run-of-mine coal produced is exported, while the remaining 21% is used locally (excluding power-station coal). The remainder cannot be sold and is wasted.

The rest of South Africa's coal production goes to various local industries:

62 percent goes to electricity generation,

23 percent to petrochemical industries (Sasol),

8 percent to general industry,

4 percent to metallurgical industries (Mittal), and

4 percent goes to merchants to be sold locally or exported.

The fact that Eskom ranks first in the world as a steam coal user and seventh as an electricity generator demonstrates the importance of South Africa's coal reserves in the economy. Sasol is the world's leading coal-to-chemicals company.

South Africa's coal deposits are shallow by international standards, with thick seams, making mining easier and, in most cases, cheaper. There should be more than 50 years of coal supply left at the current rate of production.

Facts and Figures

1. South Africa holds 3.5 percent of the global coal reserves.

2. The country's annual total exports are 6% of global exports, accounting for 3.3 percent of global production.

3. This places South Africa sixth among coal-exporting countries.

4. South Africa produced 260 MT of coal in 2014.

182.7 MT were sold domestically for R54.7 billion, while 69.9 MT were exported for R46.7 billion.

5. The principal export port is the Richards Bay Coal Terminal (RBCT).

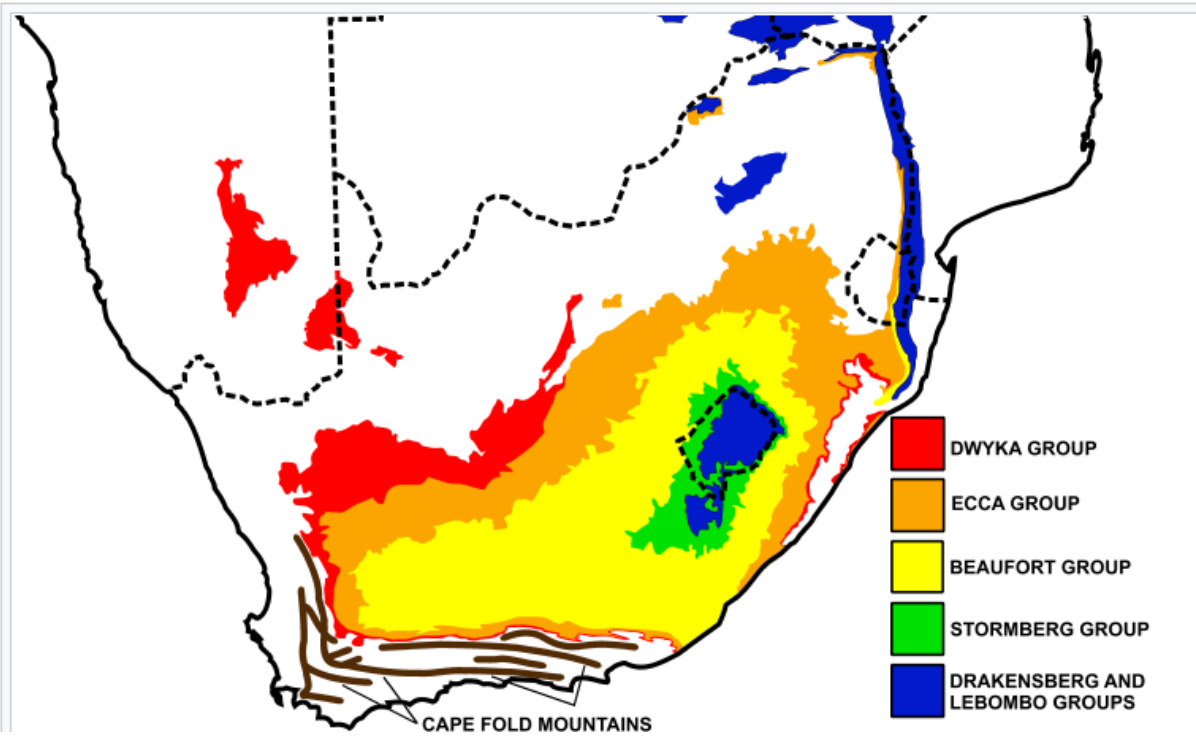
6. RBCT has its own rail line.

7. ESKOM, the state-owned power utility, generates 81 percent of its power from coal. ESKOM currently operates 16 power plants and plans to add two more by 2021.

8. ESKOM purchased 122 MT of thermal coal in the year ending March 2015.

9. Sasol mines 40 MT of coal per year for gasification and liquid fuel conversion.

Location and geology of South African Coal



The Ecca deposits, a layer of the Karoo Supergroup originating from the Permian epoch between 280 and 250 Ma, include South Africa's greatest coal resources. The Ecca Group encompasses almost two-thirds of South Africa (much of it covered by slightly younger rocks - see diagram on the left). Only the northern and north-eastern portions of the Ecca deposits are coal-bearing, although they comprise more than a third of the Southern Hemisphere's total coal reserves.

Notable coalfields are:

- Waterberg Coalfield
- Highveld Coalfield
- Witbank Coalfield
- Ermelo Coalfield
- Utrecht Coalfield
- Klip River Coalfield

South African Reserves by Coalfields[11]

- Highveld (31%)
- Witbank (30%)
- Ermelo (13.8%)
- Waterberg (11%)
- Vrg. -Sasolburg (6%)
- South Rand (2%)
- Utrecht (2%)
- Klipriver (1.9%)
- Soutpansberg (1%)
- Other (1.3%)

Coal Mining in South Africa

The first coal in appreciable tonnages was extracted on the Highveld coal field near the fledgling Witwatersrand gold mines in the late 19th century, with the first coal in appreciable tonnages being extracted on the Highveld coal field adjacent to the nascent Witwatersrand gold mines. However, when the country entered an era of industrialisation during and after World War 2, demand began to rise slowly at first, then exponentially. This comprised a large-scale power plant construction programme, mainly on the Witbank and Delmas coal resources, as well as Sasol's massive coal-based synfuels and organic chemicals complex at Secunda. South Africa was essentially constructing an industrial future and technical skills base based on its primary fossil-fuel resource. Other fossil fuels have yet to be discovered, and the country's fossil future remains firmly anchored on coal.

For many years, the coal industry was mostly controlled by local private interests, primarily the old mining houses. However, during the 1970s oil crises, foreign oil firms competed for coal resources and built new collieries aimed specifically at export markets. Following the 1994 democratic election, ownership was increasingly transferred to historically disadvantaged South Africans, in many cases exceeding the Mining Charter's 2014 target of 26 percent black ownership.

The Richards Bay Coal Terminal (RBCT) was founded in 1976 as a joint venture between the biggest coal corporations of the time, with a 12 million tonne annual capacity. With a perfect balancing of the needs for rail capacity to transport coal from inland collieries to the coast, this has steadily expanded to its current 91Mt design capacity. Seaborne coal prices were generally higher than domestic coal prices for many years as this export potential was expanded. As a result, the RBCT and the rail line that supplies it faced fierce rivalry for capacity. However, the commodities recession of recent years, as well as a global excess of bulk commodities, have harmed the industry As exporters from rival countries struggled to preserve market share, export prices have fallen by more than half since 2013.

As we enter the second decade of the century, power plants built more than 30 years ago will continue to operate at least until the middle of the century. Eskom is now constructing two major thermal power plants, Medupi and Kusile, in the country's northwestern regions, based on coal reserves in Mpumalanga and Limpopo. No further thermal power plants are in the works as the government and state-owned Eskom weigh the pros and cons of nuclear power.

After gold and platinum group metals, coal employs 92,230 people, making it the third largest group in the mining industry. Their total annual revenue is R27.9 billion.

3.7 Coal in China :

With over a thousand coal-fired power stations, China is the world's largest producer and consumer of coal, as well as the world's largest user of coal-generated electricity. [1] During the 2010s, coal's proportion of the energy mix decreased, from 80 percent in 2010 to 58 percent in 2019. [2] [3] China accounts for almost 10% of global greenhouse gas emissions. China's robust demand contributed to the postponement of peak global coal output; coal production hit a new high in December 2021[5], while coal consumption in China is expected to hit a new high in 2021.

Coal production

China is the world's top coal producer, producing 3.84 billion tonnes in 2020 and anticipating an increase in 2021, according to the China National Coal Association. In 2018, coal production totaled 1829 Mtoe, accounting for 46.7 percent of total global production and more than the next nine biggest coal producers combined.

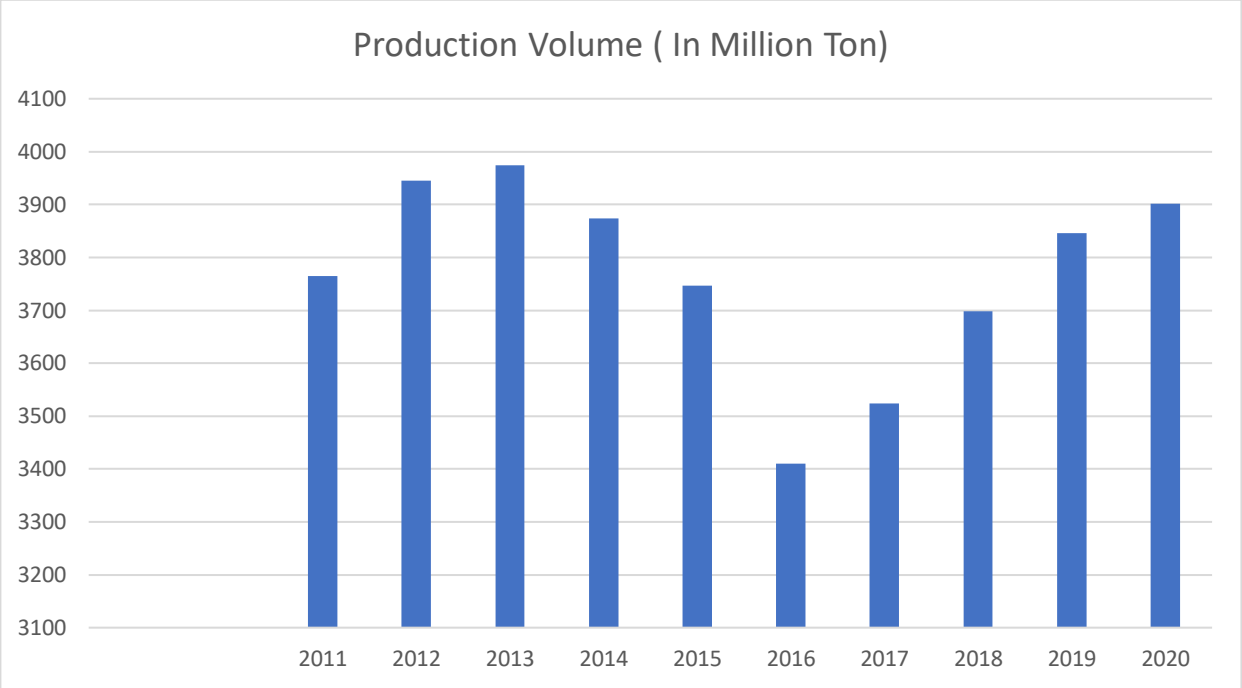
China is the world's top coal importer, with significant shipments from Russia and Indonesia expected in the 2020s. Coking coal imports from Mongolia and the United States rose after the boycott of Australian coal in 2020.

Key information about China Coal Production:

- China's coal production was reported at 3,902.000 tonnes per million in December 2020, up from 3,846.332 tonnes per million in December 2019.
- China Coal Production statistics is updated yearly, with an average of 1,434.113 Tonne mn from December 1981 to December 2020.
- From 1981 to 2013, the data reached an all-time high of 3,974.322 Tonne mn and a record low of 621.600 Tonne mn.

• BP PLC reports China Coal Production statistics, which is still active in CEIC.

China's Coal Production From 2011 to 2020 :-



Source: WWW.CEICDATA.Com

Capsize Freight Rate Matrix :

Load port	Unload port	Cargo intake	Last week	Current week	Change
Baltimore (USA)	Mundra(India)	149,000	39.68	42.97	+ 3.29
DBCT (Australia)	Gangavaram (India)	168000	13.27	15.48	+ 2.21
DBCT (Australia)	Mundra (India)	165000	13.33	15.74	+ 2.41
Norfolk (USA)	Gangavaram (India)	149000	40.46	43.85	+ 3.39
Puerto Bolivar (Colombia)	Dhamra (india)	150000	33.18	35.97	+ 2.79
PUERTO Bolivar (Colombia)	Mundra (India)	150000	30.80	33.53	+ 2.73

Richards Bay(S.A)	Dhamra	110000	29.63	32.50	+ 2.87

Richards Bay (S.A)	Gangavaram	161000	21.39	23.91	+2.52
Richards Bay	Mundra	161000	21.98	19.59	+ 2.39
Richards Bay	Mundra	110000	30.47	33.46	+ 2.99
Tanjung Bara Coal Terminal(Indonesia)	Gangavaram	160000	8.72	9.81	+ 1.52
Tanjung Bara Coal Terminal (Indonesia)	Mundra	160000	9.39	10.66	+ 1.74

Supramax Freight Rate Matrix :-

Load Port	Discharge Port	Cargo Intake	Last week	Current weak	Change
Hay point (Australia)	Vizag (india)	52000	48.51	48.60	+ 0.09
Houston (USA)	Vizag	55000	57.03	57.00	- 0.03
Nakhodka(Russia)	Hazira (india)	33000	64.51	65.45	+ 0.94
Nakhodka (Russia)	Jaigarh (India)	33000	56.15	56.91	+ 0.76
Nakhodka (Russia)	Krishnapatnam (India)	33000	47.62	48.26	+ 0.64
Nakhodka	Paradip (India)	33000	51.04	51.76	+ 0.72
New Port News (USA)	Vizag	55000	61.64	61.52	- 0.12
Richards Bay (S.A)	ECI (India)	55000	35.15	35.44	+ 0.29

Panamax Freight rate Matrix :

Load Port	Discharge Port	Cargo intake	Last week	Current week	Change
New Orleans (USA)	Dhamra (India)	65000	47.32	47.24	- 0.08
New Orleans(USA)	Mundra	65000	48.85	48.87	+ 0.02
New Port News (USA)	Vizag	77000	43.87	43.49	- 0.38
NPLCT (Indonesia)	Dhamra	77000	14.95	16.95	+ 1.64
NPLCT	Gangavaram	77000	15.26	16.93	+ 1.67
NPLCT	Jaigarh Port (India)	77000	16.89	18.88	+ 1.99
NPLCT	Mundra	77000	16.92	18.91	+ 1.99
Richards Bay (S.A)	Krishnapattam	77000	26.98	27.33	+ 0.35
Richards Bay	Mundra	77000	26.34	26.68	+ 0.34
Richards Bay	Dhamra	77000	28.15	28.51	+ 0.36

Conclusion :-

Conclusion:

The delivered coal price is calculated by adding the free on board (FOB) coal price to the cost of ocean freight. The price competitiveness of coal vs other fuels is largely determined by freight rates. While both capesize and panamax vessels are utilised to transport bulk cargo to India, Panamax vessels are employed to feed the Indian thermal coal market due to constraints in all thermal coal Indian ports. Richard's Bay to the west coast of India and Kalimanatan to the east coast of India are the three freight routes used to create the pricing series for thermal coal delivery to India. Month-ahead voyage charter freight prices for all routes were obtained from a private database compiled by freight trading companies and compared to data provided by the Baltic Exchange. On the east coast of India, ports for delivery include Chennai, Ennore, Gangavaram, Haldia, Karaikal, Krishnapatnam, Paradip, and Vizag; on the west coast, ports for delivery include Kandla, Mumbai, Mormagao, Mundra, New Manglore, Navlakhi, and Pipavav.

Indonesia has been a key coal exporter to India, and the cost of coal in Indonesia is lower than in South Africa. When compared to South Africa, the energy content of most Indonesian coal is lower in India. As a result, the energy content of most Indonesian coal is roughly 10% lower than that of South African coal traded on the seaborne market.

While the standards in the section about South African coal are typical of European and Japanese markets, they do represent a unique opportunity. Coal grade that provides the most amount of energy for power plants in India. The relative levels of ash and moisture in Indonesian sub-bituminous coal and South African bituminous coal are a significant variance. South African coal often has a greater ash content, while Indonesian coal has a higher moisture content. Moisture has a considerable impact on the energy content of coal when it is converted into electrical energy, and is thus an important factor to consider when comparing pricing differences.

Chapter – 4

Summary and Conclusion

The following are the findings of the study, which were based on this study:

1. In the spot market, a freight rate is solely determined by how supply and demand collide. When shipowners get a cargo bid, they usually determine a freight rate based on their costs. This freight rate will always cover their capital expenditures, operating costs, and trip costs, as well as a profit margin.

2. When a cargo offer is made, a large number of shipowners are encouraged to submit quotes. If there is more tonnage available than cargoes at a given time and location, cargo owners have the option of choosing the lowest rate or using the market information system (Brokers network) to provide sensitive information to shipowners in order to negotiate a better freight rate.

3. Shipowners have the upper hand and can enjoy a higher freight rate if there are more cargoes on the market than boats trading. Supply and demand are momentarily balanced at specific times and in some places. In such cases, freight prices will remain constant, and any players who refuse to accept this price will be released from their contract. They must keep an eye on the 'last done' market, which will serve as a good reference point for the current negotiations.

As previously stated, supply and demand are relatively set at a given time and location, but they are nevertheless elastic when the market reaches extreme levels. Shipowners and cargo owners may be able to alter their supply/demand productivity to some extent based on freight levels. Shipowners may ballast their regional markets where freight levels are relatively high, they may change vessels to save fuel oil consumption in a low market or increase fleet in a high market, they may decide to lay – up or dry dock vessels if there is a high freight level, and they may decide to lay – up or dry dock vessels if there is a high freight level Of course, order newbuilding projects will typically take two years to join the market, which is better than variablr. Cargo owners can choose to postpone transportation, try to locate a substitute supplier with a shorter delivery time to decrease freight costs, or modify the size of cargoes less frequently to benefit from economies of scale. The effects of cargo owners are minor, but any changes in price may affect the spot market's temporary equilibrium.

In terms of coal imports into India, demand for higher grade seaborne thermal coal has increased as it is used in the manufacture of electricity, sponge, and cement. Indonesia, South Africa, Australia, and China are the countries closest to India that have thermal coal ready for export. The grade of coal required for power plants in India often surpasses the quality criteria of native coal, ensuring that imported coal has a market. The construction of ultra- mega power plants, or UMPPs, on India's coasts, each with a capacity of over 4GW, is driving the fast increase in demand for higher growth sub-bituminous and bituminous coal. Because these units are positioned far from existing domestic mines and are designed to maximise power capacity by using better grade coal, the majority of their thermal coal requirements are fulfilled through exports. Coal imported from Indonesia is cheaper than coal imported from South Africa or China, and freight costs for coal imported from Indonesia are lower than coal imported from China to India.

Conclusion:

Only if the basic conditions improve can the shipping market and underlying profitability improve. As a result, transporting higher volumes over longer sailing distances or reducing the size of the dry-bulk fleet is a requirement for better markets to come.

The reliance on international transportation to complete the delivery of enormous volumes of cargo grows as trade grows steadily. For more profitable operations, a well-developed global dry bulk fleet is available. Market forecasting is very impossible in the dry freight market due to perfect competition and fluctuating demand. Both sides are seeking for ways to reduce risks and increase earnings.

A shipping pool has been identified as a method to alleviate the issues that develop in the dry bulk shipping industry, and shared marketing is essential for proper operation of shipping pools. One of the most significant characteristics of a bulk shipping pool is joint marketing. From the perspective of those who are not members, a shipping pool is an organisation in which members collaborate in the chartering business. Their instincts are correct. Most of the time, the pool management business advertises the fleet as a single, coherent organisation, which is actually a chartering company in charge of the pool's commercial activities.

The ships are usually exchanged under the pool's name, and the characters' own identities become less significant once they realise the ship is in a specific pool.

Before joining a pool, all pool participants want to have a high earning potential. In practise, most pools set a target for their earning potential over a specific time period. This earnings benchmark is always higher than the average of the market Before a new member joins, one of the first things they should do is compare this standard to their own earning potential. Because shipping pools can benefit from high cargo utilisation, shorter ballast voyages, consistent income, and increased bargaining power, it's not surprising that, if run well, a pool's earning capacity may eventually need a high benchmark rate.

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