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GENERAL CARGO VESSELS CHARTERING STRATEGIES: TIME CHARTER VS SPOT

Postgraduate Student: Georgios Kontomichalos

Supervisor: Ass. Professor Ioannis Lagoudis

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The members of the Committee were:

- MEMBER A': Ass. Professor **IOANNIS LAGOUDIS**

- MEMBER B': Professor **THEOTOKAS IOANNIS**

- MEMBER C: Ass.Professor **POLEMIS DIONYSIOS**

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Abstract

The global dry bulk shipping industry plays a pivotal role in facilitating the movement of essential commodities across international markets. Operational and commercial considerations, including chartering strategies and vessel specifications, play a critical role in navigating the complexities of the dry bulk shipping market. Time charter and voyage charter arrangements offer distinct advantages and drawbacks, influencing decision-making processes for shipowners and charterers. Time charter contracts provide stability and predictability in revenue streams, mitigating market volatility, while voyage charters offer flexibility and adaptability to changing market conditions. Embedded options in time charter contracts, such as extension and redelivery options, present challenges in pricing and risk management, highlighting the importance of effective contract negotiation and risk assessment.

In conclusion, the global dry bulk shipping industry encompasses diverse vessel types, market dynamics, and operational nuances. Understanding these complexities is essential for stakeholders to navigate market uncertainties, capitalize on emerging opportunities, and sustainably manage risks in the ever-evolving maritime landscape.

Keywords: Dry Bulk Shipping, Chartering Strategies, Baltic Exchange, Market trends, Freight Market

INTRODUCTION

The dry cargo market plays a vital role in global trade, facilitating the movement of goods worldwide. Understanding the dynamics, trends, and challenges within these markets is essential for stakeholders involved in international trade, shipping, logistics, and economic policy formulation. The dry cargo market encompasses the transportation of non-liquid goods, including commodities such as grains, fertilizers, coal, iron ore, minerals and other dry cargoes. It serves as a crucial component of the global supply chain, facilitating trade between producers and consumers worldwide (Stopford, 2009). Dry bulk commodities constitute a significant portion of seaborne trade, with bulk carriers being the primary vessels employed for their transportation. The demand for dry bulk shipping is closely linked to economic activities, particularly in industries such as construction, manufacturing, and agriculture (Bornozis, 2006).

The decision between time charter and spot charter has been a subject of significant academic research, with scholars exploring how these strategies impact the profitability, risk management, and operational efficiency of shipping companies. In their study, Stopford (2009) highlights the fundamental differences between time charter and spot charter, noting that while time charter agreements provide steady cash flows and stability, spot charters expose owners and charterers to price volatility. The research suggests that the long-term nature of time charters makes them an attractive option in periods of market uncertainty, as they ensure predictable income. However, spot charters, with their shorter durations, allow for greater flexibility, potentially leading to higher profits during favorable market conditions (Stopford, 2009).

Baatz (2017) examines the legal and contractual considerations surrounding chartering strategies, noting that time charter agreements often come with complex terms that allocate responsibilities for maintenance, repairs, and insurance between the owner and charterer. The study emphasizes the importance of these terms in determining the financial viability of time charter agreements, as any misalignment between the parties' expectations can lead to disputes. On the other hand, spot charter agreements, being simpler and short-term, carry lower legal complexities, but their dependence on market fluctuations means the revenue generated is less predictable (Baatz, 2017).

Recent studies also consider the economic factors influencing chartering decisions. For example, an empirical analysis by Tsolakis et al. (2016) reveals that the volatility of freight rates is a key determinant in the decision to choose between time charter and spot charter. Their study suggests that shipping companies are more likely to opt for time charter agreements during periods of low market volatility to secure a steady income stream, whereas during periods of high volatility, spot charters are more appealing as they provide the potential for higher returns.

These studies underline the complex trade-offs between stability and flexibility that characterize the choice between time and spot charters, with decisions often shaped by external market conditions and the financial objectives of shipping companies.

Recent market trends underscore the resilience and adaptability of the dry bulk shipping sector amidst global economic fluctuations and trade dynamics. Panamax vessels witnessed robust coal and grain shipments, buoyed by steady demand and harvest expectations. Conversely, Supramax and Handysize vessels faced challenges amid China's economic slowdown but found support in transport demand from emerging markets. Notably, the Panama Canal's operational disruptions

impacted vessel routing and market dynamics, prompting shifts in trade routes and contributing to market recoveries.

The choice between time charter and spot charter is influenced by various factors, including market conditions, risk appetite, and operational goals. While time charter provides more predictable cash flows and can offer stability in a fluctuating market, spot charters allow for potentially higher earnings but at the cost of exposure to market price swings (Lloyd's List, 2020). The strategic decision to opt for one over the other is integral to the profitability and sustainability of shipping companies, especially in light of changing market dynamics and global economic shifts.

This paper aims to explore the differences between time charter and spot charter strategies, analyzing the advantages and disadvantages of each within the context of the modern shipping industry. Furthermore, the paper examines how external factors such as fuel prices, geopolitical events, and demand fluctuations impact these chartering choices. By comparing the two strategies, the paper provides insights into how shipping companies can optimize their chartering decisions to maximize financial performance and operational efficiency.

1. LITERATURE REVIEW

1.1. SHIPPING CYCLES

Understanding the cyclical nature of the shipping industry is vital for analyzing chartering strategies. Influenced by factors such as global economic conditions, trade patterns, fleet capacity, and regulations, dry bulk shipping cycles have been extensively studied. Stopford (1997) highlighted the supply-demand dynamics shaping these cycles, with later research incorporating technological, regulatory, and geopolitical factors. Stopford (2009) identifies three cycle types: long-term cycles (secular trends), short-term cycles (business cycles), and seasonal cycles. Short-term cycles, typically spanning 3-12 years, and seasonal cycles, such as the dry bulk market's downturn in July-August, significantly impact chartering decisions and market behaviors.

A typical shipping cycle consists of four phases: trough, recovery, peak/plateau, and collapse. The trough phase sees oversupply and declining freight rates, leading to idle ships and financial struggles. In recovery, market conditions improve with rising freight rates and decreasing vessel layoffs. During the peak/plateau, demand matches supply, and freight rates soar. The cycle ends with a collapse, triggered by supply outpacing demand, economic downturns, port congestion, and new vessel deliveries, causing a sharp market decline. This cycle reflects the constant fluctuations in vessel supply, demand, and freight rates in the shipping industry.

Overall, the cyclical nature of dry bulk shipping holds profound implications for diverse stakeholders. Shipowners are tasked with the complex management of vessel portfolios in the face of market uncertainties, where they must weigh decisions regarding fleet expansion against fluctuating asset values (Talley, 2011). Charterers, including commodity traders and producers, are compelled to maneuver through unpredictable freight markets, aiming to optimize shipping logistics and manage costs effectively (Goulielmos & Psifia, 2018). During boom periods, characterized by high freight rates and strong demand for shipping, charterers and owners are more inclined to opt for spot charters. Spot charters offer the potential for higher earnings due to increased market rates. Spot charters provide flexibility, allowing owners to capitalize on favorable market conditions (Stopford, 2009). In contrast, during market slumps, when freight rates are low and demand for shipping is

weak, shipping companies may prefer time charters. Time charters provide more stability and predictable cash flows, mitigating the risks associated with market downturns (Tsolakis et al., 2016).

As shipping cycles progress, companies adjust their strategies to manage risks and optimize profits. In periods of market recovery, when rates begin to rise again, owners may look to secure long-term time charters to lock in favorable rates, while charterers may opt for spot charters to take advantage of rising rates (Baatz, 2017). Thus, shipping cycles significantly influence whether a company chooses the security of a time charter or the flexibility of a spot charter.

1.2. DRY BULK TRADES

Dry bulk commodities are divided into "major" and "minor" bulks. Major bulks, including iron ore, coal, and grains, make up over 50% of global trade, with iron ore being vital for steel production (Tsioumas, 2017). Minor bulks comprise goods like steel products, fertilizers, and bauxite. In 2022, iron ore was the leading dry bulk commodity, with 1.52 billion tons traded, mostly on Capesize and Panamax vessels, with trade routes focused on Brazil and Australia to China, driven by reduced domestic mining in China.

Figure 1 Iron Ore Seaborne Trade

Source: Banchero Costa Report, 2024

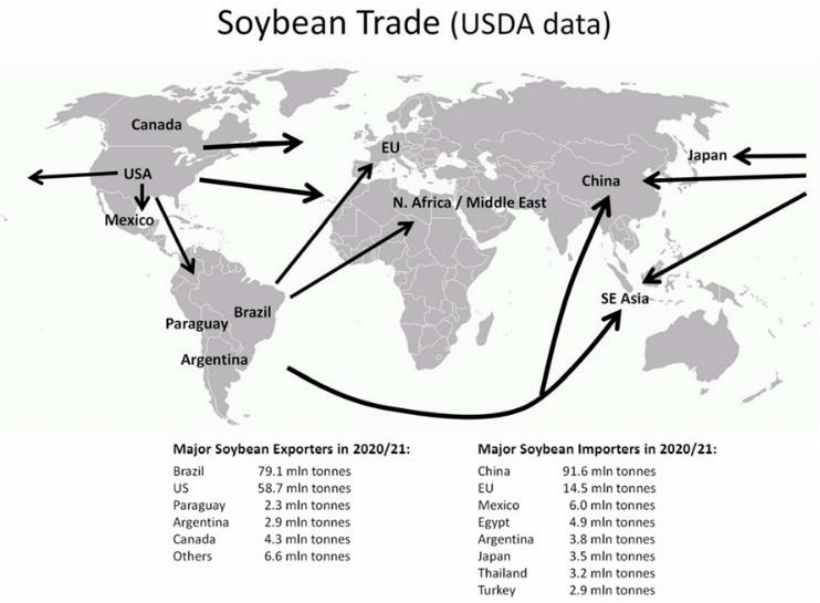
Coal was the second most traded dry bulk commodity in 2022, with 1.2 billion tons exchanged, 78% of which was thermal coal and 22% coking coal. After a surge in demand from 2009 to 2013, coal saw a decline in 2020 but rebounded in 2021. While demand in Europe and Japan is declining, China, India, and ASEAN countries are increasing imports. In 2023, Indonesia and Australia were the top exporters, together accounting for 63% of global coal exports.

Figure 2 Thermal & Coking Coal Seaborne Trade

Source: Banchero Costa Report, 2024

According to data from AXS Marine, global exports of soybeans amounted to 128.2 million tons in 2023. Brazil and the United States are the principal exporters, collectively accounting for 97% of the total soybean exports. The trade is predominantly driven by imports from China, which constitute approximately two-thirds of the global volume.

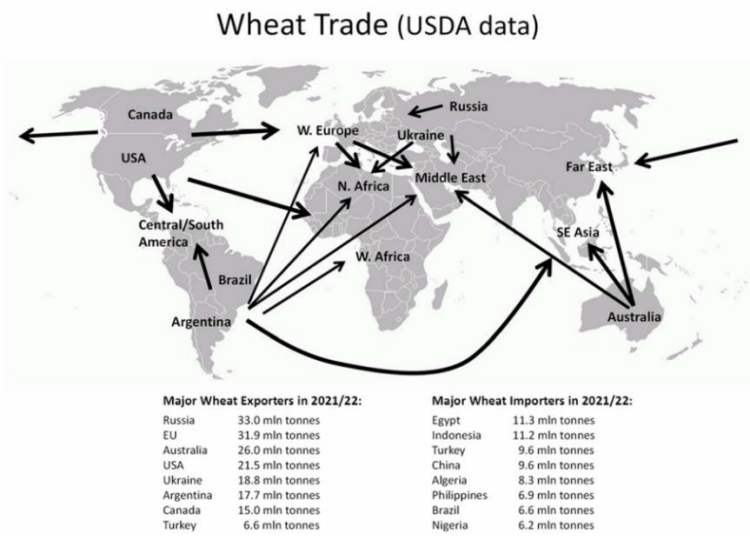
Figure 3 Soyabean Seaborne Trade



Source: Banchero Costa Report, 2024

Global wheat trade grew by 4% in the 2022/2023 season, with a projected 0.3% increase for 2023/2024 (USDA, July 2023). Major exporters include the European Union, the Black Sea region, the U.S., and Canada, while key importers are in the Middle East, North Africa, and Southeast Asia. This trade dynamic reflects increasing demand from these regions for wheat supplies.

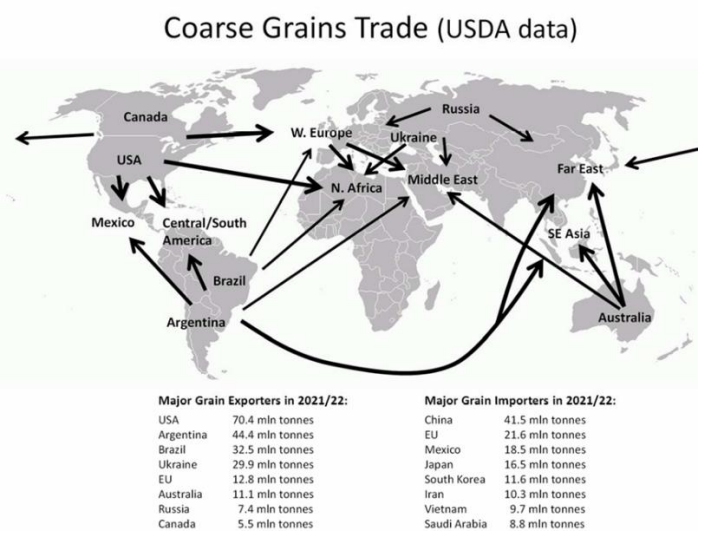
Figure 4 Wheat Seaborne Trade



Source: Banchero Costa Report, 2024

The global trade in grains is predominantly led by exports from South America, especially Brazil and Argentina, the United States, and the Black Sea region, with the primary import destinations being East Asia, the Middle East, North Africa, and Mexico. In 2023, global grain exports totaled 132.8 million tons, as reported by AXS Marine. Of this, approximately 50% originated from South America, with Brazil contributing 31% and Argentina 19%. Additionally, the United States accounted for 23% of these exports, with a sizable portion directed towards the Far East, particularly China. (Banchero Costa Report, 2024)

Figure 5 Coarse Grains Seaborne Trade



Source: Banchero Costa Report, 2024

1.2.1. Movements and Market Trends

Capesize vessels, primarily used for transporting iron ore and coal, experienced strong activity in 2023, driven by steady crude steel production in China. The economic recovery following COVID-19,

along with the easing of industrial regulations, facilitated a rebound in iron ore imports. Increased demand for aluminum, spurred by the growth of electric vehicle and renewable energy industries, led to higher bauxite imports, particularly from Guinea in West Africa. By 2023, bauxite volumes exceeded 100 million tons. However, market conditions were sluggish in the first half of the year due to the resolution of port congestion in China and improved ship dispatch efficiency. Activity picked up in the latter half, driven by the resumption of bauxite shipments after the West African rainy season. Weather disruptions in the Atlantic and limited ship capacity from the Far East also impacted vessel movements. A surge in spot cargoes of iron ore from Brazil and bauxite from West Africa further boosted market sentiment, leading to a notable rise in market rates starting in late November.

Panamax vessels, which primarily transport coal and grain, sustained robust activity throughout the year. Grain shipments, especially from South America (Brazil and Argentina), began in March, aligning with expectations of a favorable harvest. However, delays in harvesting led to a prolonged period of lower shipments, reducing the market impact compared to previous years. A market downturn occurred from May to August, exacerbated by uncertainty surrounding China's economic recovery. The situation improved around August, especially after restrictions on Panama Canal passage due to water shortages starting in November. These restrictions bolstered market sentiment across the dry bulk sector, with strong coal exports from North America and grain shipments from South America helping to revive the market. Additionally, cargo diversions to Panamax vessels amid rising Capesize rates contributed to market recovery.

Supramax and Handysize vessels, which transport a variety of goods including food and infrastructure materials, faced challenges due to a slowdown in the Chinese economy. However, demand remained steady, driven by economic expansion in India and Southeast Asia, though growth was slower than expected. The market remained sluggish from early spring to autumn, mirroring the trend seen in Panamax vessels. The Panama Canal restrictions from November played a crucial role in boosting market activity for these vessel types. The increased use of alternative routes, such as the Suez Canal, especially impacted Supramax vessels on the US Gulf grain route. This shift led to a surge in the Atlantic market and positively affected the Pacific market as well.

1.3. Dry Cargo Market

The demand for dry bulk shipping services is closely tied to global economic activity, especially industrial production and construction. Fluctuations in economic growth can significantly impact the demand for raw materials and, in turn, the volume of shipping required (Heaver, 2006). Additionally, global economic changes, such as the rise of emerging markets, have altered the demand for dry bulk commodities (Cullinane & Song, 2017). As economies grow, the need for raw materials like coal, iron ore, and other bulk goods increases, driving demand for dry bulk carriers. The industrialization of countries like China and India has been particularly influential, with rising imports of iron ore for steel production and coal for energy generation. Iron ore remains the most transported cargo by dry bulk vessels, heavily impacting the steel industry, which plays a vital role in sectors like construction, automotive, and infrastructure. Despite the global shift towards renewable energy, coal continues to be an essential energy source for many developing nations, maintaining consistent demand for its transportation.

Dry bulk shipping demand also experiences seasonal fluctuations. For example, grain exports peak during harvest seasons in countries like the United States, Brazil, and Russia. Coal demand rises during winter in the northern hemisphere, driven by increased energy needs. Regional factors, such

as political stability and infrastructure, also influence shipping demand, particularly in Asia, a major hub for manufacturing activities. On the supply side, the availability of deadweight capacity is crucial. The growth of the global dry bulk fleet, with the addition of larger, more efficient vessels, impacts freight rates and the ability to meet demand. The age and composition of the fleet also influence market dynamics. Older vessels are phased out, reducing supply. During periods of high freight rates, ordering new vessels can lead to oversupply and eventual market downturns (Notteboom & Vernimmen, 2009).

Freight rates are a key indicator of market conditions and are influenced by supply, demand, and macroeconomic factors. Freight rate volatility plays a significant role in shaping investment decisions and risk management strategies in the dry bulk shipping industry (Ng & Pallis, 2013; Pallis & De Langen, 2010).

1.3.1. Baltic Exchange Indices

The Baltic Exchange plays a pivotal role in the global shipping industry by offering transparent and reliable benchmarking data through its various indices. These indices, including the Baltic Dry Index (BDI), Baltic Capesize Index (BCI), Baltic Panamax Index (BPI), Baltic Supramax Index (BSI), and Baltic Handysize Index (BHSI), are essential tools for understanding the dry bulk market and aiding informed decisions by investors, traders, and industry participants.

The BDI, which combines the timecharter averages of Capesize, Panamax, and Supramax vessels, serves as a key indicator of global economic health, particularly in the commodities and shipping sectors. It reflects the cost of shipping raw materials like coal, iron ore, and grain. An upward trend suggests increasing demand and a robust economy, while a decline signals economic slowdown (Stopford, 2009).

Each sub-index targets specific vessel categories and routes. For instance, the BCI tracks Capesize vessels, mainly involved in iron ore and coal transportation, while the BPI focuses on Panamax vessels used for coal, grain, and minor bulk cargos. The BSI and BHSI cover Supramax and Handysize vessels, respectively, providing insights into various trade routes and cargoes.

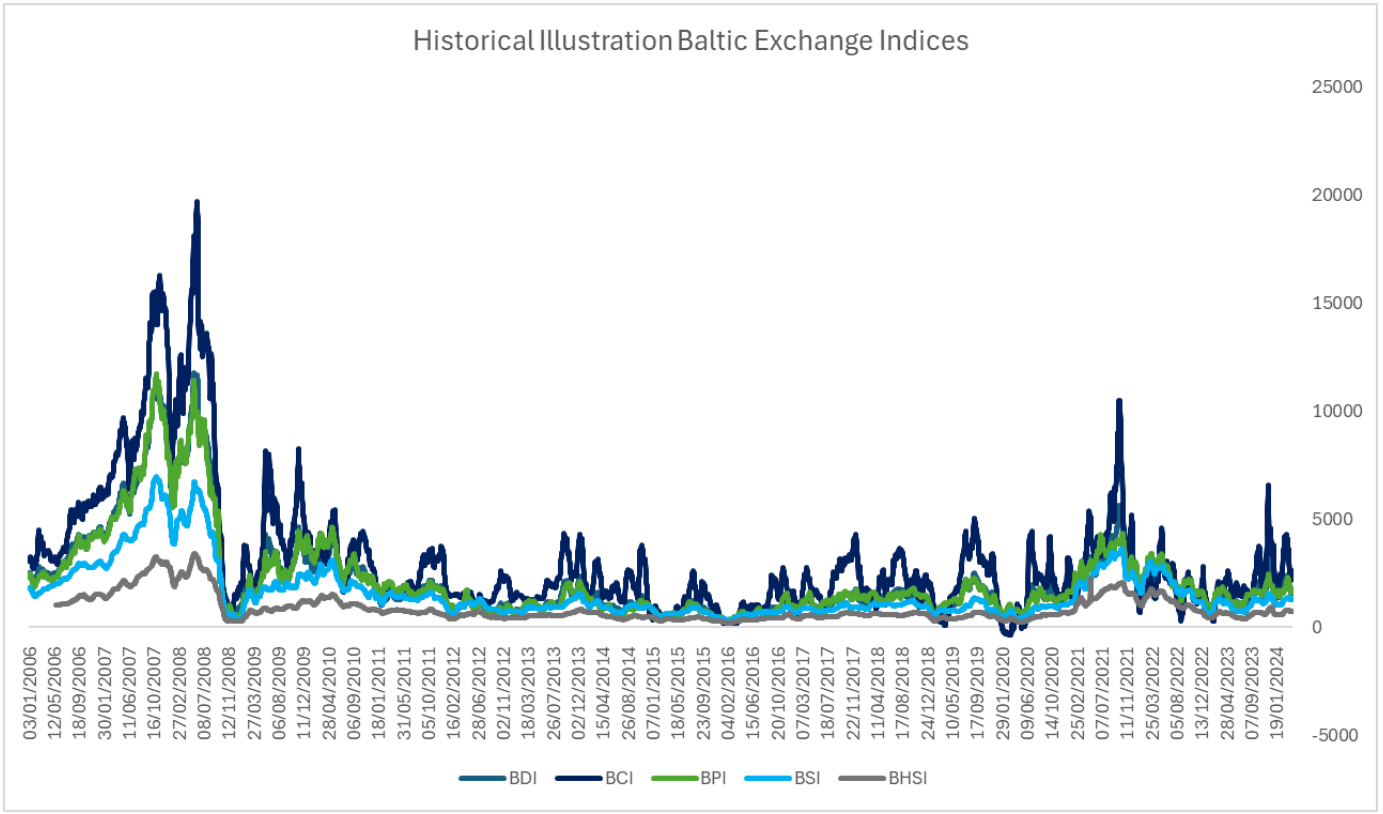
The Baltic Exchange's consistent, impartial data fosters transparency and trust among stakeholders, offering vital market insights for risk management, strategy development, and economic forecasting. These indices are indispensable for understanding supply-demand dynamics in the dry bulk shipping market.

The Baltic Dry Index (BDI) is a key economic indicator that tracks the average transportation costs of raw materials like coal, iron ore, cement, and grains across 50 shipping routes, accounting for various vessel sizes. The BDI serves as a leading indicator for global economic trends, with high values suggesting tight shipping supply and increased demand, potentially leading to inflation, while declines may indicate reduced demand and possible economic downturns. The Baltic Panamax Index (BPI) measures Panamax vessel performance based on daily assessments of selected routes within the dry bulk sector. The index calculates the Time Charter Average value using weighted contributions from different routes, including trans-Atlantic and Pacific round trips, each with specific duration and commission rates. These routes help gauge shipping costs and market conditions for Panamax vessels. The Baltic Supramax Index (BSI) was redefined in April 2017 after

market analyses and adjustments to vessel specifications and route configurations. The index now uses a standard "Tess 58" vessel model without scrubber fittings, offering a more accurate reflection of Supramax shipping conditions. The Baltic Handysize Index (BHSI provides a daily metric for Handysize vessels, based on independent assessments from a panel of experts. Though excluded from the BDI calculation since March 2018, it continues to be reported independently, serving as a valuable tool for evaluating shipping conditions in the Handysize sector.

Together, these indices provide comprehensive insights into the dry bulk shipping market, helping stakeholders monitor trends, assess supply-demand dynamics, and make informed decisions.

Figure 6 Historical Illustration of Baltic Exchange Indices 2006-2024



Source: Baltic Exchange, Visited on 16/04/2024

Analysis of historical BDI trends reveals notable volatility, notably during the period spanning 2006 to 2009, characterized by a speculative bubble attributed to fluctuations in commodity prices, particularly oil. After this period, despite a recovery in global trade, the BDI remained subdued due to an excess of shipping capacity resulting from the influx of vessels ordered during the speculative phase. However, the onset of the COVID-19 pandemic in 2020 precipitated a reversal in BDI trends. Initially, shipping rates declined in response to diminished demand; however, by the latter half of 2021, the BDI exhibited a resurgence, attributable to a contraction in shipping capacity, thereby exerting upward pressure on rates (Baltic Exchange, 2024).

In December 2023, the Baltic Exchange's quarterly report focused on examining whether the heightened dry bulk freight rates observed at that juncture constituted a sustained trend or merely a transient phenomenon akin to a "head-fake". Freight encountered during the fourth quarter of 2023 (4Q23) appear to align with the latter characterization. Subsequent to this assessment, freight rates underwent a period of attenuation, persisting at subdued levels leading up to the Chinese Lunar New Year, albeit displaying a recent uptick. Concurrently, the values of bulk carrier assets remained notably robust throughout 2023, notwithstanding the prevailing weakness in freight rates over the course of the year. It is noteworthy that dry bulk cargo ship newbuild prices exhibited a degree of fortification during the same period.

Throughout the majority of 2023, the Baltic Dry Index exhibited a decline when juxtaposed with its 2022 levels; however, there was a resurgence in freight rates towards the conclusion of the year. Current forward freight agreements suggest that freight rates for 2024 may, on average, surpass those of 2023 across all sectors. Despite this optimistic projection, the outlook on freight rates is somewhat tempered, owing to the anticipation of restrained demand growth. This cautious stance is particularly pronounced in the panamax segment, where a notable reduction in coal shipments could precipitate a decline in freight rates. Market estimates indicate that coal shipments accounted for over half of the cargo transported by panamax vessels in 2023.

Conversely, the capesize and handysize segments are poised to benefit from minimal fleet expansion, which may bolster freight rates throughout 2024 and 2025. However, the anticipated influx of new panamax and supramax vessels could exert downward pressure on freight rates within these respective segments (BIMCO,2024).

1.4. Freight Market

1.4.1. Ship delivery types

The four distinct and most commonly used ship delivery types in chartering are: Dropping Last Outward Sea Pilot (DLOSP), Arrival First Pilot Station (AFPS), Direct Continuation. Each delivery type presents unique advantages, considerations, and implications for stakeholders in the maritime industry.

DLOSP refers to the practice of dropping the last outward pilot before proceeding to the vessel's next loading port. This method is commonly used for vessels departing from ports or terminals and requires careful coordination between the vessel's crew, port authorities, and pilotage services. DLOSP deliveries are preferred for their efficiency in minimizing pilotage costs and optimizing vessel transit times (The Standard Club, 2020).

AFSPS refers to delivery arriving at the first pilot station of their loading port, where they are guided by pilotage services into port facilities. This method is commonly used for vessels approaching

congested or restricted waterways, where pilotage assistance is required for safe navigation and berthing. AFSPS deliveries require effective communication between vessel operators, port authorities, and pilotage authorities to coordinate arrival procedures (The Standard Club, 2020).

Direct Continuation involves vessels proceeding directly from their current location to the next leg of their voyage without intermediate stops or port calls mainly under the same charterers. Direct Continuation deliveries require efficient voyage planning, route optimization, and adherence to scheduled departure and arrival times (International Maritime Pilots' Association, 2017).

For example, the following scenario can provide a more comprehensive understanding. A vessel is in the process of discharging coal in Zhoushan, China and is scheduled to complete operation within the next 10 days. Concurrently, the vessel's owners are engaged in negotiations for next employment which entails another cargo of coal from Indonesia, necessitating ballasting the next loading port. The ballast days are approximately five (5) days. The negotiation between the shipowners and the charterer revolves around the terms of the time charter trip agreement. The charterer prefers the option of taking the ship on arrival at first pilot station in Indonesia, thereby avoiding the expenses associated with the ballast leg. Conversely, the shipowners advocate for the charterer to accept the vessel at dropping outward pilot in Zhoushan, following the completion of discharge operations. This divergence in preference underscores the underlying issue of determining responsibility for covering the costs associated with the ballast leg.

The above scenario encapsulated the essence of the concepts, wherein stakeholders grapple with the allocation of expenses related the vessel's movements between charter engagements.

1.5. Methods of Ship Employment

Voyage chartering denotes the practice of engaging a vessel for a single journey, wherein the vessel loads cargo from one or more ports for subsequent discharge at one or more designated ports. In exchange for the transportation of the cargo and potentially covering loading and/or discharging expenses, the shipowner receives a financial compensation termed freight. This remuneration may take the form of a lump sum payment or, more commonly, be calculated proportionately based on the quantity of cargo carried, typically per tonne. It is customary to stipulate the permissible duration for loading and discharging the cargo, referred to as laytime, within the charter agreement. Should the stipulated laytime be exceeded, the charterer becomes liable to pay liquidated damages, known as demurrage. The charter agreement also delineates the period during which the vessel must be made available for loading at the designated port, known as laydays, in addition to specifying the type and quantity of cargo to be transported. These contractual provisions serve to establish clear parameters and obligations for both parties involved in the voyage charter, mitigating potential disputes and uncertainties.

Most voyage charters originate from charterers seeking to transport cargo, prompting them to engage ship owners through intermediaries, typically brokers, to secure a vessel for a specific voyage. Payment arrangements for voyage charters typically adopt one of two methods: remuneration based on cargo tonnage transported, known as per-ton basis, or a lump-sum payment. Per-ton basis payment is favored when cargo tonnage is significantly lower than the vessel's maximum cargo

capacity. Conversely, a lump-sum payment is preferred when transporting heavier cargo loads, requiring ship owners to ensure compliance with the vessel's load limits, including on-deck cargo tonnage and load lines.

Contractual agreements governing voyage charters include key terms dictating time-related provisions throughout the contract duration. Laytime, denoting the allowable duration for loading and unloading activities at a port, is a critical term. Ship owners incur expenses such as port duties and berthing charges, thus expecting charterers to expedite operations. Failure to adhere to laytime provisions incurs demurrage charges, compensating ship owners for costs incurred due to delays. Conversely, early completion of loading and unloading operations enables charterers to claim despatch payments from ship owners, serving as an incentive for prompt port activities.

In voyage chartering, ship owners assume responsibility for fuel, operational, and crew-related expenditures. They oversee the hiring of officers and crew members, either directly or through brokers. Moreover, owners cover expenses such as berthing and loading operations, including equipment usage costs. To offset these expenses, ship owners charge charterers higher rates. Despite the elevated costs, charterers often favor voyage charters for one-off consignments, as they offer flexibility without long-term contractual obligations.

In essence, a voyage charter entails charterers hiring a vessel for a single pre-determined voyage, with ship owners bearing responsibility for duties, expenses, and crew management, while charterers oversee cargo transportation.

1.6. Time Chartering

In contrast to voyage chartering, where vessels are hired for a single journey, time chartering involves the engagement of a vessel for a specified duration, such as 12 months plus or minus 15 days. This arrangement entails distinct responsibilities for the involved parties. Under a time charter, the charterer assumes control over the operational or commercial aspects of the vessel, including tasks such as appointing and compensating port agents, procuring bunkers, and settling port charges. However, the shipowner retains responsibility for the overall management of the vessel, particularly concerning maintenance, crewing, insurance, and related matters. In return for assuming these responsibilities, the shipowner receives regular payments of hire, typically disbursed monthly or semi-monthly in advance. However, instances of vessel malfunction or disruptions to smooth operations, such as mechanical breakdowns, may render the vessel off-hire, during which period the owner is not entitled to remuneration.

In time chartering, the majority of responsibilities typically shift to the shipowner, although the charterer often retains responsibility for stevedoring, cargo handling, and cargo insurance. Time-chartered vessels may be deployed on liner services operated by the time charterer, with some vessels secured on extended charters for this purpose, while others may be chartered for shorter durations to accommodate dry-docking, repairs, or seasonal fluctuations in cargo volumes.

Charterers commonly negotiate the option to temporarily rename the vessel if it is deployed on a liner service, facilitating easier association of the vessel's name with the specific route or line it serves. On occasion, the parties may even agree to a change of flag as part of the charter arrangement.

Ship operators frequently incorporate optionality into their business models, obtaining tonnage on timecharter with optional extension periods and redelivery options, exploiting the perception that these options are given away for free. For instance, Jørgensen and De Giovanni (2010) noted that a significant portion of shipowner D/S Norden's reported net asset value in their 2007 annual report consisted of ship purchase options embedded in timecharter contracts. Two primary sources of optionality are typically embedded in a timecharter contract: the extension option and the redelivery area option. The extension option allows the charterer to redeliver the vessel at any time within the specified redelivery period, influencing their decision based on market conditions. Conversely, the redelivery area option dictates where the ship is redelivered to the owner, often within a broad geographic region. Recent research suggests that the presence of extension options may have a negative impact on agreed daily hire rates in the drybulk market, indicating that options may not only be undervalued but that charterers may even receive compensation for accepting them. This anomaly has been attributed to factors such as owner quality, negotiating power imbalances, and perceived credit risk premiums.

Time charter contracts are fundamental agreements in the shipping industry, defining the duration and payment of hire for vessel usage. They can be categorized into two main types: Period Charters and Trip Charters. In a timecharter agreement, the date of delivery marks the commencement of the charter period, and the charterer is obligated to redeliver the vessel upon the expiration of the agreed-upon period. Deviating from this timeframe constitutes a breach of contract.

Given the unpredictable nature of voyages, charterers often incorporate flexibility into the charter period to accommodate unforeseen delays. This flexibility can be expressed in various forms, such as specifying a range of months or allowing for a margin of days beyond the stipulated period. For example, this objective can be realized through the following means:

- Approximately four months
- Four months with a variance of up to fifteen days, at the discretion of the charterers
- A minimum duration of three months and a maximum of five months
- Approximately four months, extendable to a maximum of five months
- Approximately four months, with no explicit assurance or guarantee.

Trip charters, on the other hand, link the charter period directly to the duration of a specific voyage. The charter period extends for the duration of the voyage, with no fixed timeframe beyond that. Combining elements of both period and trip charters is also common, wherein the voyage is defined, but a period is also specified for additional flexibility.

In summary, time charter agreements necessitate careful consideration of duration and flexibility to accommodate the uncertainties inherent in maritime operations. Various approaches, such as specifying periods with tolerance margins or linking the charter period to specific voyages, are employed to address these challenges effectively.

Finally, in some cases a Consecutive Voyage Contract is opted which involves a ship committing to a series of voyages under pre-agreed terms, with the option for freight rates to fluctuate. Each voyage is treated as a separate contract, meaning delays or expedited turnarounds on one voyage do not affect others. If the vessel is lost, the contract ends immediately. This differs from a Contract of Affreightment, which has distinct obligations. Each voyage operates independently, despite being part of a longer-term arrangement.

1.7. Time Charter vs Voyage Charter

In essence, the maritime industry employs various contractual arrangements, including time charters, voyage charters, and spot rate contracts, each delineated by specific durations and scopes. Kavussanos (1996) scrutinizes market volatility as a risk metric for dry-bulk vessels, contrasting volatility estimations between time charters and spot rates, as well as across vessels of different sizes. Findings reveal that smaller vessels entail lower risk when spot rates are utilized, whereas time charters exhibit greater unpredictability. Consequently, risk-averse ship owners may opt for spot market engagements and investment in smaller vessels (Kavussanos, 1996).

Axarloglou et al. (2013) empirically explore the dynamics of the spread between voyage and time-charter rates, highlighting its evolution over time and its correlation with market demand, future market expectations, and volatility. Their analysis suggests that managerial decisions regarding resource commitment are contingent upon market fluctuations, with short-term commitments favored during market upswings for flexibility and longer commitments preferred during downswings to safeguard against business opportunities scarcity. These insights offer managerial perspectives on resource allocation, enhancing decision-making in chartering, budgeting, and economic management within the maritime sector (Axarloglou et al., 2013).

Examining the relationship between time charter and spot freight rates, Zhang & Zeng (2015) investigate the price discovery function of time charter contracts across Capesize, Panamax, and Supramax dry bulk vessels. Their analysis, employing impulse response functions and vector error correction models, reveals a bidirectional lead-lag correlation between time charter and spot freight prices, with smaller vessel sizes and longer voyages enhancing the price discovery function of time charter rates (Zhang & Zeng, 2015).

In conclusion, decision-making regarding contractual arrangements in the maritime industry involves multifaceted considerations for ship owners and charterers. Factors such as vessel type, dry bulk characteristics, geographical considerations, economic landscape, and macroeconomic factors influence the choice between time charters, voyage charters, or spot rate contracts. An integrated approach, considering various elements and examining price dynamics through integrated indices such as the Baltic Dry Index, is essential for informed decision-making within the maritime sector. Therefore, the subsequent subsection delves into the Baltic Dry Index, a pivotal economic parameter in the shipping industry intricately linked to freight rates and price dynamics.

1.7.1. Advantages and Disadvantages

Chartering strategies play a pivotal role in the dry bulk shipping industry, influencing vessel deployment, revenue generation, and risk management. Time charter and voyage charter emerge as two primary methods for engaging vessels in commercial activities, each offering unique advantages and challenges. This paper aims to conduct a comprehensive analysis of the advantages and disadvantages of time charter and voyage charter, shedding light on their operational characteristics, financial implications, and suitability for different market conditions. By elucidating the strengths and limitations of these chartering strategies, the study aims to equip stakeholders with the knowledge needed to optimize their chartering decisions in the dynamic maritime transport sector.

1.7.1.1. Time Charter

Time charter contracts provide shipowners with a steady income stream by offering fixed daily hire rates over a predetermined period. This stability enables shipowners to mitigate the impact of market volatility and fluctuations in freight rates (Lam & Notteboom, 2014). These arrangements afford shipowners predictable cash flow, facilitating effective financial planning and investment decisions. Shipowners can rely on the consistent revenue generated from time charter contracts to meet operational expenses and debt obligations (Pallis & De Langen, 2010). Finally, time charter contracts grant charterers the control over vessel deployment and scheduling. Charterers can optimize the vessels utilization and adapt to changing market conditions by adjusting voyage routes and cargo selection (Ng & Pallis, 2013).

However, time charter contracts impose some disadvantages concerning the limitation of potential earnings, since the vessel is chartered under fixed daily hire rates, constraining shipowners; earning potential during period of robust market demand (Talley, 2011). This can be mitigated by choosing to charter the vessel at a percentage of the Baltic Exchange indices. Frequently, vessels' specifications are compared to the Baltic Exchange's vessel specifications, known as the Baltic Keel Index (BKI). The BKI serves as a reference point for assessing the suitability of vessels for chartering purposes. When negotiating charter agreements, both shipowners and charterers analyze the vessel's specifications in relation to the BKI standards. This comparison allows the parties to agree on a specific percentage indicating how closely the vessel aligns with the BKI criteria. Subsequently, the time charter rate is often determined based on the daily index published by the Baltic Exchange. This index reflects the prevailing market conditions and serves as a benchmark for setting charter rates. By referencing the BKI and utilizing the daily index, shipowners and charterers can establish fair and competitive time charter rates that accurately reflect the value of the vessel in question. Overall, this practice underscores the importance of standardized vessel specifications and market indices in facilitating transparent and equitable charter agreements within the maritime industry. By leveraging these benchmarks, parties can negotiate contracts with confidence, knowing that the terms are based on objective criteria and market dynamics. Finally, time charter agreements typically span several months to several years, requiring shipowners to commit vessels for extended durations. This lack of flexibility may limit shipowners' ability to capitalize on short-term market opportunities and adapt to changing business conditions (Cullinane & Song, 2017).

1.7.1.2. Voyage charter

Voyage charter contracts offer charterers greater flexibility in cargo selection, destination, and scheduling. Charterers can exploit short-term market opportunities, adapt to changing demand patterns, and optimize freight earnings by selecting lucrative voyages under voyage charter arrangements (Heaver, 2006). These contracts enable charterers to maximize profit potential by capitalizing on favorable market conditions and freight rates. Charterers can secure higher earnings

during periods of robust demand and volatile freight markets by leveraging voyage charter arrangements (Goulielmos & Psifia, 2018). Finally, they are typically short-term and do not entail long-term commitments, providing charterers with greater flexibility and agility in vessel deployment. Charterers can adjust voyage routes and cargo selection based on prevailing market conditions without being bound by extended contractual obligations (Stopford, 2009).

However, voyage charter also entails some disadvantages. These contracts expose charterers to revenue volatility and market uncertainty, as freight earnings are contingent upon prevailing market conditions and freight rates. Charterers may face diminished earnings or losses during periods of weak demand and declining freight markets (Lam & Notteboom, 2014). They entail heightened market risk and exposure to external factors such as geopolitical events, weather conditions, and supply-demand dynamics. Charterers must navigate market uncertainties and fluctuations in freight rates, which may adversely affect profitability and financial performance (Pallis & De Langen, 2010). Finally, these contracts necessitate meticulous negotiation of terms and conditions, including laytime, demurrage, and cargo handling protocols. Charterers must engage in comprehensive due diligence and risk assessment to ensure favorable contract terms and mitigate potential operational and financial risks (Ng & Pallis, 2013).

Time charter and voyage charter represent distinct chartering strategies with unique advantages and challenges in the dry bulk shipping industry. While time charter offers stability, predictability, and operational control, voyage charter provides flexibility, profit maximization, and short-term commitments. Shipowners and charterers must carefully weigh the advantages and disadvantages of each chartering method based on market conditions, operational requirements, and risk preferences. By understanding the intricacies of time charter and voyage charter, stakeholders can make informed decisions to optimize vessel deployment, revenue generation, and risk management in the dynamic maritime transport sector.

2. Methodology

Voyage estimation for dry cargo represents a critical and intricate process, essential for evaluating the financial feasibility of maritime voyages. It consists of determining the projected profit or loss from a proposed voyage charter by carefully examining numerous associated costs and revenues. Key expenses incorporated into this estimation include the costs of chartering the vessel, fuel expenses, port charges, and fees associated with the loading and unloading of cargo. In addition to these direct costs, the process also entails consideration of various other operational expenses related to the voyage.

To calculate the potential return on a voyage, ship owners or charterers juxtapose the anticipated revenue from the charter against the estimated total costs. This evaluation not only encompasses monetary factors but also requires an assessment of time and resources necessary to complete the journey between specific ports. Potential risks and delays, such as adverse weather conditions, geopolitical tensions, or logistical constraints at ports, must also be factored into the voyage estimation to ensure a comprehensive analysis.

The process of voyage estimation thus involves several critical steps aimed at achieving a precise calculation. Initially, a detailed analysis of the voyage route and itinerary is conducted to identify

possible challenges and delays. Following this, a meticulous calculation of the voyage costs, including fixed and variable expenses, is performed. The final stage involves a rigorous assessment of the market conditions to project the potential revenue from the cargo being transported. This methodical approach to voyage estimation is vital for maritime operators to make informed decisions regarding the deployment of vessels, ensuring not only profitability but also efficient resource management in the complex and often unpredictable environment of maritime logistics.

In order to proceed with a comparison of the two case studies, that is Time Charter and Voyage Charter, a vessel with the specifications below has been taken into consideration:

VESSEL DESCRIPTION
M/V XXX - SPORE 28/30 APR
80,283 ON 14.468/ 95171.8CBM / 2010
B/L 13.5/13 @ 30/32 + 0.2 MT
ECO B/L 12/11.5 @ 23/25+ 0.2 MT
PORT I/W 2.5/5 + 0.2MT LSMGO

The vessel has been picked randomly to represent 15-year-old Panamax vessels with economic speed and consumption specifications as per Baltic Panamax BKI type vessel as follows:

Quote[1]

=====

Baltic Panamax vessel for Timecharter routes is a non-scrubber fitted vessel based on the following description:

82,500mt dwt on 14.43m SSW draft
Max age 12 yrs
LOA 229m, beam 32.25m, TPC 70.5
97,000 cbm grain
13.5 knots laden on 33mt fuel oil (380cs t) / 14 knots ballast on 31mt fuel oil (380cs t) + 0.1 MGO at sea
11.5 knots laden on 22mt fuel oil (380cs t) / 12.5 knots ballast on 23mt fuel oil (380cs t) + 0.1 MGO at sea

=====

Unquote

All information has been gathered via Marine Traffic and Balic Exchange website to ensure that results will illustrate a realistic approach to deciding a chartering strategy. The voyage instructions have been created as a result of consultation with industry experts already employed in brokerage houses while also considering the Baltic Exchange routes and indices as of May 2024. The below proposed charters have been picked among a variety of trading routes offered at standardized terms by the Baltic Exchange and are aligned with the indices that are published daily in the platform to depict a real-life case study.

[1] Baltic Exchange Interactive Map

The above methodology has been opted to be beneficial for the successful completion of this paper since it is a mixture of current literature and market analysis from renowned organizations in the industry.

2.1. Time Charter Estimation

As the prevalent practice of charterers engaging vessels on time charter for trips has become widespread, there arises a necessity to estimate the daily profit derived from this mode of employment akin to the estimation process for voyage charters, facilitating a comparative analysis between the two alternatives. Indeed, this approach delineates the comparison between time charter rates denoted in daily amounts and those expressed per summer deadweight tonnes. While many merchants favor the apparent simplicity of voyage chartering due to organizational constraints hindering successful operation of time chartered vessels, there exist others who frequently opt for vessels on time charter trips, perceiving potential savings in overall costs. Hence, the ability to accurately estimate the net cost of time chartering and juxtapose it against the voyage chartering alternative is of paramount importance. Fortunately, the estimation of trip time chartering entails a relatively straightforward exercise. In numerous cases, it suffices to subtract commission and brokerage from the gross daily hire for a direct comparison with an alternative voyage outcome. However, prudence is warranted concerning items such as domestic fuel costs, hold-cleaning payments, and bunker price differentials, where realism may not be entirely reflected.

The complexities emerge notably with time charter estimating, particularly when a vessel is not immediately taken on hire after its previous employment. In such instances, allowances must be made not only for the time lost to the vessel's owners during unemployment but also for bunkers consumed during that period. Nevertheless, the ensuing calculation is not overly intricate when total income and expenditure are meticulously considered and applied to the venture's entire duration. Depending on the prevailing strength or weakness of the freight market, a charterer may remunerate an owner with a ballast bonus to offset the expenses incurred in positioning a vessel for delivery onto a time charter, or infrequently, for delivering a vessel in an unattractive location. Subsequently, the shipowner confronts a ballast voyage to regain a favorable position for securing suitable employment. Irrespective of whether shipowners finance a ballast run before or after a trip time charter from their own resources or with the assistance of a ballast bonus from a time charterer, the principle guiding the accounting remains consistent. All income from time charter hire and ballast bonus must be aggregated and compared with all expenses, encompassing bunkers and tolls, for a positioning canal transit. The resultant figure, divided by the total number of days overall, furnishes a gross daily figure, forming the basis upon which the venture's financial viability can be assessed and juxtaposed, perhaps, with a voyage alternative.

In instances where freight markets exhibit weakness, charterers often negotiate ballast bonuses that may not accurately reflect the actual cost to an owner of positioning a vessel. Conversely, during periods of freight market strength, charterers may be compelled to pay far more than the actual cost. Such dynamics underscore the essential elements of a free market, necessitating that time charterers, their brokers, as well as shipowners, exhibit financial acumen and proficiency in conducting precise ballast bonus calculations when required. Finally, other voyage estimating techniques, such as back-hauling and voyage equalization, are occasionally employed by the discerning to furnish more realistic guidelines for enhancing overall profitability.

Considering a vessel is under time charter for a period of about 3 to about 5 months (about means +/- 15 days) at 13,000 USD/day, the gross revenue for the owners can be easily calculated as follows:

VESSEL DESCRIPTION
M/V XXX - SPORE 28/30 APR
80,283 ON 14.468/ 95171.8CBM / 2010
B/L 13.5/13 @ 30/32 + 0.2 MT
ECO B/L 12/11.5 @ 23/25+ 0.2 MT
PORT I/W 2.5/5 + 0.2MT LSMGO

Gross Revenue: 13,000 x 90d =1,170,000 USD

Thus, for the minimum period of this time charter (3 months) owners shall be credited with the amount of 1,170,000 USD

2.2. Practical Example

2.2.1. Voyage Estimation

VOYAGE INSTRUCTIONS (1)
75000 +/-10% COAL IN BULK
15000 SHINC/12000 SHINC – SF 43
1 SBP TABONEO/ 1SBP KANDLA
LCN 10-15 MAY
5% TTL ADDCOM
LOAD D/As USD 20K/DISCH D/As USD 145K
Charterers' freight idea at USD 11.61USD/PMT

Below is calculated basis Singapore prices IFO 640/ MDO 760 for a vessel with following specifications:

VESSEL DESCRIPTION
M/V XXX - SPORE 28/30 APR
80,283 ON 14.468/ 95171.8CBM / 2010
B/L 13.5/13 @ 30/32 + 0.2 MT
ECO B/L 12/11.5 @ 23/25+ 0.2 MT
PORT I/W 2.5/5 + 0.2MT LSMGO

Sailing days required basis speed about +/- 0.5 knots:

Ballast Leg
SINGAPORE/TABONEO = 2.8 DAYS (A)
BUNKERS CONSUMPTION = 2.8 * 23 TONS PER DAY = 64.4 TONS

PORT COSTS USD 20,000

Laden Leg
TABONEO/KANDLA = 13.6 DAYS (B)
BUNKERS CONSUMPTION = 13.6*25 TONS PER DAY = 340 TONS
PORT COSTS USD 145,000

PORT DAYS
LOAD PORT (TABONEO) = 75000/15000 = 5 DAYS (C)
DISPORT (KANDLA) = 75000/12000 = 6.25 DAYS (D)
TOTAL PORT DAY BUNKERS CONSUMPTION = (11.25 *0.2) + (11.25*5) =58.5 TONS

TOTAL DURATION = (A)+(B)+(C)+(D) =27.65

TOTAL EXPENSES
HSFO AT SEA = (2.8*23*640) + (13.6*25*640) = 258,816
LSMGO AT SEA = (2.8+13.6) * 0.2*760 = 2,492.8
HSFO IN PORT = (11.25*5*640) = 36,000
LSMGO IN PORT = (11.25*0.2*760) =1710
LOADPORT D/As = USD 20,000
DISPORT D/As = USD 145,000

TOTAL EXPENSES = USD 464,019

BREAKEVEN FREIGHT RATE TO PERFORM VOYAGE = 464,019USD/75,000TNS = USD 6.19 PMT ROUNDING IT UP AT USD 6.2 PMT
CHARTERERS' IDEAS AT 11.61 USD/PMT = USD 870,750
GROSS VOYAGE INCOME = 870,750 – 464,019 = USD 406,731
GROSS INCOME OF USD 406,731 BY VOYAGE OF 27.65 = 14,709.98 USD /DAY
ROUNDING IT UP TO = 14,710 USD/DAY
ADDCOM 5% = USD 735.5
NET INCOME PER DAY = 13,975 USD/DAY

For the duration of the trip (17days) owners shall be credited with the total amount of 386.400 USD as net profit.

If we consider a second voyage on the below bss:

VOYAGE INSTRUCTIONS (2)
75000 +/-10% GRAINS IN BULK
15000 SHINC/12000 SHINC
1 SBP SANTOS/ 1SBP QINGDAO
LCN 26-31 MAY
5% TTL ADDCOM
LOAD D/As USD 65K/DISCH D/As USD 65K
Charterers' freight idea at 18.414 USD/DAY

BALLAST LEG : 30.53 DAYS
BUNKERS COSUMPTION : 702 * 640 = 449.333 USD
PORT COSTS: 65.000 USD

LADEN LEG : 45.44 DAYS
BUNKERS CONSUMPTION : 45.44 * 1136 = 726.969
PORT COSTS : 65.000 USD

PORT DAYS
LOADPORT SANTOS : 12.72 DAYS
DISPORT QINGDAO : 12.72 DAYS
TOTAL PORT DAYS BUNKERS CONSUMPTION : (25.44 * 0.2*760)+(25.44*5*640) = 85.287 USD

TOTAL EXPENSES
HSFO AT SEA = 1.176.302 USD
LSMGO AT SEA = 11.546 USD
HSFO IN PORT = 81.408 USD
LSMGO IN PORT = 3.866,88 USD
LOADPORT D/As = USD 65,000
DISPORT D/As = USD 65,000

TOTAL EXPENSES = USD 1.403.136

BREAKEVEN FREIGHT RATE TO PERFORM VOYAGE = 1.403.136USD/75,000TNS = USD 18.70 PMT
CHARTERERS' IDEAS AT 21.58 USD/PMT = 1.618.500 USD
GROSS VOYAGE INCOME = 1.618.500 – 1.403.136= USD 215.364
GROSS INCOME OF USD 215.364 BY VOYAGE OF 101,40 = 2.123,90 USD /DAY
ROUNDING IT UP TO = 2.125 USD/DAY
ADDCOM 5% = USD 920
NET INCOME PER DAY = 1.205 USD/DAY

Total Net Profit for the Voyage shall be 121.946 USD

3. Results

Time chartering allows shipowners to lease their vessels for a specified period at a fixed daily rate, ensuring predictable earnings (Stopford, 2009). In the given case, a vessel under a time charter for approximately three months at a rate of $13,000 per day generated a gross revenue of $1,170,000 over the contractual period.

One of the primary benefits of time chartering is its simplicity in revenue estimation, as costs associated with fuel, port charges, and voyage planning are primarily borne by the charterer (Lun et al., 2013). However, hidden costs such as commissions, domestic fuel consumption, and vessel

positioning expenses must be considered. The financial viability of a time charter hinges on market conditions, which dictate the competitiveness of daily hire rates.

While time charters provide revenue stability, they may expose shipowners to risks if market rates fluctuate significantly. In strong markets, a fixed-rate contract might limit potential earnings, whereas in weaker markets, time charters provide insulation against rate volatility (Martin et al., 2017).

Voyage chartering, in contrast to time charters, offers a more dynamic cost structure where revenues and expenses are directly tied to individual voyages (Kavussanos & Visvikis, 2006). This research examined two specific voyage charter cases, each with distinct cargo types and trade routes:

3.1. First Voyage: Coal Shipment from Taboneo to Kandla

- **Freight rate:** $11.61 per metric ton
- **Cargo quantity:** 75,000 metric tons
- **Total voyage duration:** 27.65 days
- **Total expenses:** $464,019
- **Gross income:** $406,731
- **Net daily earnings after commission:** $13,975/day
- **Total net profit:** $386,400

The coal shipment voyage generated an attractive net profit of **$386,400**, translating to a net daily income of **$13,975** after a 5% commission deduction. The voyage's profitability exceeded the daily income from the time charter contract ($13,000/day), demonstrating the potential benefits of voyage chartering under favorable freight market conditions (Glen, 2008).

However, voyage charter profitability is heavily influenced by fluctuating bunker prices, port charges, and operational efficiencies. Delays at loading or discharge ports can impact overall earnings, making precise voyage estimation essential (Paixão Casaca & Marlow, 2005).

3.2. Second Voyage: Grain Shipment from Santos to Qingdao

- **Freight rate:** $21.58 per metric ton
- **Cargo quantity:** 75,000 metric tons
- **Total voyage duration:** 101.4 days
- **Total expenses:** $1,403,136
- **Gross income:** $215,364
- **Net daily earnings after commission:** $1,205/day
- **Total net profit:** $121,946

In contrast, the second voyage, carrying grains from Santos to Qingdao, resulted in significantly lower daily earnings of **$1,205** per day, with a total net profit of **$121,946**. The extended voyage duration of **101.4 days** impacted profitability, as prolonged sailing and port stays increased fuel and port cost expenditures (UNCTAD, 2021).

Although the freight rate was higher than in the coal shipment, the voyage's profitability was substantially lower, illustrating the importance of considering total voyage duration and associated costs when estimating financial returns (Stopford, 2009).

It is highly important to note that if we consider a different vessel, and different routes in this paradigm the results will not be the same and might fluctuate either to increase the final net profit or decrease it, even in negative amount.

From the findings, several critical observations can be made regarding the financial viability of time chartering versus voyage chartering:

1. **Predictability vs. Profitability**
    - Time charter contracts offer **stable and predictable revenue streams** with minimal risk to shipowners (Lun et al., 2013).
    - Voyage charters present **higher potential earnings** but expose shipowners to operational risks such as fuel price volatility, port delays, and fluctuating freight rates (Kavussanos & Visvikis, 2006).
2. **Impact of Voyage Duration on Profitability**
    - The first voyage (coal shipment) yielded **higher daily earnings** ($13,975/day) compared to the time charter rate ($13,000/day).
    - The second voyage (grain shipment) yielded significantly lower daily earnings ($1,205/day) due to an extended voyage duration.
3. **Market Conditions and Freight Rate Fluctuations**
    - When freight markets are strong, voyage charters can generate **superior financial returns** compared to time charters (Glen, 2008).
    - Conversely, in weak freight markets, time charters provide a **safer financial hedge** against rate volatility (Martin et al., 2017).
4. **Cost Implications**
    - Voyage charters require detailed cost estimation, including bunker expenses, port charges, and transit costs (Paixão Casaca & Marlow, 2005).
    - Time charters allow shipowners to offload certain variable costs to charterers, making them an attractive option in uncertain market conditions (UNCTAD, 2021).

The comparative financial analysis of time charter and voyage charter contracts highlights the importance of selecting the most suitable chartering strategy based on market conditions and operational preferences.

- **Time charters provide stable earnings** but may limit revenue potential in strong freight markets.
- **Voyage charters can be highly profitable** but require precise estimation and careful management of operational risks.

For shipowners, the optimal approach may involve a combination of both chartering strategies, leveraging time charters for stability while selectively engaging in voyage charters to capitalize on market opportunities. A well-balanced chartering strategy ensures sustainable profitability while mitigating financial risks associated with volatile freight markets.

4. Conclusions

The comparison between time charter and voyage charter in the dry bulk shipping industry reveals a nuanced landscape of advantages, disadvantages, and considerations for stakeholders. Time charter contracts offer stability, predictable cash flow, and operational control for the shipowners, providing a steady income stream over a predetermined period. On the other hand, voyage charters offer flexibility, potential for higher profits and minimal financial commitment for charterers, allowing them to adapt to market conditions and optimize freight opportunities. Both chartering strategies play essential roles in the dry bulk shipping market, catering to the diverse needs and preferences of shipowners and charterers. The choice between time charter and voyage charter depends on a range of factors including market conditions, cargo requirements, operational considerations, and risk management preferences. Shipowners may opt for time charter contracts to ensure stable revenue streams and long-term financial planning while charters may prefer voyage charters to capitalize on market fluctuations and maximize profitability.

The results of this research highlight key differences compared to existing scientific literature on chartering profitability. While previous studies, such as Stopford (2009) and Kavussanos & Visvikis (2006), emphasize the stability of time charters, this study demonstrates that voyage charters can sometimes generate significantly higher daily earnings, especially under favorable market conditions. For instance, the coal shipment voyage yielded $13,975 per day, surpassing the fixed $13,000 per day from the time charter, aligning with findings from Glen (2008) that voyage charters can be more profitable when freight rates are strong. However, unlike studies that advocate for voyage charters as the most lucrative option (Martin et al., 2017), this research shows that voyage profitability is highly variable. The grain shipment voyage, for example, resulted in much lower daily earnings ($1,205/day), emphasizing the risks of extended voyage durations and higher operational costs, as also noted by UNCTAD (2021).

Additionally, while previous literature primarily focuses on general trends, this study provides a detailed numerical breakdown, illustrating how hidden costs such as bunkers and port delays impact profitability. The results support the argument that a balanced approach—combining time and voyage charters—is optimal for sustainable profitability in volatile shipping markets.When considering which Chartering Strategy to follow there are many parameters that should be taken into account. First and foremost, one should consider the characteristics of the bulk trade as well as the specifications of the vessel in question. Only after having a close correlation between the very basic market and vessel trades should one decide upon the strategy. The shift in commodities demand, vessel availability, fuel costs and geopolitical events must also be taken into consideration, since shipping rates are dramatically influenced by the above.

This research provides valuable insights into the financial performance of time and voyage chartering but has several limitations. The study relies on specific freight rates and market conditions at a given time, making the results difficult to generalize due to market volatility influenced by global economic fluctuations, geopolitical events, and seasonal demand (Stopford, 2009). While voyage chartering appears more profitable in strong freight markets, this advantage could diminish if rates decline. Additionally, the study assumes fixed costs for bunkers, port charges, and operations, though these fluctuate due to factors like fuel price changes and port congestion (Kavussanos & Visvikis, 2006). External disruptions such as weather, labor strikes, and regulatory changes, which significantly impact voyage duration and costs (UNCTAD, 2021), are not accounted for. Furthermore, the research is limited to specific vessel types and trade routes, reducing its generalizability. Different ship classes and global trade variations could yield different results (Glen, 2008). Expanding the dataset to include

multiple vessel types, routes, and predictive cost models would enhance the study's applicability. Despite these limitations, the findings contribute to understanding chartering profitability and highlight the need for further research incorporating market fluctuations and broader shipping variables.

There has been noteworthy progress in understanding time charter and voyage charter in the dry bulk shipping industry, however there are still areas for further research and exploration. Future studies should focus on incorporating predictive models, emerging trends such as digitalization, sustainability, and decarbonization, examining their impact on chartering practices and market dynamics. Additionally, empirical analyses of chartering decisions, contract performance, and risk management outcomes would provide valuable insights for industry practitioners and policymakers.

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