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Haute école de gestion de Genève
Geneva School of Business Administration

Should oil trading companies possess their own tankers?

Bachelor Project submitted for the Bachelor of Science HES in Business Administration with a major in International Management

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Declaration

This Bachelor Project is submitted as part of the final examination requirements of the Geneva School of Business Administration, for obtaining the Bachelor of Science HES-SO in Business Administration, with major in International Management.

The student accepts the terms of the confidentiality agreement if one has been signed. The use of any conclusions or recommendations made in the Bachelor Project, with no prejudice to their value, engages neither the responsibility of the author, nor the adviser to the Bachelor Project, nor the jury members nor the HEG.

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Geneva, (August 14th, 2015)

Ulysse HALDEMANN

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Executive summary

The purpose of this report is to understand if it would make sense for oil trading companies to purchase and operate oil tankers. The report begins by defining the current concept of trading. In fact, trade is defined as the action of buying and selling goods. The concept has evolved from prehistoric times to today where the trade industry involves millions of transactions completed each day. Moreover, the current report provides an overview of commodity trading in Switzerland and Geneva, which are popular for their commodity trading sector as Geneva is home to the oil trading industry.

This project provides a snapshot of the crude oil sector with details about historical and current trends from different parts of the world such as in the United States, where oil production has been increasing drastically over the last years, or in Asia, where the demand for oil is constantly growing. Furthermore, information on key traders of the oil industry in terms of oil traded volume is established. Then, the report exposes the shipping market by looking at five different types of tankers shipped by oil trading companies and the most commonly used oil routes.

Further, the profitability of each tanker under a time charter party is analyzed by comparing both capital and operating costs with freight rates. It is observed that smaller tankers were more profitable in 2012 and 2013 than larger tankers. Moreover, it results that operating and financial costs are fairly predictable and stable, while freight rates have the specificity of being volatile and unpredictable.

Furthermore, it is discussed how major oil trading companies relate to shipping in terms of tanker ownership. Generally, oil traders don't purchase oil tankers but prefer to charter them through time charter. It is also discovered that oil trading companies are slightly heading to a medium asset strategy as their fixed assets increase constantly. Moreover, the report discusses the differences between purchasing a tanker in the second hand market or in the new building market. Finally, it is explained that oil tankers provide optionality in terms of time, location and lot size.

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1 Introduction

1.1 The context of commodity trading

1.1.1 Yesterday and today

”Trade”, which is defined as the action of buying and selling goods and services (Oxford, 2015), takes its origin in the prehistory when goods were exchanged between prehistoric humans. As of today, trade has evolved to become an independent industry in which commodities are bought and sold millions of times per day. The need to trade commodities began as soon as goods were unequally distributed around the world. Before the beginning of the Christian era, Asian and European civilizations started to trade spices from a place to another. At this time, trade was first mainly achieved by land and then greatly developed to maritime routes. Nowadays, Drewry (2014) estimates that 85% of world trade in volume terms is moved by sea.

Nowadays, the supply chain of commodities is much larger than it was in the past. Today, numerous players, such as farmers, governments, traders, insurers and banks, are involved in this enormous business dealing with a large range of commodities from agricultural to energy products. Currently, commodity trading has become an industry in which trading companies are managing several risks, such as credit and market risks:

> “*Our business is moving physical molecules from point A to point B and managing the credit, market and operational risk associated with that.*” (Alireza, 2014)

Over the last 20 years, the industry has grown rapidly thanks to globalization, as emerging countries such as China drastically increased their demand for many commodities. In other words, a trading company will equilibrate the world supply and demand by carrying the goods from oversupplied areas to areas with shortages. A trading company could be defined as:

> *“The trader plays an essential role between producers and consumers as organizer of the value chain. In a globalized economy where flows are becoming more intense, more complex, the trader must act as intermediary for information, liquidity and risk control between economic agents with varied expertise, embodying an interface between all levels of the logistical chain, and facilitate the realization of transactions by managing the operational and commercial risks.”* (Graber, 2014)

1.1.2 Commodity trading in Switzerland and Geneva

In the last 30 years, Switzerland has been a major place for commodity trading companies. According to a report released by the Federal Department of Foreign Affairs (2013), more than 500 companies and around 10,000 employees are estimated to be working in the Swiss trading industry. Both stability and predictability in the political system, a solid economy and a competitive corporate taxation regime among others are competitive advantages among others that Switzerland provides to commodity trading companies.

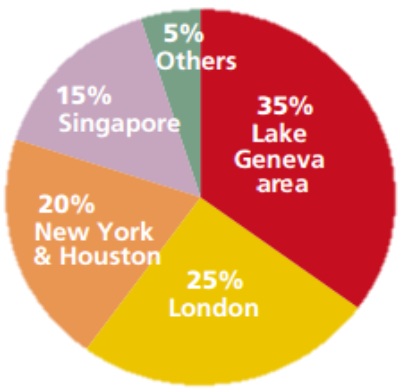
On a smaller scale, Geneva, the leader in coffee, sugar, grains, rice and oil, is considered as the most important trading place in the world. This success has been possible due to many factors such as its geographical centrality and perfect time zone, which allows trading companies to deal with the Americas, Middle East and Asia in the same day. Moreover, Switzerland's second largest city provides a competitive framework to international institutions, high-skilled personal and a high quality of life. Geneva is also the leader in trade finance (handling around 50% of global transactions), adding a certain competitive advantage for the region. Geert Descheemaeker, the CEO of SAM Shipping Group, describes one of Geneva's strong advantages as follows:

> *"all these companies are in the same place, meeting, solving problems and thinking of new ideas."* (Descheemaeker, 2012)

1.1.3 Oil trading in Geneva

According to the Swiss Trading and Shipping Association (2015), around 30 million barrels (3,577 million liters) of crude oil are exchanged every day in the world, which makes about 1.5 billion tons traded per year. To this number, around 600,000 tons of refined oil products are added. The Swiss Trading and Shipping Association (STSA) estimates that, of the 2.1 billion tons, about 700,000 are physically traded in Geneva. As it can be seen in Figure 1, 35% of worldwide oil is traded in Geneva and several Geneva-based companies have made oil their core business. Finally, the association also appraises that 75% of Russian exports of crude oil are managed from Geneva.

Figure 1: Where is oil traded?



Source: STSA, 2014

1.2 Oil as a commodity

1.2.1 Crude oil history and price evolution[1]

The first discovery of crude oil was in Pennsylvania in the 1840's and was discovered few years later in Texas, California and Oklahoma. The production was modest while most of the wells were not able to produce more than 40 daily barrels. This tiny amount of production was just enough to satisfy the lamp oil industry. In 1901, a man named Patillo Higgins was capable of producing around 50,000 barrels per day, which represented 20% of the daily US production at the time. During this period, discoveries occurred in other parts of the globe, such as in the Caspian Sea, the Middle East and Russia.

At the beginning of the 1900's, Henry Ford started to develop and massively produce his new Ford Model T, creating demand for crude oil distillates. From this date to 1950, oil was mainly used as transportation fuel. Around 1950, an impressive economic growth in developed countries increased the demand for energy commodities. Little by little, oil overtook coal in countries where coal was rare. In 1960, the Organization of Petroleum Exporting Countries (OPEC) was created by five founding members, including Saudi Arabia. Years later, the organization was joined by nine other countries.

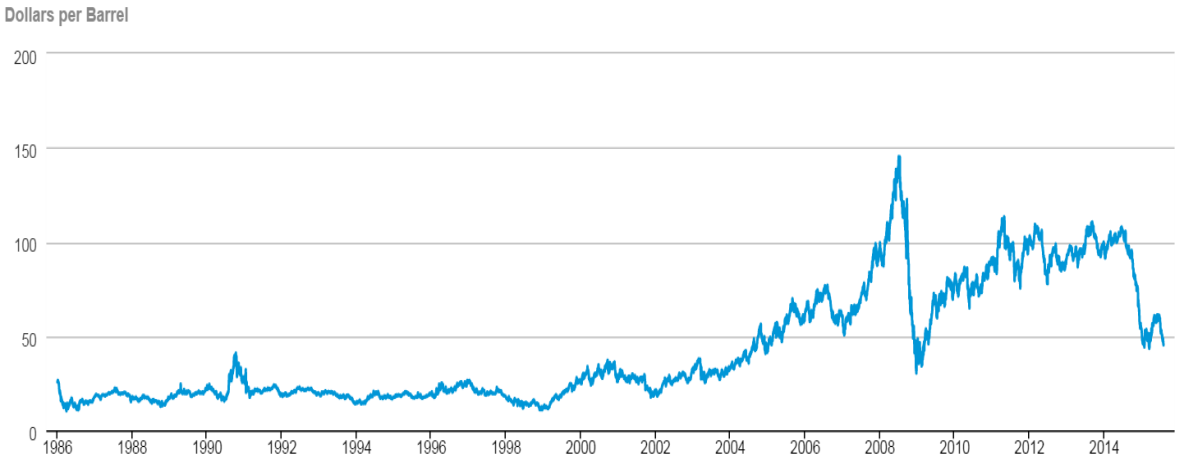
In 1971, US oil producers didn't produce enough oil to meet the domestic demand. This underproduction had the effect to move the balance of power towards OPEC nations as the Gulf was sourcing the United States. A few years later, OPEC started an unofficial embargo and decided to stop supplying crude oil to the US. As a result, from October 1973 to January 1974, the price of crude oil doubled. The embargo finally ended in March 1974.

In 1979, due to the Iranian Revolution, the Iranian oil production dropped by around 5 million barrels per day. Consequently, oil prices doubled between 1979 and 1980. In the early 1980's, Saudi Arabia decided to cut its production from 10.5 million to 2 million barrels per day in order to avoid prices to collapse. Nevertheless, the oil market didn't need the Saudi crude oil and entered in overproduction, pushing oil prices down. This drop in prices caused the bankruptcy of the Soviet Union (the second oil producer in terms of volume behind Saudi Arabia) and hugely damaged the entire US oil industry.

[1] Source: Downey, 2009

In 1990, the Gulf War pushed back the oil prices up from $17 to $39[2] per barrel for a short time before decreasing to $19. Between 1990 and 2000, oil prices were most of the time tied to OPEC production. However, in 1998, a lower demand during the Asian financial crisis pulled prices down to $11 per barrel.

Figure 2: WTI spot price in Cushing, Oklahoma



Source: Energy Information Administration, 2015

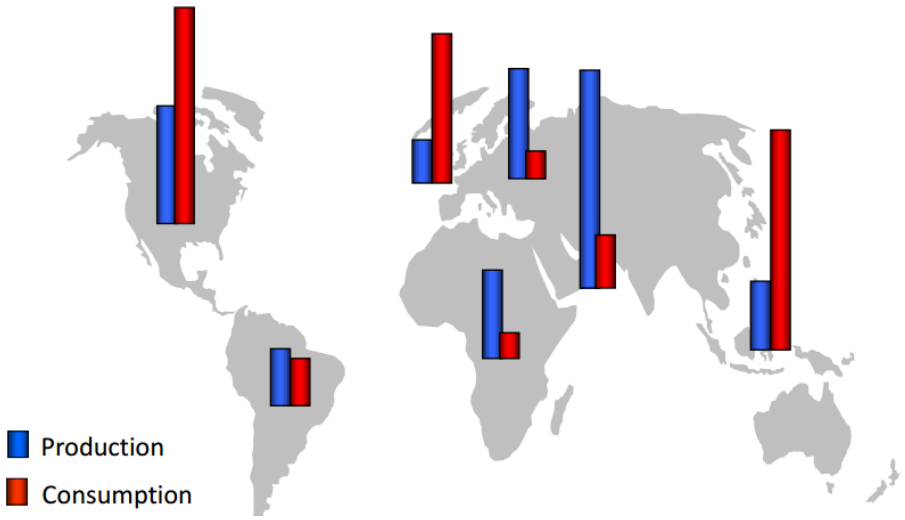
From 2002, oil prices increased to $142 before it crashed back to $33 due to the economic crisis in 2008. Finally, from 2009 to the end of 2014, crude oil price slowly increased before plunging back from $107 a barrel to $55 at the end of 2014. The reason was an oversupply in the overall market because the United States were producing more through shale oil fracking while OPEC oil producers were keeping the taps on to protect market shares. At the end of 2014, countries such as Libya announced that they were not going to cut production, keeping the market in a situation of oversupply.

[2] Refer to Figure 2:WTI spot price in Cushing, Oklahoma

1.2.2 Current trends and trade patterns

Compared to how the oil industry looked in the past, when the fundamentals were largely controlled by associations, the current ground for the industry today has changed. According to Doshi and Corrigan (2015), the traditional structural regulations have been replaced by efficient imbalanced markets in which the supply of oil increased to two times larger than the oil consumption last year. The Energy Information Association (2015) estimates that global consumption of petroleum and other liquids grew by 1.1 million barrels per day in 2014. The fact that supply doesn't meet the geographical demand added to divergences in oil qualities around the world, inevitably lead markets to be imbalanced.

Figure 3: Imbalanced oil markets



Source: Mercuria Presentation, 2015

The United States production

After decades of decline, oil production has been increasing rapidly in the United States since 2008. In total, crude oil production in North America has risen from almost 5 million barrels per day in 2008 to 7.45 million barrels per day in 2013 (Energy Gov, 2014), which is an estimation of an almost 50% increase in a period of five years. Many analysts report that the United States would become the world leader in terms of crude oil production by 2025 instead of Saudi Arabia. This growth in crude oil production is similar to the increase in shale oil production, which has expanded surprisingly fast from around 0.4 million barrels in 2007 to almost 5 million barrels a day at the end of 2014.

The reason behind this increase in shale oil production is due to high crude oil prices in 2004, which motivated the usage of new technologies to extract oil from earth. However, there are questions whether the US shale oil production will continue to increase or not over time as the United States would soon not have to import oil anymore.

Oil demand in Asia

Asian countries, notably the Big 4 – China, Japan, India and South Korea – have impressively grown in the past twenty years to become countries with a high level of oil consumption. Their economic expansion has obligated them to import large quantities of crude oil and refined oil products because they were not producing enough to meet the growing demand. Since 2008, Asia is considered as the world's largest oil consumer, overtaking North America. Hari (2015) estimates that the "Big 4" consumes around 19 million barrels per day, which represents 20% of total oil demand. Nevertheless, although the oil demand in Asia has been remarkably strong since 2000, recent data showed the slowest pace of full-year annual growth in six years with only a tiny increase in demand of 0.4% compared to the last 12 months (Platts, 2014). Finally, analysts in the oil trading industry believe that low prices would maybe stimulate Asian demand as individuals could take advantage of attractive diesel prices.

OPEC's refusal to curtail production

In the past, OPEC has often driven oil prices by just maintaining high or low levels of production. At the end of 2014, the organization decided to keep a high level of production, which therefore pushed oil prices down. In June 2015, OPEC produced 31.38 million barrels a day, which was 33.4% of total oil production. This situation puts countries with high extraction costs, such as Canada or Russia, in a delicate position as they have to fight to be profitable. The reason for this refusal to cut production despite an oversupply in the market is likely because United States shale oil producers, with hydraulic horizontal and fracturing drilling methods, have challenged OPEC members (Nikolewski, 2015).

1.3 The major oil traders [3]

Trafigura Beheer BV

The Dutch commodity trading company was founded in 1993 by Claude Dauphin and Erik de Turckheim. The company has offices in 36 countries spread over six continents. In 2014, Trafigura generated $127.6 billion in revenue. Moreover, the company is principally focused on oil and petroleum as in 2014, oil and petroleum products revenue accounted for 74% of total income. In 2014, the company traded 120.4 mmt of oil and petroleum products, while the volume of crude oil traded reached 49.0 mmt. Furthermore, the shipping and chartering division shipped around 60 mmt of wet tonnage in 2014.

Mercuria

Mercuria is a private owned company created in 2004 by Daniel Jaeggi and Macro Dunand - two students from the University of Geneva. The company considers itself as a world trading leader in physical energy products and dry bulk commodities. Mercuria operates in more than 50 countries, and the turnover was $106 billion in 2014. Regarding energy, the company is mainly active on crude oil, fuel oil, gasoline, naphtha, natural gas and LNG. Mercuria has been one of the largest success stories of these last years, as the company has grown very fast. The Swiss-based company saw its 2013 trading volumes rise 7% from 2012 to 195 million metrics tons of oil or equivalent (Hoffman, 2014). Moreover, the company estimates to have access to around 40 million barrels strategically stored around the world.

Gunvor

Established in 2000 as a merchant of crude oil and oil products, the company employs more than 1,600 employees worldwide. Gunvor is mainly active in crude oil, refined products as well as metals and bulk materials. As many other oil traders, this privately owned trader is also based in Geneva and is considered to be one of the biggest crude oil traders, sourcing crude oil from more than 35 countries. In 2014, the revenue reached $88 billion. Moreover, Gunvor estimates to trade more than 2.5 million barrels of crude oil and products daily, while the company estimates that more than 10 million barrels are stored worldwide.

[3] Otherwise stated, all information provided in this chapter comes from companies' websites and annual reports.

Noble Group

Founded in 1987, Noble Group, which employs 1,900 people, is mainly present in Asia and America. For many years, the company has been focused on energy, metals and agricultural commodities. Moreover, the energy segment, which is mainly composed of coal and oil liquids, represents a big part of Noble's activities. In 2014, the company generated revenue of $86 billion, while revenue extracted from energy business accounted for $73 billion. Furthermore, during the first quarter of 2015, oil liquids increased by 50% in terms of volume compared with the first quarter of 2014. Finally, 33.9 million tons of oil liquids and coal were traded during the three first months of 2015.

Vitol

Established in 1966 in Rotterdam, the company is considered to be the biggest oil trader in the world. The core of its business concerns energy products such as crude oil, fuel oil, gasoline, ethanol or chemicals. In 2014, Vitol estimates that more than 5 million of barrels of crude oil and products were traded per day by the company. In terms of revenue, in 2014, Vitol's turnover was $270 billion, which is two times larger than Trafigura's turnover during the same period. Furthermore, the company estimates that 268 million tons of crude oil and products were shipped and delivered by themselves in 2014.

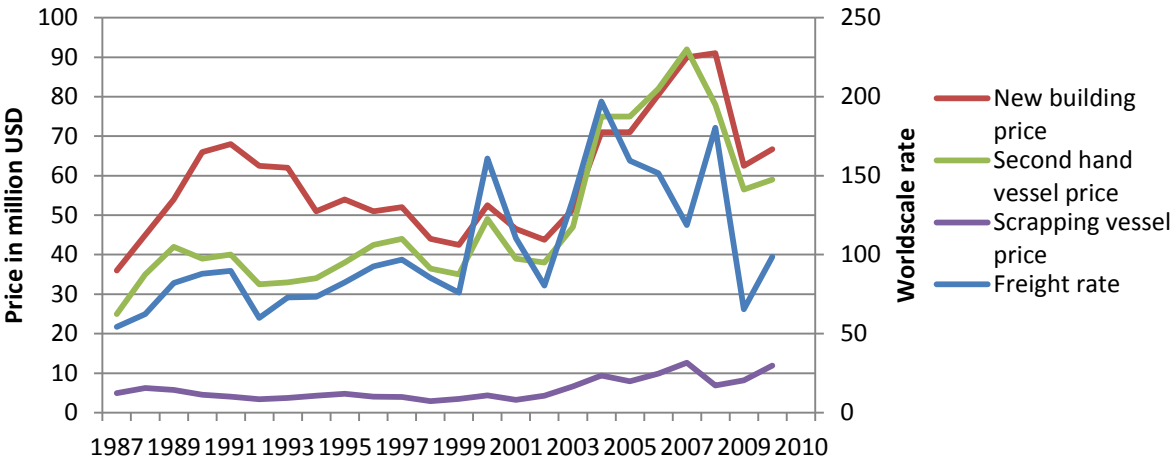
2. Analysis

2.1 The oil ocean transportation

2.1.1 Four interrelated markets

The tanker shipping market is a highly volatile and cyclical market in which earnings, investments and returns are constantly going up and down. For instance, in 2002, the freight rate for a Suezmax was $80.50 (worldscale rate), and a new Suezmax could be purchased at $43.75 million (Lun, et al., 2013). Six years later, in 2008, the freight rate grew to $180.34, and a similar Suezmax tanker was bought at $91 million.

Figure 4: Vessel prices and freight rates from 1987 to 2010



Source: Adapted from Lun, et al., 2013

According to Lun and colleagues (2013), the freight market, the new building vessel market, the second hand vessel market and the scrapping vessel market are positively associated. Moreover, the new building market and second hand market are particularly correlated with a Beta value of 0.843 (1.00 represents a perfect correlation). As it is showed in Figure 4, both markets are evolving close to each other, with the second hand vessel market generally lower than the new building market in terms of price. Although the four markets are interrelated, it is hard to foresee their evolution on the long run. Typically, when oil transportation volume increases, ship owners adapt their tanker's fleet size in order to match the demand. It could be inferred that freight rates drive vessel acquisition prices and therefore influence ship owners' decisions whether to adapt or not their tankers storage capacity. Furthermore, as second hand tankers are substitutes and highly correlated to new building tankers, second hand prices would also grow along with new building prices.

2.1.2 Tankers and routes

Nowadays, oil tankers play a crucial role in the worldwide oil industry because they are the most common way to transport oil from a part of the world to another. Unctad (2014) estimates that in 2013, oil tankers accounted for 29.1% of the world fleet in terms of deadweight capacity (dwt). In 2013, those oil tankers represented 472,890 dwt (in thousands) of tonnage capacity.

Generally, there are two types of oil tankers: crude tankers and product tankers. Crude tankers transport large amounts of unrefined crude oil from extractions points to refineries, while product tankers move refined products, such as kerosene or heavy fuel oils, from refineries to consuming market ports. In other words, oil tankers connect the three major steps in the oil trading industry: production, refining and consumption. In 2003, 9,693 billion ton-miles were generated by oil shipments, while it increased to 11,936 billion ton-miles in 2013 (Unctad, 2014). Moreover, in 2013, oil transportation represented 23.6% of the world seaborne trade, making oil the most transported commodity worldwide. Furthermore, tankers are the most efficient way to transport huge quantities of oil over long distances across water, and oil traders rely on them because they are inexpensive and allow trading companies to optimize their costs. Indeed, long haul freight accounts for around 1% of the total cost of a gallon of gasoline (American Petroleum Institute, 2011). Oil tankers are generally classified among different categories in terms of size and deadweight capacity. Product tankers, which are smaller than crude tankers, measure from 5,000 dwt to around 70,000 dwt, whereas crude oil tankers can range from 70,000 dwt to around 555,000 dwt**.** Every tanker has specific technical features, such as speed or bunker consumption.

Figure 5: Tanker types

Vessel Type	Ship size (dwt)	Service speed (knots)
Handysize	20'000 - 45'000	14 to 16
Panamax	50'000 - 70'000	14 to 16
Aframax	70'000 - 120'000	13 to 15
Suezmax	130'000 - 160'000	12 to 14
VLCC-ULCC	160'000 - 555'000	12 to 14

Source: Adapted from Alizadeh, et al., 2009

According to Makan (2013), seaborne increase reflects crude being shipped on much longer distances as oil tankers travel from West Africa and Latin America to China and India instead of the United States. This change is due to new trade patterns, like the US boom oil production or the increasing oil demand in Asia, which is putting pressure on key transit points, such as the Strait of Malacca. This point is essential because it is the shortest sea route to bring oil to China and other Asian countries.

Figure 6: Crude oil and petroleum products through chokepoints (million barrels/day)

Location	2009	2010	2011	2012	2013
Strait of Hormuz	15.7	15.9	17.0	16.9	17.0
Strait of Malacca	13.5	14.5	14.6	15.1	15.2
Suez Canal and SUMED Pipeline	3.0	3.1	3.8	4.5	4.6
Bab el-Mandab	2.9	2.7	3.4	3.7	3.8
Danish Straits	3.0	3.2	3.3	3.1	3.3
Turkish Straits	2.8	2.8	3.0	2.9	2.9
Panama Canal	0.8	0.7	0.8	0.8	0.8
World maritime oil trade	**53.9**	**55.5**	**55.6**	**56.7**	**56.5**
World total oil supply	**84.9**	**87.5**	**87.8**	**89.7**	**90.1**

Source: Energy Information Administration, 2014

As it can be seen in Figure 6, the Strait of Malacca and the Strait of Hormuz are among the main transit chokepoints. It can be said that oil routes are determined by production and consumption unbalances around the globe, creating chokepoints. There are around 15 main oil trade routes leading to different continents. For instance, the TD3 route from Middle Eastern Gulf to Japan is one of the most traded routes for VLCC's. Regarding large tankers, there are around four routes used by VLCC, and most of them start in the Middle East to go to Singapore, Japan and the Gulf. Those routes suit VLCC's as they can safely navigate from a point to another without having to cross narrow canals or critical points. On the opposite, smaller tankers provide the option for oil companies to go across critical points such as the Panama Canal situated between the Atlantic Ocean and the Pacific Ocean. The Panama Canal Authority (2010) explains that the maximum length authorized for a commercial vessel to cross the canal is 289.6 meters, and the maximum width is 32.31 meters, meaning that tankers larger than Panamax cannot transit through this canal.

2.1.3 Voyage charter vs time charter

The two most common charter contracts are voyage charter and time charter. Both contracts are concluded between a ship owner who agrees to rent its vessel to a charterer who hires it for a specific route or a concluded period of time. A time charter is a contract whereby a ship is let to a charterer for a stipulated period of time, for a remuneration known as hire, generally a monthly rate per ton deadweight or a daily rate ($ per day). The charterer is free to employ the vessel as he wishes, but the ship owner continues to manage his own vessel through the master and crew (ISS Cargo, 2015). It means that the ship owner is responsible for operations costs and capital costs such as interests. On the other hand, the charterer using the tanker would be in charge of paying all voyage costs such as bunker, port and canal costs. Furthermore, a voyage charter party is a contract for a particular ship to move a single cargo between specified loading ports and discharge ports. Contract rate covers total operating

expenses such as port charges, bunkering, crew expenses, insurance, repairs, and canal tolls (ISS Cargo, 2015). The rates are on $ per ton.

2.2 Tankers costs & returns

2.2.1 Earnings according to Greenwood and Hanson (2013)

A ship owner like an oil trading company can either operate the ship directly for its own business or he can lease it for instance, through a time charter party. In the following findings we assume that the ship owner leases the tanker in the time charter market. As seen previously, under time charter, the owner is responsible for crew costs while the charterer pays other costs such as fuel, canal and port costs.

Furthermore, we assume that the tanker is docked eight days per year for maintenance, and consequently, the owner earns the charter rate for an average of 357 days per year. The daily crew cost (crew wages + provisions + crew others) and daily time charter rates are calculated for a Suezmax. According to Greenwood and Hanson (2013), the simple formula to calculate the annual earning is the following:

$$\pi_t \equiv 357 \cdot DailyCharterRate_t - 365 \cdot DailyCrewCost_t$$

Table 1: Suezmax earnings under time charter

	2012	**2013**	
Daily charter rate	$17,356	$16,014	(X 357 days)
Daily crew cost	$4,820	$4,941	(X 365 days)
Annual earnings	**$4,436,732**	**$3,913,533**	**(-11%)**

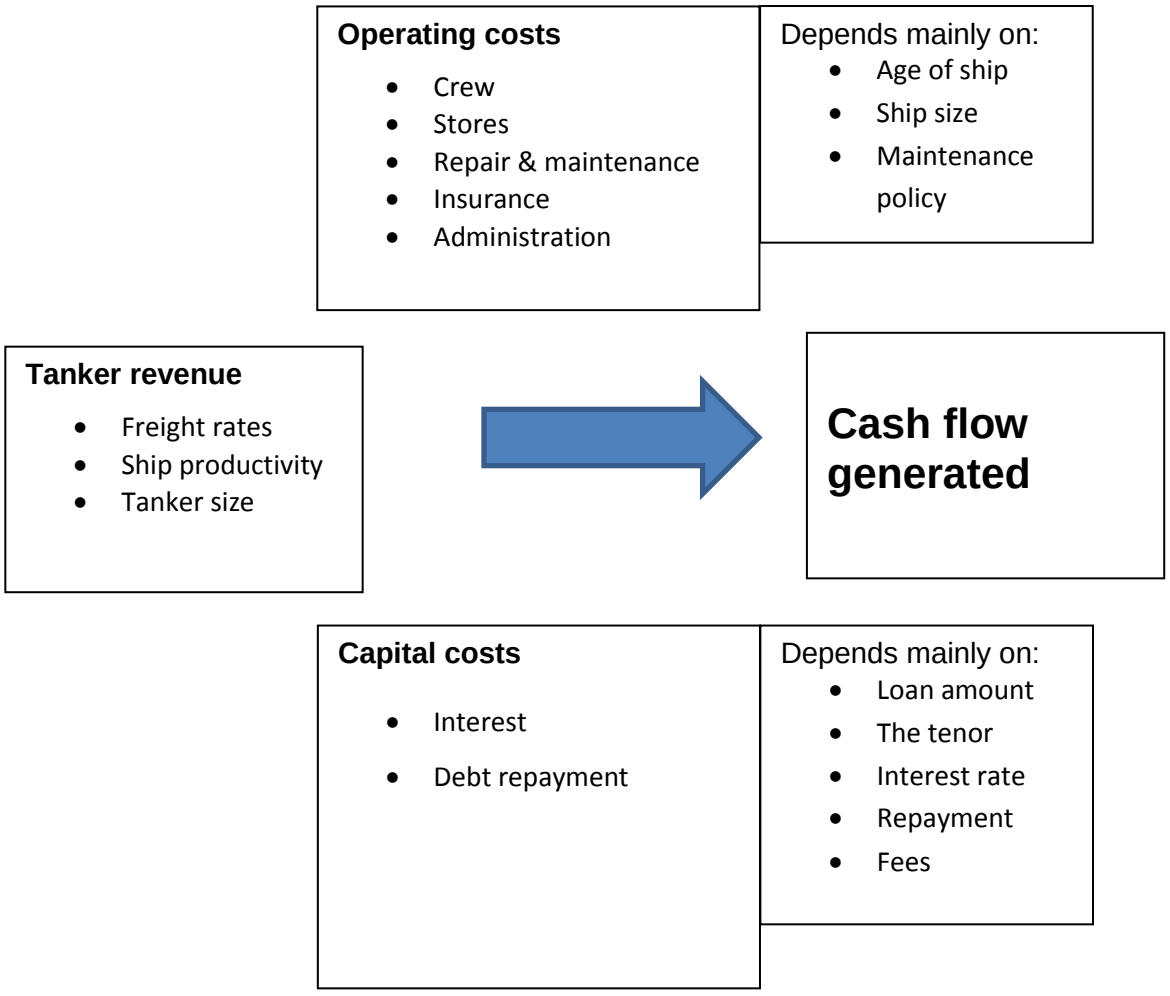
Source: Adapted from Stephensmoore, 2014

By using this method, in 2012, annual earnings for a Suezmax were $4,436,732 and $3,913,533 in 2013. Nevertheless, this method does not consider many other operating costs, such as maintenance or insurance, which the owner is responsible for. Moreover, the capital costs are also ignored. Therefore, the method of Greenwood and Hanson is not complete and doesn't reflect the reality.

2.2.2 Real financial performance under time charter

According to Stopford (2009), under time charter, three factors influence the performance of running a tanker: the revenue generated from chartering the ship, the operating costs tied to the ship and under which terms the ship is financed. The operating costs depend on the type of ship, its size and the maintenance policy applied for the tanker concerned. Then, the capital costs are composed of the interest and debt repayment due to the lender.

Cash flow model including the revenue, operating and capital costs:



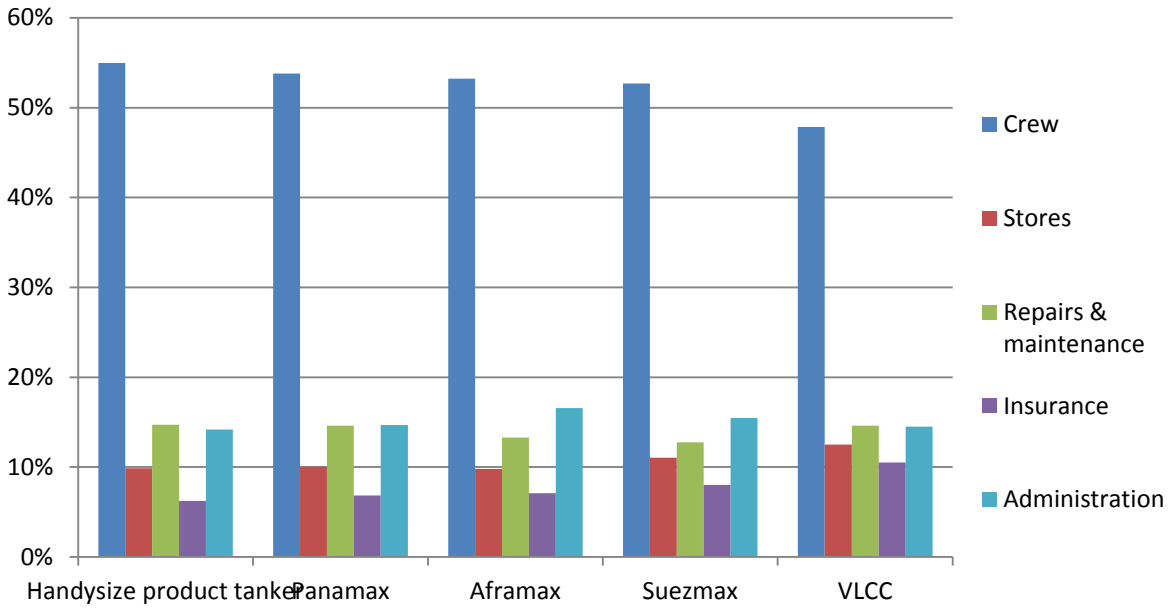
2.2.3 Tanker costs under time charter

Operating costs

When chartering a tanker, the ship owner is responsible for many operating costs depending on several factors such as the tanker's age or the type of tanker shipped. Those operating expenses are day-to-day running costs. The five main operating costs under time charter are:

Crew + stores + repairs and maintenance + Insurance + administration

Figure 7: Repartition of operating costs by tanker in 2013



Source: Adapted from Stephensmoore, 2014

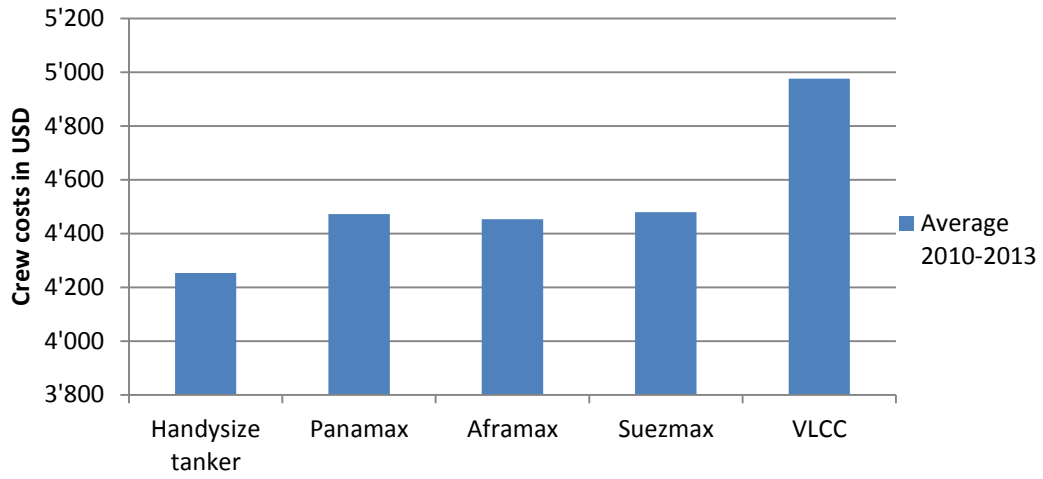
Generally, the "crew" charges account as the largest part of the operating costs. This is even truer when a ship is 15 or 20 years old because the crew needed to operate it correctly is larger than the crew capacity needed for a new ship. As shown in Figure 7, in 2013, the crew costs accounted between 47% and 55% of total operating costs, depending the type of tanker. On the other hand, insurance represents the smallest cost for all tankers (from 5% to 11%), while stores and administration, as well as repairs and maintenance, are pretty similar in terms of cost.

In total, "stores" (accounting for around 10%) are all expenses made on consumable products such as cabin stores and several domestic items. It also includes lubricating

oil, which represents an important cost into the stores' category. Another important cost category is "repairs and maintenance," which are routine repairs required to keep the tanker operational. It also deals with periodic maintenance in case of breakdowns and spares. Moreover, there are insurance costs that cover the owner of the tanker against physical loss and third party liabilities, such as injuries of crewmembers. Generally, this cost varies regarding the tanker's value and size. Finally, the owner faces administration costs, which are basically registration fees.

Crew charges depend on the tanker's size. The larger the tanker, the higher the crew expenses. This is logical because a larger ship would require more staff to operate and therefore wages, social insurance and pensions paid by the owner would be higher. As shown in Figure 8, the average crew costs (between 2010 and 2013) increase along with the tanker's size. This could be explained as a new ship provides more efficient machinery, reducing therefore crew charges.

Figure 8: Crew cost average from 2010 to 2013



Source: Adapted from Stephensmoore, 2014

Capital costs

The capital costs are made up of both the debt repayment and interests. Nowadays, financial institutions, and notably banks, are becoming very restrictive when it comes to lending money to finance vessels. Most of the time, tankers are purchased through a loan from a bank, which requires a contribution of equity capital in order to cover several risks. Moreover, banks require a security interest for the agreement, meaning that the vessel can be pledged as collateral. Generally, this is done through a mortgage on the ship. Like operating costs, capital costs depend on many factors, such as the following:

1 Loan amount: It varies on the value of the tanker. Indeed, the bank tends to advance a larger amount of the vessel's value if the vessel is new (because it offers more security) than if the ship is old and doesn't offer strong guarantees.

2 Interest rate: This is a point that ship owners are truly attentive about. Nowadays, interest rates currently set by banks are normally between 10% and 12%. Those levels are quite high compared with what level interest rates were ten years ago.

3 Term (tenor): It corresponds to the duration of the loan. Generally, ship owners are looking for a ten-year tenor. Moreover, it is logical that an owner with a longer tenor would have a lower monthly debt repayment than one who concluded a shorter tenor.

4 Repayment: It is about how the loan is repaid by the ship owner. The method used in the following example is that the ship owner pays equal instalments every year so that the payments to the bank are getting smaller over time because the yearly interests charge reduces every year. This method is interesting when ship owners are looking to make large payments at the beginning of the loan.

5 Arrangement fees: It is a fee charged by the bank for setting the loan. These fees are made to cover the administration costs related to the loan. Generally, the arrangement fees represent 1% of the loan amount.

2.2.4 Oil tankers profitability through time charter

Table 2: Tankers profitability in 2012 and 2013

2012		Daily capital costs			Daily operating costs								
Tanker type	Tanker price (5 year old) - 1 January 2012	Daily Financing cost 11% ($)	Installment 10 years ($)	Daily financing costs ($)	Daily crew costs ($)	Daily stores ($)	Daily repair & maintenance ($)	Daily insurance ($)	Daily administration ($)	Daily operating costs ($)	DAILY TOTAL COSTS ($)	Average Daily time charter rate ($)	DAILY TOTAL NET PROFIT OR LOSS ($)	Profitability in percent
Handysize	16'500'000	2'486	2'260.3	**4'747**	4'239	797	1'135	482	1'094	**7'747**	**12'494**	13'514	1'020.4	8.17%
Panamax	23'400'000	3'526	3'205.5	**6'732**	4'559	893	1'223	595	1'189	**8'459**	**15'191**	12'995	-2'195.5	-14.45%
Aframax	31'600'000	4'762	4'328.8	**9'090**	4'350	817	1'078	587	1'340	**8'172**	**17'262**	13'639	-3'623.4	-20.99%
Suezmax	45'000'000	6'781	6'164.4	**12'945**	4'820	1'059	1'173	776	1'434	**9'262**	**22'207**	17'356	-4'851.2	-21.85%
VLCC	58'400'000	8'800	8'000.0	**16'800**	4'926	1'350	1'510	1'092	1'472	**10'350**	**27'150**	22'125	-5'025.0	-18.51%

Cash-flow used ($)	Loan amount ($)
8'250'000	8'250'000
11'700'000	11'700'000
15'800'000	15'800'000
22'500'000	22'500'000
29'200'000	29'200'000

2013	Daily capital costs			Daily operating costs									
Tanker type	Daily Financing cost 11% ($)	Installment 10 years ($)	Daily financing costs ($)	Daily crew costs ($)	Daily stores ($)	Daily repair & maintenance ($)	Daily insurance ($)	Daily administration ($)	Daily operating costs ($)	DAILY TOTAL COSTS ($)	Average Daily time charter rate ($)	DAILY TOTAL NET PROFIT OR LOSS ($)	Profitability in percent
Handysize	2'238	2'260.3	**4'498**	4'378	787	1'174	496	1'129	**7'964**	**12'462**	14'351	1'889.1	15.16%
Panamax	3'173	3'205.5	**6'379**	4'565	853	1'238	580	1'246	**8'482**	**14'861**	14'981	120.1	0.81%
Aframax	4'285	4'328.8	**8'614**	4'404	812	1'099	586	1'371	**8'272**	**16'886**	13'288	-3'598.2	-21.31%
Suezmax	6'103	6'164.4	**12'267**	4'941	1'038	1'196	753	1'450	**9'378**	**21'645**	16'014	-5'631.1	-26.02%
VLCC	7'920	8'000.0	**15'920**	4'879	1'275	1'489	1'070	1'481	**10'194**	**26'114**	19'837	-6'277.0	-24.04%

Tenor	10 years
Interest rate	11%
Loan amount	50%

Source: Adapted from Stephensmoore, 2014

The purpose of this panel is to understand the different costs and their impact on tankers' profitability. We assume that all tankers are chartered through time charter. Furthermore, in this example, operating costs include crew, stores, repairs, maintenance, insurance and administration, while capital costs cover interest costs and repayment of the debt. The figures used reflect the current practices when a tanker is purchased. Therefore, the example assumes an interest rate at 11%. The loan is financed at 50% and is repaid in ten years. Moreover, it has to be understood that tankers were bought on the first of January 2012.

Financial results

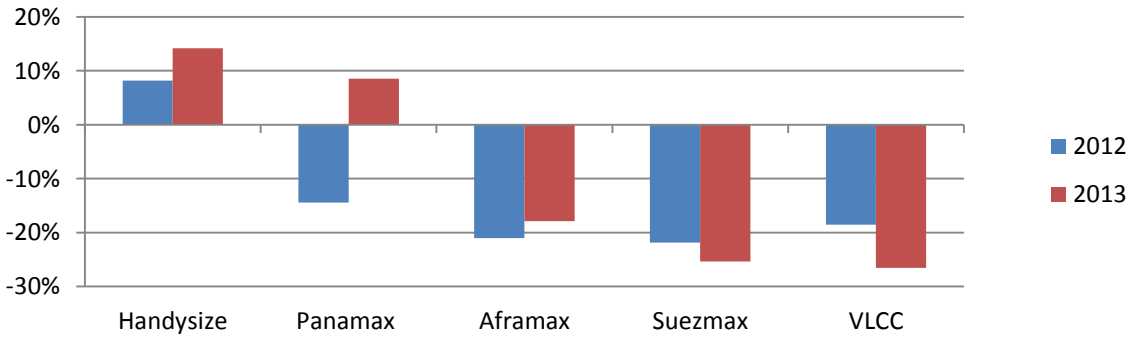
In 2012, 365 days after being bought, only Handysize tankers were profitable (8.17%), generating a daily net profit of $1,020. On the other hand, tankers such as Aframax or Panamax have faced important losses, as their daily costs were larger than daily time charter rates at this time.

In 2013, owning a Handysize was even more profitable (14.2%) than in 2012, and Panamax tankers showed a tiny daily profit of $120. On the other side, larger tankers, such as Aframax and VLCC tankers, were even less profitable in 2013 than the previous year, with notably Suezmax tankers having the least profit by losing $3,598 per day.

The profitability by tanker size

As shown in Figure 9, it is clear that each specific tanker generates different profits. However, in 2012 and 2013, smaller tankers were profitable (especially the Handysize) whereas larger tankers faced large losses. These variations can mainly be explained by freight rates not being high enough to cover the financial and operating costs. The trend at this period of time was the smaller the tankers, the higher the profit.

Figure 9: Tankers profitability in 2012 and 2013



Source: Adapted from Stephensmoore, 2014

Financing/capital costs

Capital costs normally rise in proportion to tankers' size. As it has been seen previously, capital charges depend on many factors such as the loan amount and interest rate. It therefore makes capital costs very different from one owner to another regarding applying loan conditions. By taking the same loan conditions for each tanker, in 2012, the daily financing costs for a VLCC ($16,800) were practically four times higher than for a Handysize ($4,747). In 2013, the daily financing costs were obviously lower than for the previous year because a part of the loan was already repaid to the bank.

Increasing operating costs

Notably due to inflation, usually, operating costs increase from year to year. This was the case for every tanker type from 2012 to 2013, except for VLCC tankers. For instance, the daily operating costs regarding an Aframax grew from $8,172 to $8,272 in one year. In the Table 3, a tanker operating costs index reflecting costs over ten years, shows that the operating charges climbed by 44.8% from 2004 to 2013. The average change in percentage over this period is exactly 5%. Moreover, it can be noticed that the changes vary between -3% and 15%.

Table 3: Tanker operating costs index

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
OpCost Index	125	132	144	160	184	179	181	184	179	181
Year Change	11%	6%	9%	11%	15%	-3%	1%	2%	-3%	1%

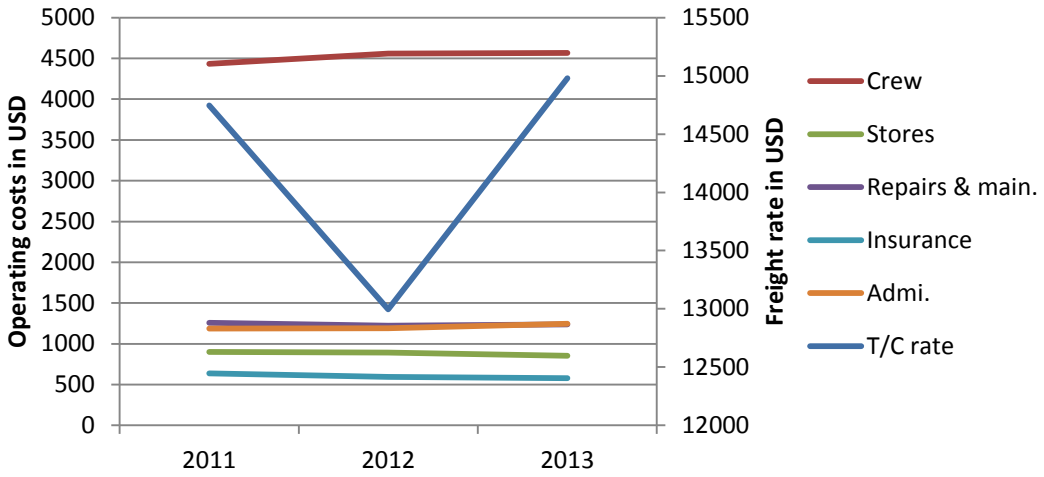
Source: Adapted from Stephensmoore, 2014

As it can be observed, costs dropped only in 2009 and 2012, whereas they were increasing in the other years. Moreover, the changes in costs were higher between 2004 and 2008 than during the 2009-2013 period. In fact, before the economic crisis in 2008, the freight market grew up at impressive levels, pulling up operating costs in the meantime. It can be advanced that operating costs usually increase over the years at levels that are fairly predictable, and variations are not too large.

Volatile freight rates

While ship owners might know precisely how much capital costs would be in the future, as well as have an idea about the level of operating costs, owners don't have any control on the very volatile and unpredictable freight rates. In fact, freight rates are the source of revenue and therefore ship owners tend to look for the highest freight rates. Figure 10 shows the high volatility of time charter rates compared to operating costs, which are far more stable.

Figure 10: Panamax time charter rate and operating costs



Source: Adapted from Stephensmoore, 2014

From 2011 to 2012, Panamax time charter rate has sharply dropped from $14,747 to $12,995, before it bounced back to $14,981 in 2013. This finding shows how much freight rates play an important role at the end of the year for ship owners in terms of profitability. In fact, the profitability of a tanker would definitely depend on the variation of freight rates, rather than on the operating costs, which are stable and pretty predictable.

2.2.5 Case simulation: Voyage costs

An owner operating its ship for its own activities is tied to certain additional voyage costs. Those costs depend mainly on the fuel consumption, the speed, the fuel price and the port charges. Ideally, the shipowner is looking for a tanker with low fuel consumption and the highest possible speed. These factors can be controlled and considered by the ship owner the day he buys the tanker. On the other hand, fuel prices and port charges are out of control, meaning the ship owner doesn't have any influence on them because they depend on the market situation.

Route example: Bonny Offshore Terminal (Nigeria) – Philadelphia (United States) TD5 route. Date: 15 January 2013.

The voyage duration for this route is expected to be around 34 days. Two days of loading and two days for discharging might be required. Regarding the voyage costs, the bunker price was $620 per mt (BunkerIndex, 2015) in January 2013. Moreover, port costs are $13,500 in Bonny and $71,000 in Philadelphia (Crweber, 2015). The tanker used for the simulation is the "Donat," a Suezmax of 166,300 mt dwt with a consumption of 56.7 mt/day (Croatian Shipbuilding, 2014). Then, the consumption considered for loading is 15 mt/day and 65 mt/day for discharging.

Table 4 "Donat" voyage costs for TD5 route

	Days	
Loading Time	2	
Voyage Duration	34	
Discharging time	2	
	Mt/day	**Total Mt**
Loading (daily)	15	30
Bunker consumption	47	1,598
Discharging (daily)	65	130
		USD ($)
Total bunker cost		1,089,960
Daily bunker cost		*28,643*
Total port costs		84,500
Total voyage costs		**1,174,460**

Source: Adapted from BunkerIndex, 2015, Crweber, 2015 & Croatian Shipbuilding, 2014

This example shows the proportion of bunker costs when operating a tanker. For the "Donat", the daily bunker costs were $28,683 per day at this period. In comparison, in 2013, total operating costs were $9,387 for a Suezmax. Obviously, bunker costs are the highest costs and they strictly depend on current bunker prices applicable in the market. However, a low bunker consumption tanker would decrease voyage costs. In fact, bunker prices vary regarding the different areas of the world, meaning that the bunker price for one route could be different from another route.

2.3 Shipping for pure oil traders

2.3.1 The shipping industry

The freight shipping industry is a very specific one that differs from the oil trading industry, although both are linked. In fact, the parties generally involved in the freight industry are not the same players active in the oil trading industry. In other words, shipping implies different aspects, issues and skills than trading does. Moreover, this industry requires large capital commitment that makes it difficult to get in. While oil traders directly deal with oil prices, production or refining, charterers are mainly focused on transportation and distribution. Their job is to charter a vessel that matches the specifications (size, destination, charter party contract, etc.) requested by traders. They have important experience and knowledge about the economic dynamics driving the shipping markets and have dedicated teams working only on how to best serve trading companies and handle the chartering of different kinds of vessels. In some cases, some charterers have their own fleet while others charterers only rely on a time chartered fleet.

Oil trading companies simply see tankers as a way to carry their goods from an origin to a destination to support their trading business. When discussing with Mr Edisher Chiaureli, he explained that both trading and shipping institutions could be considered as enemies to each other as they are both looking for profit. The trader wants to transport its oil at the lower possible price while the charterer desires to make a maximum profit by renting its tankers at the highest possible rate. So far, traders have never been involved in shipping for the simple reason that this is just not their business and they do not have the knowledge and required skills. Moreover, mentalities are also different in both businesses. Indeed, during the interview, Mr Richard Watts explained that trading was more focused on a short-term approach, while shipping required a long-term approach.

2.3.2 Oil traders' shipping strategies

Trafigura Beheer B.V

Most of large oil trading companies own many separate entities or subsidiaries that are responsible to run precise aspects of the trading business, such as shipping. For instance, Trafigura partly or fully owns multiple entities specialized either in storage terminals, asset management or refineries. Regarding shipping, the company has made a joint venture with Cochan in order to create DT Group that partly deals with shipping in Angola.

DT Group notably owns a fleet of four bunker vessels delivering around 40,000 m^3 of bunker fuel every month to the vessels supplying the rigs in Angola (Dtsholding, 2015). Although Trafigura doesn't own any oil tankers, the company has an internal shipping and chartering department divided in two parts: wet freight and dry freight. The wet freight part is in charge of fixing ships on spot voyage, buying contracts of affreightment and taking time vessels on time charter for periods around 30 days to five years. The company deals with all vessels sizes from 2,000 to 300,000 dwt tankers. Every year, the oil trader concludes around 1,600 fixtures and has a fleet of about 50 tankers on time charter (Trafigura, 2015).

Vitol Group

Vitol is an oil trader that both charters and owns vessels at a time. In fact, Vitol doesn't directly own the ships but does it through its shipping subsidiary, Mansel Ltd. This special unit is responsible for managing most of the shipping business of Vitol. In 2014, Vitol claimed to have chartered 6,053 ships journey and managed a fleet of about 150 time chartered vessels, mostly through Mansel Ltd (Vitol, 2015). The subsidiary's aim is to maximize the utilization and returns of tankers under Vitol commercial control. Moreover, the portfolio of tankers and shipping activity is extensive and mainly depends of the oil cargo flows traded by the trader (Vitol Energy, 2013). According to Equasis (2015), an international database covering the whole world fleet, Vitol currently owns one tanker through its subsidiary Mansel Shipping Co. The Dutch-owned company charters more than 100 tankers in the meantime. Therefore, this unique owned oil tanker only represents a very small proportion of all its vessel fleet.

Gunvor Group

Gunvor, the third oil trader in the world, wholly owns Clearlake Shipping, a shipping entity in charge of the largest part of Gunvor shipping business. This entity is considered to be the largest charterers of tankers in the world, and it provides Gunvor access to logistics assets such as a large fleet of time chartered vessels (Gunvor, 2014).The subsidiary operates both on spot and time charter basis to fit Gunvor's needs for transportation. The group also provides support to the needs of third-party businesses.

2.3.3 The benefits of a shipping entity

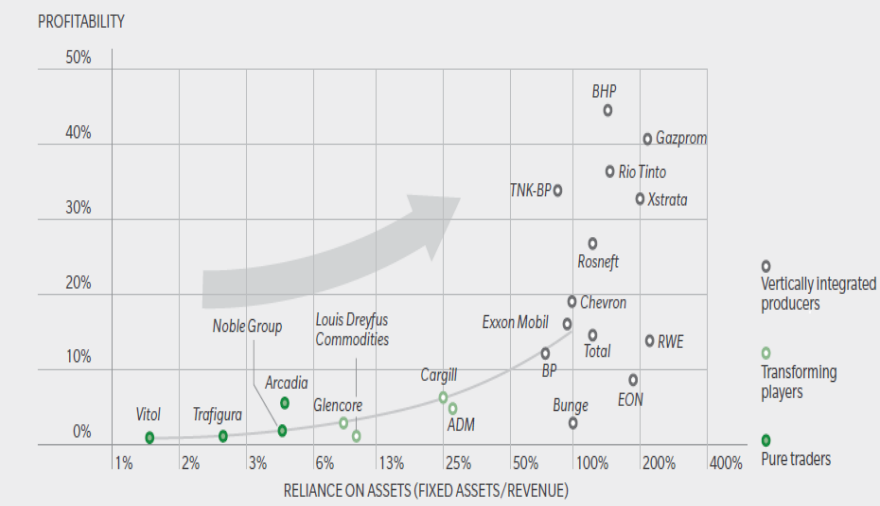
The strategy that consists of owning a shipping entity or subsidiary (only devoted to shipping) allows oil traders to have full control on the shipping aspect. Subsidiaries have time chartered vessels that are chartered back internally toward their own company. Generally, those shipping arms would first serve their own company before negotiating with third party counterparties to generate an additional source of revenue. It also provides oil trading companies more secure freight rate deals and therefore better and faster access to tankers as both entities are regularly working closely. It definitely brings better flexibility in terms of charter party negotiations as well as a quicker adaptation to market opportunities as oil trading companies get the first crack at it.

Another advantage provided is that trading companies are able to hide their volume in terms of oil transportation. Obviously, the major oil traders are constantly looking at their competitors trying to figure out their trading volume, and this is a way to reduce their own visibility in the market. Nevertheless, in order to afford such a strategy, oil traders have to generate a large volume in terms of chartered vessels. Indeed, smaller oil traders would generally require services from a charterer rather than own a tanker shipping unit because they are not dealing with enough volume.

2.3.4 Pure oil traders assets' strategies

Pure oil trading companies are among trading companies with a low reliance on assets, while agricultural trading companies, such as Cargill, have a higher ratio (fixed asset/total asset). Pure oil traders only have investments at one of two stages of the value chain, which are mainly focused on terminals, storages and refining. For instance, Trafigura owns by 49% of an entity called Puma Energy, which counts 84 storage terminals and has a storage capacity of 7 million m^3 (Puma Energy, 2015). As it is shown in Figure 11, vertically integrated trading companies owning several assets would tend to be more profitable. This means the higher the reliance on physical assets along the supply chain, the higher the profitability.

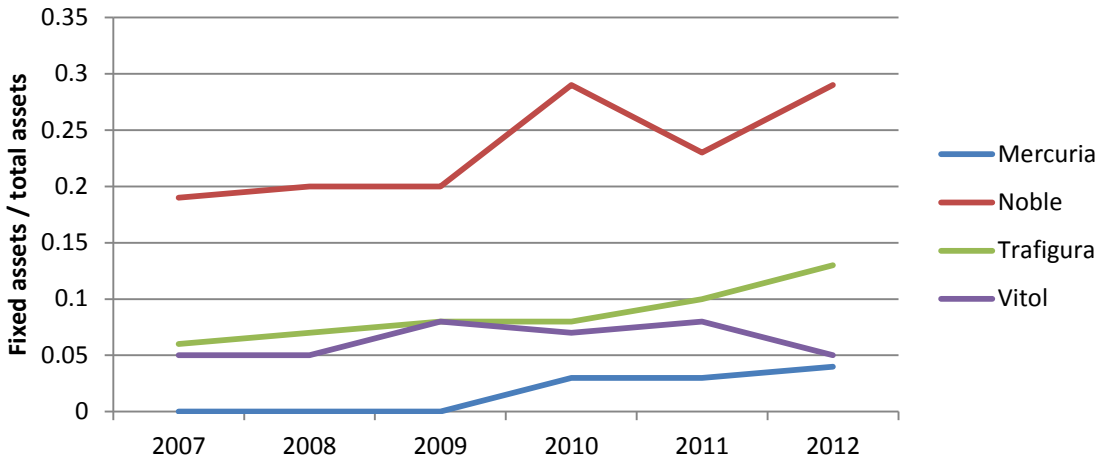
Figure 11: Profitability and reliance on fixed assets



Source: Meersman, et al., 2012

Light asset structures are the companies generating the smallest margins in the trading industry, so they have to trade and work with high volumes to break even. This is especially true for “pure oil traders” applying a distinctive strategy from vertically integrated players that own many assets at all stages of the value chain. In fact, the oil market is driven by changing short-term patterns and trends that constantly create new opportunities somewhere in the world. Therefore, it makes oil trading companies to invest intensely in fixed assets so that they gain flexibility and adapt more quickly to this fast evolving market. The perfect illustration is when Trafigura sold one part of their oil terminals in Texas in 2014, three years after having acquired those terminals to respond to a quick opportunity in the market. This example reflects that Trafigura, though getting more vertically integrated, is still focused on trading and the transportation of physical commodities, which is its core competency. Moreover, their philosophy is to stay a trader and not to transform into a vertically integrated producer such as Total, BP or Exxon.

Figure 12: Oil trading companies fixed asset intensity



Source: Adapted from Pirrong, 2014

It can be observed that most oil trading companies have increased their fixed assets over total assets from 2007 to 2012, with the exception of Vitol as they have kept their ratio stable. Since many years, oil traders decided to become more vertically integrated by relying more on fixed assets. In other words, it means that they are expanding their scope of activities by being involved at different stages of the value chain. This finding is confirmed by the CFO of Trafigura, Christophe Salmon, who stated that their fixed assets portfolio has been growing constantly over the past years to face shrinking margins and search higher profits (Andy, 2013). Although, many oil trading companies have been investing in midstream assets, such as storage facilities, their new strategy is to go up and down-stream. The reason behind that evolution is that firms will reduce transaction costs and increase availability of information about prices and flows (Pirrong, 2014). Although Noble is one of the oil traders with the higher fixed assets/total assets ratio, the company still considers itself as asset-lighter:

> *"Noble's asset-light strategy supports the integration of our supply chains while securing product flows, adding profit points and improving overall operational efficiency. Noble builds its franchise while focusing investments efficiently, aiming to use the least amount of capital and equity required to ensure the smooth, long-term operations of our supply chains*" (Noble Group, 2014).

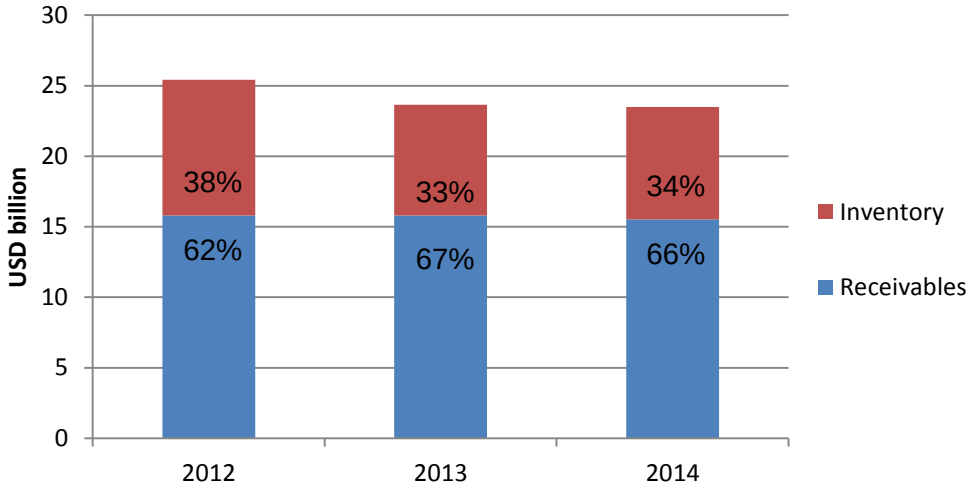
However, like most other oil traders, Noble has significantly invested in fixed assets during the past years showing its interest to cut transactional costs. It can be said that some oil traders such as Noble or Trafigura are slightly heading to a medium asset strategy.

Trafigura case

Since a few years, the company started to significantly increase its fixed assets strategy. Trafigura thought the best way to comply with changing market conditions and business environment was to rely more on its fixed assets. They believed it was going to give them a competitive advantage, thus allowing the company to grow even more and enhance its profitability. In the past, pure oil trading companies such as Trafigura were operating only with offices and communication tools and renting the physical assets they needed to trade. Their fixed assets were representing a tiny proportion of the total assets while the current assets had a far larger proportion. In 2007, fixed assets only represented 7.0% of total assets, meaning a low asset intensity, but this ratio increased to 19.9% in 2014 (Pirrong, 2014).

As previously seen, oil traders are dealing with enormous volumes each day, making the oil industry a short-term business where the oil is constantly exchanged among a few players. In the industry, keeping oil too long is generally costly. Therefore, companies are not looking to own the goods over a long period of time. For this reason, trade receivables and inventories represent a large part of the current assets.

Figure 13: Trafigura receivables/inventory ratios

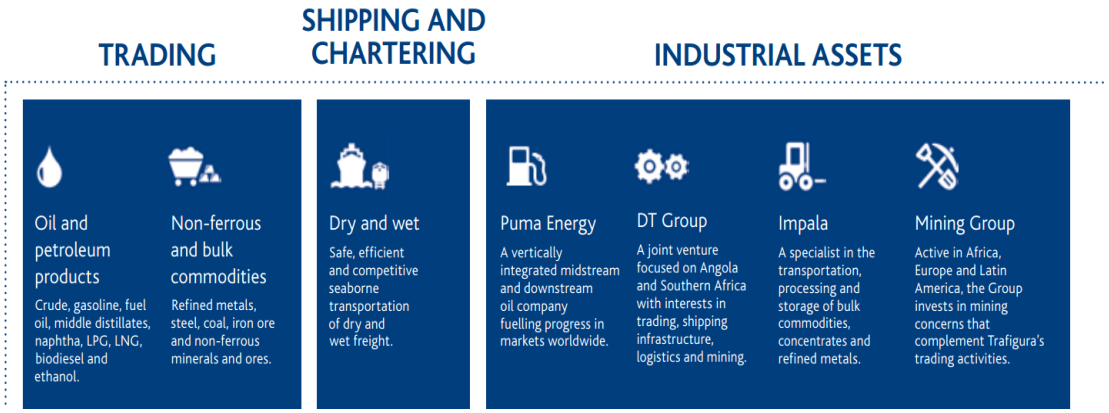


Source: Adapted from Trafigura, 2014

An oil trader would tend to have larger cash receivables than inventories because oil trading cycles are quite short and therefore oil inventory turns faster. In fact, oil traders don't have much inventory on hand but actually have more receivables. For Trafigura, in 2014, receivables represented $15.5 billion, which makes 66% of both inventory and receivables accumulated.

A specific unit only devoted to asset management, Galena, runs Trafigura assets. This asset management company was created in 2003 to leverage Trafigura's position by providing competitive advantage and seeking to profit from asset investment opportunities in the short and long-term. Galena is responsible for managing fixed upstream, midstream and downstream assets.

Figure 14: Trafigura supply chain



Source: Trafigura, 2014

Figure 14 confirms that shipping is distinctive form trading, as both businesses are truly different for many reasons as seen previously. Moreover, the Trafigura shipping strategy consists of acquiring a diversified portfolio of time chartered tankers, which is configured in collaboration with shipping specialists and seeks to be optimized for the commercial usage (Trafigura, 2014). The tanker fleet consists on new and second hand vessels, meaning any tanker is owned by Trafigura or a subsidiary of the company.

Finally, although oil trading companies are becoming more asset-intensive, oil traders don't consider tankers as industrial assets for the moment. In the past, Gunvor argued it was capital commitment burdensome and unjustified to buy vessels (Scorza, 2012). However, as pure oil trading companies become more vertically integrated by expanding their scope along the value chain, it would perhaps make sense for them to purchase and own oil tankers at some point.

2.4 Tanker acquisition

2.4.1 The new building market vs second hand market

Choosing either to buy a new tanker in the newbuilding market or a used tanker in the second hand market has always been one of the toughest shipping choices to be made. First, it has to be known that the choice of the ship directly influences the

running costs. In fact, the older the ship, the higher the running costs. A company looking for a cheap tanker would purchase it in the second hand market as prices are lower than in the new building market. According to Brown (2015), 10-year-old VLCC tankers are seen as an attractive investment because they still have several years of trading life left and generally cost around half the price of similar new VLCC. However, as both markets are very volatile, it means that the tanker acquired in the past would maybe be worth half the price three years after. Another distinction is that a second hand tanker can normally be used a few days after it has been bought whereas the buyer of a new one is more likely to wait many months or even years.

Nevertheless, already used tankers are not accepted in every port around the globe. Therefore, oil trading majors are not interested in acquiring them and prefer new ones or five or ten years old ships. Their value depends on their age, inflation and current freight rates. Moreover, a company buying a ship in the second hand market generally bears all the risks alone, while when buying a new one, the company shares the risk along with the bank.

Furthermore, market forecasts are essential, as it makes sense for a potential buyer to wait a certain period if he truly believes tankers' prices would go down. Therefore, the right timing is crucial because the buyer could take advantage of an increase in tanker prices in the future. Nowadays, ship owners do not hesitate to buy tankers because their prices are particularly low and see an opportunity to get tankers at a discount.

2.4.2 The tanker's choice

Choosing the right tanker(s) is essential for trading companies because the decision has a significant long-term impact. In fact, the choice should be wisely thought out, as many factors need to be taken into consideration. An important aspect is the size of the vessel. In fact, considering the routes oil trading companies are currently using and which routes they plan to use in the future is truly important. This point highly depends on the respective geographical presence of trading companies. A trading company whose business is mainly active in producing or buying large amounts of oil in the Middle East and selling it back to Europe would more likely own a smaller tanker as it best suits short routes. On the other hand, VLCC tankers are usually used for longer routes such as Ras Tanura (Arabia Saudi) to Chiba (Japan). Therefore, it would not make much sense to own a crude oil tanker such as a VLCC if the trading company doesn't make any business between locations that are too far away.

Moreover, the optimal size for a ship will also depend on whether or not the ports are capable of handling the tanker. Furthermore, the economies of scale are an important factor to consider. It has been estimated that a Suezmax from Ecuador to the US Golf has a lower unit cost than a Panamax (Panama Canal Authority, 2011). Indeed, using larger tankers provides significant economies of scales (depending on the tanker's size, length and speed of the voyage) but can be limited by the availability of deep-water berths. On the other hand, small tankers would offer a wider range of ports and channel access as well as the oil trader would easily fill a Panamax than a VLCC.

Another aspect is to evaluate how many oil tankers the company really needs regarding the volume traded and its fleet strategy. It would be unlikely to see an oil trading company owning a capacity tonnage exceeding its real required tonnage. However, it would be more common to notice an oil trading firm owning oil tankers covering a small part of its activities besides time chartered tankers covering the rest of its shipping side.

Diversification is another important point. Generally, a diversified fleet reduces risk and provides more flexibility. In fact, a fleet of several types of tankers generally brings wider flexibility to the ship's owner. For instance, an oil trading firm producing oil in Africa needs to bring 2 million barrels of oil to its buyer in Europe who specifically asks for this amount of oil. The only way to deliver this quantity of oil at once is to use a VLCC. Considering the company doesn't own any VLCC tankers, the company would have to make the delivery in two separate journeys using smaller tankers, or they would have to hire a VLCC through a voyage charter or time charter.

In conclusion, the tanker choice is really related to the geographic region of business the company is active in as well as its needs in terms of storage capacity needed regarding its level of transportation. The company has to understand that a diversified fleet would provide opportunities of arbitrage as well as flexibility and risk diversification.

2.4.3 The tankers' optionality

By investing in physical assets in the past few years, oil traders have developed their flexibility to take advantage of market opportunities and benefit from imbalances and inefficiencies. Tankers' optionality allows oil traders to practice notably geographical and time arbitrage.

Time optionality: Tankers allow oil companies to profit from the difference between the current price and the delivery price at a future date. The oil is first stored and then delivered at a later date. This is the case for old or unprofitable tankers that are then used as floating storages units. Those old tankers are usually used for temporary storage between two and four weeks, and sometimes for a longer period. Most of the time, the tankers used are VLCC tankers, as they have a large storage capacity of about 2 million barrels of oil. Moreover, converting oil tankers to “storage units” allows ship owners to avoid scrapping their old tankers. For instance, when the oil market is in contango, oil trading companies have an incentive to store oil and sell it later at higher future prices. On the other hand, an oil backwardation market motivates traders to sell oil immediately rather than sell it at further date. In this latter case, it would certainly not make any sense to use tankers to store oil, as the firm would lose money just by sitting on oil.

A contango situation takes place when the market believes or knows that there is an important amount of oil around, also called oversupply. At the end of 2014, oil prices dropped nearly 50% since June 2014 mainly due to an oversupply of oil in the market that created a contango. At this time, trading companies started to buy cheap oil, store it at sea into tankers and lock a profit just by selling it later by taking advantage of a steep contango. In order to be profitable by storing oil at sea, traders have to benefit from a large spread between oil future prices to cover storage, financing and other costs. The cost of storage for companies that don’t own tankers would be the time charter rate negotiated with charterers. Finally, to make profit by storing oil at sea, the profit made between both future prices should be larger than all the other costs accumulated.

Generally, storing oil on a tanker is usually more expensive and less convenient than simply storing oil on earth. Even though oil companies sometimes rely on tankers as storage units, doing it is rarely profitable. In November 2009, 141 oil tankers, around 10% of world tankers, were reported to have been converted for floating storage (Mann, 2013). It is important to notice that oil traders would more easily take advantage of time optionality if they were sailing smaller ships. For instance, a Panamax is tight enough to get through most of all strategic canals separating two points and would therefore save time by making the route shorter. Added to this, smaller tankers have a higher speed than VLCC tankers.

Location optionality: Transporting oil gives optionality to traders because they get direct access to undersupplied zones. Indeed, tankers are the best way to move huge quantities of oil between two faraway areas separated by oceans or seas. Among all tankers, small tankers provide the best location optionality because more ports accept them. However, in the past years, in order to face this issue, trading companies have developed and acquired larger port terminals that can welcome larger tankers. Therefore, oil traders can ship larger tankers and thus are able to carry more oil at a time. Finally, location optionality is crucial for oil traders because it allows them to do geographical arbitrage between two areas.

Lot size optionality: Tankers provide the owner or the charterer the benefit to decide which quantities of goods he wants to carry. In fact, tankers give to charterers an option to divide the cargo into many quantities and therefore take advantage by distributing the quantity they wish to different places. For instance, a tanker owner would benefit from this lot size optionality if he divides its cargo into two lots or more of different oils. He can then decide to keep one lot to run his business and sell the other lot to another trader or just play the role of a shipper by chartering the product.

2.4.4 Tanker afterlife

The demolition market mainly takes part in large steel importer countries, such as India, Bangladesh, Pakistan and China, where scrap yards buy second hand ships to recycle ships' components. In fact, this market, also referred to as the "recycling market," allows ship owners to sell their obsolete or unprofitable tankers to a shipyard. The crude oil tankers and oil product tankers demolition market has been stable in the last years with, respectively, between 7.5-9 million dwt scrapped each year for crude oil tankers and between 1.5-3 million dwt for oil product tankers (Bimco, 2015).

According to Buxton (1991), the decision to demolish the vessel depends on the freight market rates and the demolition market offers. In other words, a ship owner would not be willing to dismantle their ship whether he can charter it at high freight rates or use it on a profitable way to run their business. Moreover, low scraping prices would not encourage him to sell it to a shipyard.

The factors determining the prices of the ship demolition industry are mainly the availability of ships ready to be dismantled and the demand for steel and, therefore, scrap. However, tanker freight rates currently applied on the freight market would have an indirect impact on the demolition market as they would provide or not an incentive to scrap the tanker, reducing the supply of ship scrap. The recycling market is a volatility market that makes ship owners' decisions to scrap a ship even more tough to make.

3 Conclusion

The oil trading business has always been a short-term business due to constantly changing patterns and uncertain environments, habituating oil companies to adopt short-term approaches. Nevertheless, things have changed in the last 10 years, as we have seen oil trading companies becoming more assets intensive and making investments on the long-term with increasing purchases of storage facilities or refineries. However, oil traders have not really invested in tankers so far and have privileged other fixed assets. Indeed, only a very few oil trading companies really own tankers, as the most common way for oil traders is to charter tankers through time charter. Assuming specific capital conditions, only Handysize tankers were profitable in both 2012 and 2013, meaning that oil trading companies would have spent less money by owning a Handysize rather than by chartering one through time charter. However, it would have been more expensive to own larger oil tankers instead of chartering them through time charter.

The reason why oil trading companies have ignored purchasing tankers is certainly due to the volatility and unpredictability of both the freight rates and tanker prices because an oil trader doesn't want to be exposed to risky fluctuations of the shipping market. Indeed, a tanker bought at a specific price can be worth half the price three years later. Moreover, the main inconvenience is that if freight rates go down, the ship-owner still has its vessel at the same costs and doesn't benefit from lower freight rates in the meantime. For oil companies, time charter rates play a kind of hedging role because companies can look at a fixed time charter rate at a certain price over several years. This "tool" provides traders a large visibility and facilitates cost planning. Furthermore, as both Mr Edisher Chiaureli and Mr Richard Watts repeated many times, trading companies are not buying vessels, as this is not their business and they don't have the necessary skills to manage an entire ship.

Nevertheless, if there were an opportunity to purchase tankers at a very low price, oil traders would look at it and maybe buy a few ships because this is a very attractive deal. However, this kind of distress situation when prices are getting very low doesn't really exist. For instance, from 1995 to 2010, a second hand Suezmax was never available in the market for under $35 million. Furthermore, buying oil tankers could make sense if traders truly believe that the freight rates would significantly go up in the future. Doing this, oil trading companies don't have to pay high freight rates and can use their tankers by operating them at lower costs than the current freight rates.

However, one inconvenience of buying a tanker is that a large capital investment is needed, especially nowadays as banks require more financial guarantees. Added to this, the difficulty to exit in the market by selling the tanker is seen as another inconvenience, though it is not rare to see a ship-owner use their tankers as storage units.

Furthermore, if oil traders decide to purchase tankers at some point, they have to look at their financial situation as well as the interest rates and loan conditions that apply. Another aspect that oil companies have to understand is their tankers' requirements in terms of size, age and costs. Moreover, they should think about building a full team with required skills dedicated to managing oil tankers the best that they can. Obviously, trading companies willing to purchase tankers should be aware about the forecasts regarding the freight rates as well as tanker prices.

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