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# **Freight Forward Agreements, Case Study of a Shipping Firm**

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I hereby declare that the work submitted is mine and that where I have made use of another's work, I have attributed the source(s) according to the Regulations set in the Student's Handbook.

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## **Abstract**

This dissertation was written as part of the MSc in Banking & Finance at the International Hellenic University.

The purpose of this dissertation is to investigate the forward freight agreements (FFAs) and their relationship with the general status of the firm. Initially, there is an introduction of theoretical presentation of derivatives and FFAs, while subsequently it is presented the case study of a shipping firm, Norden A/S.

The existence of derivatives is dated several years ago and their use is known worldwide. This is the reason why they have been evolved through the years and have developed different types in order to be used in the markets. The shipping sector also had the need of derivatives, as a hedging tool, and this led to the creation of FFAs.

The case study includes the presentation of the firm, Norden A/S, the ratio analysis of it and the empirical study of FFAs. Norden is a very important firm with long course in maritime. Its ratio analysis indicates its profitability, efficiency, liquidity and leverage levels during the time period 2014-2018. As far as the contracts of FFAs, each year the firm decided to buy or sell them depending on its needs of hedging. This is depicted in the results of ratios, as the course of them influences the decisions regarding the sale or purchase of contracts.

Keywords: Forward freight agreement, Shipping, Ratio analysis, Norden A/S, Derivatives

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## **Preface**

I first interested in shipping sector through the elective course of “Shipping Finance” that was a part of MSc in Banking and Finance in International Hellenic University. My purpose was to make a ratio analysis in combination with derivatives of shipping sector. Forward freight agreements (FFAs) are the corresponding derivatives in shipping that are constantly grown. This was the main reason why I chose to study FFAs with the methodology of ratio analysis of a shipping firm and an empirical study of its FFAs contracts.

Sincerely, I would like to thank a strong supporting group that helped me through the time I wrote this dissertation. First of all, my supervisor, Mr. Gavalas (OP Jindal Global University), who provided advices and guidance in order to be completed this study. And secondly, my family and friends, who supported me with love and understanding. Finally, I wish to dedicate this dissertation to a person that was very important for me and is no longer in life.

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## 1. Introduction

This dissertation investigates the Forward Freight Agreements (FFAs) and analyzes, through ratio analysis, the course of a shipping firm that uses FFAs, as an instrument of hedging. The market of FFAs is relatively under-researched and as a result the research of them is very interesting.

FFAs belong to the general term of financial derivatives. Derivatives have a great expansion around the world, as many exchanges and third parts use them in order to hedge, speculate or make arbitrage. They provide the possibility to be traded in organized exchanges or “over the counter” that is between two private parties. Moreover, derivatives present many different types, such as futures, forwards, options, swaps, as they can cover different needs of the market. One important clue of their usefulness is that in 2017, 25 billion contracts were traded around the world. This indicates that derivatives play an important role in the finance sector generally.

As far as the shipping sector, the FFAs are the corresponding derivatives. FFAs have service, as an underlying asset. Practically, this means that there is no possibility of arbitrage regarding spot and future rates. Although FFAs are used recently, they have a long history in shipping. All the participants always desired to be protected from the fluctuations of freight rates and as a result they had agreements between them. Later on, in 1992 the formalization of FFAs gave the chance of a more proper way of trading regarding the derivatives of freight rates in comparison with the previous tools of hedging. Baltic Exchange was the major cause behind the creation of them, as there was a great need of contracts with formal substance and it is the only exchange that is occupied with maritime activities.

The general situation of a firm, that is profitability, efficiency, liquidity and leverage, depends on the use of FFAs, as hedging instruments, partly. Every year, the firm desires to buy or sell contracts of FFAs in order to be protected from the fluctuations of the market. The status of the firm intimates that it can hedge its position in the market if it has the appropriate levels in the above mentioned fields.

The structure of the dissertation is as follows. Section 2 includes the theoretical part of the study regarding the financial derivatives, the FFAs and the shipping market generally. Section 3 reviews previous studies concerning FFAs, followed by Section 4

that analyzes the case study of the shipping firm, Norden A/S. Finally, Section 5 includes the conclusions about the whole study.



## **2. Theoretical Part**

In the theoretical part of dissertation, it is made an analysis of financial derivatives and the types of investors initially. Then, it is given the definition of forward freight agreements, an example of them and different characteristics of shipping market.

### ***2.1. Derivatives***

The definition of derivative is a financial instrument that its value is derived from an underlying asset. The financial instrument is usually a contract between two sides that desire to be protected in a case of increase or decrease of prices respectively. The underlying assets can be commodities, stocks, bonds, currencies, interest rates or anything else that has fluctuations on its prices.

The derivatives have been discovered many years ago. In the 17<sup>th</sup> century in Netherlands, the producers of tulips and the buyers made agreements in order to have specified prices, the well-known “Tulip mania Bubble”. The producers tried to succeed higher prices, while the buyers desired lower prices. Although the participants in the market made deals, many times they did not complete them. They usually had no money and the market was not organized in order to obligate them to pay.

After the tulips, there were many other incidents of failure regarding the derivatives. The main problem was that the market was not organized and the people around derivatives did not know their real function. The first effort for a better environment in derivatives was made in United States of America after the establishment of the New York Stock Exchange (NYSE). Through the NYSE, the market of derivatives was improved, as many suggestions had been made regarding the transactions. However, the most important step was made after the Crash of 1929 in USA. The foundation of Securities Exchange Commission (SEC) tried to define the right function of derivatives in the markets. Practically, the derivatives provide security to the portfolios of the investors across the fluctuations of the underlying asset. Their main purpose is not only the speculation, but also the hedging of the risk.

## ***2.2. Categories of Derivatives***

The financial derivatives have the following four main categories: futures, forwards, swaps and options. Some of them are negotiated in exchanges, while others between the two interested parts. This out of exchange function is called over the counter.

As far as the futures contract, it is a deal between two sides that they buy or sell an underlying asset in a particular price in the future. The side that buys the asset has long position, while the side that sells it has short position. The asset can be commodities, such as oil, aluminium, gold or financial asset, such as stock index, bonds, currencies.

Futures are negotiated in exchanges and as a result it is necessary to be defined some characteristics in each contract. The factors that should be determined are the following: underlying asset, size of the contract, place and time of delivery, daily range of the price, limits of every position and unit of measurement of the price. The open positions of future contracts are settled every day in order to be mentioned the profits or losses of the position. In cooperation with the exchange, a clearing company sets margins in a way that protects the transactions and prevents the defaults. This company is the third part in the futures that deals with both the buyer and the seller of the contract in order to be completed the transactions.

With regard to forward contracts, they are similar with the future ones, but they also present some important differences. Forward contracts are negotiated between two private parties, in comparison with futures that are negotiated in exchanges with the support of clearing house. Furthermore, forwards are not settled every day, but only in the end of the contract. In the most cases, forward contracts are delivered in the end of time period in comparison with the futures that are usually not delivered and close their position before the maturity. One more characteristic of difference is the existence of credit risk. Forward contracts include credit risk in a case of no delivery, while future contracts are protected from the clearing house and the margins.

The third category of derivatives is options, which are negotiated in exchanges. Options are contracts that permit and not oblige an investor to buy or sell an asset at a prespecified price in maturity. There are two types of options, call and put options. Call options give the right to the owner to buy the asset in a prespecified price in maturity, while put options to sell it respectively. One more discrimination of options is between American and European options. American options can be exercised anytime

until maturity, while European ones should be exercised at maturity. It is important to be clarified that the place of the exchange is not related with the type of option. For the purpose of owning the right, the investor should pay to the writer of the option an amount of money that is called premium.

Last but not least, derivatives also include the category of swaps. Swaps are financial instruments between two parts that they desire to exchange cash flows or liabilities. They are not negotiated in exchanges, as they are agreements between two firms or financial institutions.

The most commonly known swaps are plain vanilla interest rate and currency swaps. In plain vanilla, part A of swap has a payment of floating interest rate, while part B has a payment of fixed interest rate. Both of them are afraid of the course of the interest rates and as a result, they conclude a swap. As far as the currency swaps, they refer to the exchange of currencies between two parties. For example, part A has currency A and part B has currency B. They deserve to exchange them, as both have payments with the opposite currency. In some cases, an intermediary enters into the swap in order to manage the credit risk.

### ***2.3. Categories of Investors***

There are three main reasons for someone to use derivatives. Depending on the purpose that someone wants to succeed, he/she can use derivatives for hedging, speculation or arbitrage.

An investor, who desires just to protect his/her portfolio from risk, can use derivatives. He/she can take several contracts in order to hedge all or a part of his/her portfolio. For example, if the investor forecasts that the prices will fall, he/she can sell contracts in order to get away with losses. In a case that the prices rise, the investor do not exercise his/her contract and close the position.

The investors that are characterized as speculators, decide to buy or sell contracts depending on the course of the price in the market. The only purpose of this category of investors is the acquisition of profits. Due to the different kinds of investors in the market, there is not always a standard way of gaining. For example, if an investor sells options, because he/she forecasts fall of prices, he/she cannot predict also the

movements of the other participants in the market. The speculators do not always desire the same positions and as a result they do not always gain profits.

Last category of investors are arbitrageurs. Generally, arbitrage is the profit or “speculation” without risk. This type of investors tries to gain profits without engaging risk through arbitrage. For example, they buy the same stocks from stock exchanges with different currencies so that gain profit from the difference of currencies. The strategy of arbitrage is purchase in the lower price and sale in the higher one. Following this, the two prices will be equal in the future and the chances of arbitrage will be limited.

#### ***2.4. Forward Freight Agreements***

Shipping sector is an extremely important part of the economy worldwide. Back in 1992, it had been made the need of formal derivatives in shipping, because of the volatility in freight rates. The participants in shipping sector needed an instrument in order to hedge the risk and the capability to participate without fear. In this way, Forward Freight Agreements (FFAs) were created. FFAs are contracts between a seller and a buyer in order to settle or hire a rate for a prespecified cargo for a route in the future.

FFAs are financial agreements between two parts that desire to hedge the risk of freight rates. Specifically, the parts of an FFA can be shipowners, ship-operators, charterers or commodity traders. They agree about the route that the vessel will follow, the date, the size of the contract and the rate that they will pay.

Initially, before 1992, FFAs were negotiated over the counter between the parts that desired to make a deal. After the increased demand, they were also introduced to exchanges and had a more formal presentation. As the classical derivatives, FFAs include brokerage firms. These firms are intermediaries between the two parts and used in order to organize the contracts and take over a part of the risk in the process.

In the day of settlement, the two sides discover their results from the use of FFAs. Specifically, the settlement is the difference between the agreed forward price of the contract and the average price of the selected index for the last seven days.

Baltic Exchange is the most important exchange of shipping around the world. It publishes indices regarding the freight rates. The most known freight indices are the

following: Baltic Exchange Dry Index (BDI), Baltic Exchange Handysize Index (BHSI), Baltic Exchange Supramax Index (BSI), Baltic Exchange Panamax Index (BPI) and Baltic Exchange Capesize Index (BCI).

As far as the routes, there are several options in the shipping sector. They are divided into three main categories: dry, wet and gas. The subcategories of dry routes are capesize, panamax, supramax and handysize, while of wet ones are clean and dirty. The category of gas includes only LPG and LNG.

## ***2.5. Types of Vessels***

In shipping industry, the vessels are separated into two main categories, dry cargo and tankers. A part of vessels can serve different types of cargo, while others are made for more specified purposes. The main categories of vessels indicate many differences between them and each one includes some subcategories that will be analyzed below.

### **2.5.1. Dry Cargo**

The market of dry cargo is the most frequent, as it includes a variety of vessels and makes the majority of itineraries. Dry cargo vessels usually carry coal, metals, grain and generally products that are not liquid. They are divided into the following subcategories: general cargo, bulk carriers, containerships and specialized vessels.

General cargo vessels have the ability to transport different kinds of general cargo, such as bagged cargoes and steels. This means that the cargo on them can be combined and serve different purposes. They also can carry containers on them.

Unlike with general cargo vessels, bulk carriers carry bulk cargo, such as coal, iron or minerals. The cargo on them is from the same material, while they cannot carry containers. Depending on their size, bulk carriers are divided into some subcategories. The most known and usable types of them are handysize, handymax, supramax, panamax and capesize.

According to the definition, containerships carry on them only containers and as a result they are used for specific purposes. Finally, the specialized vessels are also made for prespecified purposes, such as transportation of livestock, lorries, cars or frozen goods.

### 2.5.2. Tanker

In the case of tankers, the vessels carry liquid or gas products. The main categories of tankers are dirty and clean tankers, while there are other types of tankers that are more specified. Tankers can carry oil, gas, chemicals or asphalt.

Concerning dirty tankers, they carry heavy oil and crude, while clean tankers carry chemicals and petroleum products. According to the size of the vessels, suezmax, aframax, panamax and handysize are some examples of dirty tankers. With regards to clean tankers, long range 1 (LR1), long range 2 (LR2) and medium range (MR) belong to this category. Moreover, the vessels that carry chemicals are also included to the clean tankers.

One special category of tankers is gas carriers. This type of tanker usually carries liquefied petroleum gas (LPG) and liquefied natural gas (LNG). Both of them require special circumstances regarding the pressure in order to be delivered properly.

Another special category of tankers is asphalt carriers, which transport asphalt or otherwise bitumen. These vessels usually have small size, while they should maintain specific temperature, in order the products to be contributed in appropriate quality.

### **2.6. Example of FFA**

An FFA buyer and a seller would like to make a deal in order to be protected from the fluctuations in freight rates. The buyer, who is a charterer of vessels, has to transport some cargoes and is afraid of increased rates in the time period of transportation. From the other side, the seller, who is a shipowner, desires to return some vessels and have a standard payment for it. Both of them have common routes, dates and as a result they can make an agreement.

Initially, the two parts negotiate the rate that they are interested. They may have some disagreements, but they must agree in a profitable rate for both sides. In the settlement day, if the rate is higher than the agreed rate, the buyer saves money, as he pays less. As far as the seller, he has also made a good deal, as the market is higher than his forecast.

## **2.7. Shipping Market**

Shipping market is generally a constantly growing market. Nowadays, the shipping sector continues to be developed with the most of its subsectors to strengthen day-to-day. Although the supply is limited, the demand is still growing and shipping markets try to move forward. The period of crisis in 2008 has induced some changes that are analyzed below.

The last years, the most important issue in shipping is the regulations about the environment. Globally, there are attempts regarding the reduction of emissions and a “greener” life. As far as the shipping, the vessels produce a great amount of emissions that harms the environment. The International Maritime Organization (IMO) has decided to be applied a regulation about the fuel in vessels from 2020. Known as IMO 2020, the vessels must use fuels that contain sulfur no more than 0.5%. This regulation will have a great impact in the shipping sector, as many vessels should include scrubbers in order to burn lower sulfur. One more regulation that refers to vessels is the right management of the water on them. The water is valuable and must be utilized with prudence.

One more factor that has changed though the last years is the financing by banks. The financing of shipping sector was and is based mainly on syndicated loans, as the amount of money is quite big. However, some inside procedures in banks have been changed. The European banks have reduced their contribution of financing in shipping, while the total investment of banks to shipping has also reduced. However, the Chinese companies have strengthened its position globally in the sector of shipping.

Another important issue in shipping market is the trade war between United States of America and China. The volume of transactions between these two countries have been declined due to the tariffs that are forced. This change has influenced the transactions not only between these two countries, but also between other countries that correlates with them commercially worldwide.

### 3. Literature Review

Forward freight agreements (FFAs) present limited sources according the literature review. In the most cases, the scientific articles are dated after 2000. Although FFAs created in 1992, their great expansion is placed after 2000. There are several studies about the importance of FFAs, their relationship with volatility and volume in the shipping market, as well as the prediction of spot and forward prices.

The main purpose of the FFAs is the hedging of the risk in the shipping sector. According to the study of Kavussanos and Visvikis (2010), the use of FFAs is capable in order to reduce the risk. Specifically, this study examines the hedging in Capesize vessels, which have the highest volatility in comparison with the other types of vessels. The freight rates after the use of FFAs are reduced and their percentage fluctuates between 64% and 86%. Another study, referred to hedging with FFAs, has made by Alizadeh and Nomikos (2012). Hedging the risk is very important in shipping sector, as in the most cases the whole vessel is the collateral for the financial transactions. The empirical results indicate that FFAs are a very useful tool, as they can hedge the risk. Another study that refers to FFAs as a hedging tool, has made by Alizadeh *et al.* (2015). As far as the tanker FFAs, they cover the risk in the market insufficiently, as there is a residual risk that cannot be predicted and the liquidity is limited in this part of the market.

The study of Kavussanos *et al.* (2004) is focused on the volatility of the price due to the use of FFAs in four shipping routes. A common characteristic of prices is that they are volatile. Every day, the freight rates may increase, decrease or be stable and as a result this can influence the price volatility in the market. The four routes that examined in this study showed that the use of FFAs decreased the spot volatility, while two out of four routes indicated a sign of asymmetry in volatility. Another impact of FFAs was the amelioration of quality and the better circulation of information in the three routes. Another study, which examines the volatility, but also the trading volume in FFAs market, has made by Alizadeh (2013). The relationships between price – trading activity and volatility – trading activity are positive, while volume and volatility maintain an inversely proportional relationship. Moreover, the market of FFAs mainly supports the speculation instead of hedging option.



As far as the forecasting of freight rates, there are two significant studies from Batchelor *et al.* (2007) and Zhang *et al.* (2014). The first study examines the prediction of spot and forward rates and more specifically if forward rates include details about future spot rates. Both spot and forward rates present cointegration, while forward ones can be adapted easier than spot rates in order to limit the difference between them. The study of Zhang *et al.* (2014) examines the lead – lag relationship between spot and forward rates, as well between spot and time charter (TC) ones. The empirical results of Batchelor *et al.* (2007) are confirmed, as it exists cointegration between spot and forward rates. In this case, it is also observed cointegration between spot and TC rates. Furthermore, this study indicates a new price function, which refers to the TC contracts in order to develop the freight rate analysis. As far as the term structure theory, each duration provides different relationship between spot and TC rates. Yin *et al.* (2017) examined the reaction of spot rates and FFAs in a case of innovation of the rates. According to the results, spot rates are less sensitive than FFAs, as they are more volatile.

Nomikos and Doctor (2013) investigated the importance of market timing rules in FFA market. The research was made by technical analysis, using moving average, momentum and Bollinger bands. The results of this study have shown profitability according to FFA contracts, but there are signs that this liquidity and transparency in FFAs market are limited, as the market is still “young”.

The analysis of term structure in the dry bulk freight market has made by Ko (2013). The reaction of the short – term rates to the long – term ones is larger and statistically significant in comparison with the opposite relationship. This study also analyzes the speed of the adjustment, which in general terms is constant in the most freight markets. Another important characteristic about FFAs is the fleet size growth. According to Xu *et al.* (2011), there is a relationship between volatility in freight market and the size of the fleet. If the supply of fleet increases, then the volatility increases too, but in a nonlinear way.

To sum up, different studies have been conducted about Forward Freight Agreements (FFAs). The most important purpose of use for FFAs, as it has been mentioned, is the hedging of the risk in the shipping sector. FFAs are capable in order to create deals between two parts and reduce the risk in the future transactions. Volatility of the

prices is a known characteristic in the market of FFAs, as the use of them can influence the rate of volatility. Moreover, spot and forward rates present a particular relationship, as they are cointegrated. Last but not least, literature review refers some information about the importance of market timing rules, the analysis of the term structure and the relationship between volatility and fleet size growth.

## **4. Case Study of Norden**

In this part of dissertation, it is analyzed the case study of the firm, Norden. Initially, it is referred the characteristics of the firm and then data, methodology and the empirical results of the analysis.

### ***4.1. The Entity***

Norden A/S is the company that is analyzed in the case study. Below, it is presented some characteristics of the firm, such as its history, strategy and some of the most important milestones through the years of analysis.

#### **4.1.1. Profile & History**

The company that is used in case study is Dampskibsselskabet Norden A/S. It is one of the oldest shipping company, as it was founded by Mr. Mads Christian Holm in 1871. It has headquartered in Denmark, while it owns offices around the world including China, USA, Australia and Europe. It is also listed on Nasdaq Copenhagen, as a mid-cap corporation. Norden has managed to be transformed to a global known company, as through the years it has developed rapidly.

Regarding the fleet, the company has its own tonnage, but also charters sometimes. Norden provides shipping services by using dry cargo and tankers. As far as dry cargo, the firm owns a strong position in the market with Supramax, Panamax and Handysize vessels, that are totally 218. Alongside in tankers, Norden uses Handysize, Medium Range (MR) and Large Range 1 (LR1) vessels, that are totally 60. The last update about the fleet is the order of 6 vessels, 4 dry cargo and 2 tankers.

#### **4.1.2. Strategy**

The company prefers as a strategy to concentrate on short-term activities, as it can manage them easier than long-term ones. Norden desires a flexible management in order to increase the return and reduce the risk. For this reason, the firm has installed a new unit of business area except the dry owner and tankers, the dry operator. Moreover, it tries to reduce the long-term activities in dry cargo, while increase the short-term ones in tankers. Through these steps, Norden hopes that it will achieve its

goals in the future. As every firm nowadays, Norden also discovers new technologies in order to expand its operations.

#### 4.1.3. Milestones

Norden A/S is an international shipping company with long lasting presence in shipping sector. In this part of dissertation, it is presented some of the most important news of the firm through the five years of analysis. Simultaneously, these are the reasons why it has selected this specific company in order to be analyzed.

In 2014, Norden was identified as the most frequent dry cargo shipping company through Panama Canal. Although there were other companies with more passages, Norden was the first company of dry cargo. Moreover, the company strengthened its financial position, as it had three new credit partnerships in Scandinavia and Japan in order to finance its operations regarding its vessels.

In 2015, the company decided to follow a new strategy with main purpose of conquering the top of the industry. The status of the new strategy was “Focus and Simplicity” and it had as main goal to combine the focus on clients and the investments in Supramax and Panamax vessels. The company had already a strong position in these fields, but it tried to strengthen them more and get the highest position.

In 2016, the crisis of dry cargo drove Norden to discover new activities in order to be developed. The company tried to avoid dry cargo and started to use operator activities. In this way, the cargoes were combined with available vessels, in order the management to be more productive and profitable.

Norden is a company that follows the new developments and trends. In this way, in 2017, the firm decided to develop its activities in tankers in order to keep up with the market. Furthermore, in 2017 the company was identified as the most frequent dry cargo shipping firm through Panama Canal again. One more important step for Norden in 2017 was the separation of dry cargo into two parts, dry cargo owner and dry cargo operator. After this change, the firm indicated that tries to be organized better, as it has three business units any longer.

The separation of dry cargo had very positive results in 2018. The dry operator managed to increase the activities and create transparency. Both of them were goals

that finally achieved by the firm. The financial results of Norden regarding the account of profit were better in 2018 than in 2017 due to the fact of separation.

These milestones are some of the most important steps of Norden through the five years of analysis. These are also the main reasons why this firm is selected in order to be analyzed regarding its ratios and forward freight agreements.

#### ***4.2. Data & Methodology***

The case study includes the analysis of two main parts. The first part is the ratio analysis of a shipping firm, Norden, for five years, in order to be analyzed the course of the firm regarding profitability, efficiency, liquidity and leverage. Subsequently, there is a connection with the Forward Freight Agreements (FFAs). It is presented the FFA contracts that have been purchased or sold from 2014 until 2018 and the correlation between the results of ratio analysis and the management of FFAs.

As far as the ratios, it has been used secondary, consolidated data from the annual reports of Norden A/S and time-series analysis. It has been selected the most recent data for the last five years, that is 2014 until 2018. For the purpose of ratio analysis, it has been analyzed some ratios from four main categories, profitability, efficiency, liquidity and leverage.

Profitability ratios indicate the capability of a firm to create profit, based on its assets, equity or other factors. There are two types of profitability ratios, return ratios and margin ones. The selected return profitability ratios for this survey are Return on Assets (ROA) and Return on Equity (ROE). As their definition implies, ROA refers to the generation of revenue depending on assets, while ROE refers to the creation of revenue depending on equity. Regarding to margin profitability ratios, this survey contains Margin Earnings Before Interest and Tax (EBIT) ratio in accordance with net income. As EBIT does not include interest and tax, Margin EBIT indicates the general profitability of the firm without these two parameters.

The second category of ratios are efficiency ratios. This category of ratios measures how efficiently a firm can use its assets or liabilities. In this survey, three types of efficiency ratios have been analyzed, receivables turnover, inventory turnover and payables turnover. Receivables turnover refers to the transformation of sales to cash, while payables turnover the ability to receive payments from suppliers. Inventory

turnover measures how efficiently a firm handles its inventories. All these ratios are converted into days, in order to be calculated the cash cycle. By using cash cycle can be estimated the days that the firm can receive cash from its activities.

Another category of ratios that has been analyzed, is liquidity ratios. They measure if a firm can pay its current liabilities with its own current assets. Three of them have been used in this survey, current ratio, quick ratio and net working capital. Current ratio indicates the ability of the firm to cover its short-term liabilities with its current assets. Whilst quick ratio has the same property with current one, it excludes inventories from current assets, because they own the lowest liquidity in comparison with the rest assets. Net working capital estimates the difference between current assets and current liabilities in order to indicate if it is possible, the current liabilities to be covered from current assets.

Last but not least, it has estimated the category of leverage ratios. This type of ratios mentions the level of leverage in a firm. Two of the main debt ratios have been calculated, long-term debt to equity and equity multiplier. As the definition implies, long-term debt to equity indicates what percent of equity can cover the long-term debt. Equity multiplier defines the total assets over the total equity. Although it does not include debt, the term of assets involves debt. This means that equity multiplier shows off if assets include either more debt or equity.

Regarding the FFAs, there is a presentation of the contracts that the firm has purchased or sold during 2014-2018. Norden desires to hedge the risk that undertakes and manages its contracts through this purpose. Every year the firm has different needs and as a result, it chooses if it has to buy or sell contracts.

Moreover, the management of FFAs is based on the total course of the company. This course is depicted on the financial ratios that have been estimated. Profitability ratios indicate if there are adequate profits in order to be covered some contracts or the firm must sell some of them. Respectively, liquidity ratios imply the existence of enough liquidity in the firm so that it is capable to manage FFAs properly. As far as efficiency ratios, they indicate how efficiently assets or liabilities are managed. In this case, FFAs have the ability to be assets, as well as, liabilities, as they are derivative instruments. Finally, the category of leverage ratios shows how leveraged is the firm and as a result, if it can finance its activities sufficiently.

### **4.3. Limitations**

The findings of this study have to be seen in light of some limitations. The analysis of the firm is based on financial ratios. This means that the comments regarding the status of the company about profitability, efficiency, liquidity and leverage are based only on the ratios' results. The results represent the current condition of the firm and they cannot be used for a future comparison. Furthermore, the majority of FFAs' sources are not public and as result the only analysis that could be made is an empirical study of them.

### **4.4. Empirical Results**

The first part of analysis includes the evaluation of the ratios. From each of the four main categories have been calculated some ratios. Each of them indicates something about profitability, efficiency, liquidity or leverage. At this point, it is important to be mentioned again that the empirical results are based on the ratio analysis and they are also used for the further comparison with the forward freight agreements (FFAs).

#### **4.4.1. Ratio Analysis**

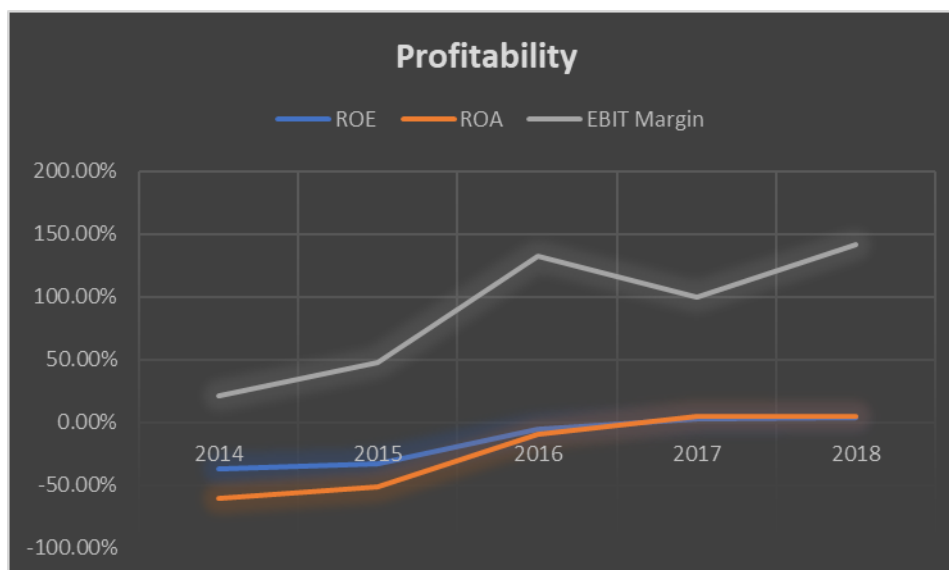
The ratio analysis of Norden A/S is based on four categories of ratios, profitability, efficiency, liquidity and leverage. Below, it is presented tables, figures and comments regarding the course of the firm through the five years of analysis.

#### **Profitability**

The first category is profitability with the following ratios: ROA, ROE and EBIT Margin. As it can be observed in the figure 1 below, the first three years ROE and ROA have negative results due to the losses of the firm in the net income. Moreover, the first two years the firm presents a high return on both equity and assets, as ROE is close to 35% and ROA to 21% respectively. The rest three years, the two indicators have lower results and close to each other, as they appear in the table 1. Specifically, ROE does not get over 6%, while ROA 4% respectively. The real reason behind the course of ROE and ROA is net income of the firm, as assets and equity have the same level approximately each year.

As far as the EBIT margin, it presents a high percent above 80% each year. This means that the firm earns money before the payment of taxes and interest. From 2014 until 2016, the ratio increases gradually and gets over 100%. In 2017, there is a small decrease, but EBIT Margin increases and exceeds 100% again.

A general comment regarding profitability is that it is increased gradually through the five years of analysis. Initially, there are losses that are reduced and after 2016 the firm presents profits and generally increases its profitability.



Source: Author's calculations Figure 1: Profitability Ratios

Table 1: Profitability Ratios

Profitability					
Year	2014	2015	2016	2017	2018
ROE	-0.36482	-0.33282	0.05689	0.029439	0.034791
ROA	-0.23376	-0.17755	0.03504	0.018518	0.019642
EBIT Margin	0.807193	0.989597	1.41427	0.949153	1.366522

Source: Author's calculations



## Efficiency

As far as efficiency ratios in table 2, the first step is the estimation of turnovers in order to be calculated the corresponding days. All these ratios have a stable course through the five years of the analysis, as it is visible in figure 2.

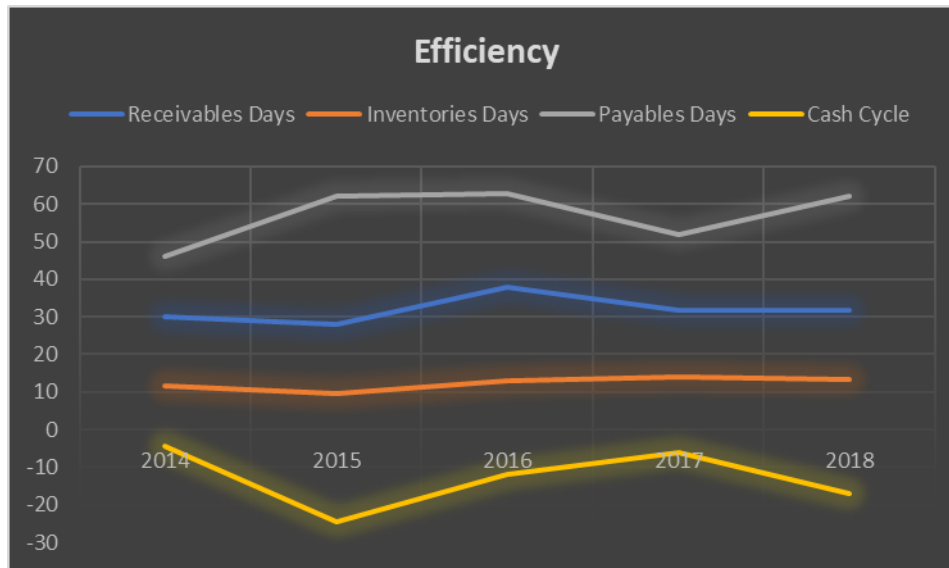
The firm needs approximately 32 days so that can collect its receivables from its clients. Except from 2016, when the receivables days were 38, the rest years the firm collects its receivables in a time period of month. The consistency of owing receivables is quite good for the firm, as it can arrange its own payments easier.

In the case of inventories, the firm holds its inventories 12 days on average. This indicates that the firm maintains its inventories for a normal period of time in order not to have production and delivery problems. Moreover, inventories days are suitable, as there is no danger to change the value of inventories in 12 days. The result of inventories days indicates liquidity, as the company converts its inventories into cash in approximately 12 days.

Last ratio of days is payables days, that reaches maximum 63 days. The firm has the ability to pay its creditors in a time period of two months roughly. This is a pretty good interval, as the firm has already been paid from its clients and has some extra time to pay its own liabilities. The firm also can use its funds in a better way in order to attain more benefits, as it has enough time to organize its plans.

The estimation of cash cycle indicates a range from 5 until 25 days. Except the years of 2014 and 2017, when the cash cycle is quite small, five and six days respectively, the rest years the firm has a satisfying time period to fund outstanding activities. Specifically, the highest score of cash cycle is detected in 2015, when the firm has 25 days in order to transform its investments into inventory and then into cash flows through sales.

A general comment as far as efficiency is that the ratios indicate fluctuations in some cases. Although receivables and inventories days are stable, the ratio of payables days influence the course of cash cycle. With exception of the years 2014 and 2017, the firm is more efficient the rest years of analysis.



Source: Author's calculations Figure 2: Efficiency Ratios

Table 2: Efficiency Ratios

Efficiency					
Year	2014	2015	2016	2017	2018
<b>Receivables turnover</b>	12.13845	13.0766	9.667274	11.45401	11.48824
<b>Inventories turnover</b>	31.82818	37.59353	27.98972	25.88069	27.31376
<b>Payables turnover</b>	7.937071	5.862937	5.80629	7.023553	5.860086
<b>Receivables Days</b>	30.06973	27.91245	37.75625	31.86656	31.77163
<b>Inventories Days</b>	11.46783	9.709118	13.0405	14.10318	13.36323
<b>Payables Days</b>	45.98674	62.25549	62.86286	51.968	62.28578
<b>Cash Cycle</b>	-4.44918	-24.6339	-12.0661	-5.99826	-17.1509

Source: Author's calculations

## Liquidity

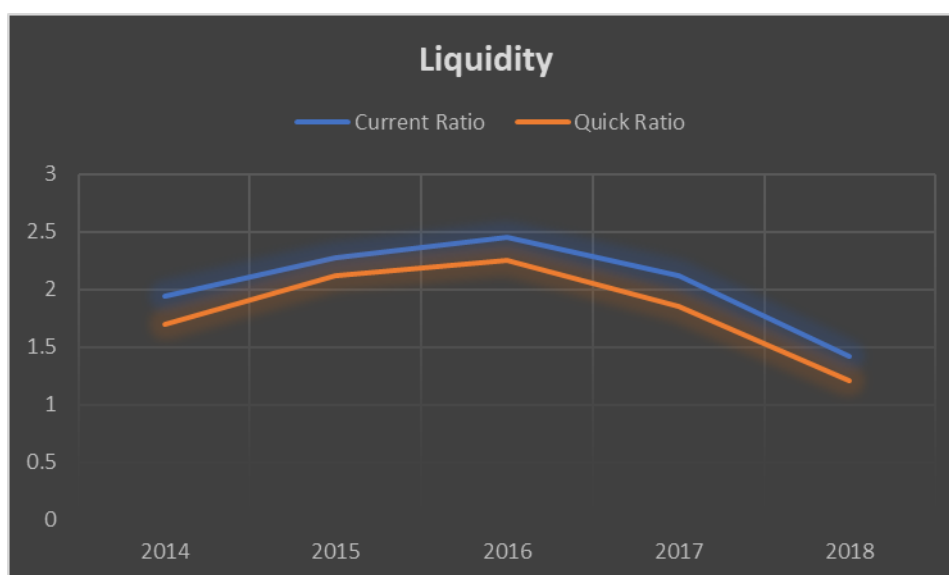
Liquidity includes two basic ratios, current ratio and quick ratio. According to the figure 3, both ratios have common course. Current ratio has on average results equal to 2 that is a very good indication about liquidity in the firm. This means that current assets have double quantity in comparison with current liabilities. The peak of current ratio is observed in 2016, when the result is approximately 2.5 according to table 3. In 2018, the current ratio presents a decrease in comparison with the rest years.

Although quick ratio excludes inventories from current assets, the results are close to 2, but a little bit lower than current ratio. It is observed an increase until 2016, when quick ratio presents its peak. In 2018, the ratio has the lowest result, as in current

ratio. Despite the fact that the results of quick ratio are lower than current one, they indicate that quick assets can cover liabilities.

The estimation of net working capital indicates that current assets have the ability to cover current liabilities, as there are not negative results. This is also a good sign regard to liquidity of the firm, as it has the ability to invest and grow.

A general comment about liquidity is that the firm has enough liquidity each year of analysis. Although the ratios indicate decrease after 2016, they are also close enough to the limits and this does not affect liquidity.



Source: Author's calculations Figure 3: Liquidity Ratios

Table 3: Liquidity Ratios

Liquidity					
Year	2014	2015	2016	2017	2018
<b>Current ratio</b>	1.948826	2.274385	2.454139	2.125134	1.421661
<b>Quick ratio</b>	1.695184	2.12388	2.251633	1.858773	1.208859
<b>Net Working Capital</b>	271204	369239	316396	285882	172806

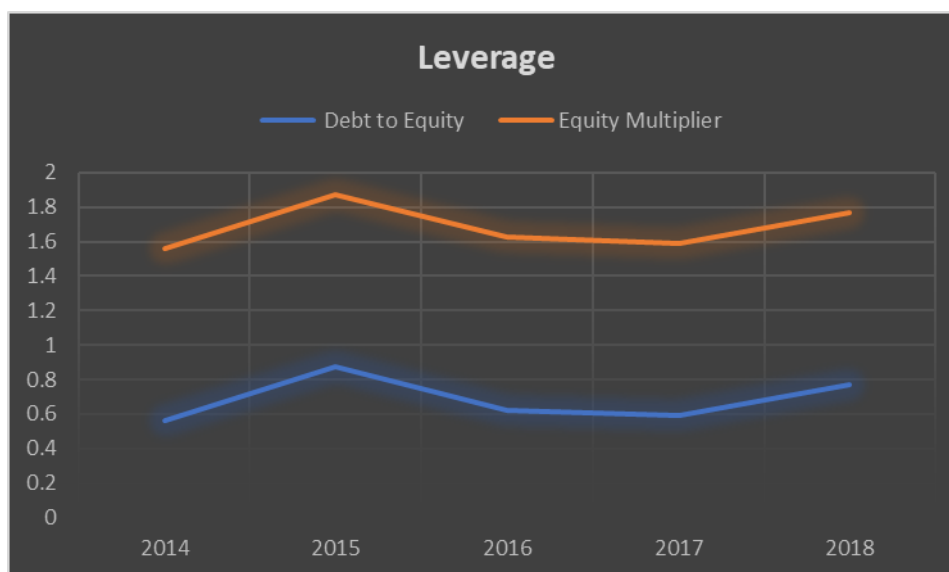
Source: Author's calculations

### Leverage

With regard to leverage, two ratios have been calculated, debt-to-equity ratio and equity multiplier. Both of them present a common course in the figure 4, but equity multiplier has a higher level in comparison with debt-to-equity. Specifically, according

to table 4, the firm has a range of debt-to-equity ratio from 0.59 in 2017 to 0.87 in 2016. Each year this ratio is under one, which means that the firm finances its activities more with its own equity than with debt. This result indicates that the risks of debt and financial leverage are limited. The ratio of equity multiplier confirms the results of debt-to-equity, as the firm chooses to finance its needs and activities with more equity than debt.

A general comment with regards to leverage is that the firm prefers more the financing through equity than debt. All the years of analysis, the ratios of leverage have small fluctuations and standard course.



Source: Author's calculations Figure 4: Leverage Ratios

Table 4: Leverage Ratios

Leverage					
Year	2014	2015	2016	2017	2018
<b>Debt to Equity</b>	0.560634	0.874492	0.623434	0.589714	0.771198
<b>Equity Multiplier</b>	1.560634	1.874492	1.623434	1.589714	1.771198

Source: Author's calculations

#### 4.4.2. Forward Freight Agreements (FFAs)

Norden purchases and sells FFAs in the market each year. The company prefers this kind of derivatives in order to participate in the market and be engaged with some risk. Moreover, the firm desires to cover the shipping days through the hedging that is

provided from FFAs. The use of FFAs is done through clearing houses in order Norden to be protected from credit risk and be carried out settlement every day.

According to the table 5, each year Norden buys or sells FFAs depending on its needs. In 2014, the firm bought the biggest quantity of FFAs in comparison with the rest years of analysis. Next year, 2015, Norden owned 33 million of FFAs, as the need of hedging was lower. Through the five years of analysis, only in 2016, the firm desired to sell 27 million of FFAs. Last two years, Norden buys FFAs again, but in a smaller quantity than the first two years. In 2017, the size of contracts was 16 million, while in 2018 was 7 million.

Table 5: Contracts of FFAs

Year	2014	2015	2016	2017	2018
FFAs (millions)	54	33	-27	16	7

Source: Author's calculations

Regarding the time period of 2014-2015, Norden chose to buy less FFA contracts. Through this period, the firm reported improvement in liquidity and profitability levels, as current and quick ratios were above two, while the losses were reduced. Furthermore, the firm had more days in order to fund outstanding activities and increased its leverage.

From 2015 until 2016, Norden changed its strategy and sells FFA contracts. Its profitability and liquidity continued the upward course with less losses and higher ratios of liquidity. However, the leverage of the firm was decreased and the cash cycle indicated less days, as the firm could be characterized as less efficient than the previous time period.

The third examined time period 2016-2017, Norden decided to buy FFA contracts again. That time, only the category of profitability was increased, while liquidity ratios were decreased. The leverage of the firm also had a small reduction, but the reduction of cash cycle is remarkable. Suddenly, the firm had half days in order to fund outstanding activities. This could be the reason why the firm chose to buy less contracts than the previous years.

The last time period, 2017 until 2018, Norden chose to buy the least amount of FFA contracts. Although the cash cycle came back to the previous levels, the rest categories of ratios had minimum or zero improvement. Profitability indicated a marginal increase, while the firm was also a little more leveraged. The indicators of liquidity presented the biggest decrease and it is the only time period, when the liquidity levels could be characterized as insufficient.

All these fluctuations in the levels of ratios regarding profitability, efficiency, liquidity and leverage influence the decisions about the purchase or sale of FFA contracts.

## 5. Conclusions

This dissertation aimed to present the forward freight agreements (FFAs) and a case study of a shipping firm, Norden A/S. It had been chosen this study, because FFAs constantly grow and there is no other study that analyzes shipping sector by using case study. The data that have been used are exclusively from the annual reports of the firm, Norden A/S, while the methodology was based on the ratio analysis of it for five years and an empirical study about the contracts of FFAs.

Regarding the case study and the choice of the firm, Norden A/S is one known and important firm in the shipping sector worldwide. It has been selected this firm, as it is one of the oldest and has presented important milestones through the years of analysis.

According to the ratio analysis, the profitability of the firm indicated a continuous evolving course, as the losses were reduced and the ratios were improved. With regard to efficiency, there were fluctuations through the five years, but the firm mainly had efficient management of receivables, payables and inventories. The indicators of liquidity also had an excellent course. Although there were some ups and downs, the firm managed to hold the liquidity in desirable levels. Lastly, the category of leverage ratios indicated a strong preference to equity financing with a stable course through the five years.

Every year of analysis, the firm chose to buy or sell contracts of FFAs based on its needs. The levels of profitability, efficiency, liquidity and leverage influenced the decisions according to the empirical study of FFAs. The decisions regarding the purchase or sale of contracts were made, based on the financial status of the firm that is depicted on the financial ratios.

As far as a further research, a recommendation could be the empirical study of FFAs by using a firm of cruises and not a commercial shipping firm. Furthermore, it could be changed the methodology. For example, an econometrical model instead of ratio analysis regarding the relationship between the contracts of FFAs and the financial course of a shipping firm.

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## Appendix

Table 6: Balance sheet & Income statement

Year	2014	2015	2016	2017	2018
<b>Net income</b>	-415634	-284918	-45591	24564	28765
<b>Total Equity</b>	1139291	856063	801406	834404	826801
<b>EBIT</b>	-335497	-281954	-64478	23315	39308
<b>Total Assets</b>	1778016	1604683	1301030	1326464	1464428
<b>Sales</b>	2038107	1653432	1251187	1808600	2451360
<b>Receivables</b>	167905	126442	129425	157901	213380
<b>COGS</b>	2307511	1639341	1233283	1751579	2382060
<b>Inventory</b>	72499	43607	44062	67679	87211
<b>Purchases</b>	2268661	1610449	1233738	1775196	2401592
<b>Payables</b>	285831	274683	212483	252749	409822
<b>Current Assets</b>	557035	658978	533979	539969	582628
<b>Current Liabilities</b>	285831	289739	217583	254087	409822
<b>Total Debt</b>	638725	748620	499624	492060	637627

Source: Norden A/S Annual Reports